

AN EVALUATION OF URBAN YOUTH GARDENING PROGRAM
PARTICIPANTS' DIETARY BEHAVIORS, AGRICULTURAL KNOWLEDGE, AND
LEADERSHIP SKILLS: A CASE STUDY

BY

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THESIS

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Abstract

This is a case study that intends to describe and summarize the dietary behaviors, agricultural knowledge, and leadership skills of all youth who participated in Roots & Wings urban youth gardening program in Rockford, Illinois in 2009, 2010, and 2011. Upon completing the program, the participants were given surveys to reflect on their knowledge and behaviors in these areas. There were 38 surveys analyzed for 2009, 14 surveys analyzed for 2010, and 12 surveys analyzed for 2011.

The summary of the survey results show that after having worked in a garden, 75% of youth participants perceive themselves as having more positive dietary behaviors, 87% of students perceive themselves as having an increased knowledge of agriculture, and 91% perceive themselves as having an increased possession of leadership skills. Many youth could list ways that they were healthier, new agricultural skills they have, and things that they could do on their own.

This study indicates that further research can be done to explore correlations and cause and effect relationships among urban youth gardening programs, dietary behaviors, agricultural knowledge, and leadership skills.

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Chapter 1: Introduction

Background

A number of urban communities across America have recently developed youth gardening programs in response to the social, nutritional, and economic challenges that they face (Smith, 2001). Socially, urban youth are disconnected from the processes, places, and people from which their food comes (Feenstra, 2002). Nutritionally 17% of urban youth are overweight (Urban Population, 2011). Economically, youth face challenges of unemployment with a 48% unemployment rate; this is the highest percent since 1948 (Employment and Unemployment, 2011).

In the past, these three issues have been addressed separately by various initiatives. Experts in public health, medicine, business, and economics have collaboratively addressed the issue of obesity in children in order to create strategies for curbing childhood obesity. According to the Urban Design Lab of Columbia University, increasing access to affordable healthy foods through food terminals, mobile markets, and community gardens offer some of the most promising ways to decline childhood obesity (Plunz, Conrad, Ackerman, Chiou, Vlachopoulos, & Schubiner, 2008). The issue of agricultural illiteracy has been addressed through efforts such as “Agriculture in the Classroom” and “Food for America”. The goals of these programs are to educate youth at a young age about agriculture, food, and food production. These programs have been implemented with various degrees of success (Birkenholz, 1990). Finally, the issue of youth unemployment has been addressed through city initiatives such as the Urban Jobs Act in New York City, which provides financial resources for non-profit groups “to prepare at-risk youth for new employment and educational opportunities”. This program views youth employment as a positive investment in the local economy and as a pathway out of poverty,

crime, and violence for youth (Addressing Staggering Unemployment among Young People, 2011).

Through the programs mentioned above, it is clear that the issues surrounding the dietary behaviors, agricultural knowledge, and career development of youth are being noticed and addressed. However, they are being addressed in specific and individual ways when, in fact, all three of these challenges are intricately connected, and thus, could be responded to with a single comprehensive program such as an urban youth gardening program. Urban youth gardening programs have the potential to positively influence the dietary behaviors of youth, reconnect youth with the food production process, and teach leadership and job-readiness skills that will help them become a productive and employable member of society (Morris & Zidenberg-Cherr, 2002; Voluntad, Dawson, & Corp, 2004).

Statement of Problem

Since urban youth are disconnected from production agriculture, and because they face challenges related to dietary behavior and job-readiness, there needs to be a way to reconnect them to our agrarian roots while addressing the aforementioned challenges. Attempting to do this is the Roots & Wings program offered by Angelic Organics Learning Center in Rockford, IL. Roots & Wings encourages at risk youth in the Rockford area to become leaders and develop career skills through gardening. The youth leaders work together to plan, plant, tend, harvest, cook, eat, and sell the vegetables from their gardens. They market their produce through the summer, earning money, job skills, and public speaking experience. The older teens also help teach younger kids about gardening and food (Roots & Wings, 2008). This program hopes its participants adopt positive changes in dietary behavior, obtain knowledge of agriculture, and develop leadership and job-readiness skills. The question remains, is such an intervention

effective at positively influencing the dietary behaviors youth, increasing the agricultural knowledge of youth, and developing leadership and job-readiness skills in our youth?

Purpose and Objectives

The purpose of this case study was to explore the self-reported outcomes of the Roots & Wings program by participants to determine if trends exist regarding program participants' dietary behavior, agricultural knowledge, and leadership skills. The outcomes of this case study will hopefully provide a foundation for understanding the impact of urban youth gardening programs. In addition, the confirmation of the effectiveness of the Roots & Wings program can be useful in securing public and private funding from parties interested in positively influencing child nutrition, increasing agricultural literacy, and developing leadership and employability skills among youth.

The following research objectives guided this study:

1. Describe the demographics of the three samples in terms of age, sex, and ethnicity;
2. Describe the dietary behaviors of Roots & Wings participants;
3. Describe the agricultural knowledge of Roots & Wings participants; and
4. Describe the leadership skills of Roots & Wings participants.

Definitions of Terms

Urban Youth Gardening Program - Lautenschlager and Smith (2007) describe urban youth gardening programs as a multicultural gardening experience that educates youth about growing food, environmental responsibility, empowerment, and cultural expression, while fighting racism and poverty. Students participate in cooking groups, community markets, and educational activities that focus on science, health, and nutrition.

Dietary Behavior – In this study, dietary behavior refers to both what people eat and what people are willing to eat.

Knowledge of Agriculture - Knowledge of agriculture in this study will refer to knowledge of urban gardening practices.

Leadership Skills – Leadership skills in this study refer to various personal characteristics.

Limitations of the Study

There are several limitations to this study. One limitation of this study is that the number of program participants in this study is not significant enough to compute valid correlations. From the data itself, nothing can be implied or assumed; however, it can raise questions for further research that might allow correlations and cause and effect relationships to be drawn out.

A second limitation to this study is the inconsistency in number of survey responses from year to year. Since the number of respondents per year varies, comparing the results from each of these years is limited.

A third limitation to this study is that there was not a pre-survey or a comparison group. Program participants were asked to reflect on their dietary behaviors, agricultural knowledge, and leadership skills upon completing the program, but there is no previous data to use as a comparison.

A final limitation of the study is in regards to the scale that was provided on the survey. Students were asked to rate how much they agreed to a series of 15 statements by responding to one of the following choices: Yes, Kind of, or Not really. This only provided the students three ratings to choose from. There was no option for students to indicate if they were indifferent. Also, for the two positive responses, “yes” and “kind of, there was only one negative response, “no”. A better scale to use would have been the Likert scale, which gives students the following

five options: strongly agree, agree, undecided, disagree, or strongly disagree (Ary, Jacobs, & Sorenson, 2010).

Basic Assumptions

It was assumed that all participants understood the questions and provided honest answers. It was also assumed that participants actively participated in all aspects of the program with an open mind to learning and experiencing urban youth gardening.

Chapter 2: Review of Literature

This section will note the literature that exists on urban youth gardening programs. Much literature exists on urban schoolyard gardening and some literature exists on urban youth gardening programs offered by non-profit organizations around the U.S. This review will discuss examples of and barriers to schoolyard gardening programs, it will give examples of non-profit urban agriculture programs for youth, and finally, it will discuss the collective opportunities that urban youth gardening programs provide in terms of dietary behavior, agricultural knowledge, and leadership development.

Schoolyard Gardening

Schools around the world are making use of gardens in a variety of ways. A study conducted within the state of Virginia found that 91.5% of teachers used gardening for students' academic learning, 83% used gardening to expand the students' learning through social experiences, 62% used the garden for recreational experiences, and 52% used gardening with their students for therapeutic experiences (Smith, 2001).

One particular urban agriculture public school program in the United States is the Edible Schoolyard (Tesler, 2005). In 1995, Alice Waters brought the Edible Schoolyard into Martin Luther King, Jr. Middle School in Berkeley, California (Our History, 2010). Alice is a chef, an author, and the founder of the Chez Panisse Foundation. The Chez Panisse Foundation is a non-profit organization that envisions a school curriculum and school lunch program where growing, cooking, and sharing food at the table gives students the knowledge and values to build a humane and sustainable future (Our History, 2010).

With one acre of garden land and an onsite kitchen, the Edible Schoolyard is a gardening and cooking program for public middle school students (Our History, 2010). On school grounds,

there is an organic garden that is tended to and harvested by the students. Teachers integrate food systems concepts, hands on ecology, and nutrition lessons into the core curriculum. In addition to science and social studies lessons, this program encourages students to appreciate how the natural world sustains people, and it promotes a healthy, social community (Our History, 2010). Eighth grader Tiara Swearington values the social aspect of schoolyard gardening as much as the other parts. She said:

"All day at school we learn theories and stuff, but here, everyone just gets to relax and chill out. We cook and eat and talk and get to know each other. If it wasn't for this, I wouldn't know half the people in my class" (Tesler, 2005, p. 26).

Outside of the United States, there is a strong movement called Growing Schools (Dillon, Rickinson, Sanders, & Teamey, 2005). Growing Schools is a government-funded program in the UK that hopes to improve children's understanding of the interdependence between urban and rural environments (Dillon et al., 2005). In doing so, Growing Schools recognizes the importance of young people experiencing the outdoor classroom. Growing Schools acknowledges the fact that children benefit from hands on experiences of plants and animals, within school grounds, and through visits to farms. For this reason, Growing Schools encourages teachers to focus curriculum on food, farming, and experiencing the natural world. As a result of studying crops and animals, and studying how food is prepared from seed to plate, students showed a significant improvement in attitudes and awareness of health and food (Dillon et al., 2005). Students who participated in schoolyard gardening were able to speak from experience and with confidence about farming, growing, and healthy eating (Dillon et al., 2005).

Private schools also believe that agriculture can be an important part of the curriculum. For example, Waldorf education is based on a philosophy rooted in the writings of Rudolf

Steiner, a social philosopher living in the late 1800s and early 1900s (Klotter, 2006). Waldorf schools spend a good deal of time studying farming and gardening. The belief is that students can observe life processes in the plants and come to understand how to relate plant processes to human processes. By working in the soil and viewing the soil as a living organism, students are able to think about the ways that the soil relates to them. Each day, the students are encouraged to reflect and discuss the observations that have been made that day (Moore, 1992).

Barriers to Schoolyard Gardening

There are several barriers to building successful and long-standing urban gardening programs in elementary and middle public schools. These barriers include student attitude and motivation, teacher attitude and confidence, and institutional restraints. A combination of fear and phobias were mentioned in several studies of students regarding gardening (Bixler, Carlisle, Hammitt, & Floyd, 1994). Students fear dirt, mud, and handling organic matter. When trying to motivate urban students to overcome these fears, teachers need to match motivational strategies to students' identities. In other words, the impact of a student's cultural identity on his or her learning needs to be considered in planning out gardening curriculum. Turner and Herren (1997) acknowledged differences in motivation between urban and rural students. When learning about food and farming, teachers must provide appropriate and meaningful experiences for the multicultural communities present in many urban schools. These specific approaches have failed to be identified.

Teachers' attitudes, knowledge, and confidence in schoolyard gardening impact how well gardens are integrated. One reason that teachers do not use schoolyard gardens is that they lack knowledge of instructional activities that could be taught outdoors, causing them to be apprehensive and insecure about applying what they were teaching in the classroom to the

outdoors (Smith, 2001). Some teachers also do not value agriculture because they are unsure of what agriculture is. In a study conducted by Knobloch (2008), it was found that teachers who understand the value of agriculture and have a positive perception of agriculture are more likely to see the value of its integration. In addition, teachers who have seen agriculture successfully integrated into the curriculum have more positive perceptions of integrating agriculture (Knobloch, 2008). By giving elementary and middle school teachers opportunities to witness successful gardening programs and by providing them with curriculum materials, perceptions of agriculture may improve, increasing the integration of agriculture in elementary and middle school classrooms.

A final barrier to agricultural integration through schoolyard gardens in schools is the pressure public school teachers have to teach core subjects in ways that reflect standardized testing (Futch, 2011). Futch said that current school and political practices

“fuel an assessment driven school culture that prioritizes individual performance on a narrow set of subjects and that trumps teacher creativity and innovation, while limiting pedagogical moments that are organic and student focused” (2011, p.100).

Teaching agriculture and integrating a schoolyard garden into schools is not something that students are tested on at the state and national level. For this reason, it is hard for teachers to rationalize spending their limited time doing so.

Community Programs

In spite of the barriers to schoolyard gardening, non-profit community organizations provide another avenue for urban agricultural education (Draper & Freedman, 2010). Looking across the U.S., there are many examples of community gardening projects aimed at youth. Three specific examples will be shared here. The first is the Garden Project. This program was

regarded by The United States Department of Agriculture as “one of the most innovative and successful community-based crime prevention programs in the country” (Sneed, 2011). The Garden Project was established as a response to crime, high rates of recidivism, and unemployment in San Francisco, CA. The Garden Project’s mission is to continue empowering both at-risk youth and former offenders through training and education while transforming the urban environment. The Garden Project’s apprentices work to learn horticulture skills and grow organic vegetables that feed seniors and families in San Francisco (Sneed, 2011).

A second program is Growing Power. Starting in Milwaukee, WI and expanding to Chicago, IL, Growing Power is a non-profit organization that uses community gardening as a source of urban youth development through their Youth Corps program (Educating our Youth, 2010). Youth Corps is an educational and entrepreneurial youth development program. It offers youth from low-income backgrounds both academic and professional experience (Educating our Youth, 2010). This program focuses on teaching youth about food sovereignty, growing organic produce, maintaining sustainable urban food systems, eating and cooking healthy, and being more physically active (Educating our Youth, 2010).

A final program to be mentioned here is the Roots & Wings program offered by Angelic Organics Learning Center in Rockford, IL. Roots & Wings encourages at risk youth in the Rockford area to become leaders and develop career skills through gardening (Roots & Wings, 2008). The youth leaders work together to plan, plant, tend, harvest, cook, and sell the vegetables from their gardens. They market their produce through the summer, earning money, job skills, and public speaking experience. The older teens also help teach younger kids about gardening and food (Roots & Wings, 2008).

Dietary Behaviors

Urban gardening programs provide and result in nutritious eating for the youth involved (Morris & Zidenberg-Cherr, 2002; Tesler, 2005). This allows food insecurity and obesity issues to be addressed. People with high levels of food skills are less likely to suffer from food insecurity (Olson, 1999). One of the most relevant actions that the American Dietetic Association suggests as a means to address food insecurity, is through comprehensive food and nutrition education programs (Position of the American Dietetic Association, 2010). Food insecurity refers to both lack of nutrition and improper nutrition. An unhealthy diet resulting in obesity is an example of improper nutrition. Research shows that children's understanding of sources of food and the effect of nutrition on the body is often limited, and there is a need to improve children's understanding of how food works with our body's biology in order to support healthy eating practices (Bullen, 2004). Food and nutrition education fits perfectly with the urban gardening curriculum and can be used to address food insecurity and obesity.

Because urban children have become disconnected from where their food comes from, they are not making associations between the food they see in grocery stores and the land that produces it (Lakin & Littledyke, 2008). Many children are simply used to buying chips and pop at corner stores—they see no harm in it, and they think it is normal (Gray, 2010). Students do not have the information they need to know what good food is. Urban vegetable gardening programs can address this issue.

A study conducted by Alaimo, Packnett, Miles, and Kruger (2008) found that adults who have a household member who participates in a community garden are 1.4 times as likely to consume fruits and vegetables, and they were 3.5 times as likely to consume fruits and vegetables five times a day. Because parental pressure is one factor that fosters healthy eating in

children (Lakin & Littledyke, 2008), it is likely that adults who are eating healthy in a home will encourage their children to as well. When a young student was asked what has changed in her life as a result of being a part of the Edible Schoolyard, she responded, “I eat more fruits and vegetables” (Tesler, 2005). In another study, post test preferences for vegetables were significantly greater than pre test preferences for vegetables after completing a gardening program (Morris & Zidenberg-Cherr, 2002). Gardening, nutrition, and cooking programs will enable students to identify, prefer, and obtain nutritious food on their plates.

Agricultural Knowledge

This section will review agricultural knowledge in terms of agricultural literacy, technical gardening skills, and agriscience achievement.

Urban agricultural education provides agricultural literacy for students regarding where their food comes from in hopes that they can make better choices as consumers purchasing food (Dillon et al., 2005). Many urban students lack a basic definition for what agriculture is. In a study of 147 Los Angeles pupils conducted by Mabie and Baker, it was found that very few children could give a basic definition of the word agriculture itself and most could not name crops grown by farmers in their state (Dillon et al., 2005). When students are clueless about where, how, and what processes are going into their food production, it is unlikely that they have the knowledge they need to make good choices when it comes to food (Gray, 2010).

Urban youth gardening programs equip students with agricultural knowledge that can be used to complete the technical skills of gardening (Tesler, 2005). While planning, planting, tending, harvesting, and cooking vegetables from the schoolyard garden, students are given the chance to discover their unknown skills in these areas. Often times, the students who are not “the smart kids” in the classroom have an opportunity to be “the smart kids” in the garden or in

the kitchen simply because they are able to exercise a different agricultural skill set that is not usually exercised in the classroom (Tesler, 2005).

In addition to looking at agricultural literacy and technical skills, there have been many studies that look at scientific achievement as a result of youth gardening programs. Because agricultural knowledge has a foundation in biological and physical sciences, we can look at these studies to review the effect that urban gardening programs have on agricultural knowledge (Dormody, 1993). Mohrmann (1999) states that gardens are “perfect laboratories where scientific concepts literally come to life. Lessons in biology, the scientific method, interdependence, and meteorology take place in an authentic environment that stimulates curiosity in a way textbook learning simply cannot”. In a qualitative study conducted by Rahm (2001), there was evidence of science learning in a community youth gardening program. Youth were able to describe plant growth needs, plant growth characteristics, and the uses of different plants that were growing in the garden. In another study, modest changes in youth knowledge concerning gardening and nutrition were evident after participation in gardening programs (Lautenschlager Beckman & Smith, 2008). Finally, of twelve studies reviewed by Blair (2009), nine of them showed a positive relationship between increases in science achievement and presence of an integrated gardening program at the school.

Leadership Development

Non-profit organizations are using urban agriculture as a tool for leadership development (Shinew, Glover, & Parry, 2004). Through these organizations, the most common form that urban agriculture takes is that of community gardens (Draper & Freedman, 2010). A community garden is a piece of land gardened collectively by a group of people to produce fruits, vegetables, and flowers that can be shared among participants. According to Shinew et al. (2004),

community gardens are often “grassroots initiatives aimed at revitalizing low income neighborhoods in urban settings” (p. 338). Often community gardens are created by converting urban spaces into gardens. Community gardens unite members of the community as they work together and give members a space for coming together (Draper & Freedman, 2010). Diverse groups bridge at community gardens working towards a common goal (Shinew et al., 2004).

Community gardens have the power to transform neighborhoods as well as build self-confidence and leadership skills among the youth involved (Shinew et al., 2004). The intent of these programs is to provide a positive place for constructive activities to steer youth away from risky behavior such as crime, substance abuse, suicide, and sexual activity (Voluntad et al., 2004).

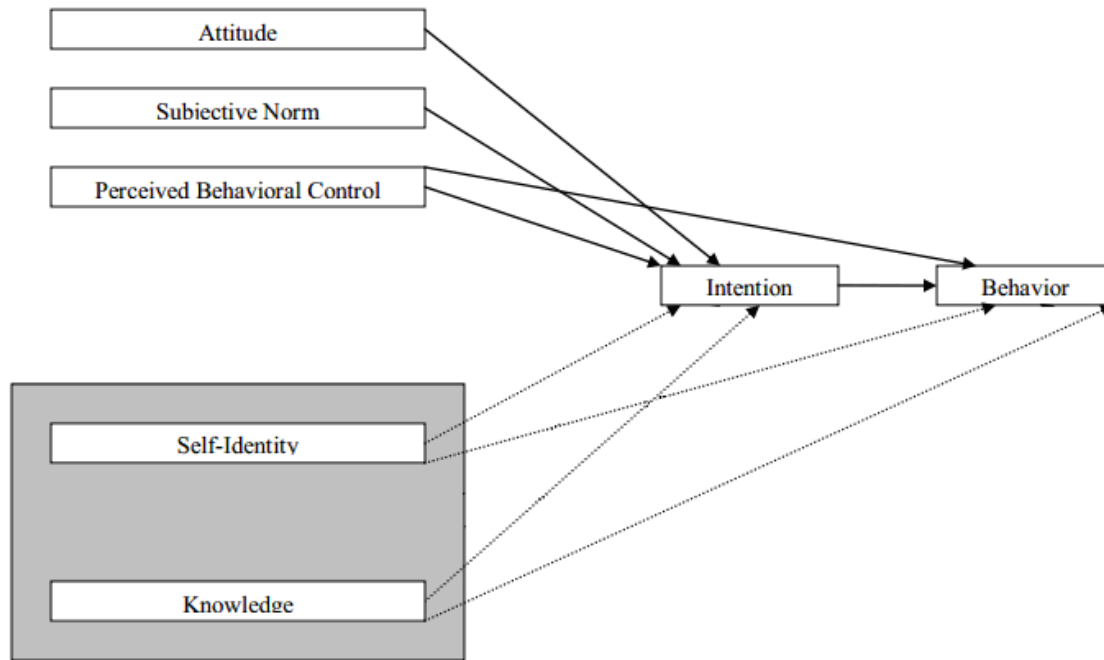
Youth development programs have great potential to positively influence the development of urban youth. Urban youth gardening programs are doing exactly what researchers have suggested to prevent school dropout and participation in criminal activities (Voluntad, et al., 2004). Researchers have suggested that in order to avoid further criminal activity and in order to keep youth in school, more programs should be developed to teach our youth life skills. These urban agriculture programs are doing just that (Voluntad et al., 2004).

Theoretical Framework

An expanded theory of planned behavior (TPB) was used as the framework for this study to assess changes in agricultural knowledge, dietary behavior, and leadership skills of Roots & Wings urban gardening program participants. This theory has served as the framework for similar studies. For example, Lautenschlager Beckman, and Smith (2008) used a slight variation of this theory as the framework for their study that evaluated inner-city youth garden program participants’ dietary behavior and nutrition knowledge.

Figure 1

A model for an expanded theory of planned behavior



Note: The entire figure shows the expanded TPB; removal of the shaded regions depicts the original TPB (Lautenschlager Beckman, & Smith, 2008).

The theory of planned behavior discusses why people decide to perform a specific behavior. According to this theory, the central factor is intention. The more willing a person is to try and the more effort they are willing to exert, the stronger the intention to perform a behavior will be. The stronger the intention is, the more likely the performance of the behavior. Intention is influenced by a variety of factors (Ajzen, 1991).

Through the original theory of planned behavior, Ajzen (1991) described three factors that influence intention. The first is that the individual has a positive attitude regarding the behavior. The second involves how the person perceives social pressures regarding the behavior. In other words, if the person perceives that the people around them accept the behavior, it is perceived as a subjective norm, and the intention to perform the behavior would increase. The

third is perceived behavioral control. Ajzen (1991) uses this term interchangeably with Bandura's definition of self-efficacy. Self-efficacy is a measure of how well an individual perceives he or she can perform a certain behavior to deal with prospective situations. (Bandura,1982). It refers to how easy or hard he or she thinks the behavior is. If the person believes that he has the ability to perform the behavior, this would have a positive affect on the intention to perform the behavior (Ajzen, 1991).

The expanded theory of planned behavior used by Lautenschlager Beckman and Smith (2008) includes three additional indicators of intention. They are self-identity, self-efficacy, and knowledge. Self-efficacy has been removed from the model for this study because, as stated above, Ajzen (1991) uses this term interchangeably with the term perceived behavior control, included in the original model. However, both self-identity and knowledge have been included as indicators of intention and behavior in the framework of the study.

Self-identity refers to labels an individual gives to himself. For example, a person can identify himself or herself as being a healthy eater. According to this theoretical framework, this identification positively contributes to their intention to be a healthy eater, which increases the likelihood that they will actually eat healthier. The same effects are in place for people who identify as being a gardener or a leader.

Knowledge is the final indicator included in this framework as an indicator of intention and behavior. According to this theory, then, if a participant gained knowledge by participating in the gardening program, his intention to garden would increase, which would ultimately increase the likelihood that he would actually garden.

Due to the content of the pre-existing survey, an expanded version of the theory of planned behavior is used as a framework for this study instead of the original, unexpanded

version. The pre-existing survey that was used in this study includes questions that clearly measure self-identity and knowledge related to dietary behavior, agricultural knowledge, and leadership skills. In order to include these survey questions in the analysis as important indicators of intention and behavior, an expanded version of the theory of planned behavior has been used as the theoretical framework of this study.

Each question from the pre-existing questionnaire was matched with one of the five indicators of intention and behavior: attitude, subjective norm, perceived behavioral control, self-identity, or knowledge. Table 1 separates each behavior and illustrates where each question fits within the model. While every question is matched to an indicator for each behavior, not every indicator of every behavior has a matched question. However, it is important to keep in mind that the presence of any positive indicator of a behavior can increase the intention and performance of a behavior. In other words, all five indicators do not need to be present for the performance of a behavior. According to the expanded theory of planned behavior, a single presence of any of the five indicators increases the likelihood of the behavior.

Table 1

Survey questions matched to the six indicators of intention and behavior

	Dietary Behavior	Agricultural Knowledge	Leadership Skills
Positive Attitude	3 (page 1). I have tried eating new kinds of food	9. I care more about the environment	18. I feel proud of myself
Subjective Norm	2 (page 1). I have brought food home for my family to eat	Indicator missing from survey	17. I feel I can make a difference in my community
Perceived behavioral control	1 (page 1). I have eaten food from the garden myself	7. I could teach someone something about gardens	16. I feel more in control of things that happen to me
	4 (page 1). I now eat more fruits and vegetables	10. I have new cooking skills	11. I work better with others on a team
	2 (page 2). Tell us one way you are healthier	15. I am better at working on things that take a long time to finish	13. I am better at taking care of problems without fighting
		1 (page 2). Tell us something new you can do on your own	14. I am better at solving problems and making decisions
			17. I feel I can make a difference in my community
Self-Identity	Indicator missing from survey	Indicator missing from survey	4 (page 2). Tell us one way you've helped your community
Knowledge	Indicator missing from survey	12. I am more of a leader	
		6. I have learned things I didn't know about gardening	Indicator missing from survey
		8. I know more about the environment	
		3 (page 2). Tell us something new that you know about where food comes from	

Summary

Urban agriculture gardening programs can address problems and bring great opportunities to children living in urban areas. School and community gardens can provide food security and connect urban and rural youth, and they can be used as a tool for students to, learn trade skills, develop academically, build leadership skills, and foster interpersonal relationships. Implementing programs that take advantage of these opportunities has the potential to transform “at-risk” youth into “at opportunity” youth (Futch, 2011). As seen by school and community

examples, researchers and educators can create gardening spaces and programs where youth are able to critically engage with ideas regarding nutrition, agriculture while building character and community. By continuing in this fashion, urban schools and communities will become greater places capable of providing even greater opportunities. Roots & Wings youth gardening program in Rockford, Illinois is an example of such an opportunity.

Chapter 3: Methodology

Design

This one-shot case study is an evaluation of the dietary behaviors, agricultural knowledge, and leadership skills of Roots & Wings urban youth gardening program participants. In a one-shot case study, a single group is exposed to a program (Types of research designs, 2012). Upon completion of the program, a survey is given to participants in order to measure the effect that the program had on the group. Without a pre-test to use as a comparison measure, there is no way to determine whether changes in behavior occurred as a result of the program (Bureau of Justice Assistance, 2012). Instead the results can be described and be used as a platform for further research. The characteristics identified above for this case study will be measured using survey responses that have been shared with the researcher by the Roots & Wings program.

The Angelic Organics Learning Center, a non-profit educational organization, that sponsors the Roots & Wings program, designed the survey that is being analyzed by this study. The Learning Center originally collected this data for two reasons. The first reason was to be used for internal program evaluation and the second was to be used on grant applications for financial support.

Prior to filling out the survey, Roots & Wings' youth leaders participated in a six-month gardening program that began in the spring and ended in the fall. Throughout the program, they attended up to four meetings and trainings each week. Meetings consisted of garden planning and leadership development. Meetings lasted two hours. Trainings consist of working in the garden, engaging in sustainable agriculture lessons, and working at the farmer's market.

Trainings range from 2-5 hours in length. They also attended one event each month that consisted of team outings and gatherings.

The survey consists of three main sections. The first section asks students to respond to a series of questions, marking “yes”, “kind of”, or “no”. The second section asked the students to list one way they are healthier, list one thing they can do on their own, and list one way that they have helped their community. The 2011 survey added the following question to this section: tell us something new that you know about where food comes from. The third section of the survey is a demographics section. The survey can be found in the Appendix A of this study.

Subject Selection

Data has been collected from all Roots & Wings (ages 6-17) participants for the past three years: 2011, 2010, and 2009. Youth who participate in this program are recommended by adult leaders from organizations that partner with Roots & Wings to produce a garden. The adults recognize leadership shown by particular youth during community gardening sessions and select those youth and recommend them to the Roots & Wings program. The youth then go through an application process and interview conducted by other youth leaders. At the end of the 9-month gardening program, all Roots & Wings participants are given the opportunity to complete a survey. The researcher of this study had no role in choosing the students for this sample.

Instrumentation

Each year, at the completion of the Roots & Wings gardening program, youth fill out an anonymous survey that is intended to track effectiveness of the program (see Appendix A). The questions on the survey ask participants to reflect on their dietary behavior, agricultural knowledge, and leadership skills after having worked in the garden. For dietary behavior,

participants were asked to reflect on whether they eat food from the garden, if they eat fruits and vegetables, if they eat fresh foods, and if they are willing to try new kinds of foods to eat. For agricultural knowledge, participants were asked to reflect on whether they learned things about gardening, whether they can teach others about the garden, whether they know more about the environment, whether they care more about the environment, and whether they have obtained new cooking skills. Possible things that they might know about the garden include what the depth and spacing requirements are for various seeds, how to use gardening tools, and when to plant and harvesting various crops. Finally for leadership skills, participants were asked to reflect on their ability to work well with others, their ability to take care of problems without fighting, their ability to make decisions, their ability to work on things that take a long time to finish, their sense of control over things that happen, their belief that they can make a difference in their community, and their sense of pride in themselves.

Data Collection and Analysis

Completed surveys from years 2009, 2010, and 2011 were collected and analyzed for this study. Staff at the Angelic Organics Learning Center distributed surveys to and collected surveys from Roots & Wings participants. These surveys were given to the researcher as hard copies without any names on them. The researcher analyzed the surveys by calculating frequencies and percentages for survey responses. Frequencies and percentages were found for all questions in each of the following areas: dietary behavior, agricultural knowledge, and leadership skills.

Chapter 4: Results

Research Objective One

Research objective one sought to describe the demographics of the three samples in terms of age, sex, and ethnicity. In terms of age, of the 64 that provided responses, 34% ($n = 22$) were between the ages of 6 and 8, 27% ($n = 14$) were between the age of 9 and 10, 14% ($n = 9$) were between the ages of 11 and 12, 9% ($n = 6$) were between the ages of 13 and 14, 11% ($n = 7$), were between the ages of 15 and 17, and 6% ($n = 4$) did not respond to this survey question. This data has been reported in two ways. First, each year has been separated out, finding the specific demographic characteristics for 2009, 2010, and 2011, separately. This information can be found in the last three columns of Table 2. Second, all the surveys were compiled and demographic characteristics have been reported as a whole—all three years combined. This information can be found on the first column on the left.

In terms of sex, of the 64 participants that responded, 36% ($n = 23$) were male, 55% ($n = 35$) were female, and 8% ($n = 5$) did not respond to this survey question. In terms of ethnicity, 67% ($n = 43$) were African American; 3% ($n = 2$) were American Indian, Eskimo, or Aleut; 2% ($n = 1$) were Asian or Pacific Islander; 2% ($n = 1$) were Hispanic; 8% ($n = 5$) were multiracial, 0% ($n = 0$) were White, 6% ($n = 4$) were Other, and 13% ($n = 8$) did not respond to this survey question.

Table 2

Demographic Information of Roots & Wings Participants

	Total		2009		2010		2011	
	%	(n)	%	(n)	%	(n)	%	(n)
Total	100	64	100	38	100	14	100	12
Age								
6-8	34	22	44	17	27	4	8	1
9-10	27	14	24	9	40	6	17	2
11-12	14	9	13	5	7	1	25	3
13-14	9	6	3	1	14	2	25	3
15-17	11	7	5	2	14	2	25	3
No response	6	4	11	4	0	0	0	0
Sex								
Male	36	23	37	14	43	6	25	3
Female	55	35	50	19	57	8	67	8
No Response	8	5	13	5	0	0	8	1
Ethnicity								
African American	67	43	65	22	79	11	83	10
American Indian, Eskimo, or Aleut	3	2	6	2	0	0	0	0
Asian or Pacific Islander	2	1	0	0	0	0	8	1
Hispanic	2	1	0	0	7	1	0	0
Multiracial	8	5	11	4	0	0	8	1
White	0	0	0	0	0	0	0	0
Other	6	4	6	2	14	2	0	0
No Response	13	8	3	8	0	0	0	0

The totals of all three years have been compiled and reported in this section. For these tables, any time a student marked “yes” or “kind of”, the response was counted as an affirmative response. Anytime a student marked “no”, the response was counted as a negative response. Results for each individual year can be found in Appendix B of this writing.

Research Objective Two

Research objective two sought to describe self perceptions of dietary behavior held by Roots & Wings youth gardening participants. Both close ended questions numbers 1-5 and open ended question number 2 on the survey have been used to measure this objective. All close ended questions in the survey were preceded with the phrase “Now that I work in the garden...”. Sixty-nine percent ($n = 44$) of participants affirmatively responded to “I have eaten food from the garden myself”, 64% ($n = 41$) affirmatively responded to “I have brought food home for my family to eat”, 75% ($n = 48$) affirmatively responded to “I have tried eating new kinds of food”, 88% ($n = 56$) affirmatively responded to “I now eat more fruits and vegetables”, 81% ($n = 51$) affirmatively responded to “I now eat food that is fresher (less packaged food)” (see Table 3).

Seventy-two percent ($n = 46$) of participants referred to healthy eating behaviors when asked to “List one way you are healthier”. Responses included the following: I eat more fruits and vegetables ($n = 14$), I eat more vegetables ($n = 15$), I eat more fruit ($n = 8$), I eat better and healthier food ($n = 7$), and I can cook ($n = 2$).

Table 3

Dietary Behavior of Participants

	Affirmative		Negative	
	%	(N)	%	(N)
1. Eaten food from garden	69	44	28	18
2. Brought food home for family	64	41	33	21
3. Tried new foods	75	48	22	14
4. Now eat more fruits and vegetables	88	56	6	4
5. Now eat fresher food (less packaged food)	81	51	16	10

Research Objective Three

Research objective three sought to describe self perceptions of agricultural knowledge held by Roots & Wings youth gardening participants. Both close-ended questions 6-10 and open-ended questions number 1 and 3 on the survey have been used to measure this objective. All close ended questions in the survey were preceded with the phrase, “Now that I work in the garden...”. Ninety-five percent ($n = 61$) of participants affirmatively responded to “I learned things I didn’t know about gardening”, 89% ($n = 57$) affirmatively responded to “I could teach someone else something about gardens”, 75% ($n = 48$) affirmatively responded to “I know more about the environment”, 92% ($n = 59$) affirmatively responded to “I care more about the environment”, and 83% ($n = 53$) affirmatively responded to “I have new cooking skills”. This information has been summarized in Table 4.

When asked, “List one thing you can do on your own”, sixty-one percent of participants listed something related to agriculture. Responses included the following: cook ($n = 7$), pick out carrots ($n = 1$), plant seeds ($n = 3$), I can water the garden ($n = 1$), I can do weeding on my own

($n = 4$), I can start my own garden ($n = 1$), point out weeds ($n = 2$), plant roots ($n = 1$), dig with a shovel ($n = 1$), I can pick basil ($n = 1$), separate worms and castings ($n = 1$), I can plant and cook ($n = 1$), I pick leaves up in the garden ($n = 1$), plant and water seeds ($n = 2$), plant food in the garden ($n = 3$), I can learn more about the garden ($n = 3$), I can pick peppers and I can take care of worms ($n = 1$), I can grow new vegetables in my garden ($n = 1$), I can start my own garden knowing how to take care of it ($n = 3$), and I can harvest ($n = 1$).

In 2011, open-ended survey question number three was added to the survey. Of the 12 participants from that year, 75% ($n = 9$) could “Tell us something new that you know about where food comes from”. Responses included the following: McDonald’s ‘ice cream’ is not ice cream because it’s made of corn starch and sugar ($n = 1$); It comes from the farmers and farms ($n = 4$); Fresh food comes from organic or urban gardens ($n = 1$); It comes from the ground ($n = 2$); It travels from many places and it takes time to grow ($n = 1$).

Table 4

Agricultural Knowledge of Participants

	Affirmative		Negative	
	%	(N)	%	(N)
6. Learned things about gardening	95	61	3	2
7. Could teach others about garden	89	57	8	5
8. Know more about the environment	75	48	25	16
9. Care more about environment	92	59	6	4
10. New cooking skills	83	53	14	9

Research Objective Four

Research objective four sought to describe self perceptions of leadership skills help by Roots & Wings youth gardening participants. Both close ended questions numbers 11-18 and open-ended questions 1 and 4 on the survey were used to measure objective. All close ended questions in the survey were preceded with the phrase, “Now that I work in the garden...” Ninety-five percent ($n = 61$) of participants responded affirmatively to “I work better with others on a team”, 83% ($n = 53$) affirmatively responded to “I am more of a leader”, 92% ($n = 59$) responded affirmatively to “I am better at solving problems without fighting, 89% ($n = 57$) affirmatively responded to “I am better at solving problems and making decisions, 83% ($n = 53$) affirmatively responded to “I am better at working on long projects”, 88% ($n = 56$) affirmatively responded to “I feel I have more control over things that happen to me”, 94% ($n = 60$) affirmatively responded to “I feel I can make a difference in my community”, and 95% ($n = 61$) affirmatively responded to “I feel proud of myself”. This information is summarized in Table 5.

When asked to “List something you can do on your own”, four students spoke about their leadership skills. Responses included the following: “I can help people ($n = 1$), I can plan and control my time when at home or school, and I am becoming more comfortable speaking in front of groups of all ages ($n = 1$), I can take care of problems ($n = 1$), and I can lead a discussion ($n = 1$).

Seventy-five percent ($n = 48$) of participants could list one way that they have helped their community in response to open ended question number 4. Responses included the following: By growing fruit ($n = 1$); Help my family ($n = 1$); I’ve helped my brothers ($n = 1$); By being good and listening ($n = 2$); Being healthy ($n = 1$); By participating in the garden as a Roots & Wings youth gardener ($n = 4$); By picking up trash and weeding ($n = 2$); I clean up the

community and I recycle ($n = 1$); By becoming a leader in the garden ($n = 1$); Working ($n = 2$); Cleaned the building ($n = 1$); Clean up the community ($n = 1$); I watered the plants rake leaves ($n = 1$); By cleaning up after myself ($n = 4$); Picking up garbage that is not mine ($n = 5$); I have planted plants ($n = 2$); I pick flowers ($n = 1$); By pulling up the dead leaves ($n = 1$); by having a garden at home ($n = 2$); I have started two gardens, one down the street and next door ($n = 1$); plant trees ($n = 1$); recycling ($n = 1$); telling people to stop littering and keep people from being bad ($n = 1$); helping ($n = 2$); plant carrots ($n = 1$); I plant vegetables ($n = 1$); I help build a garden ($n = 2$); I gardened organically ($n = 1$); Spreading the work through my family and neighbors to eat healthier ($n = 1$); and I helped people garden ($n = 2$).

Table 5

Leadership Skills of Participants

	Affirmative		Negative	
	%	(N)	%	(N)
11. Work better with others	95	61	2	1
12. More of a leader	83	53	11	7
13. Better at solving problems w/o fighting	92	59	5	3
14. Better at solving problems and making decisions	89	57	8	5
15. Better at working on long projects	83	5	11	7
16. More control	88	56	9	6
17. Can make a difference	94	60	3	2
18. Feel proud of myself	95	61	3	2

In order to look at the impact that that this limitation might have had on the affirmative responses, Tables 6, 7, and 8 break down the total frequencies and percentages of the affirmative

responses into the frequencies and percentages of the “yes” and “kind of” responses. The totals of all three years have been compiled and reported. Results for each individual year can be found in Table 9 and Table 10 in Appendix B.

Table 6

Dietary Behavior: Breakdown of Affirmative Responses

	Yes		Kind of	
	%	(N)	%	(N)
1. Eaten food from garden	63	40	6	4
2. Brought food home family	59	38	5	3
3. Tried new foods	63	40	13	8
4. Now eat more fruits and vegetables	75	48	13	8
5. Now eat fresher food	45	29	34	22

Table 7

Agricultural Knowledge: Breakdown of Affirmative Responses

	Yes		Kind of	
	%	(N)	%	(N)
6. Learned things about gardening	92	59	3	2
7. Could teach others about garden	67	43	22	14
8. Know more about the environment	58	37	17	11
9. Care more about environment	80	51	13	8
10. New cooking skills	61	39	22	14

Table 8

Leadership Skills: Breakdown of Affirmative Responses

	Yes		Kind of	
	%	(N)	%	(N)
11. Work better with others	83	53	13	8
12. More of a leader	72	46	11	7
13. Better at solving problems w/o fighting	84	54	8	5
14. Better at solving problems	73	47	16	10
15. Better at working on long projects	59	38	23	15
16. More control	73	47	14	9
17. Can make a difference	84	54	8	5
18. Feel proud of myself	89	57	8	5

The diagrams below match the indicators with the percentage of participants who exhibit the indicators. Figure 2 shows the indicator results for dietary behavior, Figure 3 shows the indicator results for agricultural knowledge, and Figure 4 shows the indicator results for Leadership Skills.

Figure 2

Dietary Behavior

Attitude
Subjective Norm
Perceived Behavioral Control
Self Identity
Knowledge

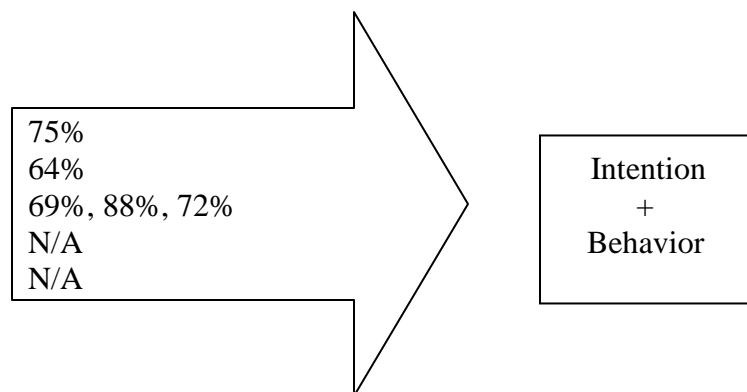


Figure 3

Agricultural Knowledge

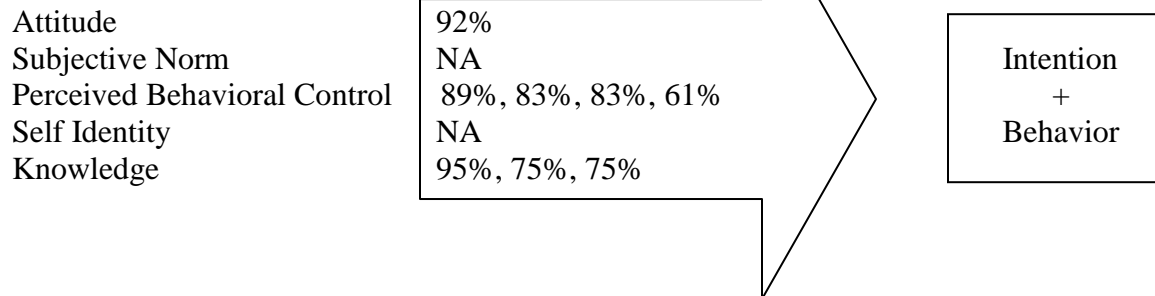
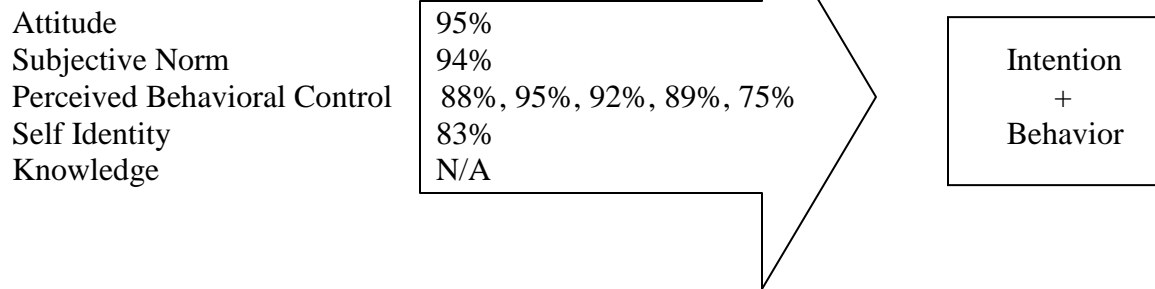


Figure 4

Leadership Skills



Chapter 5: Conclusions

This case study set out to explore the self-reported outcomes of the participants to determine if trends exist regarding program participants' dietary behavior, agricultural knowledge, and leadership skills in order to provide a foundation for understanding the impact of urban youth gardening programs. Even though the findings suggests the program needs to invest more time in recruiting teenaged participants, results more importantly indicated that the program is effective in its mission. The majority of participants reported having the intention to participate in positive dietary behaviors, exhibit agricultural knowledge, and display leadership behaviors.

One of the first major findings is that the program has served a relatively small number of youth in the community. Of the 152,871 people living in Rockford, Illinois, 38,218 of them are under the age of 18, and only 64 have been Roots & Wings participants over the past three years (U.S. Census Bureau, 2010). When put into perspective, this is an incredibly small percentage. A program that has such great potential needs to reach more youth.

In order to increase participation in urban youth gardening programs, more studies must be done on the effectiveness of these programs and that information used to elicit public funding to increase the number of urban youth gardening programs. To facilitate the expansion of these programs without tapping into completely new sources of funding, initiatives that already exist to provide job readiness skills for youth like the Urban Jobs Act in New York City could focus more specifically on funding urban youth gardening programs. In addition, public schools that focus on career and technical education can develop gardening and food processing programs as part of the urban agricultural education initiative. It is unlikely that urban youth are going to grow up to become corn and soybean farmers, but it is possible that they can use urban vegetable

gardening as a means to eat healthy, learn about our food system, and develop some job-readiness skills along the way. Therefore, this type of urban agricultural education program would be more relevant to the students and provide the foundation for community viability if the programs are effective in their missions.

The second notable finding is that the majority of the participants fell within the ages of 6-10. This means that the program was not reaching adolescent participants. Adolescents is considered a trying time for youth—a time where they have the opportunity to make good decisions that involve academic achievement and healthy hobbies or to make poor decisions that involve violence, crime, and drug use (Shann, 2001). For this reason, it is recommended that middle school and high school adolescents ages 12-17 are recruited into urban youth gardening programs. One way of doing this would be by having community programs partner with middle schools, high schools, and other adolescent hubs.

The percentages of participants who exhibited the intention and behavior indicators were high. The majority of participants had a positive attitude towards healthy eating, towards obtaining agricultural knowledge, and towards exhibiting leadership skills. They also believed eating healthy and exhibiting leadership skills were socially acceptable behaviors (subjective norm). Finally, they believed that they had the ability to eat healthy, display their agricultural knowledge through skill performance, and perform leadership skills (perceived behavioral control). Overall, the participants indicated they had gained knowledge in agriculture and could be a leader in their community as a result of participating in the Roots & Wings Program.

According to the theory of planned behavior, this shows that a high number of participants in the program intend to exhibit behaviors that reflect positive dietary behaviors, agricultural knowledge, and leadership skills. Because intention leads to performance, this same

high number of urban youth gardening participants are likely to perform behaviors that reflect positive dietary behaviors, agricultural knowledge, and leadership skills.

In addition to the existing questions, it is recommended that the questionnaire be edited for future studies to include the following statement for participants to respond to in order to measure the domains that were not covered in this study:

- I am a healthy eater.
- Eating vegetables and fruits provides my body with vitamins;
- Packaged foods tend to be high in sugar and high in fat;
- Vegetables and fruits are high in complex carbohydrates;
- A healthy weight can be maintained if I eat more fruits and vegetables and less simple sugars and fats;
- I know somebody who thinks it's neat that I know how to grow vegetables or
People like to hear about how I grow vegetables;
- I am a gardener;
- I am an ecologist;
- I am a biologist;
- If I obtain leadership skills, I will be more employable;
- Leadership skills and job-readiness skills are similar;
- Leadership skills include being able to cooperate;
- Leadership skills include being able to solve problems;
- Leadership skills include being able to make decisions;
- Leadership skills include having a sense of self-control; and
- Leadership skills include having a sense of self-confidence.

Although there are indicators missing from the survey, there were enough indicators to conclude that the program, at minimum, has an impact on the participants' intentions. This impact is promising in terms of the mission to help youth reconnect with the food production process, positively influence their dietary behaviors, and teach leadership and job-readiness skills.

The results of this case study and the aforementioned social impact of urban gardening programs provide a platform to justify further research in this area. If it can be found, through further research, that urban youth gardening programs have a positive effect in these areas, we can more confidently invest in public urban agricultural education programs of this nature. Such programs can serve individuals, communities, and the agriculture businesses. It has the potential to allow individuals to make informed choices about nutrition for their personal health, it has the potential to allow individuals to gain agricultural knowledge in the form of garden skills, and it has the potential to allow individuals to develop leadership skills. If done correctly, agricultural education has the potential to develop healthy and agriculturally literate leaders of our future.

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Appendix A: Roots & Wings Youth Survey

Please do not put your name on this survey.



Roots & Wings Youth Survey

These questions are for you to tell us how you've changed since you started working in the garden. Please tell us what is true for you. For example, some kids may have better diets from working in the garden, but others don't.

Now that I work in the garden...

Yes **Kind of** **Not really**

1. I have eaten food from the garden myself
2. **I have brought food home for my family to eat**
3. I have tried eating new kinds of food
4. **I now eat more fruits and vegetables**
5. I now eat food that is fresher (less packaged food)

Now that I work in the garden...

Yes **Kind of** **Not really**

6. I have learned things I didn't know about gardening
7. **I could teach someone else something about gardens**
8. I know more about the environment
9. **I care more about the environment**
10. I have new cooking skills

Now that I work in the garden...

Yes **Kind of** **Not really**

11. I work better with others on a team
12. **I am more of a leader**
13. I am better at taking care of problems without fighting
14. **I am better at solving problems and making decisions**
15. I am better at working on things that take a long time to finish
16. **I feel I have more control over things that happen to me**
17. I feel I can make a difference in my community
18. **I feel proud of myself**

Please do not put your name on this survey.



Now that you work in your garden....

1. Tell us something new you can do on your own:
2. Tell us one way you are healthier:
3. Tell us something new that you know about where food comes from:
4. Tell us one way you've helped your community:

These last questions are about you

Are you.... Male or Female?

What is your age?

What best describes your ethnicity? Check all that apply.

American Indian, Eskimo or Aleut
Black or African American
Hispanic or Latino
Asian or Pacific Islander
White or Caucasian
Bi-racial/multi-racial
Other

How long have you been working in your garden?

Appendix B: Data Separated by Year

Table 9

Dietary Behavior, Agricultural Knowledge, and Leadership Skills of Roots and Wings Participants by Year

	Total				2009				2010				2011			
	Affirmative		Negative		Affirmative		Negative		Affirmative		Negative		Affirmative		Negative	
	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)
DIETARY BEHAVIOR																
1. Eaten food from garden	69	44	28	18	58	22	37	14	73	10	27	4	100	12	0	0
2. Brought food home family	64	41	33	21	63	24	32	12	60	8	40	6	75	9	25	3
3. Tried new foods	75	48	22	14	66	25	29	11	93	13	7	1	83	10	17	2
4. Now eat more fruits and vegetables	88	56	6	4	84	32	8	3	87	12	7	1	100	12	0	0
5. Now eat fresher food	81	51	16	10	76	29	16	6	93	13	7	1	75	9	25	3
AGRICULTURAL KNOWLEDGE																
6. Learned things about gardening	95	61	3	2	95	36	3	1	93	13	7	1	100	12	0	0
7. Could teach others about garden	89	57	8	5	82	31	13	5	100	14	0	0	100	12	0	0
8. Know more about the environment	75	48	25	16	82	31	18	7	60	8	40	6	75	9	25	3
9. Care more about environment	92	59	6	4	92	35	5	2	100	14	0	0	83	10	17	2
10. New cooking skills	83	53	14	9	87	33	8	3	73	10	27	4	83	10	17	2
LEADERSHIP SKILLS																
11. Work better with others	95	61	2	1	92	35	3	1	100	14	0	0	100	12	0	0
12. More of a leader	83	53	11	7	76	29	13	5	86	12	14	2	100	12	0	0
13. Better at solving problems w/o fighting	92	59	5	3	87	33	8	3	100	14	0	0	100	12	0	0
14. Better at solving problems	89	57	8	5	87	33	8	3	100	14	0	0	83	10	17	2
15. Better at working on long projects	83	53	11	7	76	29	13	5	93	13	7	1	92	11	8	1
16. More control	88	56	9	6	82	31	13	5	93	13	7	1	100	12	0	0
17. Can make a difference	94	60	3	2	89	34	5	2	100	14	0	0	100	12	0	0
18. Feel proud of myself	95	61	3	2	95	36	3	1	100	14	0	0	92	11	8	1

Table 10

Breakdown of Affirmative Responses by Year

	Total				2009				2010				2011			
	Yes		Kind of		Yes		Kind of		Yes		Kind of		Yes		Kind of	
	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)
DIETARY BEHAVIOR																
1. Eaten food from garden	63	40	6	4	50	19	8	3	64	9	7	1	100	12	0	0
2. Brought food home family	59	38	5	3	58	22	5	2	50	7	7	1	75	9	0	0
3. Tried new foods	63	40	13	8	55	21	11	4	64	9	29	4	83	10	0	0
4. Now eat more fruits and vegetables	75	48	13	8	71	27	13	5	79	11	7	1	83	10	17	2
5. Now eat fresher food	45	29	34	22	50	19	26	10	57	8	36	5	17	2	58	7
AGRICULTURAL KNOWLEDGE																
6. Learned things about gardening	92	59	3	2	92	35	3	1	93	13	0	0	92	11	8	1
7. Could teach others about garden	67	43	22	14	68	26	13	5	64	9	36	5	67	8	33	4
8. Know more about the environment	58	37	17	11	68	26	13	5	36	5	21	3	50	6	25	3
9. Care more about environment	80	51	13	8	81	31	11	4	86	12	14	2	67	8	17	2
LEADERSHIP SKILLS																
10. New cooking skills	61	39	22	14	66	25	21	8	64	9	7	1	42	5	42	5
11. Work better with others	83	53	13	8	76	29	16	6	100	14	0	0	83	10	17	2
12. More of a leader	72	46	11	7	68	26	8	3	79	11	7	1	75	9	25	3
13. Better at solving problems w/o fighting	84	54	8	5	81	31	5	2	100	14	0	0	75	9	25	3
14. Better at solving problems	73	47	16	10	71	27	16	6	86	12	14	2	67	8	17	2
15. Better at working on long projects	59	38	23	15	63	24	13	5	42	6	50	7	67	8	25	3
16. More control	73	47	14	9	71	27	11	4	79	11	14	2	75	9	25	3
17. Can make a difference	84	54	8	5	84	32	5	2	79	11	14	2	92	11	8	1
18. Feel proud of myself	89	57	8	5	89	34	5	2	86	12	14	2	92	11	8	1