How Do Health Behaviours Acquired at School Translate into the Home? The Exploration of a Photovoice Project Among Students in APPLE Schools

by

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ABSTRACT

The prevalence of sedentary behaviours, physical inactivity, and poor diets is a major public health concern in Canada and worldwide. School and home environments play a significant role in influencing such behaviours, and are ideal settings for health promotion interventions. Educational approaches such as Comprehensive School Health (CSH) recognize the importance of the partnership between the school and home to achieve optimal success. The purpose of this research was to utilize and explore a photovoice project which examined how students involved in a CSH intervention, the Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools), perceived the impact of this intervention on the home environment. Qualitative methods were used to address two objectives: 1) to gain an understanding of how students perceive the healthy eating and active living behaviours acquired in an APPLE School are translated into the home environment; and 2) to explore the utilization of a student-centered classroom photo project as a tool for teachers to determine if school-learned behaviours are reaching the home.

Objective 1 employed focused ethnography as a method, and photovoice was used as the data generating strategy. Grade 5 and 6 students (n=25) from three APPLE Schools in the Edmonton area of Alberta, Canada participated in photo taking and subsequent one-on-one interviews which explored their perceptions of how involvement in APPLE Schools impacted their home environment. Interviews were structured as per the photovoice guidelines, and were audio-recorded and transcribed verbatim. Data collection and latent content analysis occurred concurrently. Student participants aided in the analytic process during a follow-up session to ensure accurate representation of the findings through member checking. Two main themes emerged: students are internalizing APPLE Schools philosophy, and students are driving change

to create a healthy home culture. The underlying theme of leadership and decisional ownership was evident in the role that students took in addressing their health and the health of those around them. Results demonstrated that students were driving positive changes in the home environment through expanding their healthy habits by trying new things, catalyzing changes to the home food environment, engaging others in healthy eating and active living (HEAL) behaviours, and modifying unhealthy behaviours.

Objective 2 utilized a descriptive qualitative method in order to examine teacher perceptions of the process of a classroom photo project (objective 1, photovoice) as a means to determine if school-learned behaviours are reaching the home. Data generation involved analyzing researcher field notes and conducting follow-up teacher interviews (n=3). Through latent content analysis, three themes emerged which highlighted the strengths, weaknesses, and future directions of using the photovoice project in the classroom. Overall, the photovoice project appeared to be a feasible and valuable way for teachers to understand how school-learned behaviours translate home.

Knowledge translation and exchange (KTE) was achieved using a variety of techniques, including the creation of photobooks and parent newsletters, presentations to the students about the findings, one-on-one meetings with the teachers, presentations at academic conferences, and in the future, publication of manuscripts.

The findings of this research demonstrated the importance of fostering student leadership and decisional ownership in order to empower students to create, sustain, and drive changes in health behaviours within the home. As such, leadership should be considered a foundational element in the CSH framework. Further, health education teachers in all school settings could

strive to foster student leadership and decisional ownership in order to ensure healthy lifestyle behaviours are adopted and sustained. Additionally, this research highlighted the capacity within children to promote HEAL and drive behaviour changes amongst their family members. Finally, the use of a novel photovoice project resulted in a means of exploring and strengthening the collaboration between the school and the home using solely student insight and involvement. This method can be used by teachers in a variety of settings to better understand and meet the diverse needs of students in order to optimize overall success.

PREFACE

This Masters thesis is original work produced by Christine McKernan. The two research projects which are included in this thesis received ethics approval from the University of Alberta Human Research Ethics Board, under the project name "Implementation of Make the Healthy Choice the Easy Choice (APPLE Schools)" No. Pro00035108_REN3 (original ethics obtained on December 6, 2012; renewed on November 4, 2015; renewal expires on November 6, 2016). The student photovoice project was also approved by the University of Alberta Faculty of Education Cooperative Activities Program (obtained July 7, 2015).

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On a personal note, I would like to acknowledge my family for their ongoing love and encouragement. To my wonderful group of girlfriends, thank you for always being there with open ears and a glass of wine to get me through stressful times. Finally, I would like to acknowledge my boyfriend, Pierre, for keeping me on track with completing this thesis and reminding me of the adventures that lie ahead.

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LIST OF ABBREVIATIONS

APPLE Schools: Alberta Project Promoting active Living and healthy Eating in Schools

AVHPSP: Annapolis Valley Health Promoting Schools Project

BMI: Body Mass Index

CBPR: Community-Based Participatory Research

CHMS: Canadian Health Measures Survey

CSEP: Canadian Society for Exercise Physiology

CSH: Comprehensive School Health

DPA: Daily Physical Activity

FTE: Full-Time Equivalent

HEAL: Healthy Eating and Active Living

JCSH: Joint Consortium for School Health

KTE: Knowledge Translation and Exchange

MVPA: Moderate to Vigorous Physical Activity

PHAC: Public Health Agency of Canada

REAL Kids Alberta: Raising healthy Eating and Active Living Kids in Alberta

ROI4Kids: Return on Investment for Kids' Health

SES: Socioeconomic Status

SHF: School Health Facilitator

SPH: School of Public Health

WHO: World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Overview

Chapter one serves to introduce and outline the thesis. This chapter will review the rationale for the research, including current lifestyle behaviours in Canadian children and health promotion settings in Canada, and provide an introduction to the Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools). As well, this chapter will provide an overview of the research purpose and objectives, thesis attributions, and overall organization of this document.

1.2 Child Health Status and Settings for Health Promotion in Canada

The prevalence of poor diets, physical inactivity, and sedentary behaviour in Canadian children continues to be a public health problem (Freeman, Coe, & King, 2014). The majority of children's diets do not reflect that of Eating Well with Canada's Food Guide (Health Canada, 2011b, 2012), physical activity levels do not reach the age-recommended minimums advised by the Canadian Physical Activity Guidelines (Canadian Society for Exercise Physiology, 2011a; Colley et al., 2011), and sedentary behaviours exceed that of the Canadian Sedentary Behaviours Guidelines (Barnes, Colley, & Tremblay, 2012; Canadian Society for Exercise Physiology, 2011b). As such, the risk of both short and long term adverse health outcomes such as diabetes, high blood pressure, heart disease, and certain cancers are increased, and the overall prevalence of overweight and obesity in Canadian children continues to grow (Roberts, Shields, de Groh, Aziz, & Gilbert, 2012; Sahoo et al., 2015). A variety of complex and interconnected factors influence lifestyle behaviours in children, and as such changing these behaviours is often difficult.

Both the school and the home are ideal settings for health promotion efforts targeting children, as kids spend the majority of their time within these two places (Epstein, 2011). However, multifaceted health promotion interventions which incorporate both environments simultaneously are particularly vital for influencing lifestyle behaviours, as children's health decisions are supported from multiple individuals and locations (Langford et al., 2015b; Sobol-Goldberg, Rabinowitz, & Gross, 2013; Wang et al., 2013).

In recent years, health promotion efforts have increasingly focused on the school setting, as children can be broadly reached through schools (Fung et al., 2012; World Health Organization, 1998). From an educational standpoint it is important to link health behaviours to educational outcomes to rationalize the time spent promoting health. Children's diet quality is associated with academic performance (Florence, Asbridge, & Veugelers, 2008), and research suggests that physical activity may enhance students' academic performance (Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001; Faught, Montemurro, Storey, & Veugelers, 2016). Studies also conclude that despite less time being spent studying these subjects, increasing the amount of class time allocated to physical activity results in students maintaining their academic performance (Ahamed et al., 2007; Trudeau & Shephard, 2008), while also getting the added health benefits that result from being active (Bailey, 2006). As such, there is good evidence to justify health promotion efforts in schools. However, in order for school-based health promotion interventions to be effective, it is important for such effects to be supported by the home. Although deemed important, the relationship between the school and home is often difficult to establish and measure (Baranowski et al., 2000; Lytle et al., 2006; Reynolds et al., 2000; Sormunen, Tossavainen, & Turunen, 2011).

Relevant research examining the translation of school-learned behaviours into the home is lacking and primarily includes studies which targeted school-based environmental programs (Ballantyne, Fien, & Packer, 2001b; Larsson, Andersson, & Osbeck, 2010; Legault & Pelletier, 2000; Vaughan, Gack, Solorazano, & Ray, 2003). Given the increase in health promotion interventions in schools and the potential impact these interventions can have on the home environment, it is important to examine if topics learned in school are translated home. Student development is maximized when the school and home work together to support children's behaviours (Cox, 2005; Epstein, 1992), and comprehensive interventions which include parent support are linked to greater success (Sobol-Goldberg et al., 2013). It is important maximize the effectiveness of school-based health promotion initiatives in order to justify the investment of time, money, and resources from schools. Understanding the translation of school-based interventions into the home is therefore of great value from both a research and educational standpoint. However, there is limited research regarding the extent to which school-based health promotion projects translate into the home environment.

1.3 APPLE Schools

APPLE Schools is a health promotion intervention that exists in 50 school communities across the province of Alberta, Canada. APPLE Schools takes a comprehensive school health (CSH) approach to health promotion in order to create, support, and sustain healthy school communities in an integrated and holistic manner (APPLE Schools, 2008). Schools aims to shift their entire culture to one that embraces healthy eating and active living (HEAL), and engages stakeholders in the school, home, and community (APPLE Schools, 2015; Joint Consortium for School Health, 2016). A unique characteristic of APPLE Schools is that schools are initially provided with dedicated staff time in order to support and create healthy changes within the

school. In collaboration with the school community, school health facilitators (SHF) are responsible for learning and understanding what the specific health needs of the school are, and engage students, teachers, administrators, and parents to facilitate a shift in school culture. As such, each APPLE School is distinctly unique as the intervention is based on schools' contextual needs and requirements.

Extensive process and outcome evaluation of APPLE Schools has been conducted in order to determine the effectiveness of the project and to understand a variety of stakeholder roles in the project's implementation and sustainability (Fung et al., 2012; Roberts et al., 2015; Storey, Cunningham, Spitters, Schwartz, & Veugelers, 2012b; Storey, Spitters, Cunningham, Schwartz, & Veugelers, 2011; Tran, Ohinmaa, Kuhle, Johnson, & Veugelers, 2014; Vander Ploeg, Maximova, McGavock, Davis, & Veugelers, 2014a). APPLE Schools has been successful in promoting HEAL behaviours in children, and as such has been recognized by the Public Health Agency of Canada (PHAC): Canadian Best Practices Portal and the National Institutes of Health: Research-tested Intervention Programs (National Cancer Institute: Research Tested Intervention Programs, 2015; Public Health Agency of Canada, 2011). Previous studies involving the implementation of APPLE Schools have explored the roles of the teachers, SHF, and administrators (Roberts et al., 2015; Storey et al., 2012b; Storey, Montemurro, Schwartz, Farmer, & Veugelers, 2015; Storey et al., 2011). These studies have provided important insight into our understanding of each stakeholder position. The role of the student is vital yet thus far unexplored, therefore further investigation into the students' perspectives is necessary in order to maximize implementation success.

1.4 Rationale

Implementation research is necessary to inform and improve APPLE Schools by providing an understanding of the process of implementation as well as to determine the role of key stakeholders within the project. Students' needs influence and shape the implementation of APPLE Schools, and as such an exploration into their perspectives on the project is highly warranted. The school and home greatly influence and determine child health behaviours, and it is also known that children's influence within the home environment has become more significant over time (Epstein, 2011; Flurry, 2007). Further, school and home partnerships are essential in order to promote the utmost success for both students and teachers (Epstein, 1992; Starkman, 2006). It is thought that because the CSH framework recognizes the importance of integrated school, home, and community support (Pan-Canadian Joint Consortium for School Health, 2008), efforts in the school to promote health will be translated to the home environment. However, it has been frequently recognized that the most challenging objective for CSH projects is engaging family members in these interventions (Langford, Bonell, Jones, & Campbell, 2015a). As APPLE Schools recognize the importance of multi-component health promotion efforts targeting the school, home, and community, students may play a key role in facilitating the translation of health promoting behaviours into the home. The relationship between APPLE Schools and the home environment must therefore be explored in order to determine the extent to which health behaviours learned at school are present within the home environment.

When teachers understand the unique and diverse needs of their students, they are able to adapt their teaching styles and lessons to foster greater student success (Starkman, 2006). Parent-teacher relations are typically utilized as the central means for schools to collaborate with the home (Crozier, 1998), however these relations are often infrequent and do not capture the needs of the entire student body (Bergnehr, 2015). Exploring student-centered approaches to

understanding this relationship may provide valuable insight into how we can strengthen the partnership between school and home. Incorporating students' perceptions may also allow for insight into if and how behaviours acquired at school are translated into the home. An exploration of novel approaches to incorporating student understandings is therefore required in order to investigate this phenomenon in addition to relying purely on teacher-parent relations.

1.5 Research Purpose and Objectives

This research will be driven by qualitative inquiry and will align with a participatory approach. Through focused ethnography, students' perspectives will be gathered using the photovoice data generating strategy (which involves photo taking and semi-structured interviews) in order to explore how students perceive their involvement in a CSH project, APPLE Schools, impacts select health behaviours in the home environment. A descriptive qualitative method will be used to explore the implications of using photovoice from both an educational and research standpoint. Detailed researcher field notes, journaling, and follow-up interviews with the teachers will serve as the data generating strategy. The research objectives of this thesis are to:

1. Gain an understanding of how students perceive the HEAL behaviours acquired in an APPLE School are translated into the home environment.
2. Explore the utilization of a student-centered classroom photo project as a tool for teachers to determine if school-learned behaviours are reaching the home.

1.6 Thesis Attributions

This thesis is a component of my Master of Science in Health Promotion from the University of Alberta School of Public Health (SPH). The SPH has worked closely with APPLE Schools since 2008, as an SPH research team was responsible for the initial conceptualization of the

intervention and is tasked with conducting the ongoing research and evaluation. Since its inception, a strong partnership between APPLE Schools and the SPH has been maintained. This relationship resulted in support and insight from the APPLE Schools management team throughout the process of conducting my thesis research. APPLE Schools has proven to be an effective school-based health promotion intervention; research has demonstrated its impact on improving physical activity levels and dietary patterns in children, as well as decreasing the prevalence of overweight and obesity in children who attend such schools (Fung et al., 2012). Due to the strength of previous research to support the effectiveness of APPLE Schools on children's HEAL behaviours, I have had the unique opportunity to explore a topic that is novel to both our understanding of CSH specifically, and our broad understandings of school-based health promotion interventions.

My thesis research fits within a larger five year research project titled Return on Investment for Kids' Health (ROI4Kids). ROI4Kids consists of six objectives, and aims to evaluate school-based health promotion projects in order to evaluate their effectiveness, estimate their cost-savings, optimize their implementation, and enhance knowledge dissemination and use (School of Public Health, 2016a). Specifically, my findings contribute to objective 3: optimizing the process of implementing and delivering school health programs and policies (School of Public Health, 2016b). My initial research question was formulated with this objective in mind, in addition to understanding the values of CSH and APPLE Schools and the scope of previous research conducted on the project. Objective 1 aligns with focused ethnography, because it involves the exploration of the culture of a defined population of interest, APPLE Schools, in the context of a specific research question. I chose to utilize photovoice as my data generating strategy as the approach has been used successfully in previous participatory research with

children, it aligns with the community-based participatory research (CBPR) nature of APPLE Schools, and through discussions with my supervisor, we agreed that using visual means may be an effective way to capture children's perceptions in order to explore the research question. My research intends to add to the overall understandings of APPLE Schools by exploring the mechanisms and extent to which behaviours fostered in an APPLE School are translated into the home. These findings will provide greater insight into the process of successfully implementing both APPLE Schools and CSH projects in general.

The concept of objective 2 emerged as the photovoice project was being conceptualized. As well, in conducting the photovoice project I was impressed with the level of student engagement and quality of responses that were provided. It was clear that the use of photovoice was pivotal to the success of the research. After discussions with my committee about the photovoice project, we agreed that photovoice may be a feasible way for teachers and educators in general to determine how school lessons are translated home. As such, I contacted the teachers for follow-up interviews in order to gather their overall feedback about participating in the project in additional to my field notes and journals.

The two research projects within this thesis were shaped, conducted, and completed by myself as original work. With the support and guidance of my supervisor and committee members, I was responsible for conceptualizing the original idea for this research, formulating the research questions, deciding on the methods, obtaining ethical approval, and conducting the data collection, analysis, and writing. As such, all stages of this research were driven by my decisions and actions. I facilitated each of the sessions with the school communities, and was actively involved in all stages of the planning and decision-making processes. All forms of knowledge translation were produced by myself and distributed with my knowledge and

agreement. As a result, this thesis presents original data that was developed and conducted in its entirety by myself and my thesis committee.

1.7 Thesis Organization

This paper-based thesis is organized into five chapters, of which chapters three and four represent stand-alone manuscripts which will independently address the above two objectives. Chapter two provides a comprehensive review of pertinent literature relating to this thesis topic. Topics in the literature review include: the status, determinants, and outcomes of select child health behaviours (diet, physical activity, and sedentary behaviours); the role of the home environment in influencing child health behaviours; the child's role in influencing and changing the home environment; an exploration of the CSH framework; the intervention of interest: APPLE Schools; and finally, the significance of the current thesis research. This thesis concludes with a final chapter which summarizes the full body of literature, research findings, and provides implications and an exploration of future directions for this research. References and appendices are located at the end of the thesis.

CHAPTER 2: LITERATURE REVIEW

2.1 Child Nutrition, Physical Activity and Sedentary Behaviour Status in Canada

Eating a healthy diet and being physically active are important lifestyle behaviours that must be supported in children and youth as a means of improving growth and development, health status, and overall quality of life (Health Canada, 2014; Sparling, Franklin, & Hill, 2013). Monitoring sedentary behaviours is also of great importance, as reduced sedentary behaviours are associated with positive health effects which are independent to that of simply increasing physical activity levels (Tremblay, Colley, Saunders, Healy, & Owen, 2010; Tremblay et al., 2011b). By not adhering to healthy lifestyles, many children and youth experience poor health outcomes, lower quality of life, and are at an increased risk of overweight and obesity (Lobstein et al., 2015). The sections below will provide an overview of the overall nutrition, physical activity, and sedentary behaviour status of Canadian children and youth, as well as the determinants and health implications of these lifestyle behaviours and trends.

2.1.1 Healthy eating among Canadian children: status, determinants and outcomes

Canadians are encouraged to eat a healthy and balanced diet as per the age-specific guidelines set by Eating Well with Canada's Food Guide (Health Canada, 2011b). Canada's Food Guide was introduced in 1992, and since then has evolved into its most current guidelines released in 2007 (Katamay et al., 2007). The present daily intake recommendations for children aged 9-13 years include the following: 6 servings of Vegetables and Fruit, 6 servings of Grain Products, 3-4 servings of Milk and Alternatives, and 1-2 servings of Meat and Alternatives (Health Canada, 2011b). Health Canada also provides healthy eating recommendations to parents such as to provide children with small, nutritious snacks and meals throughout the day; offer a variety of foods from each of the food groups; use water to quench thirst; be patient with

a child's food choices and allow for autonomy in food selection; and be a good role model for healthy eating (Health Canada, 2011a). Unfortunately, strong evidence supports the fact that the diets of Canadian children do not reflect these current guidelines (Black & Billette, 2013; Garriguet, 2007; Shields, 2005, 2006). Recent results from a provincial health survey of Grade 5 children in Alberta, Canada concluded that the following percentage of children were meeting the recommended number of food guide servings per day: Vegetables and Fruit, 30%; Grain Products, 15%; Milk and Alternatives, 54%; Meat and Alternatives, 84% (REAL Kids Alberta, 2015). This evidence demonstrates the fact that diet trends in Canadian children and youth are of public health concern. The Canadian Community Health Survey (CCHS) conducted in 2004 concluded that children and adolescents have major improvements to make in their dietary habits. Between 60% and 70% of children and youth do not consume enough Vegetables and Fruit, while only one third of children and youth consume the recommended servings of Milk and Alternatives per day (Garriguet, 2007). It is important to note that these conclusions are based on comparisons with the previous food guidelines in Canada, which have been since updated in 2007 (Katamay et al., 2007). Results from the CCHS also indicated that 20% of Canadian children aged 1 to 8 years and 30% of adolescence aged 9 to 18 years were exceeding their daily energy intake (Health Canada, 2012). The study concluded that children and adolescents were below adequate intakes of vitamin A, vitamin D, magnesium, phosphorus, calcium, potassium and fibre, while sodium levels were consistently above the upper recommended limit (Centers for Diseases Control and Prevention, 2014, 2015b; Health Canada, 2012). Additionally, only 32% of males and 47% of females over the age of 12 years reported consuming at least five servings of Vegetables and Fruit per day (Statistics Canada, 2015). A 2007 independent report found that only 25% of Canadian children were getting the minimum

recommended daily serving of Grain Products, 50% of children were meeting the recommended guidelines for Vegetables and Fruit, and approximately 30% of children were consuming one or more soft drinks per day (Breakfast for Learning, 2013). Findings also showed that approximately 30% of Vegetable and Fruit intake was accounted for by the consumption of fruit juice (Black & Billette, 2013).

Children's dietary behaviours are influenced by a wide range of individual, social, economic, and physical determinants (Taylor, Evers, & McKenna, 2005). At the individual level, children's preferences for taste and their nutritional knowledge influence their food selections, as do biological factors such as age and gender (Taylor et al., 2005). Children's diet choices are highly dependent on their parents or caregivers, as they are the gatekeepers to their child's health (Natale et al., 2014). Parents are typically responsible for food purchasing, meal selection, and preparation and as such are responsible for the overall home food environment including what, when, and how much their child eats on a regular basis (Couch, Glanz, Zhou, Sallis, & Saelens, 2014; Ventura & Birch, 2008). Parental encouragement, role modelling, personal food preferences, and involvement of the child in meal preparation have also been shown to highly influence child food choices (Chu, Storey, & Veugelers, 2014; Faught, Vander Ploeg, Chu, Storey, & Veugelers, 2015; Scaglioni, Salvioni, & Galimberti, 2008). Family socioeconomic status (SES) has been linked to outcomes of child nutrition and dietary intake, as children from higher SES households are more likely to have healthier dietary behaviours such as higher vegetable intake and lower sugar-sweetened beverage consumption (Ahmadi, Black, Velazquez, Chapman, & Veenstra, 2015). A possible explanation for this could be that in low income neighbourhoods, there tends to be less variety and availability of healthy food options

such as fresh produce (Latham & Moffat, 2007), while the abundance of fast-food restaurants in these areas is typically much greater (Larson, Story, & Nelson, 2009).

More broadly, schools, and in particular the social and physical environments, also play a significant role in influencing eating behaviours of children (Browning, Laxer, & Janssen, 2013). In Canada, however, research has found that only 53% of schools have implemented healthy eating programs and/or school health committees, and that the majority of schools have vending machines, are located nearby a convenience store, or are within one kilometre of a fast-food restaurant (Browning et al., 2013). Research into the implementation of a federal policy on healthy eating in schools has also been explored (Leo, 2007; Olstad & Ball, 2015), as provinces and territories in Canada are currently independently responsible for developing and implementing such policies with their school systems (Vine & Elliott, 2014). As such, recommendations for standardizing, implementing, and funding school nutrition programs has been suggested in a variety of studies in order to promote and improve healthy eating habits in children and youth (Downs et al., 2012; Fung, McIsaac, Kuhle, Kirk, & Veugelers, 2013; Leo, 2007; Mâsse & de Niet, 2013).

Healthy eating is linked to many positive health outcomes, including maintaining a healthy body weight, preventing high blood pressure and high cholesterol, reducing the risk of many diseases such as diabetes, cancers, heart disease and oral health, and promoting overall optimal growth and performance (Centers for Diseases Control and Prevention, 2015b). It has been established that diet quality is related to overall academic performance (Florence et al., 2008), and correspondingly, schools which provide nutritional support such as breakfast programs have been shown to result in increased school performance (Frisvold, 2015; Hoyland, Dye, & Lawton, 2009). Higher quality diets, such as diets high in vegetables and fruit and

nutrient-dense foods are also associated with greater positive mental health outcomes (O'Neil et al., 2014). Thus, maintaining a healthy diet in all living environments is important. Although research is limited, the childhood food environment may influence eating habits into adulthood thus suggesting the long-term implications of the dietary behaviours that develop in childhood (Schwartz & Puhl, 2003). Healthy eating behaviours should therefore be carefully instilled throughout childhood and adolescence by using a multi-sectoral approach including the school, home, and community to ensure diet behaviours are encouraged in an inclusive and comprehensive manner (Public Health Agency of Canada, 2010; Wang et al., 2013).

2.1.2 Physical activity among Canadian children: status, determinants and outcomes

Daily physical activity is encouraged for all Canadians. The Public Health Agency of Canada recommends following the age-appropriate guidelines established by the Canadian Society for Exercise Physiology (CSEP) (Public Health Agency of Canada, 2014). The Canadian Physical Activity Guidelines for Children and Youth state that children aged 5-17 years should acquire a minimum of sixty minutes of moderate to vigorous physical activity (MVPA) each day, including at least three days of vigorous activity and at least three days of muscle and bone strengthening activities per week (Canadian Society for Exercise Physiology, 2011b). MVPA refers to activities that are four to seven times the intensity that children require at rest, and as such are activities which increase the heart rate and cause an individual to sweat or breathe heavier to an extent that the individual may be out of breath (Canadian Society for Exercise Physiology, 2015). Unfortunately, the number of children and youth who achieve the CSEP recommended daily activity levels is staggeringly low. The 2015 ParticipACTION Report Card on Physical Activity for Children and Youth reported only 9% of Canadian children and youth are getting sixty minutes of MVPA activity per day, which is a slight improvement from

the reported 7% of children in 2009 (Colley et al., 2011; Tremblay, Barnes, & Janson, 2015). While demonstrating small improvements, these findings align with similar reports which state that trends in child and youth physical activity have remained consistently low over the past twenty years (Booth, Rowlands, & Dollman, 2015). Additionally, the Canadian Physical activity Levels Among Youth (CANPLAY) study found that the number of steps that children and youth take per day has actually decreased from an average of 11,500 - 11,700 steps between 2005-2007 to 11,000 steps between 2011-2014 (Canadian Fitness & Lifestyle Research Institute, 2014) and the most recently published report by the Canadian Health Measures Survey (CHMS) found that 97% of MVPA that is done by children is at a moderate level as opposed to vigorous (Colley et al., 2011). These statistics clearly demonstrate the need for improved activity in terms of frequency, duration, type, and intensity in children and youth.

Physical activity levels in children are influenced by a variety of biological, psychological, sociocultural, and environmental factors, including sex, age, parent support, peer influence, family SES, and the physical environment (Sallis, Prochaska, & Taylor, 2000; Sterdt, Liersch, & Walter, 2014). Previous research has shown that boys are consistently more active than girls; the CHMS found that on average, boys obtained 11 to 14 more minutes of MVPA per day than girls (Colley et al., 2011). However, physical activity levels tend to decrease in both genders as children move into adolescence (Canadian Fitness & Lifestyle Research Institute, 2014; Tremblay et al., 2015). Studies have shown that parents' positive support can be a greater determining factor for their child's physical activity adherence than role modelling (Erkelenz, Kobel, Kettner, Drenowatz, & Steinacker, 2014; Trost & Loprinzi, 2011), and parental encouragement and parent engagement in physical activity with their child has been shown to result in higher reported physical activity in these children (Vander Ploeg, Maximova, Kuhle,

Simen-Kapeu, & Veugelers, 2012). Although the relationship between parental support and physical activity levels has been shown to be greater amongst boys compared to girls, parental support, involvement, and care positively influence physical activity levels in both genders (Vander Ploeg et al., 2013). Peers also play a significant role in determining physical activity levels. Barkley et al. (2014) found that children who participated in an activity session with a friend had 54% greater average accelerometer counts than children who played by themselves, and many other studies have concluded that peers' perceptions of physical activity plays a significant role in determining a child's activity level (Barkley et al., 2014; Fitzgerald, Fitzgerald, & Aherne, 2012; Macdonald-Wallis, Jago, & Sterne, 2012; Maturo & Cunningham, 2013). It is well established that the physical environment plays a substantial role in determining activity levels in children and youth (Carroll-Scott et al., 2013; Davison & Lawson, 2006; Janssen & Rosu, 2015; Oliveira, Moreira, Abreu, Mota, & Santos, 2014). Many factors of the physical (built) environment, including availability of green space, sidewalks and trails, residential density, safety, proximity of parks and playgrounds, and neighbourhood design can play a role in determining the level of active transport and free and structured play that occurs within a child's neighbourhood (Ding, Sallis, Kerr, Lee, & Rosenberg, 2011; Sallis & Glanz, 2006). The 2015 ParticipACTION Report Card on Physical Activity for Children and Youth stresses the importance of outdoor free play in order to increase both the duration and intensity of children's activity levels (Tremblay et al., 2015). The report recommends an increase in active outdoor play for all children and youth, as unsupervised and potentially "risky" outdoor play has been shown to have positive effects on children's activity levels and overall health.

Schools also play a significant role in determining children's physical activity levels (Kretschmann, 2014; Tremblay et al., 2015). Schools provide opportunities for children to be

physically active during recess time, physical education class, intramural and interscholastic sports, and in free time settings before and after school (Physical & Health Education Canada, 2016). As a result, children typically get a significant amount of their physical activity each day during school hours (Alderman, Benham-Deal, Beighle, Erwin, & Olson, 2012; Dessing et al., 2013; Gidlow, Cochrane, Davey, & Smith, 2008). Within the province of Alberta, a daily physical activity (DPA) initiative was implemented in schools in 2005 by Alberta Education in order to ensure children are active on a daily basis. This policy states that "school authorities shall ensure that all students in grade 1 to 9 are physically active for a minimum of 30 minutes daily through activities that are organized by the school" (Alberta Education, 2008, p. 8). This policy and its guiding principles of inclusion, variety, and student autonomy allow for increased opportunities for students to be physically active throughout the day in order to increase the likelihood of them reaching the 60 minutes of activity per day recommended by CSEP's Physical Activity Guidelines. Further, Alberta Education recommends that 10% of the school year time be allocated to Health, Life Skills, and Physical Activity subjects (Alberta Education, 2015).

It is evident that low levels of activity in children and youth continues to be an ongoing health issue, specifically because insufficient activity can lead to a variety of adverse health issues and cardio metabolic risk factors (Ekelund et al., 2012; Janssen & LeBlanc, 2010). Benefits of regular physical activity include building and maintaining healthy bones and muscles, improved psychological wellbeing, decreased risk of chronic diseases such as heart disease, high blood pressure and diabetes, maintenance of a healthy body weight, and enhanced academic performance (Centers for Diseases Control and Prevention, 2015c; U.S. Department of Health and Human Services, 2008). Although the CSEP guidelines provide specific recommendations (i.e. minutes) for physical activity, research has also shown that even modest

increases in exercise should not be discounted, as they too have positive health benefits (Janssen & LeBlanc, 2010). In this regard, small improvements in children's physical activity levels should be celebrated, even if they do not fully adhere to the CSEP recommendations.

Some studies suggest that physical activity levels in childhood may predict or influence activity levels in adulthood, but these findings are mixed (Bélanger et al., 2015; Telama et al., 2014). However, regular daily physical activity has many positive implications for children and youth, including reducing the risk of high blood pressure, metabolic syndrome, depression, and overweight and obesity (Janssen & LeBlanc, 2010). As such, the need for intervention approaches which promote and encourage regular physical activity in the school, home, and community is vital in order to increase activity levels in children and mitigate the adverse health effects that exist when physical activity is not consistently achieved (van Sluijs, McMinn, & Griffin, 2008).

2.1.3 Sedentary behaviours among Canadian children: status, determinants and outcomes

As lifestyle trends in children and youth continue to be examined, new recommendations have emerged. In addition to promoting an increase in daily physical activity, the importance of encouraging less sedentary behaviour has also been acknowledged. Sedentary behaviours are defined as "postures or activities that require very little movement" (Canadian Society for Exercise Physiology, 2015) or "activities that do not increase energy expenditure substantially above the resting level" (Pate et al., 2006). Children's sedentary behaviours most commonly consist of screen time activities such as television viewing, using the computer, and playing video games, but can also include non-screen activities such as using motorized transportation,

reading a book, doing homework, and eating (Engelen et al., 2015; Herman et al., 2015a; LeBlanc et al., 2015a; LeBlanc et al., 2015b; Tremblay et al., 2011b).

Too much sedentary behaviour results in health issues that are independent of those relating to a lack of physical activity, and as such CSEP implemented the Canadian Sedentary Behaviour Guidelines in 2011 (Canadian Society for Exercise Physiology, 2012; Tremblay et al., 2011b). The guidelines for children and youth aged 5 to 17 years are as follows:

- reduce recreational screen time to no more than 2 hours per day
- limit sedentary transport, sitting, and indoor time as much as possible throughout the day (Canadian Society for Exercise Physiology, 2012).

Active transport and play are encouraged before and after school and during leisure time, while modest improvements to sedentary behaviour levels are to be acknowledged and encouraged for children who significantly exceed the screen time recommendations. The most current research regarding sedentary behaviour in Canadian children and youth comes from the 2007-2009 CHMS, which states that the average child spends 8.6 hours per day in sedentary behaviours, equating to 507 minutes (girls) to 524 minutes (boys), or 62% of a child's waking day (Colley et al., 2011). These national findings mirror the estimated 8.6 hours per day of child sedentary behaviours that are recorded on a world-wide basis (LeBlanc et al., 2015b). A recent study on screen time behaviours found slightly more favourable results, concluding that only one-third (37%) of children aged 5-13 years exceed the suggested daily screen time recommendations (Pujadas Botey, Bayrampour, Carson, Vinturache, & Tough, 2016). Concern grows because similar to how physical activity levels may decrease as a child gets older, sedentary behaviours are shown to increase as a child ages (Rutten, Boen, & Seghers, 2014). Sedentary behaviour stems from a variety of lifestyle trends in children and youth which will be explored below, and

contribute to the increased concerns regarding adverse child health status in Canada (Chakravarthy & Booth, 2003; Rey-López, Vicente-Rodríguez, Biosca, & Moreno, 2008; Tremblay et al., 2011b).

Sedentary lifestyles in children have been linked to a variety of factors, including parental SES and role modelling, the number of televisions in the home, household automobile ownership, and electronics in the bedroom (LeBlanc et al., 2015b). Research has shown that the home environment plays a significant role in determining sedentary behaviours in children. Rutten et al. (2015) and Tandon et al. (2012) found that children in lower SES households had both greater access to electronic devices (video games, televisions) in their bedrooms as well as more restrictive rules about physical activity and outdoor play, and as result overall screen time and consequently sedentary behaviours were higher (Rutten, Boen, & Seghers, 2015; Tandon et al., 2014). Sedentary behaviour is shown to be greater in all children, regardless of SES, when a television or computer is present in the bedroom (LeBlanc et al., 2015b). Additionally, parental and family role modelling has been shown to greatly influence both sedentary and physical activity behaviours in children (Granich, Rosenberg, Knuiman, & Timperio, 2011) such that when families are active together, the child's overall sedentary behaviour is significantly lower and physical activity levels are also improved (Xin, Qing-Min, Yan-Jun, Jun, & Li-Ming, 2015). Similar to recommendations for increasing daily physical activity, a review by Gray et al. suggests that more time outdoors should be encouraged as a means of decreasing sedentary behaviours (Gray et al., 2015).

The associated health impacts of sedentary behaviour differ from that of not acquiring enough daily MVPA (Hamilton, Hamilton, & Zderic, 2004; Tremblay et al., 2011a). Screen time is significantly related to an increase in metabolic syndrome, to the extent that the chances of

having metabolic syndrome are two to three times greater in youth when screen time is over three hours per day compared to youth who only spend one hour per day in front of a screen in sedentary pursuits (Mark & Janssen, 2008). Sedentary behaviour has been linked to poor bone and vascular health, increased risk of diabetes and some cancers, and poorer psychosocial health (Pate, O'Neill, & Lobelo, 2008; Tremblay et al., 2011a). Additionally, screen-based sedentary behaviours have been associated with additional negative health outcomes such as metabolic dysfunction, increased risk of diabetes, increased blood pressure, reduced bone mineral density and vascular health, as well as decreased overall self-rated health (Hamburg et al., 2007; Herman, Hopman, & Sabiston, 2015b; Iannotti, Kogan, Janssen, & Boyce, 2009; Tremblay et al., 2010). The current trends in sedentary behaviours in Canadian children and their corresponding negative health impacts signify the importance of reducing sedentary behaviours in children and youth. Innovative and comprehensive approaches to decreasing sedentary behaviours in children and youth are of utmost importance in order to improve the health status of Canadian children and promote healthy lifestyle behaviours in the future. Interventions which take a multifaceted approach to promoting healthy living through balanced eating, active living, and reducing sedentary activities are ideal in order to achieve improved health by means of addressing all three of the lifestyle behaviours explored in this section in a unified manner (Sparling et al., 2013; Wang et al., 2013).

2.1.4 Overweight and obesity in Canadian children: status, determinants, outcomes and potential solutions

Childhood overweight and obesity are major public health problems in Canada and worldwide. According to the 2009 to 2011 CHMS, 19.8% of Canadian children are currently living with overweight and 11.7% with obesity, which equates to 1.6 million, or over 30% of

Canadian children and youth aged 5 to 17 years (Roberts et al., 2012). Children with obesity are at a greater risk of developing type 2 diabetes, hypertension, cardiovascular disease, many types of cancer, bone and joint problems, sleep apnea, and mental health issues associated with stigmatization and bullying (Alberta Health Services, 2010; Centers for Diseases Control and Prevention, 2015a). Obesity is also known to track into adulthood, making children with obesity much more likely to have overweight or obesity in adulthood compared to healthy weight children (Singh, Mulder, Twisk, van Mechelen, & Chinapaw, 2008). Additionally, Hirko et al. found that all-cause and cause-specific mortality ratios were 19% and 64% higher for adults who were overweight or obese as adolescents, respectively (Hirko et al., 2015). It is therefore imperative that healthy lifestyle behaviours begin in childhood in order to ensure quality of life is maintained across the lifespan.

Overweight and obesity stem from a variety of diverse and complex factors, including biological, social, and psychological influences. The World Health Organization (WHO) recognizes that the global increase in overweight and obesity is caused by a number of factors, in particular a shift in diets consisting of an increased intake of energy dense, nutrient poor foods, decreased physical activity, and increased sedentary behaviours (World Health Organization, 2016c). It is evident that Canadian children are not meeting the recommended guidelines for these three health behaviours, and as such interventions targeting these factors are of great importance. Fostering healthy eating and active living (HEAL) behaviours is therefore an important component of such interventions.

Interventions and research involving lifestyle factors relating to childhood overweight and obesity are focused heavily on school-based health promotion programs, however the need for such interventions to include components of both the home and community environments has

been identified as a crucial factor for success (Wang et al., 2013). It is also critical to understand how these settings are working together to support health promotion initiatives in a uniform manner, as school-based interventions which include a family or home component are shown to be particularly vital for the promotion of physical activity in children and youth (Sobol-Goldberg et al., 2013; van Sluijs et al., 2008). Nevertheless, research has identified that engagement with families is often a challenging element of school-based health interventions, and as such opportunities for family involvement need to be further explored (Langford et al., 2015a). Understanding the role of the parents and family is essential in order to appreciate how the home environment shapes and influences child health behaviours. This, in turn, can help to inform the significance of the home environment in the overall success of school-based health interventions and school learning in general.

2.2 The Role of the Home Environment in Promoting HEAL in Children

Children spend the majority of their time in either the school or the home environment, so it is understandable that these settings significantly influence their HEAL behaviours. The home environment plays a distinct role in developing and influencing children's behaviours, yet partnerships between the school and home are essential because these two environments often foster a mutual and overlapping influence (Epstein, 2011; Epstein, 1992). A child's home is increasingly recognized as an informal site for learning and adapting health practices (Quarmby & Dagkas, 2015), and as such the family guides overall health behaviours and outcomes (Gruber & Haldeman, 2009). The physical and social environments of the home will be explored in greater detail in this section in respect to their influence on children's HEAL behaviours.

2.2.1 The physical environment of the home

The physical environment influences and shapes daily lifestyle patterns, and consists of one's home, neighbourhood, and the physical components of the surrounding community such as buildings, roads, and nearby facilities (Sallis & Glanz, 2006). Therefore, the physical environment of the home consists not only of the resources within the home (things such as foods, sporting equipment and electronics) and physical layout of the house, but also includes the features of the surrounding neighbourhood. The constructs of the physical home environment will be explored in this section in order to identify their role in determining children's HEAL behaviours.

2.2.1.1 HEAL within the home: resource availability and accessibility

The opportunities and options available to a child in their physical environment play an important role in determining eating habits and physical activity levels in the home. In regards to nutrition and dietary intake, availability and accessibility of food choices in the home environment play a significant role in determining a child's diet. Food availability is defined as the presence of a certain food within the environment, while accessibility refers to the state in which the foods have been prepared, presented, and/or maintained in order to promote consumption (Hearn et al., 1998). The types of foods which parents purchase and make available in the home environment impact their child's food choices and overall dietary quality and intake. This is particularly true in terms of vegetable and fruit consumption, as availability and accessibility are strong predictors of consumption (Amuta, Jacobs, Idoko, Barry, & McKyer, 2015; Blanchette & Brug, 2005; Cullen et al., 2003; Hearn et al., 1998). For children with a strong preference for fruits, fruit juices, and vegetables, Cullen et al. (2003) found that availability of these food choices within the home environment was a strong predictor of

consumption. In children with low fruit, fruit juice, and vegetable preferences, both the availability and accessibility of these options was necessary within the home in order to predict consumption (Cullen et al., 2003). In some studies, availability and accessibility have been shown to be more powerful determinants of dietary habits than child taste preference (Neumark-Sztainer, Story, Hannan, & Rex, 2003; Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). It is important to note, however, that availability and accessibility influence both healthy and unhealthy eating practices. Research into children's fruit and vegetable intakes and soft drink consumption revealed that intakes are higher in both regards when there is a greater availability within the home (Kunin-Batson et al., 2015; Reinaerts, De Nooijer, Candel, & De Vries, 2007; Verloigne, Van Lippevelde, Maes, Brug, & De Bourdeaudhuij, 2012). Children who have access to soft drinks and sugar sweetened beverages less frequently in the home are less likely to consume them, as the availability and ease of access are reduced (Grieken, Renders, Gaar, Hirasing, & Raat, 2015; Verloigne et al., 2012). As such, children's food choices are strongly influenced by the availability and accessibility of the foods within the home environment, thus demonstrating the significance of the physical environment of the home.

Access to activity and recreational resources such as sports equipment within the home have been shown to predict child physical activity, while an increase in media and electronic devices in the home such as televisions, computers, and game consoles has been correlated with greater child sedentary behaviours (Maitland, Stratton, Foster, Braham, & Rosenberg, 2013). Media equipment in the home, and particularly in the bedroom, has been linked to a decrease in child physical activity, an increase in sedentary behaviour, poor diet, weight gain and shortened sleep duration (Chahal, Fung, Kuhle, & Veugelers, 2013; Maitland, Stratton, Foster, Braham, & Rosenberg, 2014; Tandon et al., 2014). However, equipment that can be used for physical

activity, in particular the ownership of permanent resources such as a basketball net or a backyard garden, can reduce sedentary behaviours in children in their home environment (Maitland et al., 2014; Millstein et al., 2011). Additionally, the physical build of the home has also been shown to influence activity levels. The size, space, and design of the home and backyard can influence physical activity and sedentary behaviours, as providing space for children to involve themselves in active play leads to increased physical activity levels (Maitland et al., 2014). Unfortunately access to such physical environments is not always available and is generally not something that can be easily changed, especially in socioeconomically disadvantaged households. However, Maitland et al.'s systematic review of the home physical environment concluded that the social environment of the home also plays a significant role in influencing activity levels and may actually be a stronger influencing factor in determining overall activity levels (Maitland et al., 2013). The role of the social environment will be addressed in greater detail later in the section. Another important physical environment is the neighbourhood, which has also been shown to greatly influence children's physical activity and provides an additional setting for children to involve themselves in such pursuits (Sallis & Glanz, 2006).

2.2.1.2 Physical environment of the neighbourhood

The physical environment of the home consists not only of the resources within the home and physical layout of the house, but also includes the features of the surrounding neighbourhood. In relation to nutrition behaviours, the food environment surrounding the home can influence children's eating habits based on the prevalence and proximity of fast food restaurants, convenience stores, grocery stores, and other food outlets (He et al., 2012; Laxer & Janssen, 2014; Zenk et al., 2009). A systematic review which explored the relationship between

the food environment and child consumption of healthy and unhealthy foods found that a moderate relationship exists between the two (Engler-Stringer, Ha, Gerrard, & Muhajarine, 2014). Studies have identified an adverse correlation between neighbourhood fast food and convenience store availability and dietary outcomes such as increased sugar-sweetened beverage intake (Laska, Hearst, Forsyth, Pasch, & Lytle, 2010), poor vegetable consumption in adolescent boys (Jago, Baranowski, Baranowski, Cullen, & Thompson, 2007), and poor eating habits and higher body mass index scores (Carroll-Scott et al., 2013). Further, research supports that individuals living in neighbourhoods with greater access to supermarkets and grocery stores have better diets and lower obesity outcomes as compared to individuals living in close proximity to convenience stores (Larson et al., 2009; Zenk et al., 2009). Children living in neighbourhoods with greater perceived access to shops that sell modestly priced fresh produce have also been associated with increased vegetable and fruit intake, lower fat intake, higher overall diet quality, and lower overweight and obesity prevalence (Veugelers, Sithole, Zhang, & Muhajarine, 2008). Although built environment studies do not often target child eating behaviours in particular, the consumption habits within an area can be related to all members of the community, including children. Additionally, it often assumed that parents primarily determine what foods are made available in the home (Lindsay, Sussner, Kim, & Gortmaker, 2006), and their food purchasing decisions are influenced by the neighbourhood food environment. It is therefore evident that neighbourhood demographics and accessibility of food sources do play a role in influencing child eating habits and overall diet quality.

The neighbourhood setting also plays an important role in determining physical activity levels of children and youth, as a child's daily physical activity takes place in the home, school, and community (Kneeshaw-Price et al., 2013; Tremblay et al., 2015). The significance of the

neighbourhood in promoting physical activity was demonstrated in a study by Kneeshaw-Price et al. (2013). Results showed that children spend only 18% of their time inside the home doing MVPA, while 42% of their time in the neighbourhood was spent doing MVPA. Additionally, time spent being active within the neighbourhood was even greater than time spent being active at other physical activity related venues such as private or public recreation centres (Kneeshaw-Price et al., 2013). Consistent with the Canadian ParticipACTION recommendations, children who have opportunities for unsupervised outdoor free play and active travel without an adult are shown to have greater daily physical activity levels (Gray et al., 2015; Schoeppe, Duncan, Badland, Oliver, & Curtis, 2013; Tremblay et al., 2015). As such, free play within the neighbourhood has been encouraged as a means of maximizing the duration, frequency, and intensity of children's physical activity (Kneeshaw-Price et al., 2013; Tremblay et al., 2015). Neighbourhood safety may also play a significant role in determining physical activity (Holt et al., 2009; Kneeshaw-Price et al., 2013; Stanley, Boshoff, & Dollman, 2013). Kneeshaw-Price et al.'s (2015) study of the relationship between child MVPA and neighbourhood crime in San Diego, California found that children living in the lowest crime areas had almost 40 minutes more MVPA per day than children who live in the highest crime areas within the city. However, the relationship between safety and physical activity was most significantly impacted by parents' perceptions and their overall influence on their child's free play within the neighbourhood (Datar, Nicosia, & Shier, 2013; Kneeshaw-Price et al., 2013). Additionally, children are more active and less sedentary when they have good access to playgrounds, parks and recreational facilities (Veugelers et al., 2008), and the same trends are true when children are perceived to be satisfied with their neighbourhoods (Carson, Kuhle, Spence, & Veugelers, 2010). Further, high perceptions of sidewalks and parks have been linked to increased rates of active transport to

school, lower sedentary behaviour levels, and increased overall physical activity in children (Carson et al., 2010). Thus, in addition to having the support from parents, a neighbourhood environment that is clean, safe, and walkable is important for ensuring free outdoor play and active transport are encouraged to their greatest extent and with minimal barriers (Davison & Lawson, 2006; Piercy et al., 2015).

2.2.2 The social environment of the home

The family social environment plays a key role in determining health behaviours in children. Many studies link children's behaviours regarding eating habits (Faught et al., 2015; Natale et al., 2014; Webber & Loescher, 2013), physical activity levels (DiLorenzo, Stucky-Ropp, Vander Wal, & Gotham, 1998; Verloigne et al., 2012), and sedentary behaviours (Salmon, Timperio, Telford, Carver, & Crawford, 2005) to that of their parents and family. There are many diverse social factors which influence children's health behaviours in the home environment, however the most modifiable (O'Connell, Davis, & Bauer, 2015) and highly focused on (Alberta Government, 2011; American Academy of Pediatrics, 2016) are parenting style, and parent and family customs. As such, the next two sections will explore the role of parenting style and family customs and practices in relation to children's HEAL behaviours.

2.2.2.1 Parenting style

Parents are the providers of food and resources for their children, and as such they play an important role as gatekeepers to their child's health (Natale et al., 2014). Parenting styles have been shown to affect children's nutrition behaviours both in the short and long term (Collins, Duncanson, & Burrows, 2014; Hubbs-Tait, Kennedy, Page, Topham, & Harrist, 2008). Parenting styles are often conceptualized under two dimensions: demandingness, which includes control, supervision, and rules and restrictions; and responsiveness, which includes parental

involvement, encouragement, and acceptance of child behaviours (Hughes, Power, Fisher, Mueller, & Nicklas, 2005). Within these two dimensions, four general parenting styles have been identified: authoritative, authoritarian, indulgent, and uninvolved. These styles can be applied to how parents influence their child's eating habits (Frankel et al., 2014; Hughes et al., 2005). Authoritative parenting is linked to parental modeling and monitoring of food intake, and involves a greater deal of parental support and child-centred approaches to eating habits (Collins et al., 2014; Hubbs-Tait, Topham, Harrist, Kennedy, & Page, 2008; Hughes et al., 2005). As a result, authoritative parenting styles are effective in promoting an ideal environment for children to develop self-regulation and internal cues to eating habits, and are shown to positively influence child eating habits (Collins et al., 2014; Hughes et al., 2005; Rhee, 2008). Authoritative parenting has also resulted in better dietary habits in children such as higher consumption of fruits and vegetables and fewer unhealthy snacks (Kremers, Brug, Vries, & Engels, 2003; Pearson, Atkin, Biddle, Gorely, & Edwardson, 2010). Adversely, authoritarian parenting styles involve high parental restriction and control, which may lead to increased pressure on the child and decreased responsiveness (Collins et al., 2014; Hughes et al., 2005). This form of parenting has been shown to result in poor eating habits by the child, heightened responses to high fat and less healthy foods, and potentially higher overall caloric consumption (Carnell, Benson, Driggin, & Kolbe, 2014; Collins et al., 2014; Niemeier & Hektner, 2012). Indulgent parents are highly responsive, however their responses are not always developmentally appropriate for the child and as a result parents may not provide support or boundaries for their child's eating habits and may often simply "give in" to their child's food requests (Black & Aboud, 2011; Hughes, Shewchuk, Baskin, Nicklas, & Haiyan, 2008). As such, the indulgent or permissive parenting style has been linked to higher body mass index (BMI) scores in children

(Frankel et al., 2014; Hughes et al., 2005). Finally, an uninvolved or neglectful parent sets few expectations, support, or guidance for the child's eating behaviours, and poor dietary behaviours in children are a predicted result (Hughes et al., 2008). As such, the level of demandingness and responsiveness of the parent feeding practices greatly influences a child's eating habits, and parenting style should be acknowledged within health promotion efforts as a key influence of healthy eating behaviours in children.

Similar to how parenting styles affect children's eating habits, authoritative, authoritarian, indulgent, and uninvolved parenting styles have also been shown to contribute to different physical activity and sedentary behaviour outcomes for children. Authoritative parenting styles, associated with high support/high challenge parenting, have been linked to higher fitness task goal orientation in children as compared to parents who provided low support and low challenge to their children (Kimiecik & Horn, 2012). Additionally, authoritative parenting has been shown to lead to the highest level of daily MVPA in children from single parent households, compared to other parenting styles (Saunders, Hume, Timperio, & Salmon, 2012). As authoritarian parenting is often associated with high control and power assertion, research has shown that children (particularly girls) from such environments participate in a high frequency and duration of organized sports (Saunders et al., 2012). Despite this finding, research has also found that hyper-parenting styles, which involve parents being heavily involved in their child's activities and lifestyle choices, are associated with a lower frequency and overall levels physical activity (Janssen, 2015). As such, authoritarian parenting may be promising in respect to children's participation in organized sports, but it may not positively encourage free play and daily unstructured physical activity. Permissive (indulgent) parenting has been shown to result in higher MVPA levels in girls and an overall higher volume of physical activity in boys

(Hennessy, Hughes, Goldberg, Hyatt, & Economos, 2010; Jago et al., 2011) compared to other parenting styles, while uninvolved parenting styles have been linked to low levels of daily physical activity in children (Hennessy et al., 2010). Based on a review of the current body of literature exploring parenting styles and child physical activity outcomes, the findings are somewhat varied amongst the research. This inconsistency could be result of the influence of other factors such as the gender of the child, the number of parents, or the marital status of parents (Langer, Crain, Senso, Levy, & Sherwood, 2014; Lau et al., 2015; Saunders et al., 2012; Schary, Cardinal, & Loprinzi, 2012). Despite the variability within research findings, it is clear that parents do play an influential role in determining child physical activity and sedentary behaviour levels, and parenting styles may be a key determinant of this.

2.2.2.2 Family customs and practices

Beyond solely the influence of the parents, family customs and shared rituals play a key part in determining and developing eating behaviours of children (Tinsley, 2003). This section will outline some general family practices which influence children's HEAL behaviours. Family mealtimes are seen as key pedagogic opportunities for parents to influence and educate their children about healthy eating habits, as communal food values shared by the family are shown to influence children's eating behaviours and self-regulation skills (Quarmby & Dagkas, 2015; Wit et al., 2015). It is well established that children's diets are better both in the short and long term when families eat meals together on a regular basis (Burgess-Champoux, Larson, Neumark-Sztainer, Hannan, & Story, 2009; Woodruff & Hanning, 2008), and eating family meals greater than five times per week has also been shown to reduce sugar-sweetened beverage consumption and increase vegetable and fruit intake in children aged 6-11 years compared to children who eat with their families less frequently (Fink, Racine, Mueffelmann, Dean, & Herman-Smith, 2014).

Additionally, parents who role model healthy eating practices such as having salad at family dinner or eating fruit as a snack increase the likelihood of children reaching the recommended daily intakes of fruits and vegetables (Draxten, Fulkerson, Friend, Flattum, & Schow, 2014). Children who are actively involved in home meal preparation have also been shown to have healthier diets, including greater consumption of fruits and vegetables (Chu et al., 2013; Van Der Horst et al., 2007). Involvement in mealtime preparation has been linked to an increase in preference for vegetables and fruits, and an overall increase in child self-efficacy for making healthier food choices (Chu et al., 2014). However, an increase in the prevalence of television use during mealtime has been shown to potentially compromise both the level of interaction between family members during meal time, and also the overall diet quality of children at family mealtime (Woodruff & Hanning, 2008). In terms of breakfast eating habits, children have been shown to more commonly eat breakfast in two-parent homes and in families where the parents also eat breakfast in the morning (Pearson et al., 2010). It is important to note, however, that children do not play a completely passive role at their mealtime behaviours. Even from a young age, children have the autonomy to make consumption choices and are often adept at undermining their parents' food suggestions or offerings during family dinner time (Brewis & Gartin, 2006; Skafida, 2013). Uptake of healthy foods can be influenced by a variety of things such as child preference, age, parenting style, SES, and other diverse social factors (Brewis & Gartin, 2006; Fink et al., 2014; Sweetman, McGowan, Croker, & Cooke, 2011). Knowing what we do about the importance of the family in children's eating behaviours, instilling children with the knowledge and willfulness to autonomously make healthful choices and consume family meals provided by a guardian may be an important determinant to improve the overall quality of child eating habits.

Family member co-participation in children's physical activities has shown to be the leading factor in increasing frequency and duration of MVPA, as well as reducing leisure time sedentary behaviours (Xin et al., 2015). Screen time is the primary cause of sedentary behaviour (Spanier, Marshall, & Faulkner, 2006), therefore it is understandable that children are more sedentary in households that have a higher frequency of electronic media devices, in families that utilize screen time as a family leisure activity, and when children watch television with their parents (Granich et al., 2011; Hardy et al., 2006; Kunin-Batson et al., 2015; Verloigne et al., 2012). Alternatively, home etiquette such as establishing rules around screen time and whole-family participation in sports are found to be positive determinants of physical activity and reduced sedentary behaviour levels in children and youth (Atkin et al., 2015; Verloigne et al., 2012). Higher perceived family functioning amongst family members (i.e., feelings of acceptance and understanding within the family) result in less sedentary behaviour, greater physical activity, and more MVPA for adolescents especially on weekdays (Atkin et al., 2015), while weekend physical activity levels are shown to be greater in children who have more siblings and are exposed to more family encouragement and social support (McMinn, Griffin, Jones, & van Sluijs, 2013). However, it has also been suggested that further research is needed to explore the association between family and parent dynamics and child activity outcomes in order to establish more consistent findings and understandings (Mitchell et al., 2012). Regardless of the nature of the relationship between family and child activity outcomes, it is clear that family practices have a significant influence on a child's physical activity and sedentary behaviour levels, and as such the family should be taken into consideration when planning and implementing healthy lifestyle programs both inside and outside of the home environment.

Other factors such as support, encouragement, involvement, and facilitation are strong predictors of child physical activity. A study by Erkelenz et al. (2014) concluded that although the prevalence of overweight and obesity was lower in children whose parents were active, it is the supportive nature of the parenting which plays a greater role in influencing activity behaviours as opposed to role modelling (Erkelenz et al., 2014). Similar studies have also found that greater levels of support are linked to higher levels of MVPA (Gustafson & Rhodes, 2006; Langer et al., 2014). As such, it has been recommended that child-centered HEAL interventions consider both parenting style and the amount and quality of parental support that is provided as modifiable factors which influence child lifestyle behaviours (Langer et al., 2014; Saunders et al., 2012; Schary et al., 2012).

2.2.3 Socioeconomic status

Socioeconomic status (SES) refers to an individual's social and economic position, and is a reflection of their education, income, and occupation. These factors are recognized as important determinants of health, as education, income, and social status have been directly linked to overall health status (Mikkonen & Raphael, 2010; World Health Organization, 2016a). Many studies conclude the need to invest more resources into low SES communities in order to promote healthy lifestyle behaviours, as children from low SES households and communities are significantly more likely to be overweight or obese compared to children living in mid or high SES environments (McMurray et al., 2000; Moffat, Galloway, & Latham, 2005; Simen-Kapeu & Veugelers, 2010). It is necessary to consider the effects of SES on both the neighbourhood and the family in order to understand their impact on children's health behaviours and outcomes.

2.2.3.1 Neighbourhood SES

The neighbourhood food environment plays a significant role in determining food purchasing behaviours and consumption patterns. Greater availability and proximity to supermarkets is shown to result in generally healthier diets (Moore, Diez Roux, Nettleton, & Jacobs, 2008), while increased neighbourhood exposure to fast food outlets is associated with increased consumption of these foods and overall poorer diet quality (Moore, Diez Roux, Nettleton, Jacobs, & Franco, 2009). Trends in food environments are shown to greatly vary depending on the SES of the area. Studies frequently site that low SES neighbourhoods have the highest proportion of convenience stores (Canto, Engler-Stringer, & Muhajarine, 2015) and fast food restaurants (Larson et al., 2009), while access to grocery stores are typically poorest in these areas (Walker, Keane, & Burke, 2010). These neighbourhood disparities and spatial inequalities in access to fresh and readily available healthy food options commonly result in the establishment of "food deserts" in both rural and urban settings (Walker et al., 2010) Further, research has suggested that even when grocery stores are available in low SES areas, the quality of the foods available is poorer than in large supermarkets, the foods at these stores are generally more expensive (Jetter & Cassady, 2006; Walker et al., 2010), and there is lower availability of fresh produce in low SES neighbourhood supermarkets (Latham & Moffat, 2007). As such, it has been recognized that low income consumers may face additional challenges in maintaining a healthy diet compared to their mid to high SES counterparts due to SES factors that inherently shape the neighbourhood food environment (Jetter & Cassady, 2006).

SES has also been shown to influence the neighbourhood environment in regards to opportunities for physical activity. Multiple studies have shown that there are significantly more physical activity facilities in higher SES areas (Gordon-Larsen, Nelson, Page, & Popkin, 2006;

Powell, Slater, Chaloupka, & Harper, 2006), which may be one explanation for why the rates of involvement in organized sports are much lower in low SES homes (Centers for Disease Control and Prevention, 2003). Gordon-Larsen et al.'s study determined for every 100% increase in the proportion of people in a community with a college degree or greater, there is more than a twofold increase in facility access in that area (Gordon-Larsen et al., 2006). Additionally, a study of high and low SES neighbourhoods in Melbourne, Australia determined that high SES areas had a variety of features that made them more attractive compared to low SES communities. These features included the increased prevalence of picnic areas, walking and cycling trails, drinking fountains, water features, and trees to provide shade (Crawford et al., 2008). Findings such as these provide support and reasoning behind the fact that children in high SES neighbourhoods are more active, particularly in neighbourhood streets, parks, sports facilities, and outside in general (Bürgi, Tomatis, Murer, & de Bruin, 2016).

2.2.3.2 Family SES

Studies have explored parental SES in relation to children's diet intake and quality, and conclude that higher SES households result in healthier diet trends. Higher parental SES is associated with a variety of healthier food habits in children. Children consume less healthy foods such as fish and vegetables and fruit, eat more fast food, and are more likely to skip breakfast when they reside in low SES households (Sotos-Prieto et al., 2015). Alternatively, children from high SES homes tend to have better overall diet scores, consume more vegetables and fruit, and are more likely to eat breakfast on a regular basis (Sotos-Prieto et al., 2015; Yannakoulia et al., 2016). Further, SES is linked to parenting behaviours relating to children's consumption. Socio-economically advantaged parents tend to enforce restrictions about eating meals in front of the television more so that socioeconomically disadvantaged parents (Simen-

Kapeu & Veugelers, 2010). As such, the SES of parents and families can greatly predict the dietary outcomes in children, and is an important factor which influences dietary behaviours that develop in childhood.

Similar to the relation between family SES and dietary outcomes in children, SES plays a significant role in influencing children's physical activity levels. Higher parental education and income are associated with increased levels of care and encouragement in children's physical activity levels (Simen-Kapeu & Veugelers, 2010). Findings also demonstrate that children spend more time in sedentary pursuits such as watching television and playing video games when they live in low SES households (McMurray et al., 2000), and that low SES households are also more likely to set restrictions on outdoor play which may lead to a decrease in physical activity levels and an increase in sedentary behaviours (Rutten et al., 2015; Tandon et al., 2014). Although some studies suggest the positive correlation between high SES and physical activity, others are not as positive. Simen-Kapeu & Veugelers (2010) found that higher SES parents are less likely to engage in physical activity with their children, which also decreases their ability to role model these behaviours in the home (Simen-Kapeu & Veugelers, 2010). Multiple studies support the relationship between high SES and lower sedentary behaviour in the home (Brodersen, Steptoe, Boniface, & Wardle, 2007; McMurray et al., 2000), however these studies have also identified that children's physical activity levels are higher in low SES households compared to high SES households (McMurray et al., 2000). These studies also conclude that physical activity levels decline consistently as children move from childhood into adolescence, regardless of SES (Brodersen et al., 2007). As such, the relationship between family SES and children's physical activity levels highlights positive aspects of both high and low SES environments.

2.3 The Child's Role in Shaping Family Behaviours in the Home

While it is evident that the home environment impacts HEAL behaviours, children also play a role in influencing health behaviours in the home. Correlations between children and parents eating habits often exist (Oliveria et al., 1992), and the mere presence of children in the home has also been shown to increased parents' caloric consumption and fat intake (Laroche, Hofer, & Davis, 2007). As such, it is important to understand the child's role in shaping HEAL behaviours within the home.

2.3.1 The child's influence on HEAL in the home

Children play an important role in influencing parent and family perceptions and behaviours in regards to both healthy eating and active living (Flurry, 2007; Jenkins, 1979; Labrecque & Ricard, 2001; Norgaard, Bruns, Christensen, & Mikkelsen, 2007). In the 1990s and into the 21st Century, the organization of Western family dynamics has transformed significantly due to changes in the social, economic, and consumer environment (Flurry, 2007). "New" families are much smaller in size and more greatly influenced by social ties and external influences than traditional families once were (Flurry, 2007). The egalitarian structure of new families ensures that children's diverse and socially influenced opinions are recognized within the family. This, in turn, allows children to have a much more significant influence on consumption decisions, particularly in regards to food shopping and purchasing decisions that were once primarily made by parents (Flurry, 2007; Hunter, 2002). Studies in the early 21st Century estimated that children influence as great as 80% of their family's food purchasing budget, while one in three American families reported their children often or always dominate their dinner or grocery purchasing decisions (Hunter, 2002). It has also been suggested that grocery shopping is a joint process between child and parent, despite parents' perceptions that

the only significant influence that children have on purchasing is their actual presence and assistance in providing ideas and help at the stores (Norgaard et al., 2007). In terms of eating out at restaurants, children also play a significant role in the decision process to choose to eat out, as well as deciding on the location in which the family will eat (Labrecque & Ricard, 2001). Research has found that children often underestimate their influence in determining family eating behaviours, while parents overestimate this influence (Labrecque & Ricard, 2001). It is apparent that children play a major role in influencing family food purchasing and eating decisions, and their potential as catalysts for changes in the home environment should therefore be regarded.

Beyond influencing eating habits, children also impact other aspects of family decision making. Children have been shown to be highly influential in determining such things as how families spend recreational and vacation time (Jenkins, 1979). More recent research has revealed that children are playing an ever-increasing role in determining and moderating family-orientated decisions regarding things such as automotive and electronic purchases (Flurry, 2007). Children may also influence opportunities for sedentary behaviour, as they impact the likelihood of adults acquiring internet access in the home (Eynon & Helsper, 2015) which may lead to an increase in screen time for all family members. Although research is limited, the suggested broad scope of activities and purchasing choices that children influence in terms of family decision making implies that children play an important role in determining parental choices and influencing how a family chooses to engage in physical activity, recreational, and sedentary behaviours. As this body of literature is heavily saturated with research regarding the family's impact on the child's behaviours, further exploration into the role of the child's influence on family activity patterns is warranted.

2.3.2 Intergenerational learning

Children can be a catalyst for social change, as they have the ability to promote intergenerational learning across a variety of settings and environments. Intergenerational learning can be understood as the translation of knowledge, beliefs, and practices from one generation to another, such as from children to their parents, for mutual benefit (Ballantyne, Connell, & Fien, 1998; Gadsden & Hall, 1996). Such transfers of knowledge and behaviours have been recognized as a powerful means of understanding and addressing social issues and creating change in both children and their families. Intergenerational learning can improve the strength of the child's desire to turn learning into action, expose adults to new knowledge and actions, empower children to make changes in their home environment, and support families and communities through the emphasis of active involvement in such projects (Ballantyne et al., 1998). In particular, children's roles in intergenerational learning regarding environmental issues such as air and water pollution, conservation, natural history, and biodiversity have been documented in terms of how children's knowledge, attitudes, and behaviours were able to create changes within the home environment (Ballantyne et al., 2001b; Duvall & Zint, 2007; Vaughan et al., 2003). Further evidence of intergenerational learning are apparent within the upcoming areas of this section.

2.3.3 School programs translating into the home environment

It is well established that schools are ideal settings for child-targeted intervention approaches (Clarke, Fletcher, Lancashire, Pallan, & Adab, 2013; Fung et al., 2012; Langford et al., 2015b), and the importance of school and home collaboration has been recognized as a necessary component to intervention success (Sobol-Goldberg et al., 2013; Sormunen et al., 2011). Children acquire a significant level of knowledge and understanding of issues such as

health and the environment in the school setting, and have the ability to model and share these learned behaviours with their guardians in the home environment (Ballantyne et al., 1998; Gadsden & Hall, 1996). However, understanding how school-based interventions transfer to the home environment has proved a challenging objective for many researchers (Baranowski et al., 2000; Lytle et al., 2006; Reynolds et al., 2000).

2.3.3.1 General evidence from school-based programs and interventions

Research regarding the child's role of translating school-learned behaviours home is evident in relation to environmental education programs targeting things such as biodiversity, recycling and waste management, and water and air pollution (Ballantyne et al., 2001b; Duvall & Zint, 2007; Grodzińska-Jurczak, Bartosiewicz, Twardowska, & Ballantyne, 2003; Larsson et al., 2010; Legault & Pelletier, 2000; Vaughan et al., 2003). Most findings from school-based programs suggested modest improvements were made in terms of parental knowledge of such issues and as such demonstrate the ability for children to informally share knowledge with their families and effectively conduct intergenerational communication and learning (Duvall & Zint, 2007; Grodzińska-Jurczak et al., 2003; Legault & Pelletier, 2000; Vaughan et al., 2003). A study by Ballantyne et al. (2001) was able to identify the ability for students to modify their home environment in that students "discussed with their parents actions that could be taken in the home and local community" and instructed their family to make changes based on the what they had learned in their respective school programs (Ballantyne, Fien, & Packer, 2001a, p. 12). Although findings were relatively weak, Evans, Gill and Marchant (1996) also concluded that after their involvement in an environmental program, children were able to create positive changes in their parent's recycling habits (Evans, Gill, & Marchant, 1996). These promising findings demonstrate children's ability to disseminate knowledge and influence the home

environment in regards to environmental issues and behaviours. As such, the need to extend our understandings of children's influence on the household to fields of research beyond just that of environmentalism has been suggested (Larsson et al., 2010).

2.3.3.2 Evidence from school-based health interventions

A number of quantitative research findings regarding school-based healthy eating and/or active living programs established that although these programs improved the overall health status of children, it can be a challenging objective to conclude that these results were actually sustained and supported within the home environment (Baranowski et al., 2000; Lytle et al., 2006; Reynolds et al., 2000). 24-hour food recall questionnaires are often used to demonstrate that child eating habits typically improve with school health promotion interventions, however it is difficult to objectively conclude that these improved eating habits are sustained in other environments. For example, the results of a 24-hour food recall questionnaire in a study by Reynolds et al.'s (2000) indicated that there was an overall increase in fruit and vegetable consumption for students participating in a school-based health intervention even though the observed intake of fruits and vegetables at the lunchtime cafeteria remained the same. The authors concluded that a possible explanation for these results could be that children were choosing to eat more healthy foods in their home environment, therefore suggesting that the home environment was positively influenced by the intervention (Reynolds et al., 2000). Baranowski et al. (2000) and Lytle et al. (2006) also concluded that although modest post-intervention improvements were made regarding students' dietary intakes in their studies, the "(impact on) home consumption practices remains an elusive objective" which warrants further investigation (Baranowski et al., 2000, p. 107). A successful pre-post trial using pedometers to capture physical activity in school-aged children was conducted by Vander Ploeg et al. (2014),

and concluded that a school-based health promotion intervention positively impacted children's activity levels both during and outside of school time (Vander Ploeg, McGavock, Maximova, & Veugelers, 2014b). After two years of exposure to this school-based health promotion intervention, physical activity levels were increased during both school hours, and in the evenings and weekends when physical activity is typically lowest (Vander Ploeg et al., 2014b). The study demonstrated the ability for a school-based health promotion intervention to sustain changes in physical activity behaviours beyond the school environment, however the nature and mechanisms of such changes must be explored further.

Within current literature, the translation of school health programs to the home has often been explored by predominately utilizing a parental component in both the intervention and evaluation process. In research by both Baranowski et al. (2000) and Lytle et al. (2006), the school-based health programs of interest contained a highly significant intervention portion targeting the parents; tools such as newsletters, written behavioural reminders, and recipe suggestions were provided to parents in order to ensure healthy behaviours were present at home. In both of these studies, there was little ownership on the students to influence such behaviours at home, and the results of such interventions showed only modest improvements to overall child and parent health knowledge, attitudes, and behaviours (Baranowski et al., 2000; Lytle et al., 2006). Research into a school health program for kindergarten students demonstrated that parents, who were provided with a variety of educational tools and workshops, improved their eating habits and overall readiness to change attitude within the home environment (Rausch, Berger-Jenkins, Nieto, McCord, & Meyer, 2015). While this research did not demonstrate the ability for children to change their home environment, the authors noted the critical importance of common messaging in order for such behaviours to be sustained in a child's life (Baranowski

et al., 2000; Lytle et al., 2006; Rausch et al., 2015). Of the limited studies which explored the topic of school-based health promotion translating into the home, results were commonly based off of parental perceptions (Baranowski et al., 2000; Lytle et al., 2006), and had a distinguishable home or parental component (Reynolds et al., 2000). Therefore, an exploration of this phenomenon from the perspective of the child is warranted in order to establish this understanding and build on the current body of literature.

The following studies were successfully able to highlight the child's role in driving change in both the home and the community. Aldinger et al. (2008) examined the changes in knowledge, attitudes, and behaviours of children involved in a comprehensive school health (CSH) program in China, specifically drawing attention to the role of the child as a catalyst for change in the home environment. Through interviews with students, parents, teachers, and administrators, Aldinger et al. (2008) found that children attending intervention schools improved their health related behaviours, attitudes, and knowledge, and were able to influence and modify their home environments. Changes at home included conversations and a transfer of health knowledge from child to parent, children persuading their parents to cease poor lifestyle habits such as smoking, and replacing their own personal bad habits with good ones (Aldinger et al., 2008). It is important to note that Aldinger et al. explained that the phenomenon of the child as a change calalyst may have been unique to the context of the study, as this research took place in China during the one-child policy. Mukhopadhyay and Bhatnagar (2005) assessed how school children living in vulnerable areas in rural India became catalysts for health change and improvements, and in doing so became health promoters within their communities with support from school health strategies (Mukhopadhyay & Bhatnagar, 2005). Partnering with their school community, students were actively involved in performing community needs assessments of key

health issues and identified access to safe drinking water, proper hygiene and vaccine-preventable diseases as issues that their school health programs should focus on. As a result, students became "an active force for behaviour change in the community" and were able to communicate and educate their communities about topics such as sources, use, and storage of clean water (Mukhopadhyay & Bhatnagar, 2005, p. 149). This demonstrates the ability for children to learn positive health behaviours within their school environment in order to become catalysts for change in their homes and communities. Finally, Gadhoke et al.'s pre-intervention formative research on a school-based obesity prevention program concluded that children often shared health behaviours with their families in the home, and as such were acting as change agents in the home environment (Gadhoke, Christiansen, Swartz, & Gittelsohn, 2015). Children and adults from American Indian households on two reservations participated in interviews and focus groups, and concluded that children promoted physical activity and healthy eating behaviours in their households by "sharing knowledge they gained from school, engaging in healthy behaviors, and by speaking up and encouraging their caregivers to do the same" (Gadhoke et al., 2015, p. 354). Although limited, such research demonstrates the ability for children to transfer their school-learned knowledge into the home and effectively promote and maintain healthy lifestyle choices in both the school and home environment. Future efforts using diversified participants and methods may be useful to continue building on these understandings.

2.4 Comprehensive School Health

Schools are effective settings for implementing and facilitating health promotion interventions targeting children and youth (Clarke et al., 2013; Fung et al., 2012; Langford et al., 2015b; Pan-Canadian Joint Consortium for School Health, 2009). A large portion of children spend a significant amount of time over a prolonged number of years in schools. As such,

schools are institutions which are in continuous contact with children and therefore have the ability to educate, shape, and influence health behaviours that develop (Peterson & Fox, 2007). Within Canada, the CSH framework has guided many school-based health promotion interventions (Alberta Health Services, 2016; Arnold, Patton, Pearce, & Whellams, 2012). The Pan-Canadian Joint Consortium for School Health (JCSH) is a federal, provincial, and territorial government partnership which promotes optimal health and learning for all Canadian children, and in doing so recognizes the interdependence of health and education by supporting and utilizing the CSH framework (Pan-Canadian Joint Consortium for School Health, 2008). Emerging in the 1990s in Canada, CSH is an internationally recognized framework and is guided by principles constructed in the Ottawa Charter for Health Promotion, the Declaration of the Fourth International Conference on Health Promotion, and the WHO's Expert Committee on Comprehensive School Health Education and Promotion (Arnold et al., 2012; Pan-Canadian Joint Consortium for School Health, 2008; World Health Organization, 1986a, 1998). The Canadian JCSH model of CSH "addresses school health in a planned, integrated, and holistic way in order to support improvements in student achievement and well-being," and recognizes four foundational pillars which make up CSH: 1) social and physical environments; 2) teaching and learning; 3) policy; and 4) partnerships and services (Joint Consortium for School Health, 2016).

The CSH framework aims to support the development of sustainable healthy school environments, and does so by taking a multifaceted, intersectoral approach (Veugelers, 2010). In order to successfully implement CSH, collaboration between a variety of stakeholders in the school, home, and community must be established in order to ensure mutual responsibility and sustainable progress is established and maintained (Roberts et al., 2015; Stolp, Wilkins, & Raine,

2015; Storey et al., 2012b; Storey et al., 2011). This involves participation and buy-in from students, parents, teachers, administrators, and the entire school community. The flexible nature of CSH allows schools to assess what their health needs and priorities are, and consequently cater the planning, implementation, and evaluation of these approaches in a manner that suits these unique needs (Centers for Diseases Control and Prevention, 2009; Veugelers & Schwartz, 2010). On an international basis, the terms Coordinated School Health, Whole School, Whole Community, Whole Child (WSCC) and Health Promoting Schools are synonymous with CSH, and as such will be referred to under the umbrella term CSH throughout this thesis.

CSH intends to provide educational and health benefits for students, as well as foster healthy attitudes and behaviours (Alberta Learning, 2002, p. 31). As a result, CSH promotes both short term changes in healthy living habits in children, and long term prevention of chronic disease onset (Veugelers & Schwartz, 2010). CSH has been shown to be an effective approach to changing a variety of health behaviours in children, spanning from physical activity and nutrition to smoking and bullying (Langford et al., 2015a; Stewart-Brown, 2006). Research has demonstrated that children attending schools which utilize the CSH framework have lower incidences of overweight and obesity, are more physical active, have lower sedentary behaviour levels, and overall better diet quality compared to children who were not exposed to such interventions (Fung et al., 2012; Veugelers & Fitzgerald, 2005). In addition to research on the effectiveness of CSH in a school setting over the short term, further findings into the life course effects of CSH interventions have also been investigated. Tran et al. (2014) calculated the life course BMI trajectories based on a provincial CSH intervention and concluded that the impact of this program would result in lower levels of overweight and obesity in adulthood which in turn would reduce in overall associated economic costs of poor health over the lifespan (Tran et al.,

2014). As such, scaling up CSH interventions in order to reach more students would be beneficial, both in terms of health outcomes and cost-savings. Additionally, CSH-driven programs are of great value in that they have been shown to positively influence academic outcomes of children and youth (Murray, Low, Hollis, Cross, & Davis, 2007), however further research into this topic is required (Langford et al., 2014).

CSH encourages the development of "programmes that promote health, extending the teaching beyond health knowledge and skills to take account of the school social and physical environment and to develop links with the community" (Stewart-Brown, 2006, p. 7). CSH aims to create and maintain a mutually collaborative support system involving school, home, and community partners (Alberta Health Services, 2016; St Leger, 1999) in order to ensure students are supported from multiple environments (Allensworth, Wyche, Lawson, & Nicholson, 1995). Although students are undoubtedly at the center of the CSH approach (Joint Consortium for School Health, 2016), the inclusive nature of this framework strives to ensure that all stakeholders will benefit from their involvement. The WHO Global School Health Initiative recognizes that schools which utilize CSH strive to promote health not only amongst students, but also throughout the entire school community by positively engaging school personnel, family, and community members in order to create healthy living, learning, and working environments (Jones & Furner, 1998). As such, it is imperative to explore the effectiveness of CSH not only within the schools, but also within the context of the home and community environments. Further research into the scope of CSH is necessary in order to gain a greater understanding of how CSH not only shapes the school environment, but also the role it plays in influencing other areas of children's daily lives.

2.5 The Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools)

The Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools) is a school-based health promotion intervention which utilizes the CSH framework in order to support the development of healthy school communities (APPLE Schools, 2008). APPLE Schools was implemented in 2008 in 10 Alberta schools and has since expanded to include 50 school communities across the province. The project was modelled after the Annapolis Valley Health Promoting Schools Program (AVHPSP), a successful CSH approach to creating healthy school environments in the province of Nova Scotia, Canada (Edwards, Bligh, & Munro, 2004). APPLE Schools promote principles such as healthy eating, active living, and knowledge and empowerment of healthy living practices in students by fostering school environments that foster "healthy kids in healthy schools" (APPLE Schools, 2015). The purpose of APPLE Schools is to "improve healthy eating and active living among elementary aged children; to increase the capacity of the school community to address health-related behaviours and to foster a healthy school environment" (Schwartz, Karunamuni, & Veugelers, 2010, p. 3).

2.5.1 APPLE Schools recruitment and participation

APPLE Schools collaborates with schools based of a variety of factors, comprised of:

- inclusion of Grade 5 within the school configuration;
- the need for a healthy lifestyle intervention (a ranking system was used, which considered factors such as SES);
- willingness and ability to participate in ongoing research and evaluation;
- ability to structurally and resourcefully accommodate a school health facilitator (SHF);

- willingness to include the SHF as a member of school staff and participate in meetings with other APPLE Schools stakeholders (Schwartz et al., 2010, p. 5).

APPLE schools are in demand and requests to participate in the program are common, however school selection continues to be based on the criteria identified above.

2.5.2 Research and evaluation

APPLE Schools is informed by ongoing evidence-based research and evaluation, and aligns with community-based participatory research (CBPR). A key component of APPLE Schools is that dedicated staff time in the form of a SHF is provided in each of the intervention schools. The SHF's role is to facilitate the development and implementation of a school-specific plan for CSH. This often includes a range of inclusive, health-focused activities. The SHF is trained in the implementation of CSH, and as such aids in establishing school activities and initiatives which embody the CSH framework and all four pillars (Storey et al., 2015). This individual also ensures that activities are implemented in a manner that prioritizes sustainability within the school environment. The SHF plays a vital role in establishing an APPLE School, however it is important to note that buy-in has to be achieved from the collective school community (teachers, students, administrators, staff members, parents, community members) in order for a successful APPLE School to be sustainable (Roberts et al., 2015; Storey et al., 2012b; Storey et al., 2015). Many schools have now reached the maintenance phase of the project, whereas schools do not have a dedicated full-time equivalent (FTE) assigned to facilitating the school-specific plan for CSH. Typically, schools have teams of staff, parents, students, and/or community members that share the responsibilities, planning, and implementation of a healthy school action plan which includes various activities supporting a healthy school environment.

The school plan is facilitated by an in-school staff person (i.e., a health champion), who receives training and support from APPLE Schools project staff throughout the year.

APPLE schools are diverse by nature. Every APPLE school is different, as the activities, events, and approaches utilized to create a healthy school environment are dependent on the unique needs and barriers of each school community (APPLE Schools, 2015; Public Health Agency of Canada, 2011). Centered around physical activity, nutrition, and increasing community capacity within the school, examples of school activities include taste-testing of healthy foods, classroom gardens, initiatives to support free play, and parent information nights (APPLE Schools, 2015; Public Health Agency of Canada, 2011; Schwartz et al., 2010).

Since its pilot in 2008, various aspects of APPLE Schools have been evaluated using both process and outcome evaluation. Research into APPLE Schools "is related to nutrition, lifestyle, socio-economic factors and intervention programs to influence new health policies and programs for chronic disease prevention" (APPLE Schools, n.d.-a). Evaluation results are always shared with school communities in order to inform practice, provide ongoing feedback to stakeholders, and shape future school action plans. Both the process and outcome evaluation of APPLE Schools will be described in more detail within this section.

2.5.2.1 Outcome evaluation

Outcome evaluation measures the effects of an intervention or treatment, and "answer(s) questions concerning whether the program successfully achieved its goals and objectives" (Judd, Frankish, & Moulton, 2001; Nutbeam & Bauman, 2006, p. 31). Outcome evaluation determines the effectiveness of a program, which can be achieved by determining the extent to which the

program's goals were successfully met or whether the predicted impact of a program was established (Nutbeam & Bauman, 2006; Patton, 2008).

Between 2008 and 2013, APPLE Schools was systematically evaluated using a variety of outcome measures. Grade 5 students at APPLE Schools were annually surveyed about a variety of their health behaviours using a modified tool similar to the Raising healthy Eating Active Living Kids Alberta (REAL Kids Alberta) evaluation. REAL Kids Alberta was a provincial evaluation study conducted by a team at the University of Alberta School of Public Health (SPH) in order to assess the impact of Alberta Health's Healthy Weights Initiative and to monitor and collect data on child lifestyle behaviours and health outcomes across the province (REAL Kids Alberta, 2011). Information regarding factors such as dietary habits, physical activity levels, sleep habits, screen time, height, weight, and BMI were collected through surveys administered to Grade 5 students, parents, and principals. Data was collected in even numbered years between 2008 and 2014 (i.e., 2008, 2010, 2012 and 2014), and provided a provincially representative look at children's health behaviours over this timespan. APPLE Schools was evaluated on a yearly basis in a similar manner by utilizing a modified version of the REAL Kids Alberta survey with additional questions pertaining to project involvement. Consistent with REAL Kids Alberta, Grade 5 students, parents, and administrators were included in this evaluation in order to compare APPLE Schools students' results directly with that of provincially reported data. Findings from this evaluation were shared with school communities through annual school reports, and this data has been used in a variety of published literature on the effectiveness of APPLE Schools (Bastian, Maximova, McGavock, & Veugelers, 2015; Fung et al., 2012; Tran et al., 2014; Vander Ploeg et al., 2014a; Vander Ploeg et al., 2014b).

APPLE Schools has been evaluated in terms of its impact on physical activity in multiple manners. Research into APPLE Schools has also shown that it is an effective approach to health promotion in children: students who attend an APPLE school have significantly better physical activity, nutrition, and healthy body weight outcomes compared to students attending other Alberta Schools (Fung et al., 2012; Tran et al., 2014; Vander Ploeg et al., 2014a; Vander Ploeg et al., 2014b). Further research has also revealed that involvement in APPLE Schools reduces health inequalities that exist within children attending intervention schools, as students who were less physically active at baseline saw greater improvements in their activity levels compared to those who were already sufficiently active (Bastian et al., 2015; Vander Ploeg et al., 2014a). Vander Ploeg et al. (2014) also found that involvement in APPLE Schools resulted in students being more physically active during the evenings and weekends, suggesting that children sustain positive school-based physical activity habits beyond the school environment (Vander Ploeg et al., 2014b). As such, this demonstrates the ability for school-learned behaviours to transfer outside of the school and into the home. The sustainability of students' healthy eating behaviours beyond the school environment has yet to be explored, and a greater understanding of how and to what extent these behaviours are present outside of the school contexts requires further investigation.

2.5.2.2 Process evaluation

Process evaluation is defined as research which "answer(s) questions concerning the process of implementation, and recording the extent to which the program was implemented as planned" (Nutbeam & Bauman, 2006, p. 31). Process evaluation is a necessary component of intervention research because it gives insight into why certain outcomes were or were not achieved, provides a greater understanding of how intervention components are interrelated, and

can inform and improve theory-based intervention (Steckler et al., 2002). Information from process evaluation can also be used when interpreting program outcomes and when planning future intervention efforts in a similar format or field (Dehar, Casswell, & Duignan, 1993). As such, ongoing process evaluation of APPLE Schools is vital to ensure the project is implemented in a manner that embodies the CSH framework and continues to nurture successful changes within school environments.

As part of the APPLE Schools process evaluation, research has focused on determining the roles of key stakeholders within the project in order to create a better understanding of these roles and to inform future efforts. The role of the teachers, SHFs and administrators have been examined in order to identify their position and the impact of their roles within the implementation and execution of APPLE Schools (Roberts et al., 2016; Roberts et al., 2015; Storey, Cunningham, Spitters, & Schwartz, 2012a; Storey et al., 2012b; Storey et al., 2015; Storey et al., 2011). Previous APPLE Schools process evaluation research has also highlighted the success and challenges of both the implementation and sustainability of APPLE Schools (Storey et al., 2012a; Storey et al., 2012b; Storey et al., 2015) which aids in ensuring informed decision making for future endeavours. Together, the results of these findings have helped to establish a better understanding of these roles within APPLE Schools, as well as the facilitators and barriers to implementation and sustainability. These findings have also provided information regarding key components necessary for APPLE Schools to succeed (Storey et al., under review). Previous process evaluation involving key stakeholders has not included the students attending an APPLE School. As students are at the center of this school-based health promotion intervention, it is vital to gain a comprehensive understanding of their perspectives to inform project implementation. Additionally, implementation research involving the reach of

APPLE Schools into the home environment has yet to be explored. As the school and home are both critical environments which influence children's lifestyle behaviours, process evaluation regarding the extent to which students maintain their health choices beyond the school is of vital importance in order to understand the implementation success of the program.

2.6 Study Significance

APPLE Schools is an effective school-based health promotion intervention which takes a CSH approach to building and sustaining healthy school communities in a holistic and supportive manner (APPLE Schools, 2008). As such, continued research using both process and outcome evaluation methods is necessary in order to gain a greater understanding of the effectiveness of both the implementation and results of this project.

Previous process evaluation research has explored the roles of at a variety of stakeholders within APPLE Schools, however the role the students has yet to be examined qualitatively. Students play an important role within an APPLE School, and as such it is important to gain a clear understanding of their perceptions and involvement in the project. Additionally, the home environment is a critical environment for the promotion and adaptation of lifestyle behaviours (Quarmby & Dagkas, 2015). The importance of the home environment in effectively sustaining health behaviours in the school is highlighted by a guiding principal for CSH, which states the need for "participation and support of families and communities at large" (Joint Consortium for School Health, 2016). Previous quantitative research has identified that positive changes in physical activity patterns are sustained beyond the school environment (Bastian et al., 2015), however further investigation into the mechanisms of how HEAL behaviours are translated into the home is needed in order to gain a deeper understanding of the impact of APPLE Schools within the home environment. As such, evaluation regarding the reach of APPLE Schools into

the home environment will be vital to ensure a rich understanding of the extent to which the project impacts students' lives, and the mechanisms by which this is established. These understandings may also provide valuable insight into how and why APPLE Schools is a particularly successful CSH intervention. It is necessary to incorporate the perspective of the child in order to establish this understanding and build on the current body of literature on this topic. This research project aims to explore if and how involvement in a school-based health promotion intervention, APPLE Schools, affects student and family behaviours in the home environment. The mechanisms of this approach will also be explored in order to determine the effectiveness of a specific method to explore this phenomenon.

CHAPTER 3: COMPREHENSIVE SCHOOL HEALTH AND ACHIEVING CHANGE IN THE HOME ENVIRONMENT: INSIGHTS FROM A STUDENT PHOTOVOICE PROJECT

3.1 Background

Current lifestyle trends in behaviours relating to healthy eating and active living (HEAL) in Canadian children are a major public health concern (Freeman et al., 2014), as diets, physical activity, and sedentary behaviour levels do not reflect our national guidelines for achieving optimal health and disease prevention (Black & Billette, 2013; Tremblay et al., 2015). Children develop their health behaviours as a result of a variety of influences, however the school and home are recognized as the most significant environments to shape these behaviours (Epstein, 2011). As such, these two settings are commonly utilized for child-based health promotion intervention efforts relating to HEAL behaviours.

A significant body of research has focused on the complex factors by which parents and families affect a child's healthy lifestyle habits (Gruber & Haldeman, 2009; Lindsay et al., 2006), as both the physical and social environments of the home play an undeniable role in shaping a child's HEAL behaviours (Gruber & Haldeman, 2009; Quarmby & Dagkas, 2015). Emerging research, however, recognizes that cultural trends in Western society have shifted over time and as a result, children play an increasingly powerful role in influencing and shaping behaviours within the traditional family (Flurry, 2007). Children have been shown to influence the knowledge, attitudes, and behaviours of parents and family members through intergenerational learning in a variety of areas and issues, and are increasingly being shown to facilitate behaviour changes within the home (Aldinger et al., 2008; Ballantyne et al., 1998; Duvall & Zint, 2007; Gadhoke et al., 2015; Gadsden & Hall, 1996; Vaughan et al., 2003). Evidence supports children's capacity to create changes in the home particularly in regards to

environmental issues (Ballantyne et al., 2001b; Duvall & Zint, 2007; Grodzińska-Jurczak et al., 2003; Larsson et al., 2010), however the role of the child in changing health behaviours within the home has been a more challenging objective. This may be due to the complexity of both the home environment and the factors that influence healthy lifestyle behaviours, and the need to identify a valid tool to assess the relationship between these particular HEAL-promoting environments (Baranowski et al., 2000; Lytle et al., 2006; Richter et al., 2000).

While comprehensive approaches to school-based health promotion is necessary (Fung et al., 2012; Langford et al., 2015b; Sobol-Goldberg et al., 2013), there is limited knowledge and understanding of whether HEAL behaviours learned at school translate to the home. A guiding principle for most school-based health promotion frameworks such as comprehensive school health (CSH) is the impact and reach of the program beyond the school environment (APPLE Schools, n.d.-b; Joint Consortium for School Health, 2016). Further, school and family partnerships are essential in order to support children from multiple environments and to foster the utmost success (Epstein, 1992). Given the importance of these two environments and the capacity for the child to bridge these two settings, it is necessary to establish a greater understanding of the extent to which children's school environments can impact the home. Therefore, the aim of this study was to explore a CSH intervention, the Alberta Project Promoting activing Living and health Eating in Schools (APPLE Schools), in relation to its reach into the home environment. By utilizing students' perspectives, this research intended to understand how participation in APPLE Schools impacted health behaviours at home.

3.1.1 Setting: APPLE Schools

Schools are environments where children spend a large portion of their daily lives, and as such have been deemed ideal settings for health promotion efforts targeting children and youth

(Fung et al., 2012; Peterson & Fox, 2007). Worldwide, the CSH framework, also known internationally "health promoting schools" or in the United States as "coordinated school health," has been recognized by the World Health Organization (WHO)'s Global School Health Initiative as an effective approach to school-based health promotion (Alberta Health Services, 2016; Arnold et al., 2012; World Health Organization, 2016b). In Canada, the Pan-Canadian Joint Consortium for School Health (JCSH) defines CSH as "an internationally recognized framework for supporting improvements in students' educational outcomes while addressing school health in a planned, integrated and holistic way" (Pan-Canadian Joint Consortium for School Health, 2008). Within the province of Alberta, Canada, the CSH framework informs the school health intervention of interest for this research project: APPLE Schools.

APPLE Schools is a school-based health promotion project that exists in 50 schools across the province of Alberta, Canada (APPLE Schools, 2015). APPLE Schools aims to foster healthy school communities, and "students' active living and healthy eating habits [are] supported through sustainable changes to school, home and community environments" (APPLE Schools, n.d.-a). A unique feature of APPLE Schools is that schools receive dedicated staff time in the form of a school health facilitator (SHF). The SHF is trained in the implementation of CSH, and as such aids in understanding the specific needs of the school community in order to promote and sustain HEAL behaviours. APPLE Schools is informed by ongoing research and evaluation, and as such aligns with community-based participatory research (CBPR). Outcome evaluation of APPLE Schools revealed that students improved eating behaviours, were less likely to be overweight or obese, and were more physically active both during and outside of school hours as a result of their involvement in the project (Fung et al., 2012; Tran et al., 2014; Vander Ploeg et al., 2014b). Process evaluation has explored different stakeholder roles within

APPLE Schools in order to determine the barriers and facilitators to implementation and sustainability (Roberts et al., 2015; Storey et al., 2012b; Storey et al., 2015).

A guiding principle for both CSH and APPLE Schools is the impact and reach of school-based health promotion projects beyond just the school environment (APPLE Schools, n.d.-a; Joint Consortium for School Health, 2016). Previous research into APPLE Schools has determined that improvements in students' physical activity are sustained outside of school hours (Vander Ploeg et al., 2014b), however the broader mechanisms and scope of these and other healthy lifestyle behaviours has yet to be explored in the home environment. Process evaluation regarding how students internalize, share and influence the home environment as a result of their involvement in an APPLE School is also vital in order to understand the strengths and overall impact of the project. These gaps in our understandings formed the foundation of the current research project.

3.2 Methods

3.2.1 Research paradigm and theoretical perspective

This study was guided by qualitative methods, as the purpose was to gain an understanding of a culture and phenomenon by utilizing students' own accounts of their behaviours (Richards & Morse, 2007). A constructivist perspective informed this research, which assumes a relativist ontology and a subjectivist epistemology (Denzin & Lincoln, 2005). A relativist ontology accepts the nature of reality as "multiple, intangible mental constructions, socially and experientially based, local and specific in nature" and is reliant on upon the individuals who foster these constructions (Guba & Lincoln, 1994, pp. 110-111). The researcher, in turn, is presenting one possibility of many multiple truths which may exist (Mayan, 2009). Aligning with the participatory underpinnings of both APPLE Schools and the

research method used in this study, a subjectivist epistemology assumes that the researcher and participants are co-creators of knowledge and understanding (Denzin & Lincoln, 2005; Guba & Lincoln, 1994; Mayan, 2009).

3.2.2 Research method and approach

3.2.2.1 Focused ethnography

Focused ethnography was utilized as the overarching method for this research. Ethnographic research involves studying the particular culture of a group in order to understand and relay the beliefs, values, and behaviours of a defined population on a certain topic of interest (Mayan, 2009; Richards & Morse, 2007). Focused ethnography is utilized when the culture of interest being addressed uses a specific research question, and is "conducted within a particular context or organization among a small group of people to inform decision-making" (Mayan, 2009, p. 39). The project aimed to explore students' perceptions of their role in transferring, sustaining, and catalyzing changes into the home environment based on the HEAL behaviours they adapted in an APPLE School. In order to understand the perspective of a targeted subcultural group in relation to this topic, a focused ethnographic approach was best suited (Richards & Morse, 2007).

Focused ethnographies often take place near the researcher's own working and living environment, therefore the use of three Edmonton area schools aligned with the convenience of participant selection often associated with this method (Higginbottom, Pillay, & Boadu, 2013). The time frame for focused ethnographies is often short term and non-continual (Knoblauch, 2005), which was also consistent with the timeline of this research project as there are time limitations to working with and in schools. However as Knoblauch et al. note, this short-term interaction should not be deemed superficial, as focused ethnographies often require intensive

data analysis of the wide range of data collected in such a short period of time (Knoblauch, 2005). Finally, this project resounded with a focused ethnographic approach as "findings are anticipated to have meaningful and useful application in community" (Higginbottom et al., 2013, p. 2). The results of this type and topic are critically important to CSH stakeholders and were highly anticipated by APPLE Schools.

3.2.3 Participants

3.2.3.1 School selection

A meeting between the researcher and members of the APPLE Schools management team took place in the fall of 2015 in order to discuss potential APPLE Schools to partner with for the present research. The APPLE Schools management team had firsthand knowledge of the school communities, and as such were able to identify schools that would be willing to take on this research project. The researcher was connected with the school administrators via email, and project information was subsequently provided to both the administrators and teachers (Appendix A) prior to the administrator granting approval for the project. An in-person meeting with each of the Grade 5 teachers and administrators took place prior to data collection in order to ensure the school staff were acquainted with the researcher, project objectives, timeline, and participation requirements. Grade 5 curricular links were provided to the teachers (Appendix B), so as to demonstrate the relevance of the project to their classroom curriculum. Teachers were also given a list of classroom health-related activities that could be done with the developed photos, as all students would receive a copy of their photos to keep regardless of participation in the research.

While saturation determined sample size (Mayan, 2009), it was estimated based on previous research utilizing photovoice with school-aged children that 20 to 30 participants would

be required (Genuis, Willows, & Jardine, 2015; Heidelberger & Smith, 2015; Jennings & Lowe, 2014; Mayan, 2009; Wang, 2006). As such, this was the range of participants that was sought for this project. In order to ensure 20-30 participants were recruited, the researcher estimated that three classes would be needed. It was anticipated that some students would forget to take photos or get their consent forms signed, some students may be sick, and some students may lose or forget their cameras at home. Further, including three classes from three different APPLE Schools ensured that there was representation from a diverse range of communities. All three participating schools were located within the Edmonton area of Alberta, Canada.

3.2.3.2 Sampling

Once the teachers and administrators from each school agreed to participate in the project, all students in the three contributing classes were invited to participate. Students were purposively selected from three of the 50 APPLE Schools. Purposive sampling is a common sampling technique used in focused ethnography, and involves the researcher selecting specific participants based on their experiences and knowledge relating to a certain topic (Crookes & Davies, 1998; Higginbottom et al., 2013). Purposive sampling was utilized because this research project required the involvement of a specific target population (Trochim & Donnelly, 2007): APPLE Schools students who were able to share their experiences in the project and could discuss how these experiences translated home. Based on previous research involving APPLE Schools, Grade 5 students (aged 9-11 years) were selected to align with their participation in the outcome evaluation. While Grade 5 children are typically prepubescent, they have developed the cognitive ability to be valid participants in research (Riding & Mathias, 1991; Vander Ploeg et al., 2014a). As such, students at this age have the ability to grasp the concept of the research project and can provide meaningful and honest responses in an interview setting. The reasoning

behind having both Grade 5 and Grade 6 students involved in the project was for inclusivity purposes: two of the three consenting classrooms were "split" classes (consisting of both Grade 5 and 6 students), however it was important to ensure that all students in the participating classes had the opportunity to be involved in the project. Students were given parental consent forms (Appendix C) to be completed prior to their involvement in the project. To further ensure inclusivity, all students were given a disposable camera and were informed that they would receive a copy of their photos to keep. However, only those students who had provided both parental consent and verbal assent were followed up with a one-on-one interview for research purposes.

The final sample size was determined when saturation amongst participant responses was achieved, and no new data emerged (Mayan, 2009). Of the 25 students who participated in the project, 12 were from "School A," 8 were from "School B," and 5 were from "School C." Gender distribution amongst students was even, with 13 male and 12 female students participating. Students ranged in age from 9 to 11 years old, and the majority of students (n=19) were in the fifth grade. This majority was to be expected as only two of the three classrooms were Grade 5/6 split classes, and one was solely Grade 5. Fifteen students stated that they resided in houses, while ten students reported living in an apartment or townhouse. The duration of student attendance in an APPLE School ranged from a few months (having moved schools at the start of the school year in September) to 6 years (attending the school since kindergarten). Two students had previously attended a different APPLE School within the province. The family demographics of the students ranged from single-parent homes to large families with multiple siblings and relatives residing in the dwelling.

3.2.3.4 Ethics

Ethics approval was granted through the Human Research Ethics Board at the University of Alberta, as well as approval from the Cooperative Activities Program through the Faculty of Education. As a condition of the research ethics approval, students were not permitted to take any photos of people. This message was relayed to students when they received their cameras, and after being developed the researcher reviewed all photos and removed any pictures of people prior to returning the photos to the students. Parental consent, as well as verbal student assent, was required from all participants. Students were informed that they could withdraw their involvement from the project at any time during the data collection process with no negative consequences. Both verbal and photographic results were conveyed in a manner which ensured student anonymity, and no names were linked to quotes or pictures when results were shared.

3.2.4 Data generating strategy

3.2.4.1 Photovoice

Photovoice is a data generating strategy which utilizes photos to tell a story or capture visual understandings of an individual's lived world (Wang & Burris, 1997). Photovoice is often used in ethnographic studies, and aligns with the participatory nature of this project (Mayan, 2009; Powers & Knapp, 2011). Developed by Wang and Burris in the 1990's, photovoice was originally utilized as a research method for engaging those with little power or decisional ownership (Wang & Burris, 1994, 1997) as photovoice originated from the theoretical underpinnings of critical consciousness and empowerment, feminist theory, and community-based approaches to documentary photography (Wang, 2006; Wang & Burris, 1994, 1997). Paulo Freire's logic of using visual images to allow individuals to critically think about and discuss their community is utilized in photovoice in order to empower participants to take control

of how their views are depicted (Wang & Burris, 1994, 1997). In alignment with feminist theory, photovoice was initially developed by researchers exploring the voice of rural Chinese village women who work laboriously but traditionally had no voice in personal or policy decisions (Wang, Burris, & Ping, 1996). The scope of photovoice has now spread to a much wider range of social issues and participant demographics, however the concept of feminist theory still aligns with photovoice through the belief that power comes from those who have a voice (Wang & Burris, 1997). Finally, documentary photography supports photovoice as a participatory approach, as it "puts cameras directly in the hands of people who otherwise would not have access, and allows them to be recorders, and potential catalysts, in their own communities" (Wang & Burris, 1994, p. 175). Through the act of photo-taking, individuals play an active role in providing a personal voice to address personal issues and catalyzing and community change (Wang & Burris, 1997).

The nature of photovoice is flexible and can be adapted to a variety of settings, however photovoice is well-suited and frequently used in health research involving children and youth (Findholt, Michael, & Davis, 2011; Heidelberger & Smith, 2015; Postma, Peterson, Ybarra Vega, Ramon, & Cortes, 2014; Wang, 2006). There are three main objectives of photovoice: to depict everyday realities of participants, to promote conversations and understandings around concerns facing the participant or community, and to reach policy makers (Mayan, 2009; Wang, 2006). Through the process of photo-taking and interview or focus group discussion, participants are in control of how they represent themselves and their ideas (Mayan, 2009). In order to examine the translation of students' behaviours from the school environment and into the home, photovoice was used as the data generating strategy for this research.

3.2.4.2 Stages of data collection

Data collection involved three stages, as outlined in Figure 1. Data collection took place in November and December 2015.

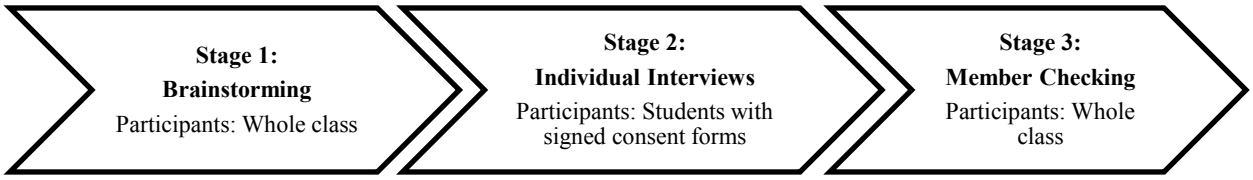

Figure 1. Stages of data collection

3.2.4.2.1 Classroom brainstorming & photo-taking.

The first stage of data collection involved an informal brainstorming session with the students in each classroom. An outline of this session is provided in Appendix E of this thesis. The purpose of this session was for students to familiarize themselves with the research topic by discussing what it meant to be an APPLE School. Students were given an opportunity to work independently, in small groups, and as a class in order to brainstorm characteristics of their school that were unique to being an APPLE School.

Next, the students were introduced to the research component. Students were asked to take photos which answered the question "*What does APPLE Schools look like in your home?*" They were informed that they would have one week to take at least 20 photos, and that the photographs should be thoughtful and creative as some students would have a chance to talk about the photos with the researcher in the coming weeks. It was also stressed that students should not take photos of people, including themselves. 24-exposure disposable cameras were given to each student, and the researcher reviewed the usage instructions with the class. Upon returning their cameras to their teacher, students would receive a copy of their photos to keep. In

order to maintain the inclusive nature of this project, all students, including those who did not obtain consent to participate in the research component of the project, were given a camera and the photo-taking instructions (Appendix F).

3.2.4.2.2 Interviews.

Photovoice includes either facilitated focus group discussion or individual interviews as a means for discussing participant photographs (Wang & Burris, 1997). One-on-one interviews were utilized because the purpose was to understanding the mechanisms by which students translated APPLE Schools into their unique home environments. While focus groups emphasize the interaction amongst participants (Mayan, 2009), interviews were ideal for this research since the intent was to hear each student's experience independently. Semi-structured interviews took place in the school setting at a time that was mutually agreed upon by the researcher and the Grade 5 teachers. Aligned with the participatory nature of the project, the interviews involved three stages of sharing: selection, contextualizing, and codifying (Wang & Burris, 1997). *Selection*: Students were reminded of the research question, and then asked to choose 5-6 photos that they wished to talk about regarding this topic. *Contextualizing:* Participants were asked a series of questions in order to frame stories about their photos. As per photovoice research methods, the questions were a modified reflection of the mnemonic SHOWeD (Wang, 2006):

- What do you **see** here?
- What's really **happening** here?
- How does this relate to **our** lives?
- **Why** does this situation, concern, or strength exist?
- What can we **do** about it?

Codifying: Students were asked to group their photos into similar ideas, and give a title to the photos or "themes" identified. Additional supplementary questions relating specifically to the research question were also included at the end of the interview (see Appendix G for full interview guide).

3.2.4.2.3 Member-checking.

The final stage of data collection involved member-checking of the initial themes with students. Within two to three weeks of completing the interviews at each school, the researcher reviewed all the photos and transcripts in order to identify the preliminary themes. The researcher then compiled school-specific PowerPoint presentations for each of the classes. In these presentations, students' photos and quotes supported each of the preliminary findings that were identified. The sessions were informal and interactive, as students were encouraged to provide verbal feedback and suggestions regarding the findings.

During the member-checking sessions, the developed photos were also given to the teachers to distribute to their students at an appropriate time. The students were informed that their input would be integrated into the final results and the researcher would visit their classrooms in the spring in order to share the findings. Following the member checking, the researcher brought photobooks (Appendix I) and school newsletters (Appendix H) for the parents, as requested by the teacher and students.

3.2.4.3 Field notes & reflective journaling

Aligned with ethnography, the researcher took detailed field notes in order to capture key observational data from the data collection process (Richards & Morse, 2007; Seale, 1999). These notes served as reference of the setting, mood, and overall reflections and feelings that the

researcher had during the data collection stages (Mayan, 2009). The researcher was mindful of including detailed notes of each of the setting and surroundings that each interview took place, including providing notes on unplanned interruptions, distractions, and any other pertinent information that may have affected the overall conduct of the data collection. Reflective journaling was also used by the researcher as a way of reporting personal notes (Richards & Morse, 2007). Journaling is a technique that aids in identifying the assumptions, issues and challenges that the researcher meets throughout the research process (Mayan, 2009).

3.2.5 Data analysis

All interviews were audio recorded and transcribed verbatim. Aligned with focused ethnography, data was analyzed inductively using latent content analysis (Mayan, 2009). Latent content analysis is a circular process which involves identifying, coding, and categorizing data into primary data patterns (Mayan, 2009). Upon the completion of the external transcription process, the researcher then began preliminary analysis by manually reading through each interview in order to record initial thoughts, personal reactions, and key points in the interviews. The researcher highlighted, underlined, and summarized the main points of each printed interview. The initial form of analysis served to identify emerging themes, and was the basis for the results which were shared in the member-checking sessions with students. The following analytical steps were followed next, as per focused ethnographic data analysis: i) coding for descriptive labels; ii) sorting for categories; iii) identification of outliers; iv) generalizing the constructs (theming); and v) memoing (Higginbottom et al., 2013). Coding, the process of identifying persistent words, phrases, or ideas (Mayan, 2009), was done manually by the researcher by highlighting and writing notes in the margins of the transcripts in order to further familiarize the researcher with the data, summarize initial segments of data, and provide

descriptive labels of these ideas (Mayan, 2009; Miles & Huberman, 1994; Roper & Shapira, 2000). Interviews were read and reread multiple times by the researcher in order to ensure all data were coded properly and that the coding process reflected the cyclical nature of the analysis. It was common for findings to initially be coded multiple times. Next, Nvivo v10 analytic software was used to complete pattern coding (categorizing) order to group "nodes" into large categories and reduce the number to analytic units (Miles & Huberman, 1994). This form of categorizing the nodes into larger groups allowed the researcher to account for the data in a meaningful way (Mayan, 2009). Negative cases were identified in subcategories, and the nature of these categories was discussed in detail with the research team. These cases were eventually used to strengthen the findings of this research and supported the validity of the broader literature scope that exists regarding this research topic (Miles & Huberman, 1994). Theming involving aligning and grouping categories together by identifying if and how each of the categories were interconnected. Memoing, the process of analytical note-taking to connect different pieces of data together in order to form larger concepts, was employed throughout the analysis process, and in particular when the themes were identified. Memoing allowed the researcher to theorize about the themes that were emerging from the data in order to identify meaningful findings that resounded with the participants' "intent within the context" (Mayan, 2009, p. 94).

Aligning with the cyclical nature of content analysis, the data analysis process was a dynamic integration of categorizing and theming (Mayan, 2009). The concluded findings were identified through constant self-reflection, revisiting of categories, and the progression of analysis through knowledge generation (Higginbottom et al., 2013; Roper & Shapira, 2000).

Two distinct themes, as well as multiple sub-themes, emerged, as well as one underlying concept which was strongly present across all of the findings.

3.2.6 Rigour

Rigour is defined as "demonstrating how and why the findings of a particular inquiry are worth paying attention to" (Mayan, 2009, p. 100). Guba and Lincoln argued that in order to establish rigour, qualitative researchers should strive to achieve trustworthiness in order to appreciate the distinct differences between qualitative and quantitative methods (Guba & Lincoln, 1982). They proposed four criteria by which trustworthiness is established: credibility, transferability, dependability, and confirmability (Guba & Lincoln, 1982). These four criteria will be explored below in respect to this research project.

Credibility refers to ensuring that the results are an accurate representation of the data (Mayan, 2009). In this research project, credibility was established and maintained through member-checking with each of the participating classes in order to get participant feedback and suggestions about the initial findings. As it was not feasible to arrange multiple classroom visits to conduct ongoing follow-up sessions throughout the data analysis, the researcher consulted with the APPLE Schools management team (the director and implementation manager) to discuss the findings and to incorporate their perspectives on confirming that the results were a true reflection of APPLE Schools. These staff members had been involved with the research from the start, so prolonged engagement between researcher and APPLE team from the beginning to the end of the project ensured that credibility in results was established. Finally, the researcher took ownership over familiarizing herself with APPLE Schools by engaging with stakeholders (staff, teachers, administrators and students), exploring previous research and

information about APPLE Schools, and independently volunteering at an APPLE School in order to gain a strong understanding of the project and its unique application in a variety of schools.

Transferability, similar to external validity, considers the applicability of the findings to other situations or settings (Mayan, 2009). This research included a sample of students from three different APPLE Schools in order to represent students from various communities and demographics. Additionally, purposive sampling was used in order to identify and utilize information-rich participants who would have the knowledge and insight to provide detailed responses to the research question. The 25 participants represented a wide range of demographics, from age to family make-up to type of residence, and as such the transferability of the project was strengthened by this diversity in student representation. Finally, transferability can be established by providing detailed, thick description (Mayan, 2009). Three strategies were utilized by the researcher to create thick description of the data: observations, interviews, and reflective journaling (Richards & Morse, 2007). Chapter 4 of this thesis provides further insight into the transferability of the research method to future studies and classroom topics.

The third criteria required to establish trustworthiness is dependability. Dependability can be seen as reliability, or the review of how decisions were made throughout the research process (Mayan, 2009). The integrity of this project was ensured by maintaining methodological coherence throughout: all aspects of the research project were aligned and congruent with the researcher's method and theoretical perspective (Mayan, 2009). Additionally, an audit trail was used in order to document decisions made throughout the research project in a manner that would be understandable to an individual who was external to the project (Richards & Morse, 2007). Extensive reflective journaling provided inside knowledge about how, when, and what decisions were made at various stages of the research process in order to ensure transparency and

insight into the analytic steps taken throughout the project (Mayan, 2009; Miles & Huberman, 1994). Throughout data analysis, the researcher confided in a critical friend in order to discuss emerging ideas and thoughts, while receiving objective feedback. The process of continually debriefing with a critical friend allowed the researcher to articulate ideas in order to gain a deeper understanding of the themes that were developing during analysis. The use of a critical friend also provided the researcher with the chance to reflect on questions or concerns that they may have not considered independently (Mayan, 2009).

Finally, confirmability is the ability to ensure findings are objective and logical during both data collection and analysis (Mayan, 2009). Further, confirmability ensures that the research findings remain true to that of the participants (Higginbottom et al., 2013). As with all qualitative research, it is essential to foster results which remain true to the participants (Roper & Shapira, 2000). The nature of focused ethnography data analysis is "an iterative, cyclic, and self-reflective process, as preliminary interpretations are challenged and data are continually revisited" (Higginbottom et al., 2013), and requires an intimate knowledge and familiarity with the data (Pope & Mays, 2006). The data analysis procedure for this research was extensive and reflective, and the researcher ensured that reflexivity was practiced throughout analysis. Reflexivity can be seen as the extent of assessing the effects of the research strategies on the findings (Pope & Mays, 2006). By revisiting themes, cross-checking findings, and staying true to the cyclical nature of focused ethnography research, the researcher ensured that confirmability was established throughout this research project.

3.3 Results

Analysis of the data revealed two major themes: i) *students are internalizing the APPLE Schools philosophy*; and ii) *students are driving change to create a healthy home culture* as a

result of their involvement in an APPLE School. Underlying both themes was the concept of student leadership and decisional ownership (Figure 2). Student leadership played a fundamental role in shaping the findings, and was consistently present throughout the results. Students' decisional ownership allowed them to take charge of their health behaviours and catalyze changes in the home environment. As a result of being in an APPLE School, students were empowered to value HEAL, and as such were able to promote, embody, and foster positive changes in both their own lifestyle behaviours and those of their families.

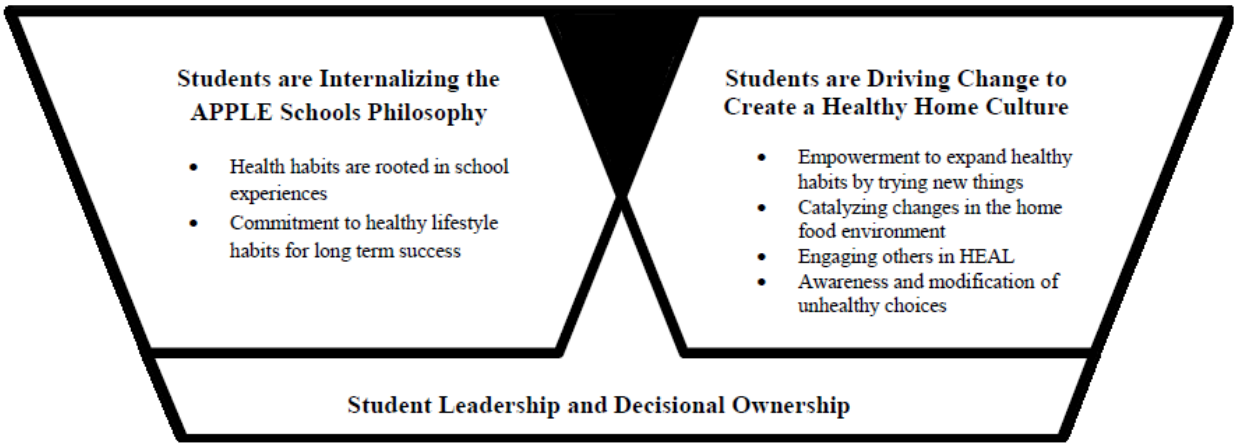

Figure 2. Results of a photovoice project examining the impact of APPLE Schools on the home environment

3.3.1 Student leadership and decisional ownership

APPLE Schools strongly values and promotes student leadership. Many APPLE Schools, including the three schools which took part in this research project, were also partnered with *The Leader in Me* process (The Leader in Me, 2016) in order to promote and foster student leadership and responsibility. It is important to note that although not every APPLE School was affiliated with *The Leader in Me*, all APPLE Schools placed a strong focus on student ownership, responsibility, and leadership. As such, the value that schools placed on leadership and decisional ownership resonated in students' behaviours, actions, and decisions in the home.

A student described how the leadership qualities she learned in school were relevant to her desire to be organized at home: “We have 7 habits…This [photo depicts] the first habit, being proactive, where you have all your things and you’re ready for the next day and you’re in charge of yourself.”

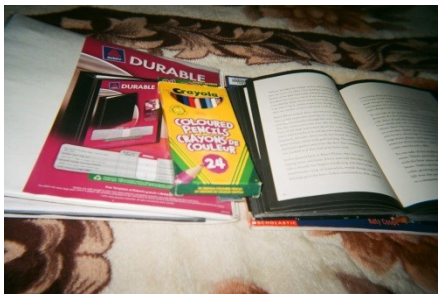

Figure 3. "Putting first things first"

Students exemplified the leadership values that were fostered in APPLE Schools in terms of being prepared for school, however the theme of taking charge of their decisions was also evident in students’ maintenance of their health behaviours at home. By embodying a sense of leadership and decisional ownership, students were able to facilitate changes in their family members’ HEAL behaviours, and as such demonstrated an ability to transform the home culture. Students had the knowledge, confidence, and decisional ownership to be leaders of both their own health choices, as well as those of their families.

3.3.2 Students are internalizing the APPLE Schools philosophy

Although each APPLE School is distinct and unique, all APPLE Schools have a consistent philosophy of creating sustainable changes in children’s health behaviours. The philosophy of APPLE Schools is a construct of the project’s mission, vision, and overall purpose. As such, the APPLE Schools philosophy can be regarded as “promoting healthy kids in healthy schools” by “empower[ing] school communities to lead, choose, and be healthy.” This leads to “sustainable changes to school, home, and community environments” in order to “foster

lifelong health and learning" (APPLE Schools, 2008, n.d.-b). In the context of this research, students from each of the three participating schools discussed how the APPLE Schools philosophy became part of their innate way of life. Students adopted the APPLE Schools philosophy in their home lives, and demonstrated an inherent mindset that habits and values fostered in school should be present in the home. Students described two main understandings of how the APPLE Schools philosophy was internalized: health habits were rooted in school experiences; and students' commitment to healthy lifestyle habits for long-term success.

3.3.2.1 Health habits are rooted in school experiences

The school environment served as a site for developing health habits from both formal and informal learning opportunities. Students saw their teachers as reliable sources of information, and therefore adapted healthy lifestyle behaviours because of the formal teaching and learning they were exposed to. Students retained the education they received about healthy lifestyle behaviours and drew on this knowledge at home in order to motivate and sustain such behaviours. Evidence of this was present in a student's explanation of how being at an APPLE School influenced him to drink more milk:

Figure 4. "Growing milk"

> [You should] drink milk every night before you go to sleep so you can be healthy and your bones and teeth will be strong…[Milk has] calcium and makes your bones strong. [I

learnt that] at different schools but they talk mostly about milk here…When I [moved] to [an] APPLE School last year after Grade 4, after spring break...I went here and I started drinking milk because it's healthy for your body.

Although this health message was relayed to the student in the school environment, the student demonstrated changing his home behaviours because of this knowledge. When students were educated about a certain behaviour and its importance, they internalized the importance of this behaviour in order to order to ensure it was maintained in the home.

The formal learning opportunities available in schools also allowed students to confidently validate their healthy lifestyle choices, as they understood and could validate why these decisions were important. The messages that students received at school informed their understandings at home regarding the importance of healthy eating. A student explained how she knew why vegetables were important because at school, "We have the sheet [of] vegetables and they will tell us what they do to our body." Students gained specific knowledge about the benefits of healthy eating from unique APPLE Schools activities, and these messages resounded with them when they made food choices at home:

Figure 5. "Cook"

Interviewer: So how does this relate to APPLE Schools?

Student: It's healthy food. Spinach, it helps- doesn't spinach help you like…hear or something like that?

Interviewer: Do you guys talk about being healthy in school?

Student: Um…We used to play games like put what's healthy and what's not healthy in like two different food groups. So like not healthy and healthy.

Interviewer: And do you remember that activity when you're at home and choosing what you want to make or put into your food?

Student: Yeah…I [try to put] a little bit of both. Mostly like- I have to get vegetables in there, so a little bit of both.

APPLE Schools fostered environments for both formal and self-directed learning of health behaviours and their importance. As a result, these values influenced students' decision making, and were engrained in students' health habits outside of the school environment.

Students internalized the APPLE School's philosophy of health and learning by adhering to the informal expectations that were inherently cultivated in the school. One student stated that she valued sleep because "sleeping is a healthy thing to do and it's healthy because you need to sleep to be able to go through your day at school." When prompted about where she learned this from, she stated "from the mistakes I learned in class…I fell asleep [and] everybody…got told that I did that." This student demonstrated how her peers implicitly influenced her sleep behaviours because she internalized their disapproval of her falling asleep in class. Deviation from the expectations of school conduct served as informal learning opportunities for students about the importance of developing and reinforcing specific lifestyle habits. Students were inherently aware of the behaviours that were expected of them in school, and errors in judgement required them to adjust habits accordingly. As such, the APPLE Schools values were embedded

in students' lives through both formal and informal learning opportunities, which played a crucial role in the ownership students felt in cultivating home health habits such as getting enough sleep, having breakfast and making healthy dietary choices.

3.3.2.2 Commitment to healthy lifestyle habits for long term success

Internalizing the APPLE Schools philosophy involved students valuing healthy lifestyle behaviours for both short and long-term benefits, and in doing so understanding the wider implications of their current actions. When asked about why they chose lifestyle behaviours such as healthy eating, being active, or brushing teeth, students shared their desire to ensure that they were setting themselves up for a successful future. One student justified her healthy eating with the knowledge that "you could live a lot longer if you eat healthy," while another explained that "if you're always eating junk food you won't be good. You won't feel good." Students internalized their school's philosophy of fostering long-term health and learning by valuing the future implications of their habits when making decisions at home. These examples demonstrated how students were self-motivated to maintain healthy habits at home due to school values which focused on the "big picture" health implications of sustaining such behaviours.

Students also had an understanding of the broader implications of developing healthy lifestyle behaviours for educational and employment benefits. Students internalized the APPLE Schools philosophy by understanding that they were in charge of developing their healthy habits in order to set themselves up for a successful future. Getting enough sleep at night was something that students felt responsible for in the home, and they identified the long-term importance of ensuring this behaviour was met. As one student explained: "If you don't get your rest and if you don't learn you won't have a good grade and you won't go to the next grade- like in junior high and high school." This sense of personal responsibility and understanding of the

broader health and educational implications of fostering positive lifestyle behaviours was aligned with the philosophy of APPLE Schools, and it was evident that these values were internalized in students' healthy lifestyle habits at home as well.

3.3.3 Students are driving change to create a healthy home culture

APPLE School students were leaders in driving positive changes for HEAL behaviours of both themselves and family members within the home environment. Students identified four distinct mechanisms by which they drove changes in the home environment in order to create a healthy home culture: empowerment to expand healthy habits by trying new things; catalyzing changes in the home food environment; engaging others in HEAL; and awareness and modification of unhealthy choices.

3.3.3.1 Empowerment to expand healthy habits by trying new things

Students discussed their openness to adopting new healthy behaviours in the home as a result of school influences. Many APPLE Schools had programs where students could taste-test new foods in order to increase their exposure, and ideally preference, to healthy snack and meal options. Beyond simply being introduced to new healthy foods, an important component of these activities was that students felt empowered to try new things because they had the freedom and confidence to do so. One student expressed how "the teachers in [school] encourage you to do things that you think you can't do." When probed about this, the student explained that because of his teacher's support in school, he felt more inclined to try new foods at home. The implication of possessing confidence and decisional ownership, and as a result acquiring a greater openness to trying new things, was demonstrated in the following quote:

Sometimes people hate stuff that they never tried, and then once they try it they like it, so sometimes they pack it for lunch 'cause they like it. Which I did, 'cause I used to hate bananas…We had a banana snack at school and I didn't really like it but I just tried it and then I just liked it.

Although teachers and caregivers played a role in facilitating the introduction of something new, students had complete autonomy over the uptake of the behaviour. It was essential for students to feel as though they had ownership over making decisions in order for them to be more inclined to introduce (and often enjoy) new healthy foods to their diets at home.

As a result of APPLE Schools supporting healthy lifestyle habits, increasing exposure to healthy options, and building decisional ownership, students increased their receptiveness to new heathy habits at home. Students were comfortable with trying new things due to the opportunities they had in school, and this empowered them to try new healthy things independently at home:

Figure 6. "Nice, tasty drink"

Interviewer: Why did you take that picture?

Student: 'Cause if you look, it has like tomatoes, lettuce, carrots, and stuff in them. My family drinks it because it's really good. And it's really healthy.

Interviewer: Any other reason why that related to being in [your] school?

> Student: Well because at [my] school we have a whole bunch of food like lettuce and stuff, and it's technically just in a- it's all just technically mushed up into a can.
>
> Interviewer: Anything you learned at school made you want to drink this drink?
>
> Student: Yeah because this school, like I said, we have lots of healthy food and I decided to try it with just all of it mushed together.

This quote demonstrates that the students' exposure to healthy foods within the school translated into a greater openness to expanding food choices autonomously in the home. The student demonstrated a desire to choose this vegetable drink at home because she knew and valued making a healthy choice as a result of her school experiences. Students also exposed their family members to new healthy food options by telling their parents about healthy snacks and bringing home recipe sheets from new snacks they tried at school. A student discussed how the conversations she had with her parents about the new snacks she had tried in school led to the introduction of new snacks at home: "Usually [my teacher and the librarian] make like these healthy snacks. And I tell my mom to like make some for me…and my brother. And so…we get to eat more healthy."

Besides healthy foods, students also shared examples about their willingness to learn new games, activities, and sports in school. It was common for students to express their desire to participate in these new activities with their families at home. Students had a strong sense of pride and ownership over learning new things and often shared these opportunities to be active with their families at home. A student who was involved in a program at her school called Kids on Track described her involvement in the program, saying: "It's like an after school thing and they teach you about like healthy stuff and we play a lot of games." She highlighted the leadership role she had in bringing these games home by stating, "I have to some-sometimes I

actually have to teach them [how to play].” The student expanded her family’s knowledge and behaviours regarding being active at home by sharing new activities with them. Through exposure to new foods and activities in programs at an APPLE School, students were empowered to try new things at home. This, in turn, promoted the expansion of positive lifestyle behaviours in the home for the benefit of both students and their families.

3.3.3.2 Catalyzing changes in the home food environment

As students expanded and shifted their food preferences towards more healthy options, changes in food availability were needed in order to foster these healthy eating habits at home. Through suggestions and recommendations, students were able to change their caregiver’s food purchasing habits. Students often asked their parents to buy healthy foods when they realized that they did not have the foods available to make healthy snacks and meals at home. A student explained:

Figure 7. "Healthy strategies"

> Student: Well we’re doing a rainbow lunch which we’re like looking at the bulletin board over there with the rainbow thing. And…it’s like healthy stuff and that’s what I usually pack.
>
> Interviewer: That’s what you usually pack- have you always packed healthy stuff, a rainbow lunch?

Student: Not really.

Interviewer: Why did you start packing a rainbow lunch?

Student: 'Cause I want to be more healthy and like…I don't want too much like…bad stuff in my body and I don't want to get sick or something.

Interviewer: Did you always have the stuff in your home that allowed you to pack a rainbow lunch?

Student: I asked my mom and dad to change what they're buying…I usually pack bad stuff and then when I asked them that, they like were like happy 'cause I don't usually do that sometimes.

Significant improvements to the content of home meals were also evident due to students' suggestions and influence. Students remarked that they would educate their caregivers about rainbow lunches to ensure that the adult would pack an appropriate lunch for them: "I told my mom like about rainbow lunches, to pack me rainbow lunches for school because when we have like special rainbow lunches I tell my mom about it so she packs me mostly rainbow lunches when I tell her." The term "rainbow lunch" refers to a lunch that includes foods from all four food groups. Students are encouraged to eat food from each of the corresponding colours of the rainbow: green represents Vegetables and Fruit, yellow represents Grain Products, blue represents Milk and Alternatives, and red represents Meat and Alternatives (APPLE Schools, n.d.-c). This student demonstrated the ownership she felt in making sure she ate healthy, and as such was able to educate her mom about the components of a healthy lunch and alter how her mother packed her school lunches. It appeared that parents supported healthy eating behaviours in the home, however it was the students' suggestions which played an essential role in actuating

these changes. As such, students played a pivotal role in catalyzing changes in the home food environment.

Figure 8. "Always have a rainbow lunch"

Beyond just the content of the students' own lunches, changes were also evident in what was prepared for family meals. One student shared that as a result of her participation in the school's Cooking Club, her parents had "changed the supper into like, into like healthy stuff." School cooking programs such as these also allowed students to get involved in meal preparation and cooking with parent or guardian in the home. Students discussed how they had become more involved in meal preparation, as they were comfortable cooking and making snacks in the kitchen both independently and alongside their caregiver. The impact of the school activities administered by APPLE Schools was demonstrated in the changes that students generated in their caregiver's purchasing habits, the content of lunches and dinners, and their increased involvement in meal preparation.

3.3.3.3 Engaging others in HEAL

Students facilitated improvements to family HEAL behaviours by actively engaging them in a variety of ways. Students expressed a sense of responsibility to look out for their family members, and had a desire to share health knowledge in order to improve family behaviours in

the home. A student demonstrated this leadership in an example she gave about reducing her older brother's pop consumption:

> Student: My brother- before he…don't want to drink milk. But I told him that he need to drink milk- not just like the Coke or that things. And it…he asked me why do we need it, do he need to drink milk, asking to be healthy. And I tell him that he can be healthy and milk is better than Coke.
>
> Interviewer: And so does your brother drink milk now?
>
> Student: Yeah-sometimes.

Similarly, another student commented on the importance he placed on drinking milk in order to "make your body fit." He shared this knowledge with his brother, and as a result, his brother "is starting to drink more milk now." Students engaged their family in HEAL by educating them about the importance of physical activity and a healthy diet. One student stated that she told her family "to exercise- like I tell them about the programs we do for exercise" because she wanted her family to live a long and happy life, while another student often told his family "to always…eat what's in the food groups." These quotes demonstrate the leadership role that students took on in educating and informing their family members about HEAL choices in order to engage them in healthy lifestyle behaviours in the home.

With respect to increasing physical activity, students reported involving their family members by participating in activities with them. Because of students' uptake of active living in the home, family members were encouraged and exposed to more opportunities to be physically active. Students shared that by increasing their own physical activity at home, their family members' activity levels also increased:

Figure 9. "Basketball with brothers"

Student: Sometimes I just play with my dad with the basketball and I played baseball…

Interviewer: Has anything change in the house because of something you learned in school?

Student: Yeah when I started playing basketball I started telling my brothers and they really like going out and playing with me. So yeah.

Interviewer: Did your brothers play basketball before?

Student: Mm huh yeah. But they didn't play it as much.

Another student discussed how she was motivated to be active at home because of a school program that promoted daily physical activity. As a result of this, she engaged her father in more opportunities to be active as well:

> We have this thing in our agenda where you exercise [for] 30 minutes. It can be recess, gym or stuff and then you shade it in. And then that like pushes me to go like, maybe go with my dad swimming, maybe to the gym, even if it's not on schedule sometimes, I wanna go.

The student demonstrated how involvement in an APPLE School not only increased her desire to be more active at home, but also how it indirectly promoted more activity opportunities for other family members. Students often shared that they supported their families by co-participating in

activities with them: “We actually go on walks, and, and bike ride, walks. And we go to the park and play some baseball…basketball, soccer, football.” As such, school activities encouraged students to increase their physical activity levels, as well as provided opportunities for students to promote and engage family members in activity at home.

3.3.3.4 Awareness and modification of unhealthy choices

Students established self-control and personal ownership of moderating unhealthy behaviours within the home environment. Unlike in school, students explained that the home was a less controlled environment as there were more opportunities to be unhealthy compared to at school:

> “Sometimes when we eat…unhealthy food, the teachers say to put it away or to eat it like when you’re not at- when you’re not at school. Because this is a healthy school and then we’re not supposed to eat junk food in healthy schools.”

Despite the decreased number of “rules” and expectations in the home, students nevertheless maintained the importance of HEAL by moderating these unhealthy behaviours. One student explained how she handled her home food environment by explaining, “My mom’s friend, he buys like lots of junk food at home. But I don’t eat them- I eat them like once a week.” Students resonated with the understanding that it was okay to have an unhealthy treat once and a while, however moderation was key:

> Student: In like third grade we had this subject on healthy food and we had to cut out- like…but out some foods in like a magazine or like a shopping list thing. And we had healthy foods and not healthy foods on the other. And we had to like arrange them.
>
> Interviewer: Do you think about that list [at home] sometimes?

Student: Yeah. I yeah, there's some things in my pantry that are like- like marshmallows and I always think- I should have these like, I should have these occasionally but not like every day.

Another student explained that although he had access to pop at home, he was still mindful of his consumption: "I usually have- like say this is a glass, I don't have it like just at the tip of it. I would usually just have a half a glass…because then I don't waste it all and it's not too unhealthy." Although students were realistic in expressing that they enjoyed having treats and unhealthy snacks, they also possessed a great deal of responsibility and awareness in modifying the number of unhealthy foods they consumed.

The importance of awareness and modification was also applied to students' sedentary behaviour levels and physical activity at home. A student shared how she reduced her sedentary behaviour by explaining: "Well at home, I usually go on the iPad and go on Mathletics or something. But then like…sometimes I'm always inside. So I go outside, going on a bike or rollerblade with my friends." Another student stated that "I'm active and we need like- not to stay and play video games all day. We need like to go outside and like play."

Figure 10. "We're supposed to stay active"

Students recognized the importance of not only reducing screen time and sedentary behaviours, but also the value of being outdoors and being physically active during this time instead. This

awareness and modification of unhealthy behaviours in the home allowed students to foster healthier habits and make positive health decisions about their HEAL behaviours.

The theme of monitoring and modifying unhealthy behaviours in the home was apparent beyond students' self-management. Students took on a role of supervising and managing the behaviours of their family members in order to ensure unhealthy behaviours were kept to a minimum. A student shared how she regulated her family's eating habits in this quote: "[I] make sure my mom and my brother don't eat too much candy when they're snacking…they both have a big sweet tooth."

Figure 11. "A healthy snack"

Students took on a leadership role in order to ensure that their home environment fostered a healthy culture similar to that of their APPLE School. Although the home environment was not as structured as school due to the lack of formal rules, students explained that they made changes to their overall home culture in order to maintain healthy lifestyle habits. As a result of her involvement in an APPLE School, a student shared that her family made a rule about having "no junk food at home," further explaining: "we have it like once or twice, but not like all the time." Through awareness and modification of personal and familial behaviours in the homes, students demonstrated their capacity to transfer HEAL values into the home environment in order to build and sustain a healthy home culture.

3.3.4 Summary

The findings revealed that the home environment was considerably altered as a result of the impact that APPLE Schools had on students' values and behaviours at the home. The interviews and photographs from students provided an in-depth look at how the home environment had been changed due to students' involvement in APPLE Schools. The underlying concept of student leadership and decisional ownership was consistent in these results, and as such emphasized the pivotal role that the students had in driving such changes in the home.

Students took ownership over their health habits, and in doing so demonstrated their role as catalysts for changes in the home. Students internalized the APPLE Schools philosophy, which was evident in the way that their health habits at home reflected their experiences in school and their overall mindset of being committed to long-term success. Students were able to drive change in the home environment in order to improve healthy lifestyle behaviours and the overall HEAL environment at home. Involvement in an APPLE School fostered student ownership regarding trying new healthy things, and through this willingness students exposed their family members to new healthy habits as well. Students catalyzed changes in the home food environment by influencing meal content and parental food purchasing habits. Students demonstrated their roles as leaders by engaging family members in HEAL at home. Finally, students drove change to create a healthy home culture by modifying both their own unhealthy choices and those of their families. Students' awareness of healthy and unhealthy choices ensured HEAL habits were promoted in their family member's behaviours as well as the overall culture of the home.

3.4 Discussion

It is well established that the home and the school environments play a significant role in influencing children's lifestyle behaviours regarding healthy eating and active living (Epstein, 2011; Gruber & Haldeman, 2009; Langford et al., 2015a). As such, collaboration between the two settings is ideal in order to support and sustain positive behaviours in multiple environments (Sormunen et al., 2011). The mission of APPLE Schools highlights this importance, stating that "APPLE Schools will empower school communities to lead, choose and be healthy. Students' active living and healthy eating habits will be supported through sustainable changes to school, home and community environments" (APPLE Schools, 2008). APPLE Schools has been shown to affect students' behaviours outside of school hours (Vander Ploeg et al., 2014b), however there are currently limited understandings regarding the mechanism by which APPLE Schools translates beyond the school environment, and engaging with families has been identified as the most challenging element of CSH interventions (Langford et al., 2015a). This research addressed these limitations by utilizing students' perspectives in order to explore the extent to which behaviours fostered in an APPLE School were transferred into the home, and demonstrated that students can play an active role in integrating their family members in behaviour changes formulated by a school-based health promotion intervention.

The underlying mechanism of these research findings was the element of student leadership and decisional ownership. As such, this component was regarded as a fundamental element that needed to be established in order for students to successfully internalize the APPLE Schools philosophy and drive changes in the home environment. The findings of this research support previous work which demonstrated the positive association between self-leadership and improved diet quality and physical activity in Grade 5 students (Ferland, Chu, Gleddie, Storey, &

Veugelers, 2015). Student-led health initiatives have been studied as a way of successfully implementing healthy lifestyle behaviours in schools (Gutuskey, McCaughtry, Shen, Centeio, & Garn, 2016), however this research demonstrates that student leadership fostered within APPLE Schools was the underlying mechanism for the effects seen beyond the school environment. These findings revealed that when students are empowered with decisional ownership over their health choices, they are able to internalize their health values and incorporate them into their everyday habits. This then translated to personal responsibility of ensuring family members also followed healthy lifestyle habits. By embracing a sense of leadership and decisional ownership, students were empowered to take charge of their actions and the actions of those around them.

Students reported internalizing the philosophy of APPLE Schools, as their school experiences guided their health choices and they demonstrated an understanding of the "big picture" implications of their current health behaviours. APPLE Schools is guided by CSH, and as such the philosophy and core values of the project align with and address the JCSH's four pillars (Pan-Canadian Joint Consortium for School Health, 2008). However, both CSH and APPLE Schools recognize the diversity within school needs and demographics, and as such there is no standard protocol for implementation (Schwartz et al., 2010; Veugelers & Schwartz, 2010). A recent review of the process evaluation of a variety of CSH studies from around the world identified challenges that have arose from interventions of this nature. Langford et al. concluded that there is a need for more comprehensive understandings and evaluations of HEAL interventions during adolescence, as well as a better way to increase family engagement in such interventions (Langford et al., 2015a). Quantitative research has demonstrated APPLE Schools' goal of promoting and improving Grade 5 students' HEAL behaviours (Fung et al., 2012), however our study is the first to highlight the unique characteristics of the APPLE Schools

philosophy which are internalized by the students, and the ability for students to impact the family as a result. These findings, although pertaining to children, address the challenges highlighted by Langford et al. as they provide valuable insight into the mechanisms by which a CSH intervention, APPLE Schools, shaped students' values and decisions relating to HEAL in the home.

The results of this research demonstrated that students are playing an active role in driving changes in HEAL behaviours within the home. These findings are particularly exciting because previous research has recognized the difficulty, yet importance, of involving families in school-based health interventions (Langford et al., 2015a; Lytle et al., 2006). Of the research which was able to demonstrate students' abilities to make changes to the home environment, these studies often associated the child's influence with cultural implications (Aldinger et al., 2008; Baranowski et al., 2000; Gadhoke et al., 2015; Mukhopadhyay & Bhatnagar, 2005), had strong parental involvement in both the intervention and evaluation (Ballantyne et al., 2001a; Lytle et al., 2006; Reynolds et al., 2000), and/or focused on intergenerational learning between parents and children regarding environmental topics and behaviours such as recycling, pollution, and waste reduction (Ballantyne et al., 2001a; Evans et al., 1996; Grodzińska-Jurczak et al., 2003). The findings of our research align somewhat with formative research by Gadhoke et al. which identified how American Indian children acted as change agents within the family regarding HEAL behaviours. The authors proposed a conceptual framework to identify how students accomplished this feat with the objective being to use this framework to inform an obesity prevention project. It is important to note, however, that the findings of Gadhoke et al.'s research were not a result of the influence of a school intervention, and had specific cultural and contextual implications. As such, their findings may not be generalizable to other communities

or populations, and did not demonstrate the specific effects of a school-based intervention on the home. Aldinger et al.'s exploration of a CSH intervention in China also concluded that children were able to positively change their family's attitudes, knowledge, and behaviours as a result of a variety of health topics learned in school. Although promising, the authors noted that the strength of the child's influence in the home may have been the result of cultural underpinnings, as this intervention and study took place during China's one-child policy. As such, this research displays novel and generalizable findings within Western contexts regarding how students perceived that they were able to translate school-learned behaviours into the home, and in doing so create positive changes to their family's HEAL behaviours.

Students shared a willingness to try new healthy things both at school and at home. As a result of their exposure to new foods and activities, students were more open to trying other new healthy things at home and they often shared these foods or activities with their families. In existing research regarding school-based interventions and their translation into the home, very few findings align with this theme. In regards to environmental programs affecting the home, Ballantyne et al. found that students educated their families about new ways to approach daily household tasks in a more environmentally friendly manner (Ballantyne et al., 2001b). For example, one student learned to use vinegar when cleaning the bathroom, and encouraged their parent to develop this new habit. Aldinger et al. also found that as students' knowledge about health topics increased, they shared these new findings with family members (Aldinger et al., 2008). To the best of our knowledge, no studies were found that supported the idea of students to trying new things in schools as a vehicle for promoting positive changes in the home. As such, this may be a feature within APPLE Schools that provides novel insight into a mechanism by which students go about driving change in the home.

Our findings demonstrated students' ability to positively change the home food environment by influencing parents' purchasing behaviours, participating in meal preparation, and requesting healthy food options in meals. Our results align with previous research which supports the idea that children can significantly influence grocery purchasing decisions (Flurry, 2007; Norgaard et al., 2007), and further that they did so in a positive manner due to their involvement a school-based healthy eating program (Lytle et al., 2006). Children's eating behaviours are greatly impacted by availability and accessibility of foods with in the home (Amuta et al., 2015; Cullen et al., 2003; Kunin-Batson et al., 2015; Maitland et al., 2014), and although the home environment is often thought to be shaped by the parent or caregiver (Lindsay et al., 2006), the findings of this research further support the role of the child in influencing food availability in the home. Students also began taking on an active role in the kitchen by helping with meal preparation, which has been shown to result in better diet quality for children, as well as more confidence in the kitchen (Chu et al., 2014; van der Horst, Ferrage, & Rytz, 2014). As such, the implications of our findings may have additional added benefits to children's lifestyle behaviours.

By participating in HEAL with family members, students were able to change their family's eating habits and increase their activity levels in the home. Co-participation in activities with family members has been shown to increase overall physical activity levels and decrease leisure time sedentary behaviours (Xin et al., 2015), which highlights the positive implications of this finding. Further, children have been shown to greatly influence how families spend their recreation time, and as such can play a significant role in determining the nature of leisure activities (Jenkins, 1979). The findings from our research support the fact that students are

valuing HEAL in the home, and as such are engaging their families in a variety of positive health behaviours.

Lastly, students drove changes in their homes through their awareness and modification of unhealthy behaviours. Others have emphasized the role that children can play in advising family members about a wide range of family behaviours, including smoking (Aldinger et al., 2008), healthier fast food purchasing (Gadhoke et al., 2015; Lytle et al., 2006), reducing environmentally "unfriendly" behaviours (Ballantyne et al., 2001a), and decreasing overall unhealthy food consumption in the home (Rausch et al., 2015). Our findings align with these results, and add to the existing research regarding students' ability to educate their families about unhealthy behaviours in order to promote healthy changes in their diets and activity levels. The mindfulness that existed in students' own HEAL choices within the home was similar to what Aldinger et al. found in their study, in that children reported modifying their own "bad habits" in order to developed good habits. These findings demonstrate the students' role in improving both their own health behaviours, as well as those of their family.

Previous literature supports children's ability to share knowledge learned in school with their family or caregiver at home through intergenerational learning (Ballantyne et al., 1998; Gadsden & Hall, 1996). Further, the role of children as health promoters in their homes and communities has been explored (Aldinger et al., 2008; Gadhoke et al., 2015; Mukhopadhyay & Bhatnagar, 2005) , but in limited capacity in a Western context. The findings of this research not only support previous studies which demonstrate children's ability to be a change agent in the home through the sharing of knowledge, attitudes and behaviours, and intergenerational learning (Ballantyne et al., 1998; Ballantyne et al., 2001b; Duvall & Zint, 2007; Vaughan et al., 2003), but also revealed that leadership and decisional ownership is essential to students' ability to

make changes in the home. To our knowledge, this was the first study to provide evidence that a school-based health promotion project was able to reach the home environment using solely the students' perspectives. In doing so, it reveals the mechanisms by which a CSH intervention effectively translates into the home. Therefore contrary to previous research which relied on parent-centered components (i.e., parent workshops, newsletters, educational tools for the home) in school-based interventions (Baranowski et al., 2000; Lytle et al., 2006; Rausch et al., 2015), this project demonstrates how students independently brought their school behaviours home and as a result were able to drive tangible changes in the home environment. As such, APPLE Schools can be seen as an effective child-centered method for health promotion in both the school and the home.

3.4.1 Implications

The findings of this research highlight the crucial importance of fostering student leadership and decisional ownership in order to sustain HEAL behaviours in the home environment. In a Canadian context, the JCSH currently outlines four essential pillars that CSH is grounded in: social and physical environment; teaching and learning; policy; partnerships and services (Joint Consortium for School Health, 2016). Emphasising leadership within the CSH framework is necessary in order to ensure future efforts recognize and adapt this trait, and this could be done by incorporating leadership and decisional ownership in the foundational pillars of CSH. Leadership could also be further stressed in the WHO's definition of CSH on a global basis, as currently there is limited recognition of such traits. With regards to implications for general school curriculum, teachers can use this knowledge in order to inform their school health lessons and programs. Teachers should strive to foster a sense of leadership and decisional

ownership within their classroom in order to ensure their students internalize lessons and translate behaviours outside of the school environment.

There are also implications of this research for health promotion efforts in general. These findings demonstrate children's ability to catalyze and drive changes in the HEAL behaviours of family members at home. As such, future health promotion efforts targeting the home environment or family members should consider utilizing the school environment and students as important stakeholders to address such issues.

3.4.2 Strengths and limitations

Strengths of this study include the diversity amongst participant demographics, and the effectiveness of using photovoice to capture student perceptions on our topic of interest. A limitation of the study stemmed from restrictions in the school board research ethics approval, as students were not permitted to take photos of people. In previous photovoice research projects involving children, photos often depicted people partaking in certain activities or behaviours (Alexander, Frohlich, & Fusco, 2014; Genuis et al., 2015; Jorgenson & Sullivan, 2010), which may have added to the richness and diversity of examples students drew from when discussing their photos. However, students in this project were still successfully able to capture and explain their photos in detail, despite the lack of people or behavioural depictions in their photos. Additionally, by restricting the presence of people in the photos, this helped to ensure anonymity in the students' photographs and oral responses. A further limitation was the small number of schools that participated in this research. Because each APPLE School tailors CSH to the specifics of each school and community (Schwartz et al., 2010), students from other schools may have varying responses and examples about how they brought APPLE Schools home. However,

due to the saturation in responses from the 25 students at the three participating schools, it can be confidently concluded that the ideas and responses of students were accurately represented.

3.4.3 Conclusion

The findings of this research provide an understanding of the reach of APPLE Schools into the home, and demonstrate the significant role that students have in catalyzing changes in the home as a result of their involvement in CSH. Fostering student leadership and ownership over health behaviours was a fundamental concept which underlined the findings of this research. Students reported internalizing the philosophy of their APPLE School by rooting their health habits in school experiences and valuing the "big picture" implications of their actions. Students' involvement in APPLE Schools empowered them to drive changes in the home environment through a variety of different means relating to healthy eating and active living. This finding was supported by previous literature which provides evidence of children influencing home behaviours through intergenerational learning. However, our study adds to this body of literature by clearly demonstrating the effects that a school-based health promotion project has on student and family behaviours in the home as a result of changes driven solely by students. The findings of this study provide encouraging evidence that APPLE Schools impacts much more than just the school environment, and that changes made in the school can have a significant positive impact in the home environment. Further, this study demonstrates the powerful role that schools and children can play in health promotion efforts within the home.

The results uncovered promising findings about just how significant of an impact APPLE Schools has had on students' health behaviours, as well as those of their families. The understanding of the essential component of student leadership is important for future child-centered health promotion efforts, as we found it is critical to establish this element in order for

students to become catalysts for positive changes in their lives and the lives of others. Given the significance of the evidence surrounding poor lifestyle behaviours in both Canadian children and adults, this research reaffirms the importance of APPLE Schools as an effective method of promoting healthy lifestyle behaviours in both children and their families. Additionally, engagement with families has been identified as the most difficult task in CSH interventions (Langford et al., 2015a), however our findings suggest a novel and encouraging approach to do so. Future research into children's roles as key stakeholders in family health promotion is therefore warranted, and may offer a promising direction for future child and family health promotion efforts.

CHAPTER 4: USING A STUDENT-CENTERED PHOTOVOICE PROJECT TO EXPLORE HOW SCHOOL HEALTH BEHAVIOURS TRANSLATE HOME: STRENGTHS, LIMITATIONS, AND FUTURE DIRECTIONS

4.1 Background

It is well supported within the literature that collaboration between school and home is essential for fostering the utmost success in student development and wellbeing (Cox, 2005; Epstein, 1992, 1995; Sormunen et al., 2011). Children spend the vast majority of their lives in these two environments, and as such these settings undoubtedly shape children's behaviours (Epstein, 1992). When relationships are established between the school and the home, research typically highlights the partnership between teachers and parents as the pivotal determinant of success (Epstein, 2011; Sheridan, 2007). Although significant, focusing solely on the parent-teacher dyad runs the risk of undermining the child's role in utilizing school programs to shape and drive changes in family behaviours and the home environment.

Both overtly and covertly, children have a significant impact on the home environment and parents' decision-making processes. Children have been shown to strongly influence health behaviours in the home regarding both family dietary behaviours (Hunter, 2002; Laroche et al., 2007; Norgaard et al., 2007) and physical activity (Flurry, 2007; Jenkins, 1979). Research regarding intergenerational learning between children and their parents also highlights the important role that children play in influencing adults' knowledge, attitudes, and behaviours relating to a variety of topics including environmental and health issues (Ballantyne et al., 2001b; Duvall & Zint, 2007; Vaughan et al., 2003). The evolution of Western family dynamics, advances in technology, and the increase in external influences shaping children's socialization in the most recent century have allowed children's influence on family dynamics to grow (Flurry, 2007). In the "new" family environment, children make decisions more autonomously

and have more responsibility in family decision-making processes than they did in a traditional family structure (Clulow, 1993; Flurry, 2007).

Given the significant role that students play in influencing the home environment, and the linkage between the school and the home, insight into how the home environment is influenced by the school is highly valuable to teachers. The partnership between school and home is essential for student success (Epstein, 1992), and as such it is necessary for teachers to understand students' home dynamics in order to properly meet their students' needs (Starkman, 2006). Opportunities for school-home collaboration are in the child's best interest and should be encouraged as often as possible in order to achieve outcomes such as academic success and positive behavioural management (Jónsdóttir & Björnsdóttir, 2015). Further, it has been recognized that teachers play a central role in utilizing resources from the school and home in order to optimize learning and development within the school environment (Peralta & Galaviz, 2013). School-home relations primarily exist through parent-teacher correspondence, however opportunities to build these relationships are often minimal and limited to parent-teacher meetings or formal school gatherings that are typically not held on a regular basis (Bergnehr, 2015; Crozier, 1998). As such, it has been suggested that relying solely on parent-teacher relations results in the needs of high risk students (i.e., those with learning or behavioural problems) being prioritized above all other students (Bergnehr, 2015). Employing student-centered approaches to understanding the translation of school lessons to the home environment may provide valuable insight into the strengths and weaknesses of school programs and teaching methods. This, in turn, would allow teachers to adapt their instruction in order to better meet the needs of their students as a whole. Utilizing a student-centered approach to better understand the home environment would also allow for greater insight into the diverse scope of needs within a

classroom context, as the knowledge, insight, and collaboration between the school and student's unique home environment is strengthened (Peralta & Galaviz, 2013). As previous research on the relationship between the school and home is largely focused on the teacher and parent interactions, it is necessary to identify a wider means of exploring this relationship using students' perspectives.

A previous research project using photovoice was conducted in order to examine students' perspectives regarding how their involvement in a school-based health promotion project influenced their home environment (McKernan et al., 2016). The approach used in the photovoice project was novel, and allowed for an understanding of this phenomenon from purely the students' perspectives. The results provided valuable insight into the capacity that students have to drive changes in the home. The strength of the research findings calls for the need to understand how and why this participatory approach was so effective. Therefore, researcher field notes and teacher interviews were utilized to address three questions: 1) What unique features of this photo project were essential to its success?; 2) Could this project be applied to understanding the effects of diverse school subjects and topics on the home environment?; and 3) Is it feasible for teachers to implement this project in their classroom independently?

4.1.1 Setting: APPLE Schools

The Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools) is a successful health promotion intervention in 50 school communities across the province of Alberta, Canada. APPLE Schools follows the comprehensive school health (CSH) framework in order to foster the vision of "healthy kids in healthy schools" (APPLE Schools, 2015). The implementation of APPLE Schools is unique to each school community, therefore school-specific health promotion initiatives are developed based on the needs and requirements

identified by each school community (Schwartz et al., 2010). Although APPLE Schools is primarily school-based, an important component of both the project and CSH is the link between the home, school, and community (APPLE Schools, 2008; Joint Consortium for School Health, 2016).

4.1.2 The photovoice project

This section will provide a detailed overview of the process that was utilized in the initial photovoice project (which took place at three APPLE Schools) in order to provide important context for the research presented in this chapter regarding teacher perceptions. As the primary coordinator of the project, first person narrative will be used throughout this chapter in order to distinguish my role in the decision making and facilitation of the project that took place between November 2015 and May 2016. As a general overview, Figure 1 provides a timeline of the photovoice project in one of the participating schools, and highlights the steps that were taken. These steps will be explored in greater detail within this section. After reviewing the photovoice project steps, the specific methods for the present research regarding teacher perceptions will be reviewed.

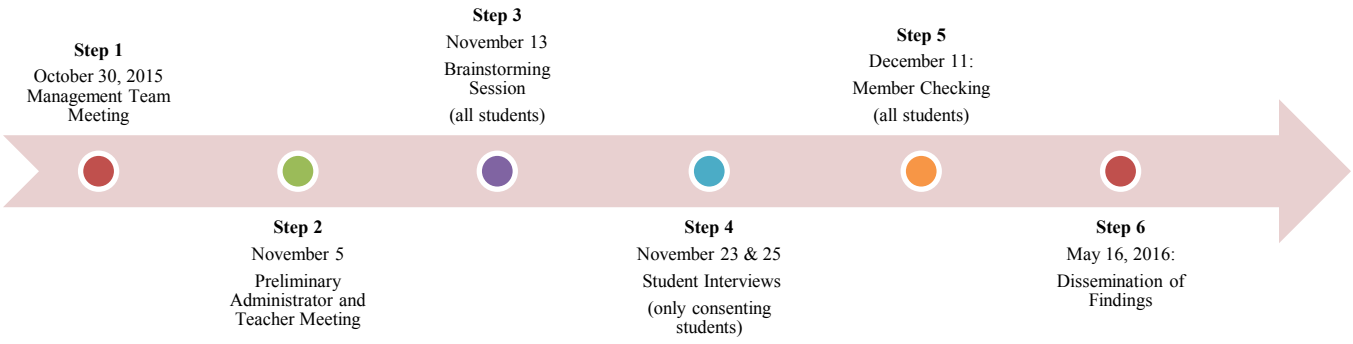

Figure 12. Photovoice project timeline for school "A"

Step 1: Management team meeting

The initial stage of the photovoice project began with a meeting between members of the APPLE Schools management team and myself. This meeting served to introduce the photovoice project, obtain initial feedback from the team, and discuss recruitment strategies for school involvement. The APPLE Schools management team identified potential schools to partner with, and made the initial contact with schools by introducing the project to administrators. Upon receiving interest and support from the administrators, the APPLE Schools management team then connected me with the schools via email, and I was able to provide further details to the administrators and pertinent Grade 5/6 teachers. I arranged a face-to-face meeting with the administrators and teachers in order to discuss the photovoice project and begin scheduling the classroom sessions.

Step 2: Preliminary administrator and teacher meeting

I met with the administrator and Grade 5/6 teacher at each of the respective schools in order to formally review the photovoice project and address any questions or concerns they had. It was important to ensure that the administrators and teachers were aware of the purpose of the project, as well as to incorporate their feedback and suggestions as best as possible. The teachers and administrators were given project information letters (Appendix A) which outlined the three stages of data collection which required classroom time. Participation in this project needed to be mutually beneficial for both the teacher and myself, and this meant that there needed to be both research and education-driven incentives. In order to justify taking upwards of three hours of classroom time to conduct this project, I created a document (Appendix B) which linked the photovoice project to relevant curricular outcomes from the Grade 5 Alberta Education guidelines (Government of Alberta, 2016). The project aligned with educational outcomes in Health and Life Skills, Language Arts, and Physical Education. The teachers were also provided with a list of creative ideas and suggestions for how they could use the photographs for further educational purposes (Appendix B, page 4). Further, I wanted this project to be of value to the teachers and students because of the time and effort that they would be investing through their participation. Students would be actively engaged in the analysis and confirmation of findings, and results would be shared with students in an attractive manner that was mutually agreed upon (see Steps 5 and 6 for details on these stages) in hopes to promote ownership in the project and to celebrate the students' involvement.

Step 3: Classroom session #1

There were multiple purposes for the first classroom session. This was my first opportunity to meet the students, begin building a relationship with them, and learn more about their unique perceptions and involvement in APPLE Schools. From a project standpoint, this session was meant to introduce the photovoice project, get the students excited about being involved, and prepare them for their photo-taking "mission." An outline of this session is available in Appendix E.

The initial classroom session was crucial for effectively developing the students' understanding of the project expectations while relaying an abstract concept in a way that would minimize the influence on the students' responses. First, students were each given a half-sheet of paper with the question "What does APPLE Schools look like at (school name)?" The APPLE Schools logo was also visible on these sheets of paper, so as to trigger any additional thoughts or ideas for visual learners. This opportunity for independent reflection gave students a chance to brainstorm their unique ideas and school experiences. Students were encouraged to use whatever means they preferred (i.e., writing sentences, words, or drawing pictures on their paper) in order to identify and share their ideas. Next, students were divided into small groups of four or five, and given a poster-sized paper with the same question written in the middle of it. Students were instructed to work together to create a word-web of their ideas. After five to ten minutes, students returned to their desks and I facilitated a word-web with the whole class on the white board using popcorn sharing. Popcorn sharing involved the students raising their hands and rapidly sharing their ideas with me one at a time as I recorded them on the white board. This was an efficient way to hear a lot of the students' responses in a short amount of time. The purpose of this activity was to familiarize myself and the students with the activities and aspects of their school community that were unique to APPLE Schools.

The aforementioned activity transitioned into the introduction of the research purpose. When introducing the topic, care was taken to avoid the words such as "healthy" and "unhealthy," as I did not want to limit the students' perceptions and ideas of what APPLE Schools entailed. Students were each given a 24-exposure disposable camera and specific guidelines to follow. A take-home sheet of paper had the guidelines listed, as well as the overarching "mission" for students, which was to take pictures to answer the question: "What does APPLE Schools look like in your home?" (Appendix F). Students were

instructed to bring their cameras back to their teacher for pick up within one week. There was an opportunity for questions at the end of the session, and we gave three students an opportunity to share with the class an example of what could be a suitable photo to take at home. The reasoning behind providing three examples was to ensure that students were on the right track with their photo-taking, but to not influence their photos and ideas. Students were encouraged to be creative with their photos, and they were told that there were no wrong answers.

Step 4: Student interviews

For students who provided consent to participate in the research component of the photovoice project, one-on-one interviews were conducted in order to explore the photos within the context of the research question. Prior to the interviews, I reviewed the photos to ensure that there were no inappropriate photos or pictures of people. Photos of people were removed and destroyed.

Student interviews were conducted in the school setting, in a quiet area arranged by the teachers. As previously arranged with the teachers, students were taken out of class for 15-20 minutes in order to review their photos and complete the interview process. The interview questions followed the photovoice guidelines developed by Wang and Burris (1997), which are described in greater detail in Chapter 3 of this thesis and in Appendix G.

Step 5: Member checking

Due to the participatory nature of this project, the member checking stage was essential in order to receive student feedback on the initial results. I compiled classroom-specific PowerPoint presentations to showcase quotes and photos from those students who participated in the research component of the project. I asked all students in the classroom to provide feedback about the themes and to share further examples of how these ideas were present in their homes. I also explained to the students that they were the experts, and I truly valued their opinions and feedback. The students were excited to see their photos and quotes on the PowerPoint presentations, and were enthusiastic about their roles as "researchers." At the end of the session, I explained to the students that I would now be using all of the information I had gather to write a large research report and would be back in the spring to share the final results with them. In conversation

with the teachers, all were supportive of the idea of using photobooks and newsletters to share the project findings with their school communities.

Step 6: Dissemination of findings

The final classroom visits involved sharing the newsletters (Appendix H) and photobooks (Appendix I) with the students. Each student received a newsletter to take home, and each school received two photobooks to keep. Students were once again excited to see their photos in the books, and provided more examples of the themes that were present in the books. This session therefore not only celebrated the students' involvement in the research project, but also reinstated the strength of the findings. A detailed exploration of the results from this study can be found in chapter 3 of this thesis. The knowledge dissemination session also served as an opportunity for me to meet with the teachers to discuss the photovoice process with them in greater detail. It was during this session that the one on one teacher interviews were conducted.

4.2 Methods

4.2.1 Methodological approach

This research was guided by a descriptive qualitative method. Descriptive qualitative research is often used when trying to describe or summarize a phenomenon (Mayan, 2009). This method was employed in order to identify, describe, and summarize the characteristics of the photovoice project that were crucial to its success from the perspectives of the teachers. When utilizing a descriptive qualitative method, the researcher works closely with the data, which is often less abstract than that of traditional qualitative methods (Mayan, 2009). As I was very familiar with the conduct of the research and topic of interest, a descriptive qualitative approach was a suitable method for the research objective.

4.2.2 Participants and ethics

In order to understand the phenomenon of interest, participants were purposefully sampled based on their experience and role in the photovoice project. Purposive sampling aligns with the descriptive qualitative approach used (Mayan, 2009). The teachers from the three participating Grade 5/6 classes assisted in providing feedback for the second objective of this research project as they were present for the duration of the photovoice project and as such could provide valuable insight into the feasibility of using this approach in the classroom. The teachers were contacted via email and asked to participate in a one-on-one semi-structured interview. All three teachers consented to participate. Two teachers were male and one was female. Notably, one teacher was the school's "Health Champion," and another had the role of curriculum coordinator within the school.

Ethical approval was granted through the Human Research Ethics Board at the University of Alberta. Teachers were given project information letters which stated the purpose of their involvement, and completed consent forms prior to participating (Appendix I). Verbal consent was also established at the start of each interview.

4.2.3 Data generation

4.2.3.1 Teacher interviews

Aligned with descriptive qualitative inquiry, interviews served as the primary data source (Mayan, 2009). One-on-one semi-structured interviews were conducted with three Grade 5/6 teachers in order to receive their feedback on the photovoice project and to understand their perceptions of the feasibility of this approach. Semi-structured interviews were used as I had significant insight into the research objective and was therefore able to create an interview guide to address the main topics of interest; however, unanticipated probes were also incorporated as

necessary (Mayan, 2009; Richards & Morse, 2007). The interview guide was developed through consultation with the APPLE Schools team and an expert in the education field. Questions aimed to address the teachers' feedback on the photovoice project, gain their input on the importance of school to home knowledge translation, provide insight into how they used the various resources provided (i.e., curricular links, student photographs), and identify the implications of repeating the photovoice project again independently. A full version of the interview guide is available in Appendix J. I conducted the interviews in each of the respective schools at a time that was convenient for the teachers. Two interviews took place during the teachers' prep time, and one interview took place at recess. The teacher interviews lasted between seven and 16 minutes.

4.2.3.2 Field notes

As the primary facilitator of the photovoice project, my experience as an active participant in the research was an important source of data. As such, the observational field notes I took while conducting the photovoice project were used as a form of data. Field notes are valuable sources of information, as they provide an understanding of the research setting that may not be possible simply through interviews alone (Mayan, 2009). Detailed researcher journaling was completed throughout the entire process of conducting the photovoice project, which included both participant observations and insight into the classroom settings where the project took place. Field notes included objective data regarding the date, location, time, and length of each session. Additionally, these notes provided a subjective and personal account of my experiences in each stage of the photovoice project. Participant observations included a detailed description of the setting, any notable occurrences that took place during each of the sessions, and the personal feelings, emotions, and reflections I made immediately after each of

the sessions took place. As the interviews were often conducted in public spaces (i.e., the school library or "flex space") it was important to note any distractions that may have interrupted or influenced how the interviews were conducted. Referring back to my field notes during the analysis process allowed me to recall my personal thoughts about each of the sessions in order to adequately recall and contextualize each of my experiences in the schools.

4.2.4 Analysis

Interviews were transcribed verbatim and data was imported into Nvivo v10 qualitative analytic software. Latent content analysis was used to identify, code, and categorize the data into themes (Mayan, 2009), and analytic codes were identified in order to develop categories theoretically (Richards & Morse, 2007). The data suggested categories based on the strengths and limitations of the project, as the teachers spoke about both the positive and negative features of the project. As such, these codes were later merged into categories which established three themes: i) strengths of using the photovoice project; ii) barriers of using the photovoice project; and iii) future directions of using the photovoice project in the classroom setting to understand the translation of behaviours from the school to the home.

Field notes were also used throughout the analytic process, as I had first-hand insight into the research project of interest. I reviewed my field notes in order to identify the contextual factors that influenced the project. These contextual factors aided in developing the emerging themes identified above by providing an understanding of the consistent observations that existed amongst the three school visits. As such, the findings are a reflection of both the follow-up teacher interviews and personal field notes that I completed during the stages of the photovoice data collection process.

4.3 Results

Analysis revealed three themes: the strengths of using the photovoice project, the limitations of the photovoice project, and the future directions of using the photovoice project. Overall, the feedback from teachers was very positive and strongly supported their students' involvement. This quote summarizes the general feelings from the teachers regarding the approach and their participation in the project:

> We were super excited to be a part of it. Like it fit very nicely into our school focus and I would encourage others from the university to continue that… I thought you did an excellent job from whoever first created this and how it was executed and your rapport with the students and just the whole coming back and showing them it wasn't for nothing, that this is a product that you have to create…We were pleased to be a part of it. And we would again, if there was opportunity.

4.3.1 Strengths of the photovoice project

The teachers identified three crucial factors which were imperative to the success of the photovoice project from both a research and educational standpoint to understand the abstract concept of how school-learned behaviours are transferred home. The three strengths which supported use of this approach in the classroom were: genuine student participation; strengthened communication between the school and home; and addressing multiple learning domains.

4.3.1.1 Genuine student participation

A necessary factor to the success of the photovoice project was the level of buy-in from the students in terms of genuine participation. Students were excited about the project from the beginning, and this was clear in the amount of effort and attention they gave to it. Teachers

discussed how the students felt a strong sense of ownership over the project as they were given a lot of freedom and responsibility in the task of taking photos in their home. As one teacher explained:

> [The students] got to make choices, they got to make evaluations as to what they felt fit the profile of something that was acceptable. They take ownership for it, they put some pride into it and it was a situation where they were able to express their understanding of what they chose and why.

The classroom sessions continually highlighted the participatory nature of the photovoice project, and I fostered an understanding with the students that they were the experts. By telling the students that there were no wrong answers, I hoped to generate the student's confidence and ownership of the project. When students shared examples of APPLE Schools, I was excited and supportive of their responses. As a result, I observed that more students were willing to share their stories and experiences with the class and in the interview process. Due to the nature of the topic, all students were able to relate and contribute to the classroom conversations surrounding the research. As a teacher explained:

> Because we're an APPLE School, [the project] was something right away they could relate to, and getting our kids feeling confident about sharing stuff is important 'cause sometimes if they feel that they don't know the answer they're pretty timid. But you brought something that they all had experience with and could relate to.

The relatability of the topic allowed students to be interested and engaged, and as such their participation was rich and genuine.

The photovoice project was facilitated in a way that promoted students' sense of pride and accomplishment, therefore students felt invested in the project. The member checking and knowledge dissemination stages were opportunities to showcase the quality of the students' work, and students were excited to see their photographs in the newsletters, photobooks, and PowerPoint presentations. The value that was placed on the students' responses allowed their confidence and sense of ownership to grow throughout the research process. One teacher spoke about her observations during the classroom sessions:

> [It's] important to show that hey, your findings matter and now it's published in a book and now it's – like you're talked about in a newsletter and what you did was pretty incredible. So they will have a lot of pride with that and know that they contributed to that.

Finally, both myself and the teachers recognized the crucial role that the cameras played in facilitating and encouraging meaningful participation. As disposable cameras are now somewhat of a novelty for children (none of the students had ever seen or used one before), the students were intrigued by the devices and felt a sense of ownership in looking after their cameras during their photo-taking "mission." Further, the photographs added a great deal of depth to the responses and conversations in the interviews and classroom sessions. As one teacher indicated: "If you had said 'here's a piece of paper, write down ten things in your home that show healthy living,' you wouldn't have had the same response." Students felt a personal connection to the project because the findings were solely based off of the photos and feedback that they supplied. As a result, students fostered genuine participation throughout the research process.

4.3.1.2 Strengthened communication between the school and home

Learning more about the student's home environments was something that the teachers valued, but agreed was often difficult. One teacher discussed how there was a lack of communication between the school and the home, and as a result it was challenging to know if school behaviours were transferring home. The teacher explained, "I feel there's a big disconnect between home and school in general, in this community. And we don't see the parents very often, or hear from them. The communication is lacking." The teacher went on to describe how it was necessary to strengthen the teamwork between school and home in order for students to succeed, and this communication was essential for both the teachers and parents to properly meet the needs of the students. By understanding the dynamics of the home, the teachers spoke about how they could adapt their teaching styles to meet those needs: "I think it helps to understand where background knowledge might be missing as well as to see where students, you know, might have trouble seeing connections." One teacher described how having a relationship with the home was valuable to their teaching by explaining: "I know better how to meet [the students'] needs…By being in regular contact with home, and sharing with them what's going on, they're better informed as to what the children are doing." The teachers all agreed that the photovoice project was an effective means to explore and understand the home environment as it was a novel approach to strengthen the communication between the two environments. One teacher also spoke about how they would be interested in using a similar project to better understand the resources that students have in their home environment in order to provide the students with realistic and accessible options for HEAL choices. As such, it was agreed that the photovoice project was a promising tool to strengthen the communication

between the school and the home environment, and could allow for tailored teaching approaches due to the increased insight into students' personal needs.

4.3.1.3 Addressing multiple learning domains

From an education standpoint, an appealing feature of the photovoice project was the ability to link it to a variety of curricular outcomes, subjects, and learning domains. The photovoice project gave students a hands-on opportunity to be creative with their learning, which appealed to visual and kinesthetic learners. The use of technology involved "higher end thinking skills," which one teacher described as a unique feature that promoted both teacher and student engagement. In the classroom sessions and interviews, the support of the photographs helped the students to get their messages across, and drawing from visual cues helped them to think about creative and diverse examples from their homes. As one teacher explained, "it's transferring into the different types of learning that they have to do, because so many are visual…it brought a new element to the learning that we're encouraged to use."

In addition to expanding the learning styles used within the classroom, teachers also spoke about how the photovoice project could feasibly be incorporated into a variety of school subjects beyond simply Health and Life Skills and Physical Education. Although I provided the teachers with Grade 5 curricular links and suggestions for how to use the photos, the teachers shared a variety of other ideas that they independently had thought of for the photos. The teachers talked about how this was a worth-while project due to the number of educational outcomes and subjects it could potentially be linked to:

> It's got a whole education concept because there's – there's a lot of different ways you can go and the nice thing about doing project-based learning…is if you're going to create

a project with kids, you want to hit on multiple curricular areas – from an assessment standpoint, also from a time standpoint where you can justify both.

This teacher spoke about the challenges of fitting his health lessons into just one 30-minute block per week, and how a project such as this could touch on a variety of subjects, thus allowing for more class time to be allocated to the project. The photovoice project was therefore an attractive class activity from an educational, scheduling, and learning standpoint, and the teachers had promising ideas about how to incorporate the project into the wider Grade 5 curriculum. Beyond health topics, this method could be used as an effective way to explore a broader range of school subjects in order to determine their reach into the home.

4.3.2 Limitations of the photovoice project

The barriers to utilizing the photovoice project within the school setting were much less significant, but were to be expected based on the nature of the project. The teachers and I recognized three major barriers: cost, privacy issues, and gaining support from parents.

4.3.2.1 Cost

The biggest barrier to repeating the photovoice project in the classroom was the cost involved. When conducting the research project, I received external funding in order to support the costs of the disposable cameras, film development, and printing of the photo books and newsletters. The disposable cameras were ideal for the photovoice project due to their one-time use, privacy, and relatively low cost if students did not return them, however the cost and time associated with developing the film may not be realistic for schools to accommodate. The teachers had access to photo-taking resources in their schools, namely Chromebooks and iPads, however they expressed their concern in allowing these devices to be brought home: “It becomes

a situation where we can't send a $500 piece of technology home with the student and trust that it's going to come back in one piece- or that it's going to come back." Additionally, it was mentioned that a project like this may highlight the socioeconomic discrepancies that exist amongst students and families. Many students did not have access to devices such as computers and digital cameras at home, therefore it would be unfair to expect students to supply these resources from home in order to participate in a project like this. As such, the financial cost of accommodating a classroom photovoice project relating to the home environment was the major barrier identified.

4.3.2.2 Privacy

Ethical considerations in terms of privacy and confidentiality were an issue of concern when conducting a photovoice project. Formal ethics approval from both the University of Alberta and the school district was established for the initial student research project, and as a condition of these ethics boards students were not allowed to take photos of people. Written parental consent and verbal student assent were attained prior to participation as well. As such, proper steps would need to be in place in order to ensure future projects were conducted in a sensitive manner, because as one teacher explained: "otherwise we're going to run into a nightmare of people's faces [in the photos] and…it could create some concerns or problems." However, the teacher did go on to say that privacy issues could be minimized or prevented as long as the teacher clearly explained the expectations of the photo-taking procedure to the students, and potentially screened the photos before using them for a project. When conducting the photovoice project, I ensured that students were clearly aware that they could not take photos of people by providing both verbal and written instructions stating this. Further, I screened the photos prior to returning them to the students, but overall only had to remove three photos that

included people. As such, privacy issues could be minimized when the correct preventative steps are taken.

4.3.2.3 Parental support

An issue that both the teachers and I identified was obtaining parental support for the photovoice project. Because of the somewhat invasive process of taking photos in the home, some parents did not want their child taking part in the photo project. During the classroom sessions, some students shared with me that their guardian did not want them to partake in the activity, and as such some students did not feel comfortable taking a camera home despite the fact that they would not participate in the research component. Parental support is crucial when working with children, as consent is required in order for students to participate. One teacher spoke about this issue, however also came to a conclusion regarding building trust over time in order to gain parent support for projects of this nature: "If I used [the photovoice project] more often, or in different ways, it would build more of a trust aspect too, from home and school. Like this is a legitimate way to capture your child's learning…we're not spying on you." Implementing a project such as this over a prolonged and continuous period of time may therefore be beneficial to increase familiarity and support from parents.

4.3.3 Future directions of the photovoice project

Through conversations with the teachers about the strengths and limitations of the project, the teachers shared multiple ideas that they had for expanding the student-centered photovoice project in the future. These ideas supported the question of whether or not this was a worthwhile project to independently implement within the school setting. When asked how the teachers used the students' photos, all three teachers admittedly either sent the photos home with the students to keep, or were still in possession of the photos as there was potential for a future

project. Two of the teachers described that in the future, they hoped to utilize the students' photos and experiences in order to facilitate student-driven health promotion advocacy to their families and their school communities. As one teacher explained:

> I wanna see if we can extend [the project] to more of a whole school thing…we've got some valuable tools here now so we might want to do school-wide lessons, as them as leaders and to show, hey, this is what we were part of, it's pretty cool.

The teachers were excited about the fact that the students took such ownership over the photovoice project, and were motivated to continue to use the project as a way to promote student leadership within the school. Another teacher shared an idea of student led health promotion advocacy, stating:

> As a Grade 5/6, the kids in the room are the oldest in the school. Therefore an opportunity for them is to now take what they're doing at home and share it with the [Division] 1s, using the pictures, creating a presentation, doing those kinds of things.

The teachers' eagerness to promote student-centered health promotion activities within the school communities opens a wide range of potential implications of using this photovoice project in the classroom. Other promising future directions for the project that were expressed by the teachers included partnering with community members to fund the project, using the photographs in digital portfolios that the students could continually build on, and adding an educational component to the project in order for students to learn more about topics such as portion sizes, sugar content, etc.

4.4 Discussion

From both a research and education standpoint, the use of a photovoice project was an effective way to learn how students translate school behaviours home. Analysis revealed that the students' genuine participation in the project was pivotal to the research findings as well as the teachers' enthusiasm to use the project in the future. Genuine participation is recognized as a human right for children, as young people's participation can vary across many degrees (Hart, 1992). The "ladder of participation" demonstrates how children's participation can exist on a range from tokenism to genuine participation (Hart, 1992). This project, although adult-initiated, demonstrated a high level of student involvement and shared decision making. Hart stresses that the most important component of genuine participation is that "programmes should be designed which maximize the opportunity for any child to choose to participate at the highest level of his ability" (Hart, 1992, p. 11). Photovoice, by nature, is a participatory approach with promotes the participants' free choice throughout. From choosing to initially participate in the project, the photo-taking process, selection of what photos would be discussed in the interviews, and opportunities to provide feedback and make changes to the results during the member-checking sessions, students' choices were incorporated throughout the entire research process. Therefore, although it is difficult to truly verify that the students' participation was meaningful and genuine, the level of choice, ongoing participatory steps taken throughout the research process, and insight from the teachers about their students' ownership in their involvement supported the idea that this project produced a high degree of true participation.

Similar to the evaluation conducted in this paper, Jardine & James (2012) completed a process evaluation of a youth photovoice project on tobacco use amongst children and youth in Northern Canada. A major difference between our studies, however, was the level of

participation that they invoked from students. In Jardine & James' photovoice project, older youth were trained to actually conduct the research process. High school students facilitated all aspects of the research, from the development of the interview guide, to conducting the interviews, as well as the analysis process and drawing conclusions about the findings (Jardine & James, 2012). The authors concluded similar results: that their community-based participatory research (CBPR) project resulted in a strong sense of youth ownership, and as a result produced more valid and credible research findings. Using a more conventional approach to photovoice (Wang & Burris, 1997), my findings therefore support the ability for student-centered photovoice research to produce meaningful, genuine participation and valuable insight while being conducted by an external researcher. This may have been in part due to the relatability of the research topic and the relationship I fostered with the students to ensure that they felt as though their voices were valued and heard.

Promising findings were identified regarding the project's implications in the classroom. The importance of fostering a strong relationship between the school and the home is vital in order to support children from multiple environments to achieve the utmost success (Epstein, 1992; Sormunen et al., 2011). Student-centered visual means such as photo taking, illustrations, and journaling have been used in the past to strengthen the collaboration between the school and home and allow for greater insight for both parents and teachers into the needs of the child (Yuen, 2011), as well as provide age-centered understandings of the home environment that may not have been uncovered through interviews alone (Jorgenson & Sullivan, 2010). However, our understanding of the impact of school behaviours on the home is primarily parent-based (Gadhoke et al., 2015; Rausch et al., 2015) or concludes elusive findings (Baranowski et al., 2000; Lytle et al., 2006; Reynolds et al., 2000). To the best of our knowledge, the photovoice

project suggests a novel approach to solely capture children's perceptions of the translation and impact of a school-based intervention on the home environment by using visual means.

The teachers in this project noted that the partnerships between the school and home were weak, and although the teachers valued creating meaningful lessons that related to their students' lives, this was difficult when there was a lack of knowledge about the home environment. Our photovoice project allowed teachers to gain a better understanding of their students' home lives, and as such provided the teachers with insight into how better to meet their students' needs. Modifying teaching methods and styles in order to meet students' unique needs can aid in building better relationships with students, allow students to apply more skills to "real world" situations they face, and can foster greater student engagement by making lessons applicable and relatable to their own lives (Starkman, 2006). In addition to the value the photovoice project had in providing insight into the home, teachers also shared that the project fit well with their curriculum by being applicable to various subjects. The Alberta curriculum for Grade 5 classes states eight mandatory classroom subjects, as well as up to six additional option courses which include religion and language subjects (Alberta Government, 2015). The teachers believed that this photo project could be implemented into their school curriculum through a variety of school subjects, not just those relating to health. Further, the approach to using photos to explore a topic was a feasible way to address multiple subjects through one project. Instead of multiple small, short-lived projects, teachers could therefore invest a greater amount of time to foster and develop a meaningful photo project that would span across a variety of subject areas and facilitate higher-end learning. The photovoice project also addressed a variety of standards as listed by the Teaching Quality Standard Ministerial Order, some of which include: the importance of engaging parents, purposefully and meaningfully, in all aspects of teaching and

learning; how student learning is enhanced through the use of home and community resources; and establishing key partnerships within the school, home, community, and within your own school to improve the school environment (Alberta Education, 2016a). As the teachers highlighted the difficulties they had in connecting with parents and their students' homes, this project provided a feasible way to address this issue.

The barriers that were identified aligned similarly with previous research on implementing programs within the school setting. Pinkelman et al. (2015) identified that a lack of school resources, including both money and time, are common barriers to promoting and implementing school-based supports and interventions (Pinkelman, McIntosh, Rasplica, Berg, & Strickland-Cohen, 2015). It is understandable that with limited school and classroom budgets, cost concerns would arise when implementing a photovoice project in the classroom due to the added external expenses (i.e., the cameras, film development) required. Time and the issue of balancing competing interests in the classroom has also been frequently cited as an obstacle for teachers to overcome when implementing new programs in the school setting (Griffin et al., 2015; Langford et al., 2015a; Pinkelman et al., 2015). Promisingly, the photovoice project was identified as a means to actually overcome this barrier. Teachers had recognized the ability for the project to incorporate various subjects into one class assignment, and as such this could lead to more efficient time management. We previously established that engaging parents in school-based projects and interventions can be a challenging task, and as such parental involvement is often cited as a barrier for such projects (Griffin et al., 2015; Langford et al., 2015a). Although the photovoice project aimed to address this issue by utilizing students as information sources and knowledge brokers, a barrier to using the photovoice project was inevitably gaining the support of parents. The photovoice project did not require parental involvement or participation,

however a project of this nature needed parental consent because students were required to take photos in their homes. The issue of privacy was a barrier that was fairly unique to this project due to the involvement of photographs and the potential for students to take pictures of people whom did not give their permission. In the interviews, however, the teachers were able to address this barrier with feasible solutions such as ensuring clear directions were given to the students about the nature of their photos, and screening the photos prior to returning the prints the them. Finally, a barrier that is often identified when implementing school-based projects is the need for teacher and staff buy-in (Griffin et al., 2015; Pinkelman et al., 2015). The teacher feedback about the photovoice project was supportive and positive by nature, therefore these findings did not identify teacher buy-in as a barrier, but rather suggested promising implications for the future use of this method in the classroom.

The use of participatory approaches has been recognized as an effective way to promote genuine and valuable participation from children, and can lead to increased social responsibility, community development, and self-determination (Hart, 1992). The teachers shared a variety of ways to carry the photovoice project forward, with their primary idea being to use the photos in student-centered health promotion advocacy efforts within the school community. This initiative aligns with previous photovoice research which has resulted in student-led social action and community change (Wang, 2006; Wilson, Minkler, Dasho, Wallerstein, & Martin, 2008). However, the future directions discussed by the teachers were particularly exciting and unique because these intiatives were solely developed by the teachers within the school community (rather than being researcher-driven), thus adding to the value and worth that they gave to the project.

4.4.1 Limitations

The results of this research are from a combination of my own field notes and observations, as well as one-on-one structured interviews with three teachers whose classes participated in the photovoice project. The insightful comments from the teacher regarding future directions for the photovoice project were both promising and encouraging in terms of the wider implications of using such an approach in the classroom. However, because only three teachers were involved in the photovoice project and were therefore able to provide feedback on their participation, the responses and eagerness to utilize the project for further health promotion efforts may be rather ambitious compared to most teachers. The three Grade 5/6 teachers had willingly taken on the research project, and as such were supportive of investing their time and effort into this topic. They had to agree to initially accommodate the APPLE Schools photovoice project in their classroom, therefore they may have been more invested in elements of health, APPLE Schools, and CSH compared to Grade 5/6 teachers who opted out of participating in the project. This selection bias may have been reflected in their enthusiasm about the project and it's health promotion implications. Further, one teacher identified as the "Health Champion" in their school, while another teacher was the curriculum coordinator. This strong interest in the research topic therefore may have been translated into a greater desire to use the photographs for further self-directed health promotion activities. Other teachers may not be as ambitious or invested in the project and the follow-up activities that were mentioned in the interviews. As such, representation from a wide range of teachers was a limitation of this study.

4.4.2 Conclusion

The purpose of this research was to incorporate feedback from the researcher (myself) and participating teachers in order to gain a deeper understanding of the strengths, weaknesses,

and future directions of utilizing a student-centered photovoice project to determine how students translate school behaviours into the home. Overall, the teachers expressed positive feedback regarding their participation in the photovoice project. The major strengths of the photovoice project were identified as fostering genuine student participation, strengthening communication between the school and home, and the ease of linking the photo project to multiple learning domains within the classroom and school setting. These strengths heavily outweighed the limitations of the photovoice project, which were namely cost, privacy issues, and gaining parental support. The teachers also identified a variety of ideas future directions to build on the photo project in the school and community at large. A promising finding was the teachers' potential to utilize the photovoice project to foster student leadership and health promotion advocacy. This opportunity would extend the students' meaningful participation by allowing them to share the project and potentially educate others about healthy eating and active living behaviours in the school and home.

The photovoice project demonstrated a novel way for teachers to gain a greater understanding of how their students are bringing lessons home, as well as to strengthen the relationship between the school and home environments. Further, teachers supported the idea that this project could be used to explore the relationship between school lessons and the home in a variety of school subjects, not just health-related matters. The lack of literature regarding student's role in behaviour change in the home as a result of student-based programs and interventions demonstrates the need for an effective method to evaluate this phenomenon. Based on the strengths of the findings from the initial research project, as well as the positive feedback and support from teachers, this photo method serves as a way to identify and explore this relationship in both a research and education-based format. Further utilization of student-

centered photovoice projects to explore how school behaviours impact the home are encouraged in order to strengthen the evidence for the use of such an approach.

CHAPTER 5: CONCLUSIONS

5.1 Summary of Findings

The purpose of this research was to utilize students' perspectives in order to explore the reach of a school based health promotion project, the Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools), into the home environment. Further, this research aimed to understand if the photovoice project used to explore this relationship provided a feasible way for teachers to determine how school lessons translate home. It has been well established that the school and the home play significant roles in influencing children's healthy eating and active living (HEAL) behaviours (Langford et al., 2015b), and that collaboration between these two environments is essential for optimal success (Epstein, 2011). Comprehensive school health (CSH), an international approach to health promotion in schools, recognizes this importance and was the guiding framework for our intervention of interest, APPLE Schools (APPLE Schools, n.d.-b; Pan-Canadian Joint Consortium for School Health, 2008). Previous research involving APPLE Schools has suggested positive implications for out-of-school physical activity, as evidence demonstrates students at APPLE Schools are more active after school hours and on weekends (Bastian et al., 2015; Vander Ploeg et al., 2014b). However, the mechanisms by which students maintain HEAL behaviours in the home had yet to be explored. Utilizing student and teacher perspectives and researcher field notes, this research addressed two overall objectives:

1. To gain an understanding of how students perceive the HEAL behaviours that are fostered in an APPLE School are translated into the home environment.
2. To explore the utilization of a student-centered classroom photovoice project as a tool for teachers to determine if school-learned behaviours are reaching the home.

5.1.1 Objective 1 summary

The first objective of this research was to understand how students perceived their involvement in APPLE Schools impacted HEAL behaviours in the home. The approach to understanding this objective was guided by photovoice, and involved students taking photos of their home environment to be used in follow-up one-on-one discussions. Results revealed three key findings: students are taking on a leadership role in both their own HEAL behaviours and those of their family; students are internalizing the APPLE Schools philosophy; and students are driving change to create a healthy home culture.

Student leadership and decisional ownership was an underlying component of both themes that emerged in this research. Students displayed a "take charge" attitude when making their health choices, as they possessed the knowledge and confidence to make informed HEAL decisions. APPLE Schools aims to foster student leadership within their schools, and this element was essential for students to feel empowered to make changes in their homes. Students understood that it was their responsibility to look after themselves and make healthy choices. As a result, it was evident that students possessed the decisional ownership to lead changes in their own behaviours at home, as well as those of their family members.

The mission and vision of APPLE Schools creates a philosophy by which school communities promoted HEAL values. The APPLE Schools philosophy can be understood as: "promoting healthy kids in healthy schools" by "empower[ing] school communities to lead, choose, and be healthy." This leads to "sustainable changes to school, home, and community environments" in order to "foster lifelong health and learning" (APPLE Schools, 2008). The values taught at an APPLE School were engrained in student's decision making processes at home, and as such students internalized this philosophy by rooting their health habits in school

experiences and committing to their healthy habits for long term success. The formal and informal lessons that students learned in school were used to inform their decision making processes, which resulted in a strong sense of ownership and motivation to make healthy choices at home. Students also understood and rationalized their healthy decisions by acknowledging the "big picture" implications of developing positive HEAL habits currently. As such, they inherently embodied the APPLE Schools philosophy by valuing the lessons learned in school and the lifelong implications of such behaviours.

These results demonstrated that students were not only advocating for HEAL behaviours within the home, but more importantly that they played a primary role in driving changes to create a healthy home culture. Four mechanisms were identified by which students drove these changes. First, students were empowered to expand their healthy habits by trying new things. Involvement in an APPLE School exposed students to a variety of new healthy habits, such as new foods and activities. As such, students reported expanding their preferences for healthy options and led these changes within their homes. Students introduced new activities to their family members, and as a result of their openness to trying new things, their family members were also exposed to these options. Further, students demonstrated a sense of ownership in their understanding that trying new things helped to expand their overall preferences and enjoyment of healthy habits. They were more inclined to try, and share, new healthy habits at home as a result of their involvement in APPLE Schools.

Second, positive changes were made to the home food environment as a result of student's suggestions and guidance. Students catalyzed changes in parental food purchasing, the contents of their own lunches, and family dinners. In order to pack healthy lunches, students often cited that they had to ask their parents to buy different foods in order to ensure they met the

requirements of a "rainbow lunch." Through these requests, students were able to influence their parent's grocery purchases in order to introduce or promote more healthy food options at home. Students also gained confidence in helping with meal preparation. Not only were they able to change the content of home meals, they also participated more in cooking with their parent or guardian. It is important to note that students commonly cited that their parents were supportive of the healthy suggestions they made, however the students played a critical role in actuating these changes through the suggestions and requests that they voiced at home.

Third, HEAL behaviours were shown to increase in students, and as a result students were more inclined to encourage and participate in such behaviours with family members. Student driven co-participation in physical activity resulted in family members engaging in more physical pursuits than they were previously doing. Students also educated family members about HEAL, and in doing so were able to facilitate improvements to their eating habits. Students were leaders in HEAL at home, and encouraged their family members to follow suit by participating in healthy lifestyle behaviours with them. APPLE Schools therefore increased students' emphasis on HEAL at home and promoted students to change their family's behaviours through engagement and co-participation.

Finally, students displayed a greater responsibility towards modifying their unhealthy behaviours at home. The home was an environment where students had more freedom over their HEAL decisions, and as such there were more temptations and opportunities to stray from the HEAL values they fostered at school. However, students established ownership over their behaviours in order to moderate their intake of unhealthy foods and sedentary behaviours, as they knew these things were not good for them. Further, students educated and advised family members of these understandings in order to ensure they modified their unhealthy choices. As

such, students were once again leaders in promoting and changing behaviours at home in order to sustain the HEAL values learned in an APPLE School.

5.1.2 Objective 2 summary

The purpose of objective 2 was to evaluate the photovoice project used in objective 1. The findings from objective 1 provided valuable insight into students' perceptions of how APPLE Schools translated into the home, and to the authors' best knowledge this was the first study to understand how school behaviours reach the home using solely the students' perspectives. As insight into the home environment can be particularly useful for teachers and educators (Epstein, 1992; Starkman, 2006), the use of photographs to explore the reach of school behaviours may be a feasible way for teachers to explore this relationship within the constructs of their classroom. As such, objective 2 utilized follow-up teacher interviews and researcher field notes in order to evaluate the photovoice project used in objective 1 and answer three questions: 1) What unique features of this photo project were essential to its success?; 2) Could this project be applied to understanding the effects of a wide variety of classroom subjects on the home environment?; and 3) Is it feasible for teachers to implement this project in their classroom independently?

Feedback about the implementation of the photovoice project was overwhelmingly positive. Teachers identified three major strengths that led to its success from both a research and education standpoint. First, genuine participation from students made the project engaging and worthwhile. The teachers shared that students felt ownership in the project because they could relate to the objective of the research and felt as though their feedback mattered. The novelty of using disposable cameras also aided in students' genuine participation, as they were excited to use the cameras and the photographs played a crucial role in the facilitation of the

interviews. The project was worthwhile because it fostered genuine participation from all students.

A second strength that was identified was that the photovoice project strengthened communication between the school and the home. The teachers all agreed that understanding their students' home lives was important in order to properly meet their students' needs. However, the teachers also identified that it was difficult to foster relationships with the home, and communication with parents and families was often a challenge. The photos and responses from the students provided valuable insight into their home environments, and this was of great value to both the teachers and the objective of the initial research project. As such, the teachers agreed that this was a viable, student-centered approach to gain insight into the home in order to learn more about their students' unique needs.

From an education standpoint, a major strength of the photovoice project was that it could feasibly address multiple learning domains at one time (Alberta Education, 2015, 2016b). The photovoice project not only appealed to teachers because it promoted visual learning, but beyond this teachers also spoke about how the project could viably apply to a variety of subjects and curricular objectives as it embodied both higher-end and project-based learning. As a result, the teachers agreed that this project could feasibly be implemented within the classroom, and there were many ways in which it addressed multiple learning domains.

The limitations of using this photovoice project within the classroom were less substantial, yet were to be expected. Teachers identified cost, privacy issues, and parental support as the three major barriers to implementing this project again within the classroom. Promisingly, however, the teachers were quite easily able to think of ways to overcome these

limitations. As such, the project appeared to have minimal restrictions if it were to be implemented independently by the teacher as a classroom project.

Finally, the teachers shared some exciting ideas about the future directions of using a photovoice project within the classroom. An idea that arose was to organize student-led presentations in the school in order to display the students' role in the project, as well as to promote HEAL advocacy both at school and in the home. The teachers cited different ideas for this, ranging from using the photos in bulletin board displays to the students facilitating presentations to younger students within the school. The teachers recognized that the students' participation in the project, paired with the tangible result they acquired in the photographs, had many implications in terms of student-centered health promotion within the school. These results demonstrated promising implications for future photo-projects within the classroom setting.

5.2 Interpretation of Findings

Research presented in this thesis used photovoice as a novel approach to determine how students perceived their involvement in APPLE Schools impacted their healthy lifestyle behaviours in the home environment. The photovoice project was evaluated through teacher interviews and researcher field notes to determine its efficacy of being used by teachers to gain greater insight into the home environment. The importance of the school and home to foster health behaviours in children has been well established (Langford et al., 2015b) and we know that collaboration between these two environments is necessary for children's utmost success (Cox, 2005; Epstein, 1995; Sormunen et al., 2011). As such, this research added to the current understanding of how children can be powerful change agents in the home as a result of their

school experiences, and how children can be valuable stakeholders in bridging our understanding between the school and the home.

Leadership traits in children have been associated with positive HEAL behaviours in students (Ferland et al., 2015), and student leadership has been previously utilized as a means for successfully implementing health promotion initiatives in schools (Gutuskey et al., 2016). The present research findings add to current literature which suggests leadership is a key component for the successful implementation of CSH program amongst a variety of stakeholders, including administrators, teachers, and health champions (Rasberry, Slade, Lohrmann, & Valois, 2015; Roberts et al., 2015). However, the results presented in this thesis highlight the importance of fostering leadership within students in order to ensure that behaviours are sustained in other environments. Previous literature has identified that leadership traits can be acquired as a result of involvement in health programs and initiatives (Keselman, Ahmed, Williamson, Kelly, & Dutcher, 2015), however the concept of leadership has not previously been identified as an important element of students' ability to translate school behaviours to the home (Aldinger et al., 2008; Ballantyne et al., 2001b; Gadhoke et al., 2015). The findings in this thesis therefore provide new insight into the importance of leadership in order for students to drive changes in the home.

There were four mechanisms by which students were able to drive change in their home environment. Of these, some were previously identified in literature while others provided new insight. First, students identified changing HEAL habits because they felt empowered to expand their healthy habits by trying new things. This finding was unique, and added to the literature on behaviours (both health related and otherwise) being translated into the home. Some APPLE Schools used activities such as taste-testing and cooking clubs in order to facilitate the

introduction of new healthy foods to students, and it was assumed this was why students felt empowered or motivated to try new foods at home. Secondly, students reported catalyzing changes in the home food environment through means that are consistent with previous research findings. It has been reported that children influence and improve parental food purchasing habits (Flurry, 2007; Lytle et al., 2006; Norgaard et al., 2007), aid in meal preparation (Chu et al., 2014; van der Horst et al., 2014), and influence meal content (Aldinger et al., 2008; Labrecque & Ricard, 2001) in order to promote healthier consumption patterns for themselves and family members. The present findings therefore support previous literature on this topic. Thirdly, as a result of their involvement in an APPLE School, students increased their HEAL behaviours and engaged family members to do so. Co-participation between children and family members has been previously shown to result in increased HEAL behaviours, in particular physical activity (Aldinger et al., 2008; Xin et al., 2015). Finally, students reported greater awareness and modification of unhealthy choices in the home. Aldinger at al. (2008) had similar findings in their investigation of the changes that came from implementing a CSH project in China. In their study, students made recommendations to family members regarding a variety of health topics including reducing or quitting smoking, wearing helmets when biking, and eating less fried foods (Aldinger et al., 2008). Children's role in health promotion was also identified in India by Mukhopadhyay and Bhatnagar (2005), and in Gadhoke et al.(2015), however the cause of these efforts was not due to a school program in the latter study. The present findings regarding how students drove change in the home environment supported previous research and provided novel insight into the mechanisms by which students' involvement in a school-based health promotion intervention impacted their home.

It is important to establish genuine and meaningful participation from children when involving them in research in order to ensure their autonomy and free choice is respected (Hart, 1992). Through the findings in objective 2, and in maintaining the participatory nature of the research in objective 1, this research confirmed that student's participation in the project was genuine. A previous study by Jardine and James (2012) used photovoice in order to explore children and youths' perceptions of tobacco use within their community, and also concluded that they fostered genuine participation from all students. The authors concluded this genuine participation was a result of their research approach which was rooted in community-based participatory research (CBPR) and involved older youth actually facilitating the research process. The present research, however, demonstrates that genuine participation can be achieved amidst having an external researcher facilitating the research process.

The overall results of this research support the use of a photovoice project in order to accurately capture students' perspectives of the reach of school behaviours into the home. Objective 1 was able to provide insight into exactly how students are driving change in the home, while objective 2 confirmed the use of this tool as a feasible means for educators to understand the reach of school lessons into the home, as well as to provide insight into students' home environment. The use of visual means to explore students' needs has successfully been used in the past in order to strengthen the support from the school and the home (Jorgenson & Sullivan, 2010; Yuen, 2011), and this research further supports such approaches.

Within the literature regarding the translation of behaviours from school to home, parents are typically cited as having the most significant role (Ballantyne et al., 2001b; Gadhoke et al., 2015; Grodzińska-Jurczak et al., 2003; Legault & Pelletier, 2000). The present research provides innovative insight into this transfer of behaviours from the students' perspectives. The findings

from this research strongly support the positive effects that APPLE Schools has on HEAL behaviours in the home environment due to changes driven by students themselves. Further, photovoice was deemed to be a feasible way for educators to explore the effects of a wide range of behaviours into the home. As such, the combined findings from this research support the implementation of the novel use of photovoice to utilize students' perspectives in understanding how school behaviours translate into the home environment.

5.3 Strengths and Limitations

A strength of this research stemmed from the balanced and inclusive demographics of our participants. Of the 25 participants, an equal number of males and female participated (n= 13 males), students had attended an APPLE School for various lengths of time ranging from a few months to six years, students came from a variety of home settings (i.e., differences existed in the place of dwelling, number of siblings, caregiver), and students represented three APPLE Schools from differing communities within the city. However, a limitation stemmed from the potential for selection bias. Only students whose parents consented for them to partake in the research were permitted to take part in the follow-up interviews and as such, the findings may have only represented a demographic of students whose families were more mindful of health in the home. Further, the teachers who were interviewed in objective 2 were included because of their involvement in the first research objective. This meant that they had already willingly agreed to participate in the project, and as such may have been more interested or inclined to support health topics, APPLE Schools, and/or research initiatives. Although qualitative research encourages selection bias in order to ensure participants are information rich (Mayan, 2009), this may limit the generalizability of the findings. Another limitation relating to the first objective

was the inability for the students to take photos of people. This may have limited the scope of pictures that the students took.

An overall strength of the present research was the concurrent implementation and evaluation of the novel use of photovoice to understand how school behaviours translate home from the perspective of students. Due to the evaluation of the photovoice process, additional insight was gained into the strengths and weaknesses of using the approach within a classroom setting. This evaluation allowed for confidence in the findings and the impact of using photovoice for future classroom based projects. As such, one can conclude that the photovoice project was an effective way for students to demonstrate how their school-learned behaviours reached the home environment.

5.4 Implications

Leadership has been recognized as an important component of school-based health promotion efforts with regards to healthy eating and active living (Ferland et al., 2015; Gutuskey et al., 2016; World Health Organization, 1997). The Ottawa Charter for Health Promotion states the importance of "enabling people to increase control over, and to improve their health" (World Health Organization, 1986b), and as such recognizes that leadership and decisional ownership are important components to developing and sustaining health promotion efforts. This research confirms that leadership characteristics were critical for students to translate behaviours acquired at school to the home. Leadership and decisional ownership are strongly promoted in APPLE Schools, however they are not articulated in the framework of CSH. In Canada, the Joint Consortium for School Health (JCSH) outlines four interrelated pillars which make up the CSH framework: social and physical environment; teaching and learning; policy; and partnerships and services (Joint Consortium for School Health, 2016). The findings of this research imply

that better health outcomes can be expected if the CSH framework adopts leadership and decisional ownership within its mandate. As such, it may be beneficial for the JSCH to consider adding leadership into their foundational pillars. The WHO recognizes the importance of leadership in their definition of the scope of CSH worldwide by stating the importance of "making healthy decisions and taking control over one's circumstances" (World Health Organization, 2016d). Although this presence is promising, a more explicit representation of the importance of leadership is required in order to demonstrate the significance of these traits in CSH efforts.

This research was particularly unique because the three APPLE Schools that partook in the project were also partnered with *The Leader in Me* process. Although APPLE Schools stress the importance of fostering student leadership within schools, it was not a requirement that APPLE Schools collaborate with *The Leader in Me* or any other particular leadership program (APPLE Schools, 2015). The findings of this research, however, highlighted the importance of having a strong sense of student leadership fostered within the school environment, and as such implementing a structured leadership component such as *The Leader in Me* into APPLE Schools allowed students to develop significant feelings of leadership and decisional ownership. This consequently enabled students to internalize their school culture and drive changes in health behaviours within their homes. As such, this research highlights the significance of developing student leadership and decisional ownership within the context of a CSH intervention. Although schools have mandatory health education curriculum, not all schools are partnered with CSH or *The Leader in Me* process. Despite this, the results of this research do have implications for general health education curriculum. Health education teachers should strive to establish and

build leadership skills and decisional ownership within their students in order to ensure that health messages are embodied and sustained outside of the school environment.

The findings from objective 1 unveiled the ability that children have to catalyze changes in their family's health behaviours. These findings are consistent with previous research regarding children's roles in shaping the home environment (Flurry, 2007), and provided further insight into the ability for children to be key stakeholders in creating and sustaining changes in the home. As opposed to targeting parents, the results of this research highlighted the important role that children and schools can play in family health promotion efforts. The trend of targeting children in order to influence both individual and family health behaviours is commonly seen in media and advertising efforts, particularly in regards to the promotion of unhealthy products and behaviours (Palmer & Carpenter, 2006; Weber, Story, & Harnack, 2006). However, this research demonstrated that instilling leadership and decisional ownership in children empowered students to maintain their healthy lifestyle behaviours outside of the controlled school environment. The research findings also revealed students were more aware of, and were able to modify, unhealthy lifestyle choices that existed in their home. School-based health promotion interventions which foster student leadership may therefore be utilized in an effort to combat the influence of media and advertisements which target and promote unhealthy behaviours in children.

Objective 2 explored the use of the photovoice project within the classroom setting as a method for teachers to better understand the home environment. The effectiveness of the approach was identified, and as such using a photovoice project within the classroom is encouraged. The project was deemed valuable for both teachers and students, as students fostered genuine participation in the project, and teachers gained a greater understanding their

students' home environments in order to better meet their students' needs. This suggests that the photovoice project was an engaging and novel way to communicate an understanding of how a variety of school subjects, lessons, and messages translate into the home. School and home collaborations are important, yet often difficult to establish and typically focus on parent-teacher relations (Bergnehr, 2015; Epstein, 1992). The photovoice project demonstrated a unique way to foster an understanding of the home environment using a student-centered approach in order for teachers to gain insight into their students' homes. As a result, teachers may use this approach to gain awareness of the unique needs of their students in order to cater their teaching to meet these needs and foster the highest level of student success.

5.4.1 Recommendations for Future Research

The results of this research imply that photovoice is an effective approach to gaining students' perceptions of the phenomenon of transferring HEAL behaviours from the school to home. However, additional research is warranted. There are few studies that are generalizable to a broader context regarding the ability for children to be catalysts for change in the home, thus future research within a Western context is recommended. In relation to research with APPLE Schools, attaining an understanding from the parent's perspective may add additional insight into the students' role and to our understandings of how the home environment has been impacted by APPLE Schools. It is recognized that each APPLE School fosters a unique school culture based on the contextual needs of the community, therefore it would also be of interest to conduct this project in more APPLE Schools in order to see which aspects, activities, and values that are fostered within their schools are translated home. As all three APPLE Schools in this study were partnered with *The Leader in Me* process, conducting this research with APPLE Schools that

have their own independent leadership initiative would provide further insight into the extent to which student leadership and decisional ownership are promoted.

The process of using photovoice to explore the translation of school behaviours into the home is novel. As such, future research examining this approach for other diverse school topics and subjects is warranted in order to strengthen its use.

5.4.2 Recommendations for Practice

As APPLE Schools continues to expand to new school communities, the findings from this research can help aid future schools in understanding how the behaviours fostered in their school are transferred home. Student leadership and decisional ownership played a key role in students' abilities and empowerment to drive changes in HEAL behaviours within the home, therefore schools should strive to develop and instill leadership values in students. APPLE Schools are evaluated on an ongoing basis in order to inform the effectiveness of the intervention in the context of each school. However, currently there is no measure or account of the leadership qualities that exist in students. Knowing now the importance of leadership and decisional ownership, future evaluation efforts would benefit from including a measure of the level of leadership and decisional ownership in students in order to ensure that this element is being fostered within each school. Schools should also continue to work towards embodying the APPLE Schools philosophy in both formal and informal learning opportunities. Students resounded with the APPLE Schools philosophy when making health choices in the home, and as such this was an important element that impacted behaviours in students' homes. These characteristics of implementation should therefore be utilized by the APPLE Schools team and future school health facilitators, teachers, and administrators in order to ensure the implementation of APPLE Schools is impactful for students beyond the school environment.

Using photovoice in order to understand how school behaviours translate home had positive implications for teacher's insight into their students' homes. Teachers may use this approach in a variety of class subjects as a tool to gain a deeper understanding of how students are applying their knowledge outside of the classroom. Teachers and educators may also utilize this approach in order to gain a deeper understanding of their students' diverse needs, and as a way to strengthen ties between the school and the home. The project fit well with multiple curriculum areas and objectives and the teachers acknowledged that importance of sustaining the project over time in order to develop trust and support from parents. As such there is potential to incorporate this approach into curriculum, as it demonstrates an effective project-based learning assignment that can be applied to various subjects. Overall, the implications of this project have both research and practical recommendations that are applicable to APPLE Schools as well as a wide range of school-based health promotion efforts.

5.5 Knowledge Translation and Exchange

A variety of knowledge translation and exchange (KTE) strategies were utilized to disseminate the findings of this research. It was of utmost importance to ensure that the APPLE School communities were aware of the findings of the research project. The teachers were informed of the results via one-on-one meetings with myself. The meetings took place after the follow-up interviews were conducted, and I prepared a number of PowerPoint slides which organized and displayed each of the themes that emerged from the findings. After I talked through the results with the teachers, they had an opportunity to ask questions and share their feedback informally. The students were informed about the results of the research through two means. I created newsletters for the students to take home in order to share the findings with their family members (Appendix H). The newsletters outlined the research process, and included

a general overview of the findings using students' photos and quotes. I connected with the administrators before visiting the schools, and brought copies of the newsletter for as many students as the administrator requested. In addition to the newsletters, I also created photobooks for the schools (Appendix I). Each school received two photobooks (I suggested keeping one in the Grade 5/6 classroom, and one for a public space in the school such as the library). The photobooks provided a more in-depth description of the results of the research, and consisted of a wide range of photos and quotes from the participants. I visited the schools to deliver the photobooks and newsletters to the students, and in doing so was given class time to meet with the Grade 5/6 students in order to conduct a short session about the findings of the research. The students had a chance to look through the photobooks and share their comments and feedback about the findings. This was also an opportunity to thank the students once again for their involvement in the project, and to celebrate their hard work and participation. Students felt a great deal of pride in seeing their photos and quotes in the photobooks and newsletters, and as such these KTE strategies aligned well with the overall strengths of the photovoice project.

The APPLE Schools management team played an ongoing role in the KTE process. I worked closely with the team during the final stages of my data analysis, and as such they were well informed about the findings of the research. A meeting was held with the team to share my findings and receive feedback from them, and they also provided feedback and insight on the initial drafts of the parent newsletters and photobooks. As such, they were actively engaged in the creation and dissemination of KTE strategies. The management team also ordered a number of photobooks and distributed the books to a variety of APPLE Schools funders, Board of Directors, and health professionals. The team played a pivotal role in sharing the results of the

research with a broad range of APPLE Schools stakeholders. The findings of this research will also be used to inform the implementation of future APPLE Schools.

Professionally, I have had the opportunity to share the findings of this research at both local and international academic conferences. Further, I plan to publish this work in academic journals. Although this project was conducted in a specific intervention context, the findings of this research are relevant to a wide range of education stakeholders beyond APPLE Schools. As such, publishing these findings and sharing this research at various conferences will ensure that the results and implications are shared with the broader education and research community. Finally, this project fits into a larger 5-year collaborative research project, titled Return on Investment for Kids' Health (ROI4Kids). Through the ROI4Kids KTE strategies, reports, and presentations, the findings of this research will be made available. My results will assist in informing the overall objectives of ROI4Kids, namely exploring the effectiveness of implementing a CSH project, APPLE Schools.

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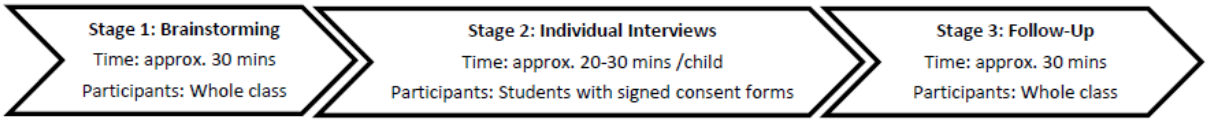
APPENDIX A: Project Information Letter for Teachers and Administrators

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

Title of Study: Using Photographs to Explore the Reach of APPLE Schools
Study Coordinator: Christine McKernan, MSc Student, 780-492-2565
Principal Investigator: Dr. Kate Storey, PhD., RD, 780-492-9609

Required Class Time: 3 visits for a total of 1 hour of class time, plus individual interview time



Research Project Overview:

The purpose of this project is to explore students' perceptions of their involvement in APPLE Schools, and to identify what APPLE Schools looks like to them at home. This will be achieved using a method called Photovoice. Photovoice will involve students taking pictures which demonstrate the presence of Comprehensive School Health (more specifically, APPLE Schools) in their home. These photos will be used to supplement a subsequent one-on-one interview. After parent and student consent forms have been completed, the project will require the Study Coordinator's facilitation in the classroom over three separate stages (see curricular links document for more information):

Stage 1: Class time required: approximately 30 minutes (all students):

The study coordinator (Christine McKernan) will introduce and explain the research project to the class. During this initial meeting, students will have an opportunity to brainstorm and share their experiences of being part of an APPLE School to orient them to the research. Each student will receive a disposable camera and written instructions on proper photo-taking etiquette. These instructions will be reiterated orally.

- To maximize student involvement in stages 1 and 3 of this project, cameras will be given to all students. However, we anticipate that not all students will return their parent consent forms. Thus only students with signed and completed consent forms will partake in Stage 2.
- Students will have one week to take their photos. They will then be asked to return their cameras to their classroom teacher and the Study Coordinator will collect the cameras.
- Each student will receive a copy of their photos to keep.

Stage 2: Time required: approximately 20-30 minutes/ interview (only students with signed consent forms):

The second stage involves individual one-on-one interviews with students who returned their signed consent forms. These interviews will be conducted individually with students at school either during class time (pulled out individually), at lunch, during recess, or before or after school. Interviews will take place in a quiet classroom or office, and will be audio recorded. Students will be reminded that their participation is completely voluntary, and that they can withdraw their involvement at any point in time.

Stage 3: Class time required: approximately 30 minutes (all students):

The third stage of this project involves a classroom discussion to get students' feedback on the photo-taking activity. This collective discussion may bring forward new ideas and plans for action, and aligns well with inquiry-based learning. Students will have an opportunity to provide their opinions on whether or not the findings from the individual interviews were reflected in the collective thoughts, values and opinions shared by others in the class. This meeting will also be an opportunity to brainstorm a creative way for students to share the results of this photovoice activity with their school community (e.g.; poster or PowerPoint presentation).

APPENDIX B: Grade 5 Curricular Links

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

Title of Study: Using Photographs to Explore the Reach of APPLE Schools
Concurrent Grade 5 Learning Objectives

Stage 1 – Brainstorming and Reflective Photo-taking

General Outcome	Specific Outcomes	Relevance to Research Project
HEALTH AND LIFE SKILLS		
W- 5.7 Safety and Responsibility	• Identify personal boundaries, and recognize that boundaries vary depending on the nature of relationship, situation and culture	• Students will follow photo-taking instructions and will be respectful and safe throughout the photo-taking process. Students will be mindful not to take photos of people.
R- 5.4 Understanding and Expressing Feelings	• Practise effective communication skills; e.g., active listening, perception checks	• Students will effectively brainstorm and share their ideas about APPLE Schools in a group setting • Students will use visual methods (photographs) in a meaningful manner in order to communicate their ideas
R-5.9 Group Roles and Processes	• Explore respectful communication strategies that foster group/team development; e.g., encourage participation of all group members	• Students will be encouraged to brainstorm ideas in an inclusive manner to ensure all voices and ideas are heard
PHYSICAL EDUCATION		
B5- Functional Fitness	• B5-1: Explain the relationship between nutritional habits and physical activity	• Students will explore the healthy eating and active living habits learned within their school, and share their understandings of the significance of these behaviours during brainstorming session
B5- Well-being	• B5-6: Infer positive benefits gained from specific physical activities	• Students will verbally communicate the importance of daily physical activity, using examples learned in school

Stage 2 – Individual Interviews

Subject	Specific Outcomes	Relevance to Research Project
LANGUAGE ARTS		
1.1 Discover and Explore	*Express ideas and develop understanding* • Use appropriate prior knowledge and experiences to make sense of new ideas and information	• Students will be asked to explore and identify how their understandings of the APPLE Schools are present in their home environment by taking photos in their home and discussing the

		photographs in one-on-one interviews
	• Read, write, represent and talk to explore personal understandings of new ideas and information	• Students will link their ideas and verbal responses to the photos they have taken
2.2 Respond to Texts	• Use own experiences as a basis for exploring and expressing opinions and understanding	• Individual interviews will encourage students to draw on personal experiences and opinions about the presence of APPLE Schools in their home
	Experiment with language and forms • Select from provided forms of oral, print and other media texts those that best organize ideas and information and develop understanding of topics	• Throughout the discussion, students will be asked to identify the photos which best represent the ideas that they are verbally sharing
1.4 Share and Review	*Construct meaning from texts* • Compare characters and situations portrayed in oral, print and other media texts to those encountered in the classroom and community • Support own interpretations of oral, print and other media texts, using evidence from personal experiences and the texts	• Students will compare and contrast experiences they have in their school with the photos and ideas taken from their home environment • Anecdotal stories and personal opinions will explored in the interview process in order to understand the students' perceptions of APPLE Schools and its influence within the home
	Share ideas and information • Communicate ideas and information in a variety of oral, print and other media texts, such as illustrated reports, charts, graphic displays and travelogues • Select visuals, print and/or other media to inform and engage the audience	• Students will be asked to respond to questions orally, while utilizing the visual aid of their photographs to provide evidence of these topics • Students select appropriate photographs to support their ideas throughout the discussion
HEALTH AND LIFESKILLS		
W-5 Personal Health	• Various	• It is to be expected that various themes involving personal health, particularly relating to healthy eating and active living, will be explored
L-5.4 Learning Strategies	• Analyze factors that affect the planning and attaining of goals; e.g., personal commitment, habits	• Students will have the opportunity to explore how their school and home environments shape their lifestyle choices

Stage 3 – Classroom Discussion

Subject	Specific Outcomes	Relevance to Research Project
LANGUAGE ARTS		
1.2 Clarify and Extend	*Consider others' ideas* • Seek others' viewpoints to build on personal responses and understanding	• Students will engage in a group discussion regarding the photos that they and their classmates have taken in order to identify and confirm themes that exist
	Combine ideas • Use talk, notes, personal writing and representing to explore relationships among own ideas and experiences, those of others and those encountered in oral, print and other media texts	• Photos taken by a variety of students will be explored and organized in order to determine which pictures best represent the oral responses and themes
	Extend Understanding • Search for further ideas and information from others and from oral, print and other media texts to extend learning	• Brainstorming of a creative way to share the findings of this project with family, teachers and school community • Once the final project is completed, students will be encouraged to share the project and its findings with others
3.3 Organize, Record and Evaluate	*Organize Information* • Organize ideas and information to emphasize key points for the audience	• Students will collaboratively match photos to the themes that have verbally been identified • Students will organize their ideas by identifying the major themes which exist
	• Add, delete or combine ideas to communicate more effectively	• Selected findings from interviews may be combined, removed or added based on group discussions in order to ensure results are accurately displayed
5.2 Work Within A Group	*Evaluate information* • Connect gathered information to prior knowledge to reach new conclusions	• Discussion will conclude with students reflecting on findings and brainstorming the implications of their results
HEALTH AND WELLBEING		
W-5 Personal Health	• Various	• It is to be expected that various themes involving personal health, particularly relating to healthy eating and active living, will be explored in the group discussion

All students will be given a copy of their photos to keep. Some creative ideas for using photos in the classroom include:

- Creating a poster or bulletin board on healthy eating and active living at home
- Putting photos in a Venn diagram to answer the question of "Where are you the healthiest? School or home? Why?"
- Have students pretend to be a news reporter and creating a newspaper article about their photos
- Making a collage with the photos
- Having students choose their favourite photo(s) and narrate a story or create a journal about the pictures. Links to larger language arts project.
- Building a cartoon or comic by cutting out photos and incorporating them into the cartoon about health

APPENDIX C: Parent Information Letter

To the Parents or Guardians of Grade 5 Students

Title of Study: Using Photographs to Explore the Reach of APPLE Schools
Study Coordinator: Christine McKernan, MSc Student, 780-492-2565
Principal Investigator: Dr. Kate Storey, PhD., RD, 780-492-9609

Background

Your child is invited to participate in a research project involving photo-taking and one-on-one interviews. Your child has been chosen to participate because he or she is a student at an APPLE School. The results of this research will be used in support of Ms. McKernan's Master's thesis research.

Purpose

Students have an important role in APPLE Schools, and we would like to gain a better understanding of their views. The home environment is shown to play a large role in health outcomes. **The purpose of this study is to increase our knowledge of student perceptions of APPLE Schools in the home environment.** These findings are important because they can inform us of the effectiveness of APPLE Schools.

Study Procedures

Participation in this research involves three steps:

1. First, the whole class will meet with the researcher and get verbal instructions about the project. The students' role and the project goals will be explained. **Each child will receive a camera** and written instructions about its proper use. Your child will be asked to take photos of what APPLE Schools looks like in their home environment. Children may take as many photos as they wish but they will be asked to not include photos of themselves or other people. Students will have one week to take their photos, then the cameras will be collected by the researcher and photos will be developed. Students will get a copy of their own photographs to keep.
2. The second part of this project involves a one-on-one interview with your child at the school. The photos that your child has taken will be used in the interview as topics for discussion. Your child will be asked to describe the photos they have taken and how these photos relate to APPLE Schools. The interview will take 20-30 minutes. Students may be asked to complete interviews before or after school, during lunchtime or recess break, or during class time (with teacher permission).
3. Lastly, a meeting will be held with the whole class to talk about the interview findings as a class. This final meeting will ensure that the research results are true to the students' beliefs.

Benefits

Sharing the ideas your child has will give us a better understanding of their experiences in an APPLE School. The information they provide will help guide future project success and improve the services provided. The information we gather will also be useful to understand the project's impact beyond the school environment. All students will receive a copy of their own photographs to keep. This project fits within multiple objectives in the Grade 5 Alberta Education curriculum.

Risks

There are no known risks associated with participating in this study. If any of the questions asked in the interview make your child feel uncomfortable, they can choose not to answer them. You or your child may ask for a copy of their photographs at any time. Any information you wish not to be included will be removed.

Voluntary Participation

Taking part in this project is completely voluntary. There will be no negative effects if your child does not want to participate. Students who do not participate in this research will still be given a camera to take photos, however these photos and views will not be included in any official research findings. Once parental consent is given, verbal student assent will also be given before students can participate. Interviews will be audio recorded and your child will have a clear understanding that they can request to shut off the audio recording and end the interview at any point in time. Your child's information will be removed from the study without consequences if you and/or your child decide later that they do not want to participate. If you or your child wishes to withdraw or have any other questions, you may contact Christine McKernan at the email address or phone number listed below.

Confidentiality & Anonymity

Your child's privacy will be maintained. To protect your child's identity, the photos will not be linked with any names. Your child will be given a false name for interview transcription and publishing purposes. We want to emphasize that any information provided throughout the interview will be kept confidential and will not be shared with any other individual. We will not record any personal information in the written records and to protect against personal information being released, we will ensure that your child's participation in this study, and any information that they provide, remains confidential. All information will be stored in a locked file cabinet in a locked office at the University of Alberta. Electronic copies of transcripts will be stored on a password protected secure server. Only members of the research team will have access to this information. The photographs, audio recordings and transcripts are kept for five years after the data are published, after which they will be destroyed.

Further Information

If you have any further questions regarding this study, please do not hesitate to contact:

Christine McKernan, MSc Student: cmckerna@ualberta.ca, (780) 492-2565
Dr. Kate Storey, PhD, RD: kate.storey@ualberta.ca, (780) 492-9609

The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

APPENDIX D: Parental Consent Form

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

Title of Study: Using Photographs to Explore the Reach of APPLE Schools

Study Coordinator	Principal Investigator
Christine McKernan MSc Health Promotion Student School of Public Health University of Alberta Tel (780) 492-2565 E-mail: cmckerna@ualberta.ca	Dr. Kate Storey, PhD, RD Assistant Professor School of Public Health University of Alberta Tel (780) 492-9609 E-mail: kate.storey@ualberta.ca

Do you understand that your child has been asked to participate in a research study?	Yes	No
Do you understand the benefits and risks involved in allowing your child to take part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study with your child?	Yes	No
Do you understand that your child is free to refuse to participate, or to withdraw from the study at any time, without consequence, and that their information will be withdrawn at either your child's or your own request?	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your child's information?	Yes	No

I agree to allow my child to take part in this study:

_____
Child's name

_____ _____ _____
Signature of Students' Parent or Legal Guardian | Date | Witness

_____ _____
Printed Name | Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____
Signature of Investigator or Designee | Date

Contact Information:
If you have any questions regarding your rights as a research participant, please contact the University of Alberta Research Ethics Office at (780) 492-2615 (collect calls are accepted)

APPENDIX E: Classroom Brainstorming Session Overview

Session 1: Brainstorming

1. Introductions
   - From the University of Alberta and doing a research project
   - *"Before we get to the cameras, I need your help with some brainstorming…"*
2. We want to learn more about APPLE Schools
   - *"Do you know that you're part of an APPLE School?"*
   - Share your experiences/past activities
   - What makes APPLE Schools special/different?
   - Reference SHF
3. Individual brainstorming (3 minutes)
   - Everyone gets a piece of paper
   - Brainstorm what APPLE looks like at (school)
4. Introduce the word web
   - Example re: winter
     - Activities: sledding, skating, making snowman
     - Clothes: mittens, coat, snow pants, toque
     - Weather: cold, snow, windy, icy
   - Groups of 4-5; one paper and marker
   - 5 minutes to make a word web of **"What does APPLE Schools look like at (school name)?"**
5. Go around to groups and listen to conversation and suggestions
6. Group Discussion: Popcorn sharing
   - Groups share their responses
   - Write on the white board/paper
7. Introduce research
   - "We just talked about what APPLE looks like at (school name). Now I need your help to learn what APPLE looks like at home"
   - Each student will get 1 camera to take home and take pictures of what APPLE Schools looks like in their home
   - **Brainstorm 3 things that we can take pictures of at home**
8. Hand out photo-taking instructions
   - Go through as a class
9. Camera DEMO
   i. Hold flash button until light shines
   ii. Wind the dial until number goes down
   iii. Look through the window
   iv. Press button at the top of the camera (demo)
10. Give out consent forms and reiterate the importance of participation
11. Give students a camera- practice holding down the flash but DONT wind the dial!
12. Everyone writes their names on their cameras

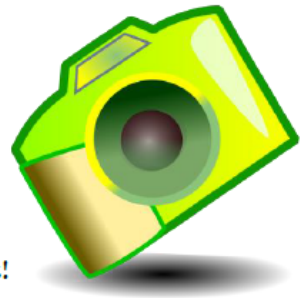
APPENDIX F: Photo-taking Instructions

Your mission is to use your camera to take photos that answer the following question:

What does APPLE Schools look like in your home?

Please remember the following rules:

- Take at least **20** photos.
- Do take pictures of anything that is not a person. Do not take photos of people.
- Stay safe when taking your pictures! For example, don't stand on a wobbly chair to take a picture.
- Photos should be clear (not blurry!) and thoughtful. Remember, you will be asked to explain the reason why you took your photos!



There are no wrong answers or ideas. Be creative and have fun taking your photos! It is your job to ensure your camera is returned to your teacher by (date).

APPENDIX G: Interview Guide

Photovoice Interview Guide

Recording Number	
Child Name	
School Name	
Grade Level	
Male/Female	
Age	
How long have you been at this school?	
Home Demographics	
Who lives there (# and type)	
Type of dwelling	

1. SELECTING:
    a. Ask: "**Select 5 or 6 photos which best represent what APPLE Schools looks like in your home**"
        - *Interviewer: please label these photos 1-6 with post-it notes accordingly, in order to correctly references photos during data analysis*

2. CONTEXTUALIZING/STORY-TELLING: Students explain each of the photos and are encouraged to tell a story to describe the situation and why they took the pictures
    a. Guiding questions (for each photo):
        - Why did you take this photo?
        - What do you see here?
        - What's happening in your home?
        - How does this relate to Belmead School?
        - How does this relate to APPLE Schools and what we talked about as a class?
        - Why do you have/do this in your home?
        - Has something you learned in school influenced this behaviour?

3. CODIFYING/THEMING
    a. Group ideas together with the help of the student, if possible
        - Are any of these pictures similar? How so?
    b. Have students give their selected photos a name or title

General Discussion Questions:

- Does this picture remind you of something you have done at school?
- How is your home like an APPLE School? How is it different?
- How could we make your home more like an APPLE School?
- What kinds of things do you learn at school and share with your family at home?
- What's an important thing you have learned as an APPLE School that you remember to do at home?

APPENDIX H: School Newsletter with Project Results

School Name
Spring 2016

Students were asked to take pictures to answer the question:
"What does APPLE Schools look like in your home?"
Let's see what students said!

Grade 5 & 6 students from 3 APPLE Schools helped out with a University of Alberta research project

In November 2015, students from your school got a camera to take home

Students took photos of things that reminded them of APPLE Schools

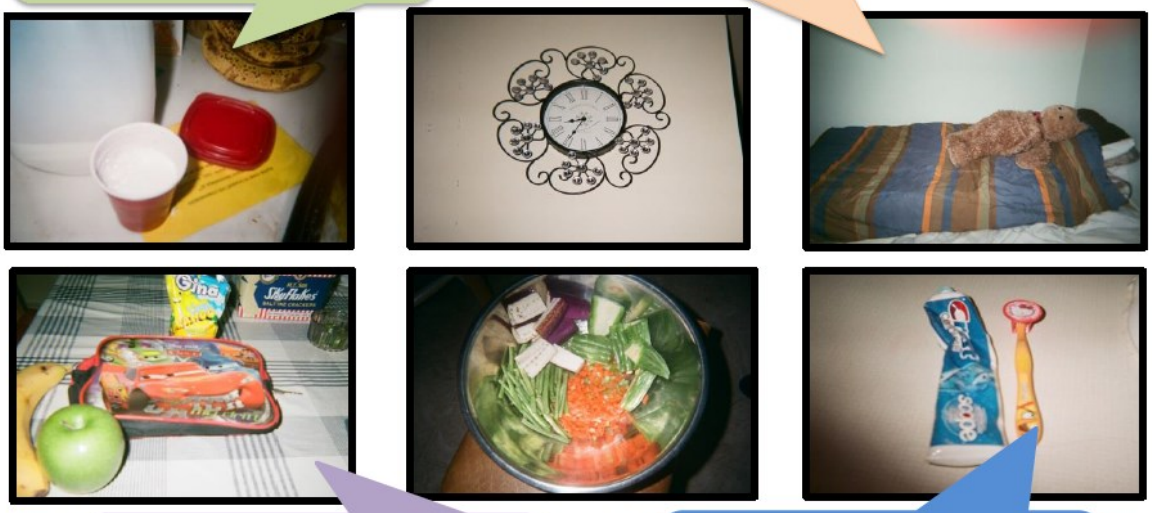
Students discussed their photos and ideas with a researcher, and the results are in!

Finding #1:

Being at an APPLE School gives students the knowledge and confidence to be healthy at home!

"I learnt it (is good to drink milk) when I was in Grade 1 because our teacher always said milk is good for your bones...I always really like milk."

"If you don't get your rest and if you don't learn you won't have a good grade and you won't go to the next grade-like in junior high and high school."



"We're doing the rainbow lunch...and it's like healthy things and that's what I usually pack...'cause I want to be more healthy."

"Brushing your teeth is important (to) keep them healthy and clean...In grade 4 they told us brushing your teeth is important."

www.appleschools.ca
www.twitter.ca/appleschools
www.facebook.ca/appleschools.ca
www.youtube.com/appleschools

apple SCHOOLS | Alberta Project Promoting active Living & healthy Eating

Finding #2:

Students are driving change to create a healthy home environment for themselves and their families!

Thank you to all the Grade 5 & 6 students, teachers, administrators and APPLE Schools staff for your help with this project.
To see even more photos and findings, check out the "Healthy Schools and Healthy Homes" photobooks in your child's school!

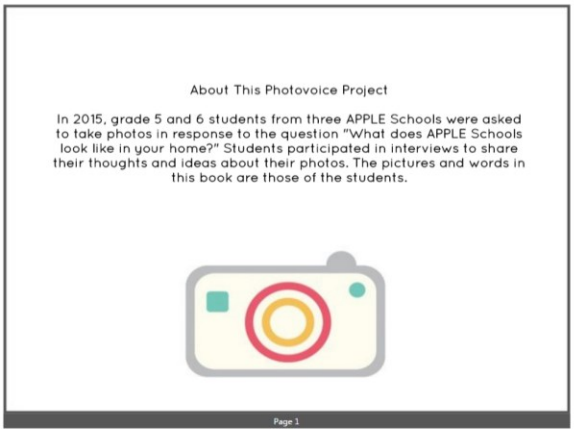
For more information, please contact:
Christine McKernan, MSc Student: cmckerna@ualberta.ca
Dr. Kate Storey, PhD, RD: kate.storey@ualberta.ca

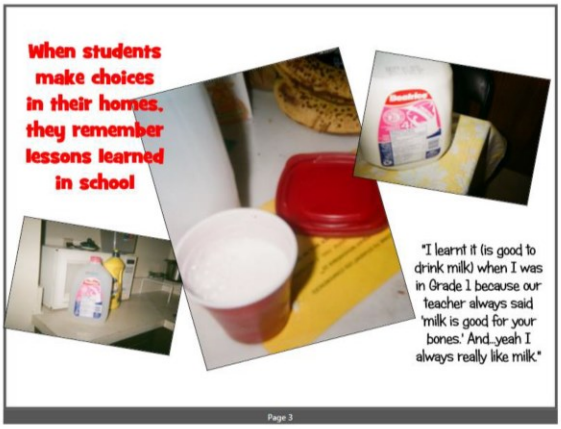
ROI4Kids | Return on Investment for Kids' Health

Alberta Innovates Health Solutions

UNIVERSITY OF ALBERTA SCHOOL OF PUBLIC HEALTH

APPENDIX I: Photobooks





"Always have a good breakfast...so if you're at school and your teacher is teaching you, you won't be looking at your stomach and that's distracting you from learning."

"Brushing your teeth is important (to) keep them healthy and clean...In grade 4 they told us brushing your teeth is important."

Page 4

Students think about their long-term success in school and health when they make their decisions

"We're doing the rainbow lunch which we're like looking at the bulletin board over there with the rainbow things. And it's like healthy things and that's what I usually pack..'cause I want to be more healthy and..I don't want to get sick."

Page 5

"If you don't get your rest and if you don't learn you won't have a good grade and you won't go to the next grade- like in junior high and high school."

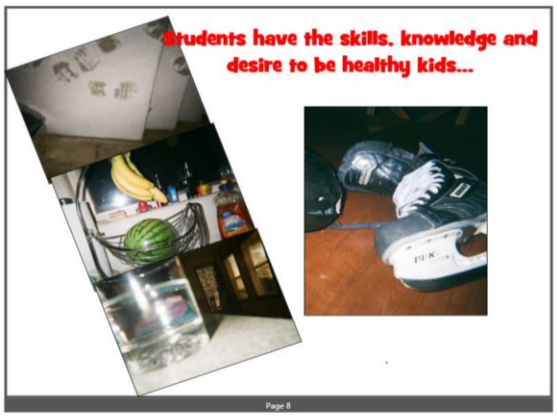
"If you don't sleep well your mind won't like...put everything that you learned, it won't keep it in a memory. Because if you want to learn something when you grow up, or if you want to be a scientist, you have to have like mostly chemistry in your mind."

Page 6

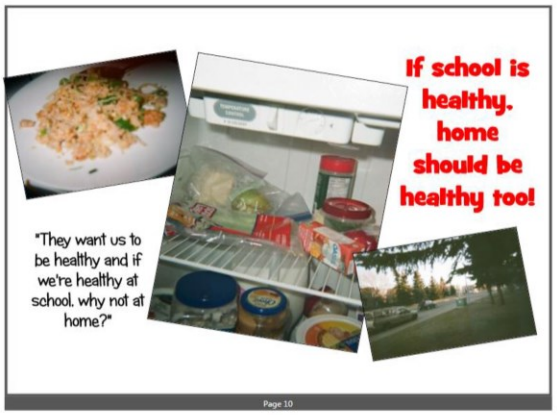
Students know that they are in charge of their health at home

"Being organized is like very good for you, 'cause if you're not organized, it won't keep your mind healthy. Because if you're looking for something you can't really find it and when you come into school, you- you're gonna forget about it"

Page 7


Students have the skills, knowledge and desire to be healthy kids...
Page 8


...and this gives them confidence to drive change to create a healthy home!
Page 9


If school is healthy. home should be healthy too!
"They want us to be healthy and if we're healthy at school, why not at home?"
Page 10


"We have some (healthy snacks at school) because our teacher usually asks us to help her and that. And then we have some at home 'cause you want to be healthy and all that."
Page 11

Students try new healthy things at home with their family

"We had a banana snack in school and I didn't really like it but I just tried it and then I just liked it. So the next day I got lunch already!"

Page 12

"At school I've decided to try some new food because we were at the store and I saw (the honeydew melon) and then my parents were like 'how about we just get this?' and we went home and it was my first time trying it and it was healthy."

"(I like) learning all the fun new games I could do at home with my family."

Page 13

Students change what foods are purchased, cooked and consumed in the home

"Cause mostly I would eat not as healthy but when I came to this school they had healthy snacks and I decided to start liking them... (my parents) buy healthy snacks more now."

Page 14

"I asked my mom and dad to like change what they're buying...I usually pack bad stuff and then when I asked them that, they were like happy cause I don't usually do that."

"I've cooked with my mom now because I know how to cook and stuff."

Page 15

Students help their families eat healthy and be active at home

"You have to be exercising- 'cause we have like this thing in our agenda where you exercise (for) 30 minutes. And then that like pushes me to go like, maybe go with my dad swimming, maybe to the gym, even if it's not on schedule sometimes, I wanna go."

Page 16

"I told (my brother) that he needs to drink milk. I tell him that he can be healthy and milk is better than coke."

"When I started playing basketball I started telling my brothers and they really like going out and playing with me."

Page 17

Students monitor unhealthy behaviours in their homes

"We need like- not to stay and play video games all day. We need to go outside and play"

Page 18

"(I) make sure my mom and my brother don't eat too much candy while they're snacking."

"There's some things in my pantry that are like- like and marshmallows and I always think- I should have these occasionally but not like every day"

Page 19

Thank you to all the students, teachers, administrators and APPLE Schools staff for your help with this photo project!

ROI4Kids
Return on Investment for Kids' Health

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SCHOOL OF PUBLIC HEALTH

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Page 20

APPENDIX J: Teacher Information Letter and Consent Form

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

3-50 University Terrace
Edmonton, AB T6G 2T4

www.publichealth.ualberta.ca

Tel: 780.492.6408
Fax: 780.492.0364

INFORMATION LETTER

Project Title: **Using Photographs to Explore the Reach of APPLE Schools**

Principal Investigator	Study Coordinator
Dr. Kate Storey, PhD, RD Assistant Professor School of Public Health Tel (780) 492-9609 E-mail: kate.storey@ualberta.ca	Christine McKernan MSc Student School of Public Health Tel (780) 492-2565 E-mail: cmckerna@ualberta.ca

May 16, 2016

Dear Teachers:

You are being asked to participate in a structured interview in order to increase our understanding of teachers' perceptions of the APPLE Schools photo project that took place in your classroom. Based upon the research literature, one of the emerging themes to investigate is the transfer of school behaviours into the home environment. Considering how critical it is to understand your perceptions, we want to further deepen our knowledge of how this project could be informally implemented in the classroom setting as a student-centered tool to determine if behaviours fostered in school are reaching the home.

Participation involves a one-on-one structured interview in person, lasting approximately 30 minutes. During the interview you will be asked a series of questions about your experience with the photovoice project. Interviews will be recorded to ensure that the discussion is captured accurately. All interviews will be audio-recorded and transcribed immediately following.

Benefits & Risks

Sharing perceptions and observations you and your fellow colleagues have in regards to work you do and your perception of the photovoice project will give a better understanding of the benefits of being an APPLE School. The information you provide may help inform future project effectiveness and improve the services provided. Additionally, the information we gather will be useful for understanding more about the project's process evaluation.

There are no known risks associated with participating in this study. However, if any questions asked in the interview make you feel uncomfortable, you can choose not to answer them. You may ask for a copy of the interview at any time. Any information that you do not wish to be included will be removed.

Confidentiality

Your confidentiality will be maintained. To protect your identity, you will be given a false name. We want to emphasize that any information provided throughout the interview should be kept confidential and not shared with any other individual. We will not record any personal information in the written records. To protect against personal information being released, we

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will ensure that your participation in this study, and any information that you provide, remains confidential. Furthermore, all information will be stored in a locked file cabinet in a locked office at the University of Alberta. Electronic copies of transcripts will be stored on a password protected secure server. Only members of the research team will have access to this information. The information is kept for five years after the data are published, after which it will be destroyed.

Freedom to withdraw

Taking part in the project is completely voluntary. There will be no negative consequences if you do not want to participate. Your information will be removed from the study without consequences if you decide later that you do not want to participate. If you wish to withdraw or have any other questions, you may contact Kate Storey at the phone number or email address listed below.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Health Research Ethics Board - Health Panel at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Sincerely,

K. Stz

Kate Storey, PhD, RD
School of Public Health
University of Alberta
Tel (780) 492-9609
kate.storey@ualberta.ca

UNIVERSITY OF ALBERTA

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INFORMED CONSENT FORM

Project Title: **Using Photographs to Explore the Reach of APPLE Schools**

Principal Investigator	Study Coordinator
Dr. Kate Storey Department of Public Health Sciences, School of Public Health Tel (780) 492-9609 E-mail: kate.storey@ualberta.ca	Christine McKernan MSc Student School of Public Health Tel (780) 492-2565 E-mail: cmckerna@ualberta.ca

Do you understand that you have been asked to participate in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you are free to refuse to participate, or to withdraw from the study at any time, without consequence, and that your information will be withdrawn at your request?	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your information?	Yes	No

This study was explained to me by: _____

I agree to take part in this study:

_____	_____	_____
Signature of Research Participant	Date	Witness
_____		_____
Printed Name		Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of Investigator or Designee	Date

Contact Information:
If you have any questions regarding your rights as a research participant, please contact the University of Alberta Research Ethics Office at (780) 492-2615 (collect calls are accepted).

APPENDIX K: Teacher Interview Guide

Guide for Teacher Interviews

1. Get verbal consent to audio record interview:
    a. *"First, I would like to confirm that you are aware this conversation is being audio recorded, and that you can request to have the recorder turned off or end the interview at any time"*
2. Tell me about the research project that took place in your classroom.
3. What other student-centered approaches have you used to understand how students bring school lessons home?
4. Is it valuable for your teaching to understand how students bring learning into the home?
5. Do you think this approach is an effective way to determine if school behaviours are being transferred home? Why or why not?
6. (What worked about this approach? What didn't?)
7. Did you receive any student feedback about the project? If so, what?
8. Tell me about how your student used the photographs.
    a. Were there any "surprises" that you observed from your students or the photos?
9. Tell me about how you used the Grade 5 curricular links.
    a. Was there a subject or link that you utilized in particular?
10. Is this something you would try again independently in your classroom?
    a. Why would you try this project again?
    b. What are some reasons why you might not re-do this project independently?

Discuss research findings at the end