HOW AN INTERGENERATIONAL LANDED LEARNING PROJECT IMPACTS CHILDREN'S CONCEPTION OF HEALTHY FOOD AND THEIR EATING HABITS

by

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B.S., The Beijing Normal University, Zhuhai, 2008

A GRADUATING PAPER SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF MUSEUM EDUCATION

in

THE FACULTY OF GRADUATE STUDIES
(Curriculum and Pedagogy)

THE UNIVERSITY OF BRITISH COLUMBIA
(Vancouver)

July 2013

Abstract

Today, malnutrition has emerged as the cause of many major health problems such as diabetes and obesity, with eating disorders on the rise. Particularly, nutrition-related health problems are significantly increasing among children, which may affect their body growth and learning ability. What's worse, food habits developed in childhood could have great impacts in later life. Consequently, nutrition education has been employed to assist children to develop healthy dietary habits. However, conventional classroom nutritional education is not conductive and straightforward enough concerning the application of knowledge into practice. Therefore, an innovative program named the Intergenerational Landed Learning Project (ILLP) at the University of British Columbia (UBC) farm was implemented to encourage children to better understand food and nutrition.

In this study, particular emphasis is placed on hearing the voices of children themselves due to the lack of attentions paid to children's opinions and preferences in the current literature. This study is conducted to answer three questions: 1). What is the students' conceptions of healthy food and healthy eating habits?; 2). How does their school-year participation in the ILLP influence their learning about healthy food and nutritional knowledge?; 3) How does this experience impact their eating habits?

To obtain answers to these questions, individual interviews with children and their school teacher were designed in both informal and semi-structured ways. Through data analysis, it was found that the children generally had a good knowledge about food and nutrition, and their dietary habits were impacted by various factors. This study investigated these factors and then summarized them into four main factors, namely,

home, school, farm and social. The relationship between the children's knowledge and their actual dietary habits was also explored. It was found that there was a disconnection between the children's knowledge and dietary habits. An anticipated benefit of this study is to improve the nutritional status of school-age children and thus provide an effective investment in future generations.

Table of Contents

List of Figures

Acknowledgements

I dedicate this to my family and friends. Thank you all for your constant support, encouragement, and positive words throughout this journey. I am grateful for the patience and support of Dr. Alex De Cosson, and the gracious contributions of everyone who participated in my research and kindly offered your time, opinions, and honesty.

Chapter I: Introduction

Food habits developed from infancy have a great impact on preferences and practices in a person's later life (Wang, Monteiro & Popkin, 2002； Contento, 2007; Prelip, Slusser, Thai, Kinsler & Erausqui, 2011). In many countries, inadequate nutrition continues to be the cause of some major problems such as diabetes, obesity and eating disorders (Ogden, Carroll & Flegal, 2008;). These nutrition-related health problems are significantly increasing in children (NFSI, 2006). It is reported that the upcoming generations may be the first to experience a shorter lifespan than their parents because of their poor dietary habits. The results of research by the 2007-2009 Canadian Health Measures Survey (CHMS) demonstrated that measured obesity had increased 2.5 times in the last decade, and among youth aged 12 to 17, obesity had tripled from 3% to 9.4%. This is a widespread problem and as a society we have the responsibility to help people to intake the proper nutrition (News and Information, Nutrition-Friendly Schools Initiative, NFSI, 2006), especially for children, because *"healthier children learn better"* (Kennedy, Nantel & Shetty, 2006) and good nutrition contributes to improving their potential learning ability (Contento, 2007; O'Brien, Nader, Houts, Bradley, Friedman & Belsky, 2007).

One promising way to solve this problem is through public health promotion and nutrition education. As Contento (2007) stated, nutrition education is an accessible effective tool in the promotion and development of people's healthy eating practices. Classrooms are one of the preferred places for children to learn knowledge about food and nutrition; however, it may not be conducive to the application of knowledge into practice, because the knowledge children learn in the classroom is abstract. Moreover,

knowledge itself does not automatically change behaviors (Dillon, 2003). For example, in a study conducted by Satter (1999), students in the second to fifth grades could sort foods into the right places in the US Food Guide Pyramid but were not able to use these classifications in their daily food choices. Therefore, learning knowledge about nutrition in the classrooms has had limited success in changing eating habits (Gatherer, Parfit & Vessey, 1979).

An interesting approach for nutrition education to transform children's perceptions and knowledge about food and nutrition is through leaning in gardens. There has been a growing trend in North America in employing gardening as a part of curricular activities for school age children. A good example of this is the implementation of a program called the Intergenerational Landed Learning Project (ILLP) at the UBC farm. The program engages students in hands-on activities which enable them to better understand food and nutrition, and to develop good eating habits (Morris, Briggs & Zidenberg-Cherr, 2000).

The purpose of this study is to explore whether a one-year experience in the ILLP can impact students' knowledge and attitudes toward food, as well as the meaning of healthy eating, which can help teachers, parents and researchers to assist children to develop healthy dietary habits. The study's multiple data sources include individual interviews and observations. Prior to this research, I have been volunteering at the ILLP for the school year, during which I observed how children learned knowledge about food and nutrition, how they communicated with their companions and us volunteers, and, more importantly, how their eating behaviors have changed. This study also made

contribution to the understanding of the impacts of garden-based education and extends qualitative studies in the field of nutrition education.

Chapter II: Literature Review

Nutrition Education

I use Contento's (2007) definition of nutrition education, which is widely accepted in the literature and endorsed by the Society of Nutrition Education and Behavior.

> Any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and well-being. Nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy levels (p. 15).

The definition of nutrition education varies in accordance with different interests and purposes. Contento proposed three approaches to nutrition education: information dissemination; behavior facilitation; and environment modification. The third approach is more comprehensive and focuses on modifying social factors.

To guarantee the effectiveness of nutrition education, many researches (Baranowski, Cullen & Nicklas et al., 2003; Ammerman, Lindquist & Lohr et al., 2003; Pomerleau, Lock & Knai et al., 2005; Contento, 2008, 2011;) suggest that more emphasis be placed on behavior/action rather than knowledge only. For instance, Contento (2008) proposed that there are three essential components in nutrition education, namely, motivational phase, action phase and an environmental component. The first two components focus on why and how to make changes, and the environmental component refers to the fact that nutrition educators work with policymakers and others to promote environmental supports for action. The environmental component has become

increasingly recognized as extremely important in nutrition education because "*environmental factors powerfully influence peoples' food related behaviors and facilitate or hinder individuals being able to act on their beliefs, attitudes, and knowledge about healthful eating*" (p. 178).

School-based Nutrition Education

School-based nutrition education is known to significantly influence students' eating patterns (Hart, Herriot, & Bishop, 2003; Power, Bindler & Goetz, 2010). A number of studies have been conducted in this area to explore what students know about food, nutrition and related topics (Seaman, Bower & Fleming, 1997; Noble, Corney, Eves, Kipps & Lumbers, 2000; Dixey, Sahota, Atwal & Turner, 2001; Stewart, Gill, Treasure & Chadwick, 2006). Important findings that were reported in Contento's (1981) study show that it is necessary to investigate the relationship between children's cognitive development and their preferences and practices with regard to food as there is a gap between the two (Lytle, Eldrige, Kotz, Piper, Williams & Kalina, 1997; Seaman et al., 1997). According to Driver, Squires, Rushmore, and Wood-Robinson (1994), while students know what is healthy and what is not, they have been choosing the unhealthy foods and their ideas were described as:

> Food is necessary for life and activity but the meaning of food is not consistent in children's thinking and they have different concepts of food in different contexts. Pupils of all ages define food as material to promote growth and health and activity. They do not recognize it is as material to become part of their bodies in growth, or as a source of energy (p. 43).

For this reason, the daily consumption of fruits & vegetable (FV) has been at low levels among children and adolescents (Jones, 2006; Antova, et al., 2003). The 2007

Youth Risk Behavior Surveillance System (YRBSS) survey reported that only 1 in 5 high school students eat five or more FV each day (Eaton, Kann & Kinchen, 2010). Among younger children, less than one fourth consume the recommended amounts (Field, Austin & Taylor, et al., 2003).

A number of school-based interventions have been developed to solve this problem and modify children's dietary habits (Gortmaker, Cheung & Peterson, et al., 1999; Gortmaker, Peterson & Wiecha, et al., 1999; Zeinstra, Koelen, Kok & Graaf, 2007; McKenzie, Stone & Feldman, et al. Shaya, Flores & Gbarayor, et al., 2008). There is one popular reward-oriented school-based FV intervention in the US known as the Food Dudes (FD) program that has enhanced the FV intake of children (Gregory Heidi, Rochelle Sheryl & A. Brooke, 2013). In Asia, nutrition education received increasing attention as well. In Japan, for instance, a school-based nutrition education program named "Shokuiku" was set up in 2007 to improve the children's dietary habits so that appropriate amount of energy and nutrition are consumed and the lifestyle-related diseases, such as obesity, could be reduced (Miyoshi, Tsuboyama-Kasaoka & Nishi, 2012).

However, it should be noted that few studies paid attention to children themselves, such as what they think and what they understand about food. This is a significant gap in the research literature that needs to be addressed. Furthermore, while classrooms have been selected as one of the preferred settings of delivering knowledge of healthy food, this approach has had limited impacts on children's ability to put their knowledge into actual behaviors. Regarding this problem, incorporating out-of-classroom settings, i.e., vegetable gardens, into the curriculum is a promising solution, because these gardens can

provide the opportunity for students to engage in health issues (Morris, Brigs & Zidenberg-Cherr, 2000; Morris, Neustadler & Zidenberg-Cherr, 2001; Morris & Zidenberg-Cherr 2002; Ozer, 2007; Poston, Shoemaker & Dzewaltowski, 2005).

Garden-based Learning

Garden-based learning is defined as "*an instructional strategy that utilizes a garden as a teaching tool, and the pedagogy is based on experiential education applied in the living laboratory of the garden*" (Desmond et al., 2004, p. 20). It is not a new initiative. Gaylie (2011) detailed the history of school gardens in her book "*Roots and Research in Urban School Gardens*" as an introduction to eight case-studies of urban school gardens situated on the west coast of the United States and Canada. School gardens were actually first implemented in the United States at the George Putnam School in Massachusetts in 1890. By 1918 there was at least one in every state (Kohlstedt, 2008). During World Wars I and II, more than a million children were contributing to U.S. food production with victory gardens, which were part of the US School Garden Army Program (Hayden-Smith, 2006; Subramaniam, 2002). During that time, gardens were sought to improve the moral character of urban children who were considered deprived of the benefits of time spent in nature. Canada experienced an increased interest in school gardens during the mid 1990's. This interest continues today with the cities of Vancouver and Toronto taking the lead on implementing school gardens with the assistance and support of Evergreen (a Canadian environmental non-profit based in these two cities).

Garden-based Learning is considered to be able to *"engage the student in a stewardship relationship with other living organisms and teaches not only the science of*

life but also the interconnected nature of the web of life and how everyday actions can have profound effects on the long-term health of the system" (Desmond, et al., 2004, p. 11). Studies have shown the improvement in children's academic performance and test scores, especially in math and science when they learn in gardens (Bell, 2001; Klemmer, Waliczek & Zajecek, 2005; Smith & Motsenbocke, 2005). In 1997, a study conducted in Florida reported that 84.3% of teachers stated that gardens helped their students learn more effectively (Skelly & Bradley, 2000). Another study conducted in the United States (Lieberman & Hood, 1998) demonstrated the success of using the environment as an integrated teaching context for children. The findings showed that 92% of students managed to achieve academic improvement in all subject areas (math, science, social studies, and language arts), and 100% had improvement in their attendance and attitudes, as compared with traditional non-environment-based schools.

Desmond et al. (2004) suggested that while experiential education and project based learning offer excellent strategies or pedagogies, they require a contextual framework or thematic structure to operate in. The authors also suggested that the practice of garden-based learning must consider rigorous guidelines, procedures and practices because these programs are the educational curriculum itself in some settings. Moreover, according to the authors, there is no universal model for garden-based learning that can be applied to every community. Each culture or community must develop their own program that addresses the particular needs of their learners and educators.

Garden-based Nutrition Education

Though learning in gardens is not a new idea, research related to garden-based nutrition education is a developing field incorporating creativity and reflection, which

adds considerable value to the garden space (Gaylie, 2011). According to Jones (2006), increasingly gardens in schools or farms were used as vehicles to teach students the food cycle, nutrition and culinary science. The growing tendency is also reflected in the number of studies about garden-based nutrition education and garden-based nutrition programs. Boyer (1972) proposed a gardening approach to teach better food and nutrition habits to program families. She concluded her study with a reflection that illustrates the experience:

> The 1200 square foot plot of ground did indeed turn out to be much more than just a garden. It was a learning experience that has touched the lives of many people in Olmsted County (p. 9).

Morris, Briggs and Zidenberg-Cherr (2000) stated that the garden-based nutrition education was a promising approach to engaging students in food issues, and could reinforce nutrition lessons through hands-on activities, such as, plant and harvest, cook and taste, thus having a long term impact on the students' life. In their subsequent studies (Morris, Neustadler & Zidenberg-Cherr, 2001, 2002), they concluded that there would be greater effects on children's vegetable preferences when nutrition lessons are combined with planting. McAleese and Rankin (2007) examined the effects of garden-based nutrition education on adolescents' (6th grade) fruits and vegetable consumption by comparing with a control group. Students in the study group participated in a 12-week nutrition education program were taught with a curriculum developed by McAleese and Rankin's "Nutrition in the Garden" (2007). The results showed that students increased their fruit and vegetable consumption compared to the control group which did not have the gardening experience. Thus,

> Gardens as educational places ask us as educators and as learners to value process over product and attend to the moment as it unfolds. School gardens encourage us to look for connections between subjects and ecosystems; to embrace spontaneity and sensuality as well as critical thinking and experimentation (Moore, 2013, p.3).

However, while the extensive literature focuses on descriptively reporting young people's nutritional intakes, there are relatively few studies that assess the social context and meaning of food in young people's lives, and this will be the subject of my study.

Chapter III: Methodology

Research Questions

My research is conducted aiming at answering the following questions:

(1) What are the students' conceptions of healthy food and healthy eating habits?

(2) How does their school year participation in the ILLP at the UBC Farm influence their learning the knowledge of healthy food and nutrition?

(3) How does this experience impact their eating and habits?

Context of the Study

This study was undertaken within the Intergenerational Landed Learning Program (ILLP) at the UBC farm, a 24 hectare learning and research farm located on the southern margin of UBC Campus in Vancouver, Canada. The ILLP is an environmental educational project designed to advance children's understanding of growing and food production through hands-on farming activities. It brings together school children and teachers from elementary schools in the surrounding area, and farm volunteers who are known as "Farm Friends".

The ILLP offers participating students, teachers and volunteers the opportunity to be involved in the various stages of the growing cycle of plants, such as planning for beds, planting, caring for the plants, and harvesting. The children (from grade 4 to 7) come to UBC Farm on 12 occasions throughout the whole school year. Every other week, on a typical day the children arrive at around 9:30 am. They work in groups of three or four with one or two farm friends, who are adult volunteers from the community with gardening and farming expertise or university students. The program manager facilitates the day's activities, and provides information of specific topics at the beginning, such as

water, pollination, composting, soil composition. During each visit every group is responsible for the job assigned by the facilitator. One of the vital tasks is to work with a program assistant in the Farm Centre kitchen to prepare lunch using what the children have harvested for all to eat. In this way nutrition and food preparation become parts of learning at the Farm. Most farm days include time for the children to share or present what they have learned in their schoolwork or what they find is valuable and interesting in the farm.

Theoretical Underpinnings

I delved into the theories of learning in an informal setting like UBC farm in my study and investigated what and how people learn outside of schools as well as how informational settings influence students' learning about food.

Theoretical and methodological approaches applied in garden-based learning have changed greatly in the field of education (Desmond, Grieshop & Subramanian, 2004). At present, constructivism is one of the most influential methodological approaches in the educational field. Constructivism is a theory about how people absorb and build up their knowledge, and an epistemological approach that deals with what, how, and when we learn. One key point in constructivism is that individuals actively construct their own new knowledge with their experience in a social context as well as their prior knowledge, (Falk & Dierking, 2007).

Theoreticians like Piaget (1896-1980), and Vygotsky (1896-1934) have also contributed to the field of study with diverse epistemological and psychological approaches. Piaget's theory focuses on whether people acquire the knowledge by

themselves and Vygotsky's (1978) social constructivist approach focuses on social factors contributing to cognitive development:

> Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals (p. 57).

Method

A qualitative research method was used in my study. It is a process of inquiry with the goal of understanding a social or human problem from multiple perspectives. According to Creswell' s (1998) definition, qualitative research is conducted in a natural setting with a goal of building a complex and holistic picture of the phenomenon of interest. One main advantage of qualitative research is that the researcher gains more detailed and rich data in the form of comprehensive written descriptions or visual evidence, such as photographs, tapes and videos. Compared with the quantitative method that ignores the context of the study, qualitative research looks at context and social meaning and how it affects individuals, which is particularly advantageous in the social sciences.

Research Design

The primary source of my research data was from interviews with the four children and their school teacher, as well as my observation during their 12 visits to the UBC Farm throughout the school year. Through interviews and observation, information and stories are explored and explicated.

Interview

I conducted both informal and semi-structured interviews with the children to study their responses to ILLP experiences (see Appendix A & B). The informal interview is unstructured and conversational while the semi-structured interview is researcher-led, audio-taped, and typically conducted during a set time within a venue selected by the interviewer (Eisner, 1991; Hatch, 2002; Merriam, 1998). A combination of informal and semi-structured interview techniques is recommended for studies involving children (Diamond, 1999; Falk & Dierking, 2000; Hein, 1998).

My interviews were open-ended individual interviews. Since there were no set response categories, I was able to ask each child similar questions and get different answers (Diamond, 1999; Fontana & Frey, 2000). Compared with focus groups interviews, in which children may be unwilling to engage in further discussing the topic (Hart, Bishop & Truby, 2002; Urueta-ortiz, 2009), individual interviews that include both open-ended and informal formats are best suited for shy children and those lacking confidence in their verbal abilities (Diamond, 1999). Furthermore, for the individual interviews there was an additional advantage in that the children had a good relationship with me and they felt free and relaxed to have conversations in the interviews.

The interviews with the students were helpful for me to gather more information about the children's learning at the farm. I selected the four children in my group because I had observed them for the whole school year, and had good relationships with them. I also conducted the semi-structure interview with their school teacher to better understand the children's conceptions about healthy food and gain some understanding of the teachers' level of confidence in their ability to effectively connect what students were

learning at the farm with their classroom curriculum. This allowed me to gather more information about the children's motives, intentions and expectations about participating in an environmental education project on an urban farm.

All the interviews were semi-structured, and were audio recorded on a digital recorder and transcribed after each session. The questions were prepared in advance, but during the interviews I asked additional questions for clarification and extension, because researchers need to remain flexible in order to respond to new ideas and changing situations as they occur (Merriam, 1998).

Observation

My goals were to observe the range of nutrition education experiences the children were exposed to, record the children's engagement and responses to specific events, and identify any changes over time. My observations focused on the children's interactions with peer volunteers and plants.

I kept taking notes of my observations to maintain an "*on the spot record*" (Jesson, 2002, p. 88) of the children's experiences, as suggested by Merriam (1998) and Jesson (2002). I observed the children's behaviors, engagement in activities and their responses to field experiences by detailing their conversations and interactions.

Study Participants

In this study, the group consists of four girls who were all born in Canada and are 9-10 years old in grade 3-4.

Data Analysis

To guide my analysis, I followed Bogdan and Biklen's (1992) approach to qualitative data analysis which involves working with the data, organizing it, breaking it

into manageable units, synthesizing it, searching for themes and patterns, so that the researcher can discover "*what is important and what is to be learned and decide what you will tell others*" (p.145).

Specifically speaking, I first transcribed the interview tapes, read the transcripts, and analyzed these data using the constant comparative method (Lincoln & Guba, 1985; Merriam, 1998; Strauss & Corbin, 1998). After the coding process, the coded transcripts were cut apart; that is, each piece of material relevant to a particular issue or theme was cut and pasted so that all materials relevant to a particular topic was placed together. I also kept a research journal for the duration of the study to maintain a record of children's experiences and log contextual details. I compiled detailed accounts of the children's experiences by documenting behaviors and analyzed the resultant data using themes and sub-themes. The observation data helped me establish validity through triangulation with data from the children's and teacher's interview responses (Krefting, 1991).

Then I expanded this process of analysis with a parallel reading and my observational data. As suggest by Miles and Huberman (1994) and Denzin and Lincoln (2000, 2003), I started the analysis with selecting general themes to act as frames, and then developed them during analysis. There are four categorized themes in my paper which are: children's conceptions about healthy food and junk food; children's eating habits; factors that influence children's views of food; and the disconnection between nutritional knowledge and eating habits.

Ethical Considerations

Prior to the conceptualization of this study, the ILLP developer had received approval from the UBC Behavioral Research Ethics Board for an evaluation of the ILLP

which involved an evaluation of students' attitudes towards learning at the farm, so the students and their parents, as well as school teachers who participated in the program have signed the consent forms since September of 2012. My research is an amendment of this program and therefore, all of the interviewees in my study do not need to sign any consent forms again.

Throughout the interview, the students were allowed to say whatever they liked relating to the questions, and to ask the researcher questions. At the beginning of the interviews, I briefly explained my interview topics to the students, and told them that this interview was not a test, and there were no right or wrong answers. I also informed them that their answers would be recorded and all recordings would remain confidential.

Given the small samples in interviews of this research, it is difficult to keep the interviewees' confidentiality and anonymity; however, the identities of the students and the school are expected to be kept confidential. The students' names were not used in all written work related to this research.

Chapter IV: Findings and Discussions

To answer the aforementioned three questions in my research, I first analyzed the results obtained from the interviews with four students and their school teacher, as well as from my observation concerning students' behaviors when they visited the farm during the school year. Then, a total of four themes were summarized in my analysis: 1) children's conceptions about healthy food and junk food; 2) children's eating habits; 3) factors that influence children's views of food; 4) the disconnection between nutritional knowledge and eating habits. The four themes correspond to the questions and will be presented separately and discussed in detail in the next section of my paper.

Children's Conceptions about Healthy Food and Junk Food

Knowing children's conceptions about healthy food and junk food would be helpful information when designing specific nutrition education programs to fit their physical and mental development thus improving their dietary habits, potential learning ability and quality of life (NFSI, 2006; Contento, 2007).

I started the interviews by asking the children about what they had for lunch that day. This question could help me begin the conversation in a relaxed environment, thus making children more responsive to further questions about how their eating habits had changed, what their favorite food was, whether they considered it healthy or not, and why this was so.

Through combining the four students' answers about their most and least favorite food, I found that their favorite food includes celery, salad, sushi, chips, pasta, watermelon, pizza and cheese, half of which could be considered junk food. Their least favorite food was all healthy food, such as mushrooms, eggs, tofu and tomatoes. They

thought “healthy food tastes bad because they are not sweet”. This attitude towards what is known as healthy food is consistent with other research findings (Ross, 1995).

Another interesting finding was that pasta is one of the four students’ favorite foods. Pasta is a popular food owing to its convenience, and its popularity among my group allowed me to engage the students in a conversation during their ninth visit to the farm on whether it is healthy. One of the students believed that “pasta is not healthy because there are a lot of cheese, and cheese can make people become fat”, while another two argued that pasta is healthy food. One said: “pasta is healthy because it is made of wheat; and wheat is healthy”, and the other said “Pasta is healthy because the sauce can be tomato and other vegetables.”

In sum, the children in the study were able to recognize what constituted 'healthy' foods. Many of them were also aware that what they termed 'unhealthy' foods were the ones that they enjoyed eating. Particularly speaking, vegetable and fruit are the most popular healthy food in their answers, thanks to what they had learned in the classroom. When I asked them after the interview to draw something that they believed were healthy, all of them finished with drawing vegetable and fruits. One of them even drew a picture of vegetables grown in UBC farm, which she thought were organic and healthy because no chemical materials but only sunshine and water were used. Actually, she believed that everything in the farm is healthy.

Figure 1. Children's drawings of their perceived healthy food.

The children also knew what was junk food, but they didn't clearly know why junk food was bad for health. Two children mentioned that fast food was equal to junk food, such as the food served in McDonalds, KFC and A&W. Other foods classified as junk foods included cake, pop, chips, chocolate, candy, ice cream, pizza, and sugar. Regarding sugar, the children suggested that junk food contained a lot of sugar, but some of them had the misunderstanding that there should be no sugar in healthy food. Some children were a little confused about whether pizza was healthy. One child said that pizza was her favorite food, but she was unsure of whether to classify it as healthy or junk food. The following is an excerpt from the transcript that illustrates her confusion:

Student: Pizza is my favorite food, especially the pizza that our group made at the UBC farm.

Researcher: Do you think pizza is healthy?

Student: Yes…actually no.

Researcher: why?

Student: because it is quite oily and it has cheese.

Researcher: Now that you know it's unhealthy, why do you still like it?

Student: I don't know, but it is made of flour, and there are some vegetable on the top of it, so it could be healthy.

I also had a short interview with their school teacher to gather information from a different perspective. The teacher told me that the students were taught about food, nutrition, and crop planting, to facilitate garden-based learning, and enhance their understandings of healthy food choices. Indeed, some children knew about healthy food very well. For instance, one girl said, "not all of the vegetable or fruit is healthy, because some farmers use chemicals to plant them. It's bad for our body to grow. Only the organic food is healthy because they grow naturally with sunshine and water, but organic food costs more than common food, so we'd better plant food by ourselves." The children also had some simple conceptions about healthy food such as "everything cooked by my mom is healthy", "I think food cooked at home is healthier than restaurant food". One child even managed to explain that "this is because my mom said there is much more sugar and oil in restaurant food." However, when it comes to the actual reason why the restaurant food is not healthy or why organic food is beneficial to their body, most of them couldn't give answers.

In conclusion, children generally had a good knowledge about what was healthy food and junk food, but they were not sure about the criteria for this categorization and

the effects of the food in their bodies (Contento, 1981). In my opinion, making children understand the difference between healthy food and junk food would be enough. There is little point sending the same health education messages to children as to adults (Satter, 1999), because different life stages require different health educational messages (Ross, 1995).

Children's Eating Habits

The data of children's dietary behaviors were collected from my observation on their lunch at the farm. At the beginning, the lunch the children brought to the farm included items such as pizza, sandwiches and hamburgers, most of which were fast food. Then some changes happened after the 6th visit at the farm. They began to bring lunch with higher nutrition, like cooked vegetables and salad. However, no fundamental changes were witnessed in their consumption of snacks, such as chocolate, biscuits, candy and crisps. Moreover, the consumption of sweets among the students was also found to be a popular trend. One of the students believed that sweets can be healthy when controlled in appropriate amount.

Researcher: do you think candy is healthy?

Student: No

Researcher: why?

Student: Because it has lots of sugar. I think it has lots of sugar and it is not good to teeth and my body

Researcher: So you seldom eat it, right?

Student: Uh oh. I eat that every day.

Researcher: Every day? But you said it is bad for your health.

Student: Yeah, but it tastes good. And I think not too much will be good and it will give me energy.

Through the observations and interviews, I found that, while their teacher educated them to stop eating junk foods, most of the children still eat them. However, it was interesting to note that the students ate more vegetables and fruit than before. One child said, "I actually only like grapes, but now, I'd like to eat other fruits like apples, because my teacher told me that 'an apple a day keeps the doctor away', so I would bring one apple to school every day." Another said, "Now I don't need my mom to push me to eat more vegetable, I myself prefer vegetable than meat." More interestingly, they all excitedly mentioned their common experience of letting Mom purchase a nutritious vegetable named kale. A possible reason for this is that one time when it was their turn to be the chef, they made pizza with kale in the farm kitchen. This experience led to their great interest in this vegetable. According to Morris, Neustadter and Zidenberg-Cherr (2001), improving children's desire to taste vegetables is thought to be the first step in developing healthier consumption patterns.

Factors that Influence Children's Views of Food

There are many factors that could influence children's dietary habits during their participation in the one-year ILLP, such as the students' family as well as school education and TV advertisements. The four children all expressed that they preferred learning at the UBC farm than in the classroom, and they had improved their eating habits after participating in the ILLP. However, the analysis of the interview data does not necessarily support that the changes of their dietary habits were directly connected to their experience in the ILLP.

Consistent with other authors' studies (Yperman & Vermeersch, 1979; Lytle, Seifert, Greenstein & McGovern, 1999; Hart, Bishop & Truby, 2002; Urueta-ortiz, 2009), it has been shown that nutritional knowledge is not the only factor in children's food choices. In the process of developing dietary habits, children acquire knowledge, attitudes and preferences from various environments. I will next review four environments: home; school; UBC farm; and social environments, and there individual affects on my study participants.

Home Environment

Food served at home is an indicator of the direct influence that parents have on their children's dietary habits. Hart, et al. (2002) stated that, whilst cognitive development is one of the major internal effectors of health awareness for primary school children, their parents may be the prime external dominant influence. Parents, serving as important health role models, play an important role in affecting their children's eating habits. One instance I noted was in regards to children's eagerness to take responsibility for their food choices that was not necessarily matched with their ability to do so. One child in the ILLP program brought meals such as pizza, chips and hamburger. She actually disliked these kinds of food which she categorized as junk food, but she said her mother thought it was convenient. Therefore, she was not in charge of her food choices though being well informed about nutrition. This example was consistent with the study of Brown and Ogden (2004).

School Environment

Another important factor that impacts children's food choices is the nutrition education they receive at school. According to PeÂrez-Rodrigo and Aranceta (2000),

good school-based nutrition education focuses not only on the delivery of nutrition information, but also on the development of skills and behaviors related to food preparation. One child shared her experience of suggesting her family plant food in their garden when her mother told her that organic food costs more. It is also believed that children can learn to develop more positive eating habits by regularly participating in school meals (Brown & Ogden, 2004). Increased school lunch participation, therefore, is often a desirable outcome of nutrition education programs.

Farm Environment

Learning in the ILLP at the UBC Farm impacts the children's understanding about healthy food and dietary behaviors. The children said that they had gained a broad perspective about farming and it was a special place where they could learn and play at the same time. The farm was also a learning space that reflected their hands-on experiences. This is consistent with the study of Mayer-Smith, Peterat and Bartosh (2009) which is supported by my conversation with one student:

Researcher: Do you like learning at the UBC farm?

Student: Yes, yes! (she looked so excited)

Researcher: Why?

Student: Because I like planting stuffs that I like to eat.

Researcher: Great! What do you learn at the farm?

Student: Many many things, like make compost tea.

Researcher: Anything else?

Student: oh, I learned how to transplant and how to weave sticks to build a sturdy bean or pea trellis.

Researcher: Do you prefer to learn at the farm or at school?

Student: The farm.

Researcher: Why?

Student: I like learning outside of classroom. It is interesting,

Researcher: Would you like to tell me some interesting things?

Student: I thought making trellis would be very easy, but it was hard because we needed to work together to finish it. And it took half an hour.

Researcher: Do you mean that you like to learn something through hands-on activities?

Student: Yes

Other responses to the question about the importance of farms were that: "To learn what is healthy and what is not", "plant stuff that I like to eat", "how to transplant", "make salad using the plants we grew", "Grow stuff to make people healthier", "learn outside is happier than in classroom", "I know how to make compost tea". Some also mentioned that plants need to grow with proper space: "If it doesn't have proper spacing, it grows smaller than it's supposed to", "if it is too crowded, a number of plants cannot get enough nutrition and sunshine." They attributed these ideas to their experience at the farm. The experience of learning and playing at the farm had an influence in students' knowledge about what a plant needs to grow and how working together (to build trellises) made projects easier to complete. Their answers went beyond the usual information that students acquired from school (Urueta-ortiz, 2009).

In conclusion, learning in the ILLP, through hands-on activities engaged students in food issues that cannot be learned in classrooms. Meanwhile, the process also had a

greater effect on children's vegetable preferences when combining nutrition lessons with planting (Morris, et al., 2001, 2002).

Social Environment

The indirect influences of social environment on children's food preferences and dietary habits have been shown in a number of studies (Clancy-Hepburn, Hickey & Nevill, 1974). For example, advertisement has great impacts on children's food choices. The children in my study believed that the food served at Subway was healthier than that of other fast food chains because "Subway is pretty much healthy as it only has 8% fat" and "the materials Subway used to prepare their food looked clean and nice", the information was all obtained from advertisements either on TV or in Subway stores. One child even commented on the chain's food handling strategy, "Some stores, they have-like, their food, they have it just sitting there for a while, but Subway, they - Subway, they clean their food and-with no chemicals."

The Disconnection between Nutritional Knowledge and Eating Habits

Throughout the study period I found that the children knew a lot about healthy food and dietary habits, but didn't put the knowledge into their actual dietary habits. For some students, their knowledge about nutrition even contradicted their food choices, which conforms to the finding of previous studies (Ross, 1995; Seaman 1997; Stewart, et al., 2006) that while students' understandings about food and healthy eating are not poor, they are often applied inconsistently and selectively. One good example is the girl who clearly knew sugar was bad for her teeth and body, but still kept her daily consumption of candies and chocolates uninterrupted. Another example is a child whose favorite food

was chips. She knew that chips bought from McDonald's or Subway were junk food and not good for her health, but still ate them every day.

In sum, there was a disconnection between knowledge and food habits: the children in this study knew a lot about healthy food and understood that junk food was not healthy; however, their favorite foods still included junk food. The reason they told me was that they did not like the taste of healthy foods. This finding suggests that for the children of my study, health is not the most important factor when making food choices, but personal preference is. This concurs with the findings of Ross, (1995) and Noble, et al., (2000). Therefore, though being effective in improving the children's dietary habits in terms of the amount of consumed fruits and vegetables, the ILLP needs to make further efforts to assist children in understanding the perils of eating junk food in their daily life, i.e., connecting their knowledge of healthy diet with action in their eating habits.

Chapter V: Conclusion

Children's health problems need urgent attention. Nutrition education, which research suggests as the most essential element to help solve the problem, is facing challenges in adopting new ways of implementing learning other than the traditional, classroom-based, teach-learn mode. To help alleviate this problem, an innovative program named the Intergenerational Landed Learning Project (ILLP) at the UBC farm, was implemented to encourage children to better understand nutrition and develop good dietary habits.

This study focused on hearing the voices of the children, investigating what is happening in their world and digging into the meanings they give to food, nutrition, and health. Through interviews and observations, the children were found to generally have a good knowledge about healthy and junk food, but were not sure about the criteria for this categorization. Moreover, junk food still remained in their everyday diet though they started consuming more fruits and vegetables. Some additional factors were found to affect their dietary habits, and were summarized into four main factors: home; school; farm (ILLP); and social.

The children said they benefited from ILLP because they've gained not only nutritional and farming knowledge but also happiness and hands-on experiences that would not exist in the classroom. While acknowledging the ILLP's benefits of delivering learning experiences in a multisensory way, this study also realized the disconnection between children's knowledge and their actual food habits and calls for further research into what may cause these discrepancies.

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Appendices

Appendix A: Semi-Structural Interview Questions for the children

1. Can you tell me what your lunch is today? Did you choose it today? How often do you choose the food you bring to school?
2. What are some of the foods your family eats for dinner (or breakfast or snack) at home?
3. Who decides what food you eat at home?
4. What is your favorite food?
5. What is your least favorite food?
6. Do you think your favorite food is healthy? What makes it healthy or not healthy?
7. What is healthy food (for you)? Why?
8. What is junk food? Why?
9. How did you get the knowledge about healthy/ junk food?
10. What did you learn about food at the farm?
11. What did you learn about food from your teacher?
12. Do you like learning about food in your classroom? Why?
13. Are you eating more vegetables or fruit now than you did before you came to the farm? Choose? Why?
15. Is there anything that you would like to tell me or ask me?
16. After asking these questions, I will ask them to draw the picture about healthy food.
    1. What does it show?
    2. Why did you draw this?
    3. Do you think the food you drew is healthy?
    4. Where did you learn this?
    5. Can you explain your drawing for me?
    6. What did you draw before?
    7. Can you compare the two pictures for me?

Appendix B: Semi-Structural Interview Questions for the school teacher

The interviews with the school teacher are more like conversations.

1. What did students learn about healthy food at school?
2. Do you think that students prefer learning about food at the farm than at school? Why ?
3. Do students share their experience at the farm with their students in other classes?
4. How do you think children's learning in the garden impacts their understanding of healthy food?
5. What does your school usually offer at lunch?
6. Are children eating more vegetable or fruit now at school?
7. Did children bring more healthy snacks or lunches than they did before they participate the project?
8. Which way is better for children to learn more about healthy food, learning in classroom or in the garden? Why?
9. What's the links and differences in children's learning about healthy food between at the farm and at school?
10. What other significant changes happened during the program year?
11. how did their participation in the Intergenerational Landed Learning Project (ILLP) at the UBC Farm during the school year influence students' understanding about healthy food and nutrition