The Impact of a Community Garden on a Local Township

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Acknowledgments

I would like to express the deepest gratitude to my parents who have shown the greatest support in all of my endeavors. I would like to take this opportunity to express appreciation to all of the Department faculty members for their help and support. Specifically I would like to thank Dr. Robert Braun and Dr. Shelley Payne for their continuing support and attention. I would also like to thank all those involved in the community garden and Blendon Township for allowing this amazing project to take hold.
Abstract

Due to increasing food insecurity and food deserts, community gardens can increase the accessibility for those underserved populations. These community gardens can help with the mental and physical health of the public. The goal of this research is to determine if a community garden will benefit a smaller community like that of a suburban Township and to use these trends to increase community health education and availability, social cohesion, and overall health behaviors and practices. A survey evaluated overall consumption of fruits and vegetables, affordability of healthy foods, and education on the consumption of these foods as well as assessing how the community garden affected the participant’s family. Demographics were obtained in hopes that those who attended would be a representative sample of the overall demographics of the township. To assess the results, the Statistical Package for the Social Sciences (SPSS) v. 20 was used. Through an extensive literature review and survey assessment of Blendon Township, the results indicated this community needed a community garden. This was due in part to its proximity to Columbus and its suburban setting.
The Impact of a Community Garden

**Background**

*Introduction*

Blendon Township, Ohio is one of the seventeen townships of Franklin County, Ohio, United States. Located in the northeastern part of Franklin County, Blendon Township is bordered by Westerville, Genoa Township, Minerva Park and Columbus. Blendon Township has a population of 9,193 and consists of 6.3 square miles of land (Best Place to Live: Blendon Township, Ohio, 2014). This township lies on the very northern edge of the second most populous county in Ohio and is primarily a suburban setting. The purpose of the research study was to evaluate the needs of a small community in a suburban setting and compare the results to the findings typical in urban settings.

The term community garden endures in literature to include everything from individual plot cultivation to collective gardening in public spaces, schools, and prisons. Most people, however, tend to distinguish community gardens as a common space that brings people together and inspire action (Firth, 2011). Blake (2009) states that “one of the simplest definitions provided by the American Community Gardening Association is: any place where two or more people garden together” (p. 797). It is important to note that community gardens are not a homogenous group. They are diverse in size, location, form and organization and can vary in location from neighborhoods, schools, city blocks, faith communities, prisons, nursing homes, and hospitals. Because of this discrepancy, Clavin (2011) discussed that it is not very useful to offer a precise definition of a community garden, as this would impose arbitrary limits on creative communal responses to local need. Community gardens began at the turn of the 20th century and had a renaissance during the world wars in response to food shortages (Twiss, 2003), and now there are more than 18,000 community gardens in the United States and Canada in 2011, and the numbers continue to grow. Initiatives in community gardens have positive community building outcomes.
including “benefits to food security, human health, the local ecology, as well as creating opportunities for community development through education, skills, and training” (Firth, 2011, p. 555). Through examining local demographics and previous literature on community gardens and examining a local community garden for identified themes, this research hopes to discover if having a community garden contributes to health education and availability, social cohesion, and overall health behaviors and practices in a small Ohio community.

**Health Education/Affordability**

Local communities are not the only ones who have difficulty providing adequate access and quality foodstuffs to their population. External factors like globalization and internal factors like economic downturns support the need for local initiatives for feeding populations and addressing challenges of rising food costs. Blake (2009) argues that “Demographic aging trends and growing concerns over food insecurity among low income and other vulnerable populations are also likely to continue to be common features of life in the twenty-first century” (p. 806). Food insecurity refers to the USDA’s measure of lack of access, at times, to enough food for an active, healthy life for all household members and limited or uncertain availability of nutritionally adequate foods. More than 10% of US households experience food insecurity in any given year (Carney, 2012). Food insecure children are defined as children living in households experiencing food insecurity and, according to the Children’s Defense Fund, in 2010 26.5% of children in Ohio experienced food insecurity (Ohio Department of Education, 2010).

Populations with health disparities, who do not always have access to nutritious food outlets due to limited financial, community resources, and inconvenient transportation systems, are among the highest of those who are affected by food insecurities (Twiss, 2003). In a study conducted by Carney (2012), it was found that in a sample of families, “food security was a
concern for about 31% of respondents to the survey before the gardening project, which dropped to 3% after the gardening project” (p. 6).

A study conducted by Walker (2011) found that there were specific risk factors that contribute to food insecurity, which included financial hardships, educational attainment, race/ethnicity, family composition, time, employment skills, health insurance status, social support, abuse, and the availability of affordable and nutritious foods within the local environment. Food insecurity has been found to be more common in large cities and rural areas than in suburban areas and other outlying areas around large cities. This can be contributed to the increase amount of people who have access to transportation as well as available food stores in the area (Coleman, 2011).

One major contributing factor to lack of access in suburban and rural areas is the presence of Food Deserts. Recently, more attention has focused on the potential impact of an individual’s place of residence on whether the components of a healthy diet are readily available and affordable as indicative of the presence of food insecurity. A Food Desert is an area where a substantial number of residents have low access to supermarkets and/or grocery stores. Typically, these are also defined as low-income areas where residents also have limited mobility options for reaching grocery stores outside of their neighborhoods (Ver Ploeg, 2010). These low access areas cause people to either travel farther or pay higher prices for higher quality foods. Walker defines a food desert as a geographic area that does not have a large chain supermarket within 10 miles in rural areas, 0.5 miles from the zip code centroid in suburban areas, or has one-way walking time in excess of 15 minutes for in an urban area. At least 33% of the Unites States census tract’s population resides in these food deserts. With no large-chain grocery stores in the area, people are forced to go to ‘fringe’ food locations such as gas stations, liquor stores, dollar stores, pharmacies,
and convenience stores (Walker, 2011). These stores mainly stock pre-packaged and canned foods high in sodium, sugar, and energy, which do not have healthy benefits to the body.

Along similar lines as a lack of affordability, those who are enrolled in the National School Lunch Program can also indicate a level of poverty in that area. The National School Lunch Program (NSLP), or free and reduced-price lunch enrollment rate, is “a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions. It provides nutritionally balanced, low-cost or free lunches to children each school day” (Children's Defense Fund, 2012). In 2012, 46.9% of children in Ohio were eligible for free or reduced lunches at school. This statistic shows that nearly half of the households in Ohio are not able to afford and provide daily healthy meals for their children. In the 2010 fiscal year, the NSLP provided lunches to an average 31.6 million children each school day- making 56% of the lunches served in 2010 free with an additional 10% served at reduced prices (Coleman, 2011)

Not only access and affordability contributed to the lack of confidence in food security, but also the amount of education in a community about health practices and behaviors contributed to the overall health of the community. Litt (2011) declared that fruit and vegetable consumption was statistically higher among respondents with at least a college degree. The United States Census, taken from 2010, documents that 57.5% of Ohioans have some college education or higher (U.S. Census Bureau) which contributes to overall health outcome knowledge. Clavin (2011) found that “Learning was an important aspect of having the ability to both act and bring about change in one’s life and local environment and also to pursue the goals that one values”. An education allows people to have knowledge on basic nutrition and the benefits of a healthy diet.

Experiential learning (enabling a more direct participatory learning experience through the active engagement of the learner) meant that the user was learning by doing. Community gardens
represent a way that connects people to nature, requires active and constant involvement by participants, and enables participants to engage with others directly and indirectly. These factors allow participants to gain knowledge about ecological systems, the growing and preparing of food, and about health and wellness. Meinin (2012) even went as far to say that community gardens develop lifetime food experiences such as developing food preparation skills, developing a preference for specific foods, and gardening contributes to food choice. In Meinin’s study, the children in an after school program who gardened had a statistically significant increase in the willingness to try new types of fruit at home and in their liking of vegetables that was related to what was grown in their garden. School gardens provide an excellent opportunity to improve children’s health through experiential learning as well as developing social skills and healthy eating habits both at home and at school.

Social Cohesion

The benefits of community-based gardening projects likely extend beyond food security, as gardens provide fresh vegetables, and the process of gardening involves physical exercise. Carney (2012) claims that family and social relationships can also be strengthened through community gardening, since community members provide advice and support to help overcome challenges and all receive the benefits the gardening project offers. Carney further explains details of his group study that when asked if the garden helped the health of the family, his survey found that “94.9% of participants reported that it did. A high percentage of participants (92.3%) also encouraged other families to start a garden too. Several individuals reported that the gardening efforts contributed to a sense of togetherness within the family or as a place to spend quality family time building relationships” (p. 5). Blake (2009) also agrees with the basic sentiments of social cohesion by illuminating that community gardens can build health for the individuals who use
them and for the communities in which they exist by building social connections and sense of community among gardeners.

A group of Occupational therapists in England observed participants of the community garden in an assisted living community and found that nearly everyone benefitted socially from the garden. By taking place in weeding, planting, and harvesting vegetables, the community was able to achieve a higher sense of belonging within the social group. Many people in the assisted living community had either mental or health problems which led them to face social exclusion, but with the community garden they were able to still participate and be a part of a group. Diamont describes this togetherness as a joint feeling of seeing their plans come to fruition (2010). This can be applied to many different situations given that gardening provides instant feedback and sense of achievement even with little tasks like weeding. Gardening as a group in public generated affirmation from the group as well as the wider community who also benefit. Broader benefits of community gardens include improved “social networks, enhanced community capital, better neighborhood aesthetics, and reduced crime” (Blake, 2009. p. 798).

This social cohesion can be included with the concept of neighborhood attachment. Neighborhood attachment relates to one’s emotional bond to neighborhoods and may influence one’s access and use of everyday places. Positive neighborhood attachment has been shown to lead to higher levels of social involvement and to serve as an important backdrop for human-environment interactions that are still vital to health behaviors (Litt, 2011). Community gardens can mobilize and empower residents of a community, resulting in a greater sense of pride and motivation to make aesthetic changes to their areas. Firth (2011) comments that community gardens are places where different ethnic groups can interact, thus providing a space to help different groups overcome potential barriers between them. Community gardens alternately create
another space outside the home or place of work where people can gather, network, and identify with one another as residents of the neighborhood opposed to identify as a specific race or socioeconomic class (p.557).

Adding to this, community gardens generate social cohesion by bringing people together with a common purpose to participate in a joint activity or venture. Firth (2011) describes this concept as “A strong sense of collective ownership and pride can be created through the manual endeavors of a shared garden” (p. 565). Neighborhood beautification can be a benefit of this sense of collective pride by either unintentional purpose or unintended benefit of the community garden. This has been a known way to revitalize distressed areas. In order to have belonging take place and for the community to strive, a physically and emotionally safe place must be available. Community gardens are one way to provide a safe gathering place and Draper (2011) even goes as far to say that community gardens can act a vessel to deter crime and violence in an area by unifying the community.

In addition to the immediate group involved, community gardens can also cultivate relationships that do not solely apply to interactions that take place between individual garden participants. Collaborative efforts with entities such as universities, corporate extensions, summer youth programs, non-profit organizations, banks, and health centers are a few examples. These relationships with larger factions of the community provide resources for the garden such as volunteers, financial assistance, and technical assistance in addition to the other local benefits.

**Health Behaviors**

Social and community cohesion is not the only benefit to having a community garden. Self-reported survey results from a 338 participants of a community garden group conducted by Twiss in 2003 demonstrated the there was an increased number of physical activity sessions from 4.9 to 5.2 per week (6%) and increased consumption of fruits and vegetables from 3.44 to 3.78 servings
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per day (10%) (p. 1436). Carney’s study in 2012 also confirmed this and described the “frequency of vegetable intake of ‘Several times a day’ increased from 18.2% to 84.8%, (p <0.001) and frequency of children’s vegetable intake of ‘Several time a day’ increased from 24.0% to 64.0%, (p = 0.003)” (p. 5). Fruits and vegetables contribute important nutrients for the human body. Eating fruits and vegetables lowers the risk of developing many chronic diseases and can help with weight management. Creating greater access to quality and affordable Fruits and vegetables nationwide is an important step to increase fruits and vegetables consumption. According to the U.S. Department of Health and Human Services (2013), adults in the United States consume fruit about 1.1 times per day and vegetables about 1.6 times per day. This same database states the percentage of Ohioans who report consuming fruits less than one time a day is 40.5% and vegetable consumption at 26.0%. In addition to this, the median daily fruit intake is only at 1.0 servings and vegetables at 1.5 servings. With these numbers, Ohio is already trailing the national average.

In addition to being a part of the community garden group, it was also discovered that the more active in that group then the better health behaviors gained. Those with more frequent community garden participation were more likely to report they were “eating food that was fresher and less pre-packages products, spending less money on food, being better able to provide food for family and self, eating less fast food, caring more about the environment, and feeling better about where one’s food comes from” (Barnidge, 2013, p. 4).

Being overweight and obesity are known risk factors for numerous life-threatening health conditions, including coronary heart disease, stroke, hypertension, and type II diabetes (Zick, 2013, p. 1110). Calculating Body Mass Index (BMI) is one of the best methods for population assessment of overweight and obesity. Because calculation requires only height and weight, it is inexpensive and easy to use for clinicians and for the general public. The use of BMI allows people
to compare their own weight status to that of the general population (Healthy Weight Assessment: Body Mass Index, 2014, p.1). Thus, any observed relationship between gardening and the risk of being overweight or obese may also have implications for other health outcomes. From these generalizations, Zick, et. al (2013) conducted a qualitative experiment in which BMIs (Body Mass Indexes) were compared again those who gardened and those who did not. Community gardeners were found to have lower BMIs than same-gender and same-aged non-gardeners living in their neighborhoods. Zick’s study stated “The women community gardeners’ average BMI was 1.48 lower than their neighbors’ and they were 34% less likely to be overweight or obese. For the male gardeners, the average BMI was 2.53 lower than their neighbors’, and there was a 36% reduction in the likelihood of being overweight or obese” (2013, p.1112). Individuals living in the same census block group likely shared access to similar retail food environments and opportunities for physical activity than gardening. Thus, it is unlikely that the observed BMI differences are attributable to differences in socioeconomic status or physical attributes of the neighborhoods in which the gardeners and their neighbors live. There was also an observed BMI advantage for community gardeners relative to their same-gender siblings. There was a significant reduction in overweight and obesity risk for women gardeners compared to their sisters. The sibling comparisons essentially controlled for a shared genetic predisposition for weight and family origin influences on diet and exercise. The odds of women gardeners being overweight or obese were 45% less than their sister’s odds (Zick, 2013, p 1113).

Children are also subject to obesity and poor dietary habits. In 2005, the dietary guidelines for Americans recommended that children and adolescents participate in at least 60 minutes of physical on most, if not all, days of the week. With more and more time being spent in school, after-school programs, or daycare and less priority being taken on diet and exercise, many children
are not meeting the daily recommendations. A study was conducted in multiple after school programs in 2010 that examined gardening in after-school programs to see its effectiveness as a form of physical activity. An advantage of gardening as a form of physical activity is that it does not require any athletic skill therefore anyone of any age and ability can participate. Children who normally abstained from physical activity with other kids showed to have greater participation in the garden given that they saw it as a viable non-competitive alternative (Coleman, 2010). Creating positive changes in school-based settings may facilitate a change in home environments that promotes healthful behavior change.

**Conclusion**

Considering these studies, it would appear that there are many benefits to community gardens. However, most studies of community gardens have been conducted in urban settings and few studies done to-date have examined how a community gardening program affects food security in rural or suburban populations (Carney, 2012, p.2). Barnidge suggests high poverty rates coupled with limited access to a grocery store may explain why rural and suburban residents are less likely to meet recommendations for fruit and vegetable consumption (2013, p. 2). In urban locations, many people have the opportunity to walk to a grocery store or corner market, but in suburban areas these facilities are larger and more spread out, requiring the use of a car or public transportation.

The National School Lunch Program provides lower income families to provide a meal to these children during the day, but what happens when these children are not in school? Students who are enrolled in NSLP have a higher risk of not eating healthily when returning home or when they are on extended school breaks due to the lack of funding a parent may have to purchase healthy foods or the lack of availability of those foods. The Food and Nutrition Services (2013) declared that six out of ten students in America are enrolled on the National School Lunch Program
during the school year (p. 3). However, these statistics reflect the numbers for everyone in the country, regardless of living setting. In order to see how people in suburban areas are affected data must be analyzed that separates those in places with a higher population density and those who are not quite as compacted. In Ohio, the average of students on the NSLP is 46.9%. However, looking at counties where the five largest cities (Columbus, Cleveland Cincinnati, Toledo, and Akron) are and their surrounding counties, shows that in urban areas the average (52.1%) is significantly higher than the average in the suburban areas (33.3%) (Children's Defense Fund, 2012).

Having a free, healthy alternative to going without food or healthy food provides more security in a family unit. A community garden provides for this added security to encourage families to utilize the food available and to maximize their health and education. Through this research, the benefits of a community garden in a suburban location will be evaluated to distinguish the needs of the smaller community.

Methods

Participants

Participants were solicited for participation while attending a Blendon Township Community Garden Harvest Day. Harvest Day consisted of weekly gatherings at the community garden where those who attended would participate in weeding, planting, fertilizing, laying ground cover, and picking and harvesting the vegetables and herbs in the garden. Also during Harvest Day, there would be some produce education and recipe sharing to teach the participants what could be fixed with their produce that each in attendance was able to take home for free. There were no other inclusion criteria other than attendance at this event. Exclusion criteria were an inability to read the survey and under 16 years of age. The goal of this research was to have all who attended Harvest Day be participants in the research in order to provide a wide demographic
and views/opinions about this garden and their nutritional habits. This would enable the research
to better analyze who in the township was attending the Harvest Day and what sample of the
overall population were in need of the community garden. Otterbein University Institutional
Review Board approved this study, which allowed the research to be performed on live subjects
[Appendix A].

Instrument

This survey [Appendix B] evaluated overall consumption of fruits and vegetables, affordability of healthy foods, and education on the consumption of these foods. The instrument also assessed how the community garden affected the participant’s family while five additional questions assessed the demographics of this population. These demographics were obtained in hopes that those who attended would be a representative sample of the overall demographics of the township. Five outside researchers assessed Face and Content Validity for the survey. Comments from the expert panel review allowed for a more thorough assessment and ultimately a stronger survey instrument.

Procedure

Following IRB approval, participants who attended Harvest Day had the option to complete the survey. After explaining to each adult in attendance the objective for this survey, he or she had the opportunity to ask further questions or opt out of this confidential assessment. Verbal informed consent was given at the time when the survey was distributed. Most completed the survey while sitting down at the picnic table. Those participants who had attended the Community Garden’s Harvest day more than once completed an additional set of questions to assess how they benefitted from the community garden. After completing the survey, each participant placed the survey in a brown manila envelope.
Data Analysis

To assess the results, the Statistical Package for the Social Sciences (SPSS) v. 20 was used. Descriptive statistics, such as means, standard deviations, and frequencies were assessed for trends in the data. The previous year’s data was also included and analyzed to get a wider number of reference points and a better overall assessment of the wellbeing for this community. The ongoing study used the same survey and methods the year previous so this prospective study could better assess the community at large and more specifically, the participants in this study.

Results

Demographics

There were a total of 47 participants included in this study of which 18 participants also completed the additional section of the survey related to multiple visits and the impact the garden had on their lives [Appendix C]. The desired outcome of the participants would be that they represented an accurate sample of the township to get a better representation of the attitudes and needs of all. Most participants were female (80.9%) and the average age of the participants was 40 years (range=16-60). The racial percentages, respectively, reflected similar trends in the census data describing the township. Our participants were 74.5% Caucasian/White, 8.5% African American/Black, 6.4% Asian, and 4.3% Hispanic. Their level of education was also evaluated with the highest percent of people (57.4%) having some or graduated from college. Statistics on total occupants per household indicated the highest amount living in a house were four (36.2%) or five people (31.9%). The mean average for each household is 3.77. Lastly, 14.9% of participants had children enrolled in free or reduced lunch programs at the local schools.

Behaviors

The participants completed surveys that assessed their overall health behaviors and perceptions related to food affordability, access and availability (Appendix C). The average fruit
and vegetable servings consumed per day was 3.38 and 3.34 servings, respectively. These servings included fresh, frozen, or canned produce but neglected juice. Results demonstrated that when asked if they were not able to afford more food to eat, a majority of the people either disagreed or had no opinion. However, 27.6% of the participants did believe food was unaffordable. In similar fashion, 34% of participants agreed that they were not able to afford healthier meals.

When asked about food preparation knowledge and accessibility, more people believed that it was less of an issue. Nineteen percent of participants agreed that they did not know how to prepare fruits and vegetables while the majority (68.1%) disagreed. Produce access was similar in these trends with 57.4% stating that they believed they had proper access. Still, 10.6% expressed a lack of access to healthy foods such as fruits and vegetables.

For those who participated more than once in this program, they completed an additional set of questions to assess the impact of our garden on their eating habits. Although not listed in either table, results yielded 92% of those who had attended the program more than once said that they enjoyed eating the produce received from the garden and now eat more fruits and vegetables at home as a result of participating in the community garden. This same number of participants also said that they believe the community garden will help their family eat healthier and they can now offer healthier foods at the dinner table. Overall, 100% of the participants said they planned to attend the next Harvest Day.

**Discussion**

The purpose of this research study was to determine whether a community garden would benefit a small suburban setting like that of Blendon Township in Ohio. Most research on community gardens has been completed in urban locations, which typically have a different
community mentality, and different community needs than those within a suburb. However, like many others, the residents of this community received the produce free.

Food insecurity is a national problem that should not occur in a developed country such as the United States. However, for many Americans, this is a very prevalent hardship. Based on the survey, 27.6% of the participants experience food insecurity and believe that they cannot afford more food to eat. Additionally, healthier food is known to be more expensive and 34% of the participants believed that healthier food was unaffordable. This local food insecurity compares to the state average of 26.5% and the county average of 23.6% (Coleman-Jensen, 2011; US Census Bureau, 2012). These numbers accurately reflect the population intended. Consequently, nearly one in every five families in Blendon Township worries about how to pay for food. This causes added stress to their life that builds over time and can cause long-term physical and emotional health problems (Diamant, 2010).

In addition, the presence of food inaccessibility is also a concern to these residents. Nearly 11% of the participants believed that they lacked adequate access to healthy food options. Given the amount of people and the distance away from the community garden, not all residents are aware of this opportunity as originally anticipated. In order to reach everyone, there needs better identification of the area in need and marketing of this garden specifically to those places. The concept of produce dispersal to those in need by identifying priority areas rather than letting the residents come to the garden is a top priority.

The level of education a person has could be directly proportional to their health behaviors. The results of our survey yielded an average of 3.35 fruit and vegetable consumption while the average for Ohio is 1.25 servings per day (U.S. Department of Health and Human Services, 2013). This higher average of fruit and vegetable consumption may be the result of our populations’
educational level. The overall average of those earning a college degree was 63.8%, which is over the national average of 39.17% (US Census Bureau, 2010). This indicated an overall higher level of formal education among the community members in this area. As a result, the more informed you are on health and health outcomes the more likely you are to make healthier decisions (Draper, 2010).

The participants demonstrated a higher level of diversity than normal for the township, which indicated a new level of social blending. The most recent census report listed Blendon Township as being 80.86% Caucasian/White, 9.95% African American/Black, 3.35% Asian, 2.26% Hispanic, respectively (US Census Bureau. 2010). The participants reflected an even more diverse group than expected. Overall, these numbers are less diverse than the national or state average but are accurate for the specific location as a representative racial sample. The community garden allows for a safe space for people of all races and ethnicities to gather, network, and interact (Diamant, 2010; Firth, 2011; Litt, 2010; Twiss, 2003). This high diversity represented indicates an aim toward social cohesion. This gathering can also lend itself to stronger community ties, empowerment, and a sense of community pride (Blake, 2009; Diamant, 2010; Draper, 2010; Firth, 2011; Litt, 2010; Twiss, 2003).

Occupants per household can also indicate of how many people need reached by the community garden and demonstrate the level of need that a household has. Comparing to the national average of 2.61, the county average of 3.05, and the Township average of 3.08 people per household (US Census Bureau, 2010), this sample shows that there are more people in each household (3.77) within this specific area that could need access to healthier choices.

Those participants who attended the Harvest Day more than once revealed that the community garden was beneficial to those who attended. Of those who repeatedly participated,
more than 90% responded positively when asked if they enjoyed the produce provided by the garden and if they planned to come again for the following harvest. This indicates that those who were able to attend the harvest day were able to obtain the healthy foods that were provided. Furthermore, the participants used the free produce in an advantageous way for the rest of their household and family. The one caveat is that not everyone will return to the garden in subsequent weeks. There needs to be a way to assess the participants who do not return and to understand why this occurs.

**Future Considerations**

The first priority is the need to identify the underserved areas within the township that the current community garden does not reach who is in need of this produce. Once identified, better marketing of the community garden within that area should occur. Next, the workers at the garden should distribute the produce to these underserved areas accordingly. Currently the left over produce not taken by the participants will go to the Westerville Area Resource Ministry (WARM) Food Bank. However, if the needed areas are identified correctly, this “left over” produce could be taken directly to those specific areas. Currently the survey only asks which zip code the participant resides in but future surveys should ask which specific street they live on. Understanding where the participants live can better serve this community.

Also there is a need to identify additional volunteer groups and organizations that can participate in the program to not only serve to grow and maintain the garden but also to transport the produce to those in need. Sustainability is necessary and this concept needs cultivated within community. The participants in this garden need to buy into this notion and take ownership of the garden.
Also for future consideration, those who manage the garden should set a schedule of education programs describing each topic (with date) for those who wish to participate. Having a set schedule based on produce readiness and perceived participation and/or suggestions will allow a more structured educational program to occur. For example, on one particular day, a salsa making education session using the vegetables and herbs picked from the garden occurred. Recipes were also distributed during this event for those interested. In the same vain, a recipe book should be developed based on the crops harvested to help those who may not understand how to prepare the foods in the hopes that it will help guide them in the kitchen.

In conclusion, through the previous literature concepts on who benefits from community gardens and the data collected from the survey, it is believed that the community garden will benefit more and more people every year. Blendon Township appears to be a good candidate to continue to examine due to its proximity to Columbus but within a suburban setting. The end goal through this research is to determine if community gardens will benefit a smaller community like that of a suburban Township and to use these trends to increase community health education and availability, social cohesion, and overall health behaviors and practices.

*Limitations*

One method flaw in this research would be the lack of reliability within the survey. Unfortunately, a reliability analysis did not occur with this sample population. Thus, overtime the data collected could be less impactful or consistent. Social desirability and recall bias are two concepts that could both affect the results of this survey (Portney & Watkins, 2000). For instance, participants could have answered the questions the way they thought the researchers wanted them to (i.e. admitting to eating more fruits and vegetables than actually occurred). Even further, the participants may have forgotten or could not remember what they ate in the past week and as a
result, miscalculated their fruits and vegetable consumption. Because of their future interest in helping with Harvest Days, a few participants put their name on the completed survey. Because of this, anonymity did not occur and the potential for participant deception is a possibility. Finally, given that this is a prospective study and data collection will continue, each year the data collection process may be adjusted and corrected but still must remain similar enough that it does not change the data outcomes, or more likely, the data may not be comparable due to needed changes.
References


INSTITUTIONAL REVIEW BOARD
RESEARCH INVOLVING HUMAN SUBJECTS
OTTERBEIN UNIVERSITY

Original Review
Continuing Review
Five-Year Review
Amendment

ACTION OF THE INSTITUTIONAL REVIEW BOARD

With regard to the employment of human subjects in the proposed research:

HS # 12/13-79
Braun & Burke: The impact of a community garden on low-income families in . . .

THE INSTITUTIONAL REVIEW BOARD HAS TAKEN THE FOLLOWING ACTION:

☑ Approved
☑ Approved with Stipulations*
☐ Disapproved
☐ Waiver of Written Consent Granted
☐ Deferred

*Stipulations stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least four (4) years beyond the termination of the subject’s participation in the proposed activity. Should the principal investigator leave the college, signed consent forms are to be transferred to the Institutional Review Board for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the IRB, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

Date: 29 April 2013
Signed: 
Chairperson

OC HS Form AF

This study needs some form of consent — verbal is okay. The consent information must say that participants may choose not to answer any questions and that they are free to quit when they want to.
Appendix B

**Community Gardens for Blendon Township**

Please answer the questions to the best of your ability. Please do not put any identifiable names/addresses on this form. You have the right to not answer any of these questions and are free to stop participating in this survey at any time. By completing this survey you are giving verbal consent to participate in this study. Thank you for your participation.

1. Do you believe there is a need for these newly added plots for families in need of fresh fruits and vegetables?
   - Yes
   - No

2. During the past week, not counting juice, on average, how many times per day did you eat fruit? Please count fresh, frozen, or canned fruit.
   - 1
   - 2
   - 3
   - 4
   - 5 or more

3. During the past week, not counting juice, on average, how many times per day did you eat vegetables? Please count fresh, frozen, or canned vegetables.
   - 1
   - 2
   - 3
   - 4
   - 5 or more

4. The following are statements people have made about the food in their household. Please indicate the level of agreement with each statement for your household in the past 30 days.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Disagree nor Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>We were not able to afford more food to eat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We did not have access to fruits and vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We did not know to to prepare fruits and vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We were not able to afford healthier meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Does your child (or children) receive free or reduced lunch in school?
   - Reduced Lunch ○ Ye□ No
   - Free Lunch ○ Ye□ No
6. Based on your experiences with the Blendon Township Community Garden (BTCG) and if you have participated in Harvest Day, chose the correct responses to the statements below (if this is your first Harvest Day for 2014, please skip this question)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed eating the fruits and vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoyed eating the vegetables I received from the BTCG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I now eat more fruits and vegetables because of the BTCG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I plan to participate in the next “Harvest Day”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoyed using the herbs in my preparation of my meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe the BTCG will help my family eat healthier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because of the BTCG, I can now offer more food at the dinner table</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Demographics:

7. I am _____ years old.

8. What is your gender?
   - Female
   - Male

9. Race/Ethnicity:
   - African American (Black)
   - Alaskan Native/American Indian
   - Asian
   - Caucasian (White)
   - Hispanic
   - Other: ______________________

10. How many occupants do you have in your household?
    - 1
    - 2
    - 3
    - 4
    - 5 or more

11. Zip code where you live: __________

12. What is the highest level of formal education you have completed?
    - Less than 12 years
    - High School graduate/GED
    - Associates Degree
    - Some College
    - College Graduate
    - Advanced degree (Masters, PhD, etc.)
### Appendix C

#### Table 1: Demographics of Blendon Township Community Garden

<table>
<thead>
<tr>
<th></th>
<th>N(%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>years old</td>
<td>16-60</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>9[19.1]</td>
<td></td>
</tr>
<tr>
<td>female</td>
<td>36[80.9]</td>
<td></td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American (Black)</td>
<td>4[8.5]</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>2[6.4]</td>
<td></td>
</tr>
<tr>
<td>Caucasian (White)</td>
<td>35[74.5]</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>2[4.3]</td>
<td></td>
</tr>
<tr>
<td>Other/Biracial</td>
<td>2[4.3]</td>
<td></td>
</tr>
<tr>
<td><strong>Occupants per household</strong></td>
<td>3.77</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>4[8.5]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3[6.4]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8[17]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>17[36.2]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15[31.9]</td>
<td></td>
</tr>
<tr>
<td><strong>Highest Level of Formal Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 12 years</td>
<td>1[2.1]</td>
<td></td>
</tr>
<tr>
<td>High School graduate/GED</td>
<td>9[19.1]</td>
<td></td>
</tr>
<tr>
<td>Associates Degree</td>
<td>6[12.8]</td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>12[25.5]</td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>15[31.9]</td>
<td></td>
</tr>
<tr>
<td>Advanced Degree (Masters, PhD, etc.)</td>
<td>3[6.4]</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix D

### Table 2: Behaviors of Blendon Township Community Garden

<table>
<thead>
<tr>
<th>Behavior</th>
<th>N%</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit consumption per day</strong></td>
<td></td>
<td>3.38</td>
</tr>
<tr>
<td>1</td>
<td>6[12.8]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10[21.3]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7[14.9]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8[17]</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>16[34]</td>
<td></td>
</tr>
<tr>
<td><strong>Vegetable Consumption per day</strong></td>
<td>3.34</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5[10.6]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10[21.3]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11[23.4]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3[6.4]</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>17[36.2]</td>
<td></td>
</tr>
<tr>
<td><strong>Not Able to afford more food to eat</strong></td>
<td></td>
<td>2.74</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>11[23.4]</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>7[14.9]</td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>16[34]</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>9[19.1]</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>4[8.5]</td>
<td></td>
</tr>
<tr>
<td><strong>We Did not have access to fruits and vegetables</strong></td>
<td>2.47</td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>13[27.7]</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>14[29.8]</td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>14[29.8]</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>4[8.5]</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>1[2.1]</td>
<td></td>
</tr>
<tr>
<td><strong>We did not know how to prepare fruits and vegetables</strong></td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>21[44.7]</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>11[23.4]</td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>5[10.6]</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>6[12.8]</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>3[6.4]</td>
<td></td>
</tr>
<tr>
<td><strong>We were not able to afford healthier meals</strong></td>
<td>2.79</td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>11[23.4]</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>7[14.9]</td>
<td></td>
</tr>
<tr>
<td>No Opinion</td>
<td>13[27.7]</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>13[27.7]</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>3[6.4]</td>
<td></td>
</tr>
<tr>
<td><strong>Children on free and reduced lunch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7[14.9]</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>37[78.7]</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D- Franklin County Map