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## Growing Health: Community Gardens And Their Effects On Diet, Physical And Mental Health And Community

Brittany Minnick Hanson  
*University of Central Florida*



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GROWING HEALTH: COMMUNITY GARDENS AND THEIR EFFECTS ON DIET,  
PHYSICAL AND MENTAL HEALTH AND COMMUNITY

by

BRITTANY MINNICK HANSON  
B.A. University of South Florida, 2007

A thesis submitted in partial fulfillment of the requirements  
for the Master of Arts  
in the Department of Sociology  
in the College of Sciences  
at the University of Central Florida  
Orlando, Florida

Summer Term  
2012

## **ABSTRACT**

Recently, research on community gardens and their benefits to health and community has become very popular. However, this influx of research has failed to investigate challenges to successful community gardening. Some articles examine issues between community gardeners and the land owners, but other than these conflicts community garden challenges, like lack of participation and quality leadership, have not been discussed in the literature (Draper and Freedman, 2010). To allow future gardens to be as successful as possible it is important to identify potential obstacles. Additionally, it is just as important to continue to examine possible benefits, for example, physical activity and health benefits of community gardening and the breadth of community issues possibly addressed by community gardeners. Continuing to research on community will allow for more successful gardens and encourage funding for these programs.

This study examines how food insecurity, health and community cohesion issues can be affected by community gardens in Central Florida. It also investigates challenges community gardens often face. To do this I conducted structured interviews with community gardeners and semi-structured interviews with community garden leaders at several gardens throughout Orange County, Florida. The results show that community gardens have several benefits including increased consumption of fresh produce, improved physical activity, mental health and community cohesion. However, gardens are not without difficulties. About a third of the gardeners and the majority of the leaders said that lack of participation was a challenge they faced.

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## INTRODUCTION

The American Community Garden Association (2011) defines community gardens as any area gardened by a group of individuals. This broad definition encompasses the many types of community gardens that exist. Community gardens can be made up of multiple individual plots or one community plot at a school, park, nursing home, community center or a vacant lot in a neighborhood in rural or urban America. Gardeners can be the teacher and students at the school or adults from the community. The variety of community gardens come from an assortment of motivations and leads to an array of results (Twiss et al., 2003).

Many communities create these gardens in an attempt to increase access to affordable, fresh, and healthy produce (Litt et al., 2011). Research finds that low income neighborhoods in both rural and urban areas often have limited access to full-service grocery stores, making fresh fruits and vegetables difficult to access and afford (Huang et al., 2010; Himmelgreen et al. 2000; Frongillo and Horan 2004). As a result, some communities start community food gardens to give residents opportunities to grow their own produce and reduce their food costs (Armstrong, 2000; Baker, 2004).

In addition to giving residents opportunities to grow their own food, many community food gardens serve as educational tools. Community gardens at schools, day cares and community centers are typically aimed at educating children about the source of food, as well as the nutritional value of fresh produce. Besides growing food, some gardens are aimed at providing therapy. Education of this type encourages a healthy lifestyle from an early age. Therapeutic gardens can be gardens that grow food or flowers and other plants. No matter what

the garden grows, the purpose is to provide emotionally and physically disabled or stressed persons and their care givers a place to enjoy nature and watch things grow.

Despite having different purposes, all types of community gardens have similar benefits. They provide opportunities for community members to get physically active, to add healthy foods to their diet, and to reduce their food costs (Litt et al., 2011; Sallis and Glanz, 2006). They also provide a meeting location for residents to get together and address other community issues, and to meet neighbors and increase social capital (Armstrong, 2000; Alaimo et al., 2010). These benefits and their effects on health have been researched but not very thoroughly (Draper and Freedman, 2010). Research on community gardens and their effects on health and community has focused primarily on Northern and Midwestern states (Draper and Freedman, 2010). Researchers have also examined community gardens in New York, where the popularity of community gardens began and has been a part of political discussion (Draper and Freedman, 2010; Schmelzkopf, 1995). Research on community gardens in the south is minimal and Florida, in particular, is absent from the literature. Florida's absence leaves a large gap in the literature because of its unique climate. Florida community gardens are able to operate year around with two different growing seasons (a hot and cool season), while in the north, winter months are too cold for gardening. Therefore, it is important to include Florida or at least some southern sites in the community garden literature.

It is important to research community gardening in Florida, but it is especially important to research community gardens' effect on food insecurity. Food insecurity is a serious health issue in the U.S., where one in ten families does not have sufficient food for all members (Freedman and Bell 2009). Health is negatively affected if a neighborhood is food insecure. If



healthy food is not available or accessible to a neighborhood, community residents will be at increased risk of health issues including obesity, high blood pressure and even diabetes (Neumark-SztLainer et al., 2002). In addition, neighborhoods that are most affected by food insecurity often have a plethora of other issues including crime, blight, and high unemployment rates to name a few (Huang et al., 2010). Community gardens are a possible low cost option to increase food security and availability. They can also provide opportunities to increase community cohesion and social capital by improving community aesthetics and providing a location to address community concerns. Besides improving healthy food access and community cohesion, community gardens may also be a viable option for improving health in general. A Centers for Disease Control and Prevention (2011) report shows that in 2007-2008 over two thirds of U.S. population was overweight or obese. East Orange County Florida has a similar rate where 65% of residents are overweight or obese. This is a cause for concern and requires an examination of possible solutions. This study examines how all of these issues (food insecurity, health and community cohesion) can be affected by community gardens in Central Florida. It also investigates challenges that gardens face that may make them less successful in addressing these issues. I have conducted structured interviews with community gardeners at several of community gardens throughout Orange County, Florida. I also conducted semi-structured, in-depth, open ended interviews with the leadership at these gardens. Both are used to evaluate the effects of community gardens on food insecurity, health and community cohesion, as well as examine challenges gardens face and keys to successful community gardening.

## **LITERATURE REVIEW**

### Community Gardens

As grocery stores close and food costs increase, the popularity of community gardens rises (Zimmerman and Doiron, 2008). Though their popularity is at a high, community gardens have had an extensive history. Community gardens created easily accessible food supplies during World Wars I and II and provided affordable food to the poor and unemployed during the Great Depression (Armstrong, 2000). Indeed, even into the 1950s and 1960s, backyard and community vegetable gardens were ubiquitous in many American small towns. As food prices rise and healthy foods become less affordable, individuals begin seeking alternatives to purchasing foods at grocery stores and look to community gardens as a means of gaining access to the foods necessary for a healthy diet.

Researchers have found that community gardens continue to provide neighborhoods access to an affordable food supply (Armstrong, 2000; Corrigan, 2011; Zimmerman and Doiron, 2008). A 1994 study found that community gardeners reduce their food cost by \$50 to \$250 per season and that one large community garden can harvest upwards of 5,000 pounds of produce a year (Armstrong, 2000). With the higher prices of produce today, it is likely that the food cost savings of participating in a food garden are also higher. In fact, a savings of \$250 in 1994 would be equivalent to a \$387 savings today (United States Department of Labor, 2012).

Besides creating access to an affordable and healthy food supply, community gardens promote both individual and community health (Armstrong, 2000; Twiss et al., 2003). Participation in community gardens leads to increased consumption of fruits and vegetables as well as increased physical activity (Litt et al., 2011; Sallis and Glanz, 2006; Twiss et al., 2003).

As a result, community gardens have the capacity to increase both physical and emotional well-being (Armstrong, 2000).

The USDA (2012) argues that individual health and well-being are contingent upon the consumption of fruits and vegetables and they recommend at least 5 servings a day. The literature shows that community gardens encourage the consumption of these foods (Alaimo et al., 2008; Litt et al., 2011, Twiss et al., 2003). A survey conducted from 2006 to 2007 found that community gardeners consumed on average 5.7 servings of fruits and vegetables a day, more than both home gardeners (4.6) and non-gardeners (3.9) consumed (Litt et al., 2011). In addition to increased consumption of fruits and vegetables, community gardeners also eat significantly less unhealthy foods like sweet foods and drinks (Armstrong, 2000). Fortunately, these effects were not limited to only the gardeners. A study conducted by Alaimo et al. (2008) showed that adults who lived with a community gardener consumed 1.4 more servings of fruits and vegetables a day and were 3.5 times more likely to consume the recommend 5 servings a day than the general population.

Increased consumption of fruits and vegetables is not the only health benefit of community gardens. A large portion of past research on the health effects of gardening in general is focused on gardening as a leisure time physical activity (Armstrong, 2000). It was found that gardening is a rather popular form of exercise and some reports have found that as much as 59% of men and 42% of women garden alone or in a community garden for leisure time physical activity (Armstrong, 2000). In addition, those that garden for exercise do so more often than those that do other typical forms of exercise (walking, biking) (Armstrong, 2000). Gardening has been found to be a moderate to high intensity level activity that is linked to

significant reductions in total cholesterol, HDL cholesterol and blood pressure (Armstrong, 2000). However, this research has focused on general gardening (home gardening) and research on the impact of community gardens on physical activity, especially since the early 2000s, has been largely neglected (Draper and Freedman, 2010). There is one 2011 study by Hale et al. that included narratives from interviews with community gardeners that highlighted the necessary physical activity in community gardening, for example, digging, raking, planting, etc. A few gardeners mentioned walking or biking to the garden and several more noted how physical activity in the garden was more enjoyable than typical exercises like walking on a treadmill (Hale et al., 2011). Further, a study of community gardens in the Netherlands found that community gardeners were more physically active in the summer compared to non-community gardeners (van den Berg et al., 2010). The specific impact of community gardening on health by increasing physical activity has been investigated, but only minimally. In order to encourage funding of community garden programs, it is necessary to continue research in this area.

Community gardens, however, do not only affect individual health, they can also foster community relations. Though the specific definition of social capital has not been agreed upon by all scholars, there is a basic understanding that social capital relates to the strength of social relationships and their benefits to the community in general or the individual in particular (Alaimo et al., 2010). Several studies have focused on community gardens' effect on social capital (Draper and Freedman, 2010). In a 2010 study, involvement in community gardens was positively linked to perceptions of social capital (Alaimo et al., 2010). In addition to studies that show increased social capital as a result in community gardens, some studies have found that community gardens lead to increased community and social cohesion, and social support (Firth

et al., 2011; Kingsley and Townsend, 2006; Teig et al., 2009). Studies have found that community gardens allow residents the opportunity to meet neighbors and discuss neighborhood issues (Armstrong, 2000; Twiss et al., 2003). Community gardens can improve social networking by giving neighbors a physical location to meet, socialize and learn about other programs in the community, and community issues (Armstrong, 2000). This is especially true for low income and minority neighborhoods (Armstrong, 2000). In these areas, community gardeners have often attempted to address community issues (Armstrong, 2000; Draper and Freedman, 2010; Twiss et al., 2003). For example, one study found that community gardeners started programs that allowed for public use of abandoned private land to create community gardens and parks (Twiss et al., 2003). Some qualitative research even shows possible reduction of crime in communities with community gardens (Draper and Freedman, 2010). Community gardens are also frequently places where politics is discussed and political involvement and social activism are encouraged (Glover et al., 2005; Smith and Kurtz, 2003; Teig et al., 2009). Historically, community gardens, especially in New York, have been hot beds of activism and this continues today (Smith and Kurtz, 2003). Recently, gardens have become involved in the Community Food Security movement (CFS) (Corrigan, 2011). “The CFS movement has gained momentum as part of a larger effort to localize food production and provide greater and equal access to healthy and affordable food” (Corrigan, 2011, 1234). Feeling that food should be grown locally and be equally accessible to everyone is a reason for many gardeners to join a community garden and often becomes a point of discussion between gardeners. Along with community gardens and health, the benefits of community organization created by community gardens need further research. The potential of community gardens to better organize a

neighborhood and address community issues has been identified; however it is unclear the exact breadth of issues community gardens are able to address.

Community garden research has become more prevalent and research in this area shows substantial benefits from health to crime reduction. However, little research has investigated challenges to successful community gardening. Aside from examining conflicts between community gardeners and the owners of the land, community garden challenges have not been discussed in the literature (Draper and Freedman, 2010). In order for future gardens to be as successful as possible it is important to examine potential pitfalls. In addition, to researching garden challenges it is important to continue to examine possible benefits, for example, physical activity and health benefits of community gardening and the breadth of community issues possibly addressed by community gardeners. Strengthening this research will allow for more successful gardens and perhaps encourage funding for these programs.

### Food Insecurity

The topic of food availability is of great importance to the country. According to the United States Department of Agriculture (2000), hunger caused by the inability to attain enough food has been a focus of social policy for some time. The USDA recognizes the success of social programs, like Food Stamps, in stamping out severe forms of hunger often seen in developing nations. However, food insecurity still exists and is of great concern. While the constant and complete absence of food is rare in American communities, many communities still suffer from insufficient access to the food necessary for a healthy diet. These communities that

experience less extreme hunger associated with inadequate access to food are said to be food insecure.

Locations designated as food insecure are known to have several identifying demographic characteristics. The most prominent of these characteristics is the presence of minority groups and of high rates of poverty. According to Freedman and Bell (2009) “an inverse relationship exists between community access” to food and the racial and socioeconomic background of the community. One study showed that 41% of families with incomes half or less the poverty level were identified as food insecure (Kasper et al., 2000). A report by Wright and Jasinski (2008) found that, in Central Florida, food insecurity largely affects only those at the bottom of the income scale. Their study showed that more than 25% of low income households reported not always having enough food for their family (Wright and Jasinski, 2008). In Winter Park (the location of four of the gardens that participated in this study), it was found that residents typically did not consume the daily recommendation of fruits and vegetables, often citing their expense (Wright et al., 2011). Additionally, 8% of Winter Park residents reported skipping or cutting the size of meals because there was not enough money for food (Wright et al., 2011). In other words, 25% of low income Central Florida households and 8% of Winter Park residents are food insecure (Wright et al., 2011; Wright and Jasinski, 2008).

In the literature, inadequate access to food has been traditionally referred to as food insecurity. The USDA (2011a) defines food insecurity as “access by all people at all times to enough food for an active and healthy lifestyle.” The USDA (2011a) found that in 2010 15% of U.S. household experienced at least some period of food insecurity in the past year. Compared to “hunger,” “food insecurity” seemingly implies a diminished intensity of a person’s food

problem, less fear about the consequences, less urgency in finding a solution. Despite these implications, however, food insecurity should not be taken lightly as it has serious consequences for health and well-being.

Inadequate access to food leads to depleted health for disadvantaged groups of people including the poor, minorities, the elderly, and children (Huang, Oshima, and Kim, 2010; Himmelgreen et al., 2000; Frongillo and Horan, 2004). Food insecure adolescents are more likely to be obese than their more food secure counterparts (Neumark-SztLainer et al., 2002). They are also less likely than food secure youth to receive the daily recommended amounts of calcium, fruits and vegetables, and grains. Also, while both food insecure and food secure youth reportedly understand the benefits of healthy eating habits, food insecure youth tend to consider healthy eating as “inconvenient” to their lives (Windome et al., 2009). Furthermore, food insecurity has been connected to lower cognitive functioning. This shows that food insecurity is not just a minor or temporary problem and has far reaching implications for future mental and physical health.

Food insecurity is most often linked with poverty, yet increasing amounts of research are connecting food insecurity to a person’s inability to access grocery stores. The term food desert has been given to these areas where most residents struggle to access grocery stores. Though the definition or even existence of food deserts is still largely debated, it is clear that there are communities in both rural and urban America that struggle to physically and economically access supermarkets (Morton and Blanchard, 2007; Mead, 2008; Shaw, 2006; Cummins and Macintyre, 2002). Food desert residents, like those that are food insecure, are less likely to have adequate amounts of fresh fruits and vegetables as well as dairy and protein in their diet putting



them at risk for serious health issues (i.e. obesity, diabetes and high blood pressure) (Morton and Blanchard, 2007). Research shows that areas that are considered food deserts are often lower income neighborhoods where grocery stores have found it no longer profitable to operate (Schafft et al., 2009). Once grocery stores are not readily accessible, residents are required to travel several miles to grocery stores in more affluent neighborhoods to purchase healthy foods, like fresh fruits and vegetables. Traveling this distance is often physically and economically undesirable because residents may not have their own vehicle or the extra income to purchase the additional gas and pricey fresh produce. This leaves food desert residents constrained to purchase processed, pre-made, generally unhealthy foods from fast food restaurants and convenient stores that still operate in their neighborhoods.

Food insecurity and food deserts have serious health consequences and necessitate real solutions. Community gardens offer a viable low cost option to increasing access to fresh produce in areas where residents struggle to acquire adequate amounts of fresh fruits and vegetables for a healthy diet. However, to fully evaluate community gardens as a possible solution to food insecurity and food deserts, it is particularly important to investigate community garden benefits in known food deserts where many residents are affected by poverty and food insecurity. Though some community garden research has found food security and food production as both a motivation for and a benefit of community gardens the literature has failed to address community gardens in food deserts (Draper and Freedman, 2010).

## METHODS

In this study I employed a mixed methodology approach. Mixed methodology is basically the use of both quantitative and qualitative measures in one study to best answer the research question. For this study I found that a mixed methodology approach allowed for a deeper understanding of community gardens' effects on health and social cohesion as well as a thorough examination of challenges gardens faced. A combination of numerical and narrative data created a clear picture of the benefits and challenges of community gardening.

To collect numerical data I interviewed community gardeners at several community gardens in Orange County, Florida over a six month period. The interviews were designed to examine the benefits of community gardening on health and social cohesion and challenges to success that gardens encountered. In total, I interviewed 64 gardeners at 11 community gardens. These gardens included the community gardens at Winter Park Towers (n=4), Mead Botanical Garden (n=14), Depugh (n=7), Winter Park Presbyterian (n=7), Apopka (n=5), Parramore (n=10), Audubon Park (n=3), First Unitarian Church of Orlando (n=1), Festival Park (n=1), Pine Hills Community Center (n=5), and the University of Central Florida (n=7). Originally, a master list of all community gardens in Orange County was created using several sources (American Community Gardening Association website, Google, The Winter Park Health Foundation, and the Central Florida Local Food Guide 2011-2012). All the gardens were contacted, typically on multiple occasions, and those willing to participate were included in this study. Once I identified gardens willing to participate, I either attended a work day, received phone numbers for the gardeners or had the leader disseminate my information to all the gardeners. Only those

gardeners 18 years of age or older that consented to participate were included in the study. No names or other identifiable information was collected.

The structured interview was largely adapted from an interview created and tested by the University of North Carolina. It was highly structured and included 18 close ended questions with specified response categories and seven open ended questions. Though community gardeners' responses were recorded in the specified response categories, many respondents offered additional information that was noted on the interview sheet (see Appendix B).

Interviews were conducted either face to face or over the phone. Face to face interviews were conducted at the community garden either during a scheduled workday or at a garden meeting. Phone interviews were conducted when gardeners were unable to meet with me at their garden. In those cases, the leader of the community garden either provided me with phone numbers or emailed the gardeners and asked them to contact me. Those that contacted me either reached me by telephone or emailed me their phone number and I called them to conduct the interview.

Interviews were not audio recorded, rather responses and additional information was recorded by hand on the interview sheet.

The first several questions of the interview gathered demographic information, including gender, race/ethnicity and age of the respondents. Demographic information was used to get an idea of who is participating in community gardens in Orange County. In addition, I asked about the gardener's family composition. Family composition focused on the number of children six and under, seven to 12, 13 to 17 and the number of adults 18 to 64 and 65 and over that resided with the gardener. The purpose of inquiring about family composition was to investigate others

that possibly benefitted from the community garden, especially its food supply, without participating directly.

Next, the interview inquired about gardening. First, I recorded where they gardened. Keeping record of where each gardener gardens allowed me to investigate differences in benefits and challenges between gardens. Then I asked if others helped them in their garden bed. It is necessary to examine how many people are participating in each bed to examine approximately how many people are benefitting from the community garden. I then asked their main reason for participating in the community garden and their familiarity with gardening prior to joining to analyze motivations for community garden participation.

Other questions followed that focused on physical activity in the garden. This included how often they visit the garden, how long they stay when they visit and the physical exertion required for gardening activities (watering, weeding, planting and harvesting). I also evaluated the benefits on diet by asking questions on changes in consumption of fresh fruits and vegetables since participating in the garden. In addition, I asked how often they are able to eat something they grew in the garden. All of these questions helped to determine community gardens' effect on physical health.

A few questions aimed at understanding community cohesion affected by the community garden were also included. I asked what they did with produce they grew in the garden, such as giving it others (friends and family or those in need). I also asked how many people they had met by participating in the community garden. Then I addressed keys and challenges to success. I asked about the importance of leadership in the success of the garden. I also asked gardeners what improvements they would like to see made to the garden as well as what challenges the

gardens faced. Finally, I asked three food knowledge questions. For example, what is the healthiest choice for protein in a meal out of three given choices. These questions are focused at evaluating community gardeners' understanding of what is healthy.

After collecting the data the structured interviews were entered into SPSS for statistical analyses. I then calculated frequencies and cross tabulations to understand the data.

The second aspect of data collection gathered qualitative data that added a narrative to the quantitative data received from the structured interviews. I conducted semi-structured interviews with leadership at seven of the community gardens. The leaders at all 11 gardens, where gardeners had participated in the structured interviews, were invited to participate in the semi-structured interviews and seven participated (Winter Park Towers, Depugh, Mead Botanical Garden, Winter Park Presbyterian, Parramore, Pine Hills Community Center and the University of Central Florida). These interviews included 23 opened ended questions, most with multiple parts, and lasted between 30 minutes and 75 minutes. All but one of the interviews were conducted face to face; the other was conducted over the phone. The interviews were not audio recorded, instead all pertinent information was recorded by hand. Questions included in the semi-structure interviews of community garden leaders were posed to understand the health and social cohesion benefit as well as keys and challenges to success of community gardens.

The interview started off by asking gardeners if they considered themselves a leader of their respective community garden. This was asked to insure that they were in fact a leader of the garden and how they viewed their position. I continued by asking what do you mean by leader, what does being a leader entail, and what does the leadership structure (hierarchy) look

like. These questions allowed me to differentiate between leadership types and styles and benefits of each.

The next set of question asked about the startup of the garden. I first asked how long the garden had been operating and how long they had been a leader of the garden. If it was determined that they had been a leader since the beginning, I asked what their role was in the conception and start of the garden. I then asked if there was any neighborhood resistance or organized opposition to the garden, the main reason the garden was started, if that had changed and if funding or donations of supplies had been received for the startup. These questions were largely focused to examine challenges in starting a community garden as well as motivations that lead to successful startups and if these motivations were sustained. I also asked about the type of wood used in the construction of the beds, as all gardens had at least some beds constructed from woods and for most this was the majority of beds. This question was posed to determine if there were differences between the resources available to gardens in more affluent neighborhoods versus in lower socioeconomic areas.

Other questions were aimed at understanding challenges both financially and systemically. To address financial challenges, I asked if the garden currently received donations of money or supplies, if there was a fee to secure a garden bed and how these monies were used. Other more systemic challenges were examined by simply asking about challenges the garden was currently facing and has faced in the past. In addition, to inquiring about challenges I asked about skill building opportunities that may improve the success of gardeners. I asked whether the community garden ever offered skill building opportunities like speakers or workshops. If they did offer these opportunities, I asked how important they were in the success of the garden.

If any had said they did not offer skill building opportunities, another set of question would have followed. However, all said they had offered some type of skill building opportunity.

Benefits of community gardens to health were addressed using a lengthy set of questions. I started by asking some fairly general questions. For example, I asked what purposes the garden serves to the gardeners and the community in general and their main reason for participating in the garden. I then asked more specific questions. The first set was used to examine the benefit of community gardening on physical activity including how often they visit, how long they stay and gardening as an exercise. The second set was aimed at analyzing community gardens benefits on diet. I asked what types of produce were currently growing and had been grown in the garden in the past, how much this affected their diet and if produce was ever shared with others. Together these two sets of questions allowed me to examine benefits to health by both increased physical activity and improved diet.

Lastly, I asked questions about community in the community garden. I first asked who was allowed to have a garden. For example, was garden participation restricted to residents of a certain neighborhood? I then asked how often gardeners got together in the garden for workdays or social events. Finally, I asked if there was ever any discussion between gardeners of community issues including the community food supply, neighborhood cleanliness, crime, and financial security. All of these questions allowed me to examine community garden benefits on community cohesion and the ability of community gardeners to address other community issues.

After completing the interviews, the hand written data was typed into a Word document. Once all interviews were typed, the data was analyzed qualitatively for similarities and differences in responses to each of the answers to understand the results.

## **TIMELINE**

This thesis received initial IRB approval on October 6, 2011 and data collection began shortly thereafter. This initial IRB approval was just for the structured interviews of community garden members face to face. As the study evolved to include structured interviews conducted via the telephone and semi-structured interviews of community garden leaders, amendments were filed with the IRB. All portions of the study were considered “exempt” by the IRB as all participants were 18 years of age or older, interviews were not audio or video recorded and no identifiable information was collected. Data collection concluded on March 15, 2012. Data collection was a lengthy process as contacting and then securing participants from various community gardens was rather difficult and took repeated attempts.



## RESULTS

### Gardens and Gardeners

During the data collection process I became rather familiar with some of the gardens. In the six months it took to collect the data I visited Winter Park Towers, Winter Park Presbyterian, Depugh, Mead, Pine Hills, Parramore, and UCF community gardens on multiple occasions. At these seven gardens I was also able to interview the leaders. Though I did not visit the Apopka community garden as I was never able to arrange to meet a gardener there, I did complete the interview with several gardeners over the phone, many of them generating in depth discussions. With these interactions I got a very clear picture of these eight gardens and the communities they are a part of. I think it is very important to have an understanding of the context the gardens operate within to clearly comprehend the effect the gardens have on the gardeners and their communities. I discuss this context below. Unfortunately, I was not able to get the clearest picture of Audubon, First Unitarian Church of Orlando and Festival park community gardens. I only talked to one gardener at First Unitarian Church of Orlando and Festival Park and just three gardeners at Audubon and the interviews did not generate much conversation beyond direct responses to the questions.

Winter Park Towers (see Figure 1), Mead (see Figure 2), Depugh (see Figure 3) and Winter Park Presbyterian (see Figure 4) community gardens are all located in Winter Park, Florida. Winter Park is known to be a rather affluent Orlando suburb. The Winter Park community definitely has pockets of large upscale homes, but the majority of the community consists of middle class families. Results of the structured interviews found that in these gardens, the majority of the gardeners were white (29 out of 32) females (25 out of 32). The

average age of the gardeners was 58. Additionally, most of the gardeners had had previous success with gardening. Twenty five of the gardeners reported they were either extremely familiar with gardening or had succeeded at gardening before and wanted to try it again. Only seven were completely new to gardening or had tried before, but failed. The community garden at Winter Park Towers is set up differently than most of the other gardens. Winter Park Towers is a retirement community and the community garden is one activity offered to the residents. As a result the garden is tended more as a group effort. There are five raised beds and then a plethora of plants in pots and several things growing in the ground. Two of the gardeners have two beds each and the other gardeners help take care of the rest of the area. This is different from the other gardens where each gardener (or family) is responsible for their own bed and the gardens are made up almost exclusively of raised beds. For example, at Mead community garden there are 33 beds. Four beds are used to grow produce for Second Harvest Food Bank. Volunteers and children from The Monarch Academy tend these beds. Another two beds are used by the School of Holistic Living for their own purposes. The remaining 27 beds are gardened by individual gardeners or families. Depugh community garden is similar to Mead. There are 21 beds at Depugh. Two are used by the Welbourne Nursery and Kindergarten and two are used by The Gardens at Depugh Nursing Center. The other 15 beds are tended by individual gardeners or their families. Winter Park Presbyterian has 26 beds all gardened by individuals or family.



**Figure 1: Winter Park Towers Community Garden**



**Figure 2: Mead Community Garden**





**Figure 3: Depugh Community Garden**



**Figure 4: Winter Park Presbyterian Community Garden**

Unlike Winter Park, Pine Hills and its community garden (see Figure 5) are located in an area on the western edge of Orlando that is unfortunately known as a poverty stricken neighborhood with higher than usual crime rates. Pine Hills also struggles with food insecurity and limited access to grocery stores. In fact, the USDA has determined Pine Hills to be a food desert (USDA, 2011). Pine Hills fits the USDA's criteria for a food desert which is defined as a "low income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store" (USDA, 2011). This neighborhood's residents are also primarily known to be black which previous research has identified as a risk for food insecurity (Freedman and Bell, 2009). This neighborhood demographic was paralleled in the demographics of the gardeners. The results showed that most of the gardeners were black (four out of five) and female (four out of five) and were approximately 70 years old on average. Four of the gardeners reported they were either extremely familiar with gardening or had succeed at gardening before and wanted to try it again, but one reported having tried before, but failed. This garden is set up very similarly to the other community gardens. It has ten raised beds and each one is gardened by an individual or a family. Additionally, the garden is located at the Pine Hills community center which is a hub of community activities including a senior group and a Head Start school, allowing lots of residents to watch the garden grow.





**Figure 5: Pine Hills Community Garden**



Parramore suffers from many of the same issues as Pine Hills, but to a greater extent. Adjacent to Downtown Orlando, Parramore is known as the poorest community in Orlando and is plagued with crime. Residents suffer from health issues as a result of food insecurity and unavailability which led to the determination of Parramore as a food desert. The Hebini Group (2009) found that residents had limited access to healthy food options, including a lack of full service supermarkets. The food markets that can be found in Parramore have poor quality and limited quantity of the healthier foods available. Instead the neighborhood has an abundance of fast food and convenience stores with unhealthy food options (Hebini, 2009). Similar to Pine Hills, Parramore residents are primarily black which again puts them at greater risk of food insecurity. Accordingly, the majority of the gardeners were also black (seven out of ten). Unlike the gardens previous mentioned the majority of Parramore gardeners were male (seven out of ten). This garden also had slightly younger gardeners that were new to gardening. The average age of the gardeners was 45 and three of the gardeners interviewed were totally new to gardening, while seven were either very familiar with gardening or had succeed before and wanted to do it more. Parramore community garden (see Figure 6) has 19 raised beds two are devoted to Teen Express which works with local high school students to teach them how to live a healthier lifestyle. Additionally, beds are also used by 4-H in conjunction with the Callahan Center (a community center located in the heart of Parramore). The rest of the beds are gardened by individual gardeners. The garden is located on a lot that was previously vacant in central Parramore. It is directly on a well-travelled street allowing passerby's to see the ever changing garden.



**Figure 6: Parramore Community Garden**

The University of Central Florida (UCF) community garden (see Figure 7) has a unique setup. It is run by staff of the UCF Arboretum and is tended by volunteers. The UCF garden is one area with majority of the vegetation growing directly in the ground and the rest in two small raised beds. There is no common area or walk way that separates raised beds which is typical in the other gardens. It is tended as a group effort. On Thursdays and Fridays volunteers come in to help in the garden under the direction of the staff. Volunteers vary on a day to day basis and anyone can come in, though it is primarily UCF students. If there is produce ready to be harvested, volunteers are allowed to take some to enjoy. The University is located on the east side of Orlando, where the vast majority of residents are UCF students. Some areas directly surrounding the campus have known crime problems, but as you get a little further from the university you enter rather nice suburbs like Oviedo and Waterford Lakes. Since the majority of the garden participants were college students the average age reported was the youngest of all the community gardens at 22 years of age. Results revealed that five of the gardeners interviewed were white and two were black. There was a pretty even split between male (four) and female (three) gardeners. However, there was a range in garden knowledge between gardeners. Three of the gardeners were either totally new to gardening or had tried to garden before, but failed and four were either very familiar or had tried at least once before, succeeded and wanted to do it again. The garden is in a secluded location of the UCF campus. Someone would have to know it was there to find it, making it difficult for the garden to impact those that are not directly involved.



**Figure 7: University of Central Florida Community Garden**

As mentioned, I was unable to visit the Apopka community garden. However, being somewhat familiar with the area and having very in depth conversations with the gardeners I did interview by phone, I was able to create a pretty clear picture of the garden and neighborhood. Apopka is a large geographical area and I was told by many participants that within this area there are distinct neighborhoods, one being a nice middle class suburban neighborhood, another area with serious crime problems and residents in visible poverty, and many pockets of rural farmland. The community garden was strategically placed in the lower income area in an effort to improve the neighborhood and provide food access to those residents. However, all the gardeners I spoke with drove from other parts of Apopka and told me the rest of the gardeners did as well. Those really familiar with Apopka may know about these different neighborhoods. However, Apopka is more widely known as an agricultural area. Though this has waned in recent years, the area is still home to many farms. This agricultural background was shown in the results as all five gardeners were either very familiar with gardening or had succeed in the past and wanted more. All the gardeners I spoke with were white. They had an average age of 33 and three were male and two were female.

As I continue to discuss the results of the study these differences between the gardens become very important. Though in a lot of incidences the effects of the community gardens are very similar, sometimes they vary greatly. Knowing the setting and demographics of each particular garden helps to better understand these results. This is especially true in the discussion of a community gardens' effect on diet and food insecurity.

### Diet and Food Insecurity

An important aspect of this study was to examine community gardens' effects on diet. It was also an important part of the startup of most of the gardens. Over half of the leaders reported that the main reason for starting the garden was to help improve the diets of community members. For those that said diet improvement was not the main reason for starting the garden, they said that it was now a goal and a benefit that gardeners enjoyed. Several of the leaders also mentioned that growing vegetables was the main reason they wanted to participate in the garden. This was echoed by the gardeners themselves. The structured interview showed that 39% of gardeners wanted to participate in the garden to grow and learn how to grow fresh produce and it appears the gardens were reaching this goal.

Leaders supplied me with a lengthy list of produce that had been grown in their gardens. This included peanuts, beans, peas, carrots, tomatoes, broccoli, radishes, peppers, eggplant, papaya, lettuces, pineapples, strawberries, dill, squash, cucumber, cauliflower, herbs, corn, onion, okra, sweet potatoes, black/blueberries, collards, spinach, Brussels sprouts, cabbage, leeks, citrus and beets. As the leader of the University of Central Florida community garden put it, "basically anything that can be grown in Florida has been." The gardeners not only grow this wide variety of produce, they eat it on a regular basis, too. On average, gardeners ate something grown in their garden one to three times a week. One in five reported eating something out of the garden on a daily basis.

In addition to providing gardeners the opportunity to grow and eat their own produce, the community gardens also increased the amount of fresh produce in gardener's diets. As previous studies have shown, community gardens can increase the amount of fresh produce that a

gardener consumes (Litt et al., 2011). This was also the case in these Central Florida community gardens. The structured interviews revealed that 64% of the gardeners said that their consumption of fresh vegetables had increased since participating in the community garden. However, only 33% reported an increase in their fresh fruit consumption. Many gardeners noted that their consumption of fruit had not changed because it is rather difficult to grow fruits in a community garden. All other respondents said their consumption of fresh produce had stayed the same and many cited their already healthy diets. These same sentiments were expressed in the leadership interviews. A couple of leaders said that participating in the garden greatly improved their diet while the others said that though participation did not necessarily improve the health of their diet it did have other effects. The Mead community garden President said “[the community garden] challenges me to use things I didn’t use before. We always ate healthy but now we eat things we didn’t use before like Okinawa spinach.” Others mention that community gardening increased their enjoyment of eating healthy foods as they had grown the foods themselves and others noted that they spent less money on produce. While questioning gardeners on changes in their consumption of fresh fruits and vegetables, it became clear that those that chose to participate in the garden already led a healthy lifestyle. Many gardeners mentioned participating in other healthy living activities, eating a variety of healthy foods and being conscious of their health. Community gardeners were most often already healthy individuals looking for opportunities to add enjoyment and another healthy activity to their lifestyle as well as reduce the cost of fruits and vegetables.

Though the community garden did not increase every gardener’s consumption of fresh fruits and vegetables, it did have other clear benefits. It increased enjoyment and reduced cost,



but most notably it increased availability of organic produce. As the USDA (2009) explains, “Organic food is produced without using most conventional pesticides [and] fertilizers made with synthetic ingredients.” All but one garden leader said that chemical pesticides and fertilizers were not allowed in the community garden. Instead gardeners used companion planting and other organic methods to deter pests and composting to create rich soil. The other garden did not allow for use of chemical pesticides on the plants but did use a synthetic fertilizer. Most of the produce grown in community gardens can be considered organic, improving availability of organic produce for the gardeners.

Community gardens did not improve just the diet of the gardeners but of the community as well. The structured interview showed that on average gardeners lived with one or two other adults. It is very likely that these adults also benefited from community garden produce as 69% of the gardeners said that they shared the produce they grew in the community garden with friends and family. In fact, several respondents explained that they cooked the produce for their family at home and also shared it with other family and friends. In addition to sharing it with friends and family, 36% gave extra produce to those in need and every garden leader explained that they shared the produce with at least one organization. At the Winter Park Presbyterian community garden, gardeners were asked to donate 10% of the produce they grew to the church’s food pantry. Mead had just designated four beds that the group would garden and donate all the produce to Second Harvest Food bank. The most interesting story, “the miracle eggplant story,” was told by the leader of Winter Park Towers. She explained that on a regular basis they donated food to the kitchen in the retirement community to be added to the salad bar. However, on one occasion she gave them some eggplants that were placed on top of bar with a



note that said they were from the community garden. By coincidence they happened to be serving a meal containing eggplant that day. Though the recipe did not use the eggplants from the garden (there wasn't enough eggplant to have done so), many residents assumed it did and were more willing to try this healthier meal option. Besides improving the diet of the gardeners, the community gardens inspired healthier eating habits in the community as a whole.

In food insecure neighborhoods and food deserts, the lack of fresh and healthy foods available and residents' reliance on fast food and convenience stores for their dietary needs results in diminished health of residents. Both Parramore and Pine Hills are known food deserts, putting residents of these neighborhoods at great risk for serious health issues (Hebni Nutritional Consultants, Inc., 2009; Neumark-SztLainer et al., 2002; USDA, 2011). The leader of the Parramore community garden even mentioned this, "we are an unhealthy community." In both of these communities health can be positively impacted by increasing the availability of healthy foods, like fresh fruits and vegetables and results of this study showed community gardens are one possible option for improving the food landscape in these neighborhoods.

Though the differences are small, especially based on the sample size, the results show that gardeners in Parramore and Pine Hills were more motivated to participate in the community garden because of their desire to grow and learn to grow fresh vegetables than all gardeners in general (47% compared to 39%). In other words, increasing the availability of fresh foods was a motivating factor for almost half of the community gardeners in these food deserts. Once the gardens began to flourish and better availability was established Parramore and Pine Hills gardeners' consumption of both vegetables (80%) and fruits (47%) were more likely to increase compared to the gardeners overall (64% vegetables and 33% fruits). Additionally, they ate items

out of the garden at a slightly higher rate (4.1) than the average (4.0). These improved results are likely to have a more dramatic benefit on health by reducing residents' reliance on fast food restaurants and convenience stores and improving healthy food availability, indicating that community gardens are a viable solution to food insecurity.

### Physical and Mental Health

In order to understand the effect of community gardens on health, it is important to not only investigate their impact on diet, but on physical activity also. Unfortunately, many of the activities required in the garden were denoted by the gardeners to not be very strenuous. The gardeners on average said that watering, weeding, planting, and harvesting required between a low and moderate level of exertion. Watering required the least amount of exertion, while weeding and planting needed the most. This was discussed further by several of the gardeners. These gardeners and leaders of the gardens explained that starting the beds both at the very beginning and the beginning of each season was the most work. Leveling the ground and building and filling the beds at the startup of the community garden were said to be the most physically demanding, followed by tilling and refilling the beds at the beginning of a new season. Like the Winter Park Presbyterian leader said, "Pushing the wheel barrel takes work and can be tiring!" Although physical activity in the garden is not always strenuous, it is an activity that all but one of the leaders feel is a form of exercise. The Parramore garden leader even said, "People come just for the exercise." However, the leaders also said that it wasn't a sufficient form of exercise. The leaders did not use gardening as their main form of exercise and all of them supplemented it with some other form of exercising, like yoga and walking.

Despite gardening not being a sufficient form of exercise, participating in a community garden clearly has the potential to reduce the likelihood of a sedentary lifestyle. Typically, gardeners visit the garden a few times a week and stay for at least 30 minutes each time. Leaders visit the garden about as frequently as the rest of gardeners (a few times a week), but stay for longer periods of time, usually more than an hour. Spending this amount of time being physically active, strenuous or not, decreases the amount of time available to be sedentary, thus improving health.

In addition to improving physical health, physical activity in the garden can also improve mental health. Even though neither the structured or semi-structured interviews were designed to examine mental health benefits of community gardens, several gardeners and leaders mentioned it. Mental health benefits were typically discussed when I asked about physical activity in the garden. Many gardeners added that the activities were not strenuous and in fact were relaxing and brought them joy. A University of Central Florida garden leader told me how she was often cooped up in an office all day and that participating in the community garden allowed her to get outside and enjoy nature. The Pine Hills leader said, “It brings me joy and peace of mind and it is very relaxing.” The Mead garden leader even specifically said, “It improves my mental health!” This improvement in mental health is largely a result of being physically active in the garden, but also stems from the social and community aspect of the garden. Spending time with others that share the same healthy lifestyle attitude is a positive outlet that seemingly improves mental health.

## Community

The community in community gardens was most obvious in the increased size of each gardener's social network. Results from the structured interview showed that gardeners met on average, approximately 12 neighbors they previously did not know. As discussed above, these relationships often included conversations while in the garden about their interests in living a healthy and sustainable lifestyle. A few gardeners even mentioned that these discussions sometimes resulted in friendships outside of the garden, but this did not seem to be very prevalent. The leader of Winter Park Towers said that there was often a discussion of personal issues, but it did not carry outside of the garden. The UCF leader noted that through interactions in the garden several volunteers began participating in other clubs on campus. Though a sense of community did exist in these community gardens, it was not as strong as some might expect. The majority (six out of seven) of the garden leaders said that there was no discussion of community issues other than sustainability and healthy living. Only a couple of the leaders mentioned social activity in the garden and they noted it was minimal. This was true for all except one garden. Parramore community garden's impact on community cohesion was unique compared to the other gardens in this study.

As mentioned in the garden section, Parramore is a community that struggles with poverty and crime. However, those involved in the community did not appear to struggle with community cohesion. The leader said that interactions in the garden has led to "...friends for life!" He mentioned that they support each other in and out of the garden. He said, "This is a very sharing community. I help people when they need it and they help me." Along with strengthening personal relationships, the community garden has led to gardeners addressing

many other community issues. The leader told me that the gardeners would call each other and go together to community meetings. At these meetings they addressed homelessness, crime, drug and health issues. He said “We make sure that the needs of this community are being addressed by the mayor and commissioner. They are willing to address *known* issues, but expect community members to be a part of the solution.” A clear example of this is the Parramore community garden. The neighborhood was in severe need of a solution to health issues stemming from food insecurity and unavailability. Together residents and community leaders opened the Parramore community garden. The community leaders continued to be supportive of the garden which has resulted in a thriving garden oasis where residents can grow their own healthy foods at a nominal cost. In addition to improving health, the garden has also appeared to reduce crime. The gardeners explained that the area surrounding the garden is much safer as a result of the garden’s creation. Gardeners call the cops if they see crime happening. Plus, it gives even those not involved in the garden a sense of pride in their community (see Figure 8). It is possible for a community to grow plants but also community. Plus, it appeared that stronger community cohesion resulted in better garden success.



**Figure 8: Pride in the Parramore Community Garden**

### Success and Challenges

As a result of both gardener and leadership interviews, several factors that increase the success of the community garden began to appear. Garden leadership and gardener participation seemed to be the most important factors. It was reported by the leaders and gardeners that good leadership was important to the success of the garden. Likewise, waning participation of gardeners was the gardens' biggest challenge.

Four out of five gardeners said that leadership was very important to the success of the garden. The leaders of the garden reported taking on multiple duties. They kept in communication with gardeners, collected fees, allocated fees for garden needs, made sure gardeners were abiding by the garden rules, held meetings and coordinated workshops. They also acted as a liaison between the garden and organization officials that are over the garden. For example, Winter Park Presbyterian and Depugh community gardens are a part of an organization called Our Whole Community. Our Whole Community has partnered with the Winter Park Health Foundation, a not-for-profit organization that sponsors health programs, to create several programs aimed at improving the health of Winter Park residents, like the community gardens. The Winter Park Health foundation gave Our Whole Community a grant to implement and run these programs. Therefore, it was important for the leaders of Winter Park Presbyterian and Depugh community gardens to work with the Our Whole Community officials, especially the treasurer, to get the funds necessary to address garden needs. Several other garden leaders acted as liaisons between the garden and some other organization as well. Parramore community garden worked closely with the City of Orlando and the Orange County Health Department, Mead community garden has to report to Mead Botanical Garden, Winter Park Towers

community garden had a close relationship with the operators of Winter Park Towers, Pine Hills community garden answered to the Pine Hills community center, and the UCF community garden is under the control of the University. A strong positive relationship between the garden and their “parent” organizations and funders greatly improved the success of the garden. For instance, Pine Hills community garden had a great relationship with the community center and as a result the leader of the community center helped the garden secure the funds necessary to install a fence around the garden to deter theft. On the other hand, the UCF community garden lacked support of university officials and as a consequence they have been unable to make desired changes to the garden. As the UCF garden leader explained, The University of Central Florida is a growing school and often looking for ways to expand and as a result university officials feel the UCF community garden takes up valuable real estate. They do not view the community garden as an integral part of the UCF community and on multiple occasions officials have put plans in place to demolish the community garden and build on the site. However, they have had trouble securing the necessary permits to build, for now saving the community garden. Though the UCF community garden lacks support from university officials it does have a large student support network. In fact, a newsletter is regularly sent out on the gardens listserv to nearly 3,000 supporters. As the cultivators of these relationships and in charge of many other important tasks, garden leaders were vital to the success of community gardens.

Great leaders improved the success of the garden; at the same time, ineffective leaders were detrimental to the gardens’ success. The leadership structure varied by garden: some gardens had just one leader, others had a hierarchy (President, Vice President, etc.). Some garden leaders were elected to their positions while others just volunteered. Though the type of



leadership structure did not appear to have a strong relationship with the success of the gardens or their leaders in general, the extensive bureaucracy of one garden's leadership structure did lead to a poor perception of the importance of leadership. Apopka gardeners felt that leaders were much less important than the rest of the gardeners did. After completing the Apopka gardener interviews, it became obvious that this was the result of a negative experience with their current leaders. Several of the gardeners explained that there was a large panel of garden leaders and every action taken in the garden had to be approved by a vote. Leader meetings and voting constantly produced time consuming discussions with little action, leaving the garden largely unchanged and not improving. Alternatively, in gardens with an extremely active and verbal leader, gardeners reported feeling that the leadership was very important. In Pine Hills and Parramore there is a group of leaders (i.e. President, Vice President), but it was clear that the President led the garden and made the important decisions. Out of five gardeners in Pine Hills and ten in Parramore, all said that leadership was very important to the success of the garden. This was also true at the UCF garden where there is just one leader. Clear, effective leadership is obviously important to the success of community gardens.

It is also extremely important to have a high level of gardener participation. Waning participation was a challenge that many gardens had. A third of gardeners reported that lack of participation was a barrier to a more successful garden -- the highest reported barrier to success by far (the second highest was natural barriers, like bugs and the weather, at 11%). Though only one garden reported having any vacant beds, several noted that beds were often neglected. The gardens were able to secure a gardener for each bed at the beginning of the season and collect the

fees for that bed, in fact many gardens even had a waitlist, but by mid season beds would be untended and empty (see Figures 9 and 10).



**Figure 9: Neglected Bed**



**Figure 10: Another Neglected Bed**

In addition to untended beds, participation in skill building activities was minimal and reported by leaders as their biggest challenge. All of the gardens offered some type of skill building opportunity, a speaker, workshop, etc. and the leaders felt these activities were very important to the success of the garden. “We want our gardeners to be successful, it’s why we’re here,” is how one leader put it. Plus, if individual gardeners were successful, it improved the success of the garden as a whole. Unfortunately, leaders struggled to get gardeners to attend these events. Mead community garden offered a skill building activity monthly. I attended two of these events during my data collection process. Out of 33 beds and at least that many gardeners, only a handful attend the activities and it was primarily the same people at both of the activities I attended. Gardens also faced a lack of participation in workdays. Consequently, common areas were often ignored. The way the majority of the gardens are set up with individual garden beds encourages a “my bed, your bed” mentality. As discussed in the garden section, there is little group effort in the maintenance of the garden which was visible on garden work days. I was told by garden leaders that garden work days typically have low attendance and result in leaders being largely responsible for general garden maintenance. Despite difficulties with participation, only a few gardens advertised on a regular basis to encourage community garden involvement (see Figure 10). This is most likely because gardens don’t necessarily have issues getting gardeners to take a bed, but are more challenged with keeping them active. Advertisement and other means of increasing participation need to be investigated to improve the success of community gardens.





Figure 11: Advertisement to Encourage Participation

## CONCLUSIONS

Multiple conclusions can be drawn from this study. First, it is clear that community gardens have several positive impacts. Community gardens improve health by increasing the consumption of fresh produce. This is especially true in food insecure communities and food deserts. Community gardens provide a low cost option for accessing healthy foods, particularly for individuals who otherwise struggle to obtain the food necessary for a healthy diet. Community gardens also improve health by encouraging physical activity. Gardeners are active in the garden several times a week for at 30 minutes each time. This lessens the amount of time they are not being physically activity, reducing the risk of living a sedentary lifestyle. In addition, community gardening improves mental health. Participating in a physical activity with others who also enjoy living a healthy lifestyle is a positive outcome for many of the gardens. It reduces stress and improves mental well-being.

Also, community gardens can improve community cohesion (although not all of them do). Although this study did not show as great an impact on community cohesion as previous studies have, it did show an increase in community cohesion. Gardeners increased their social networks by almost 12 people. Additionally, the impact on the community cohesion in Parramore echoes the findings of Armstrong (2000), which found that the greatest impact on community was in low income neighborhoods where gardening often results in other community issues being addressed.

Finally, though community gardens are extremely popular and largely successful, they still face great challenges. Garden leadership is important to success and the study found that while quality leadership greatly improves the success of the garden, poor leadership can be

detrimental. Furthermore, participation by the all the gardeners is important to a successful community garden as well. Unfortunately, keeping gardeners active, specifically in group events (i.e. workshops and workdays), is difficult and a constant struggle for the leaders. In conclusion, this study found that community gardens had many positive impacts on the gardeners and community, but to have an even greater impact some challenges need to be addressed.



## LIMITATIONS

One limitation was that not all the community gardens in Orange County, FL were included. Several gardens were not included as I was unable to make contact with the leader of those gardens. Additionally, all the gardens included in the study were not equally represented. Many gardens were well represented in the gardener and leadership interviews, while others were only minimally represented. For instance, Mead had 14 gardeners participate and the President was also interviewed, compared to, say, Festival Park where only one gardener participated and the leader was not interviewed. Though comparison between the gardens that were well represented was possible, it was not possible to include Audubon Park, Festival Park and First Unitarian Church of Orlando community gardens in these comparisons.

Another limitation was the lack of strong quantitative measures of changes in diet. As this was a cross sectional study of the impact after the implementation of the community garden program, it did not allow for a specified evaluation of the amount of fruits and vegetables consumed before and after participating in the garden. However, in any study this would be difficult to assess. It would require identifying community garden participants before they chose to participate. It would also require study participants to be highly active in the research and keep detailed logs of their food consumption over a period of time both before and after joining the community garden. Instead this study simply asked if the gardener felt their consumption of fruits and vegetables had increased, decreased or stayed about the same.

A third limitation, was neglecting to inquire about the effects of community gardens on mental health. The aspect of improved mental health as a result of participating in the community garden was not included in the gardener or leadership interviews. Yet, it was a

theme that arose, especially when interviewing garden leaders. Mental health definitely needs to be included in future evaluations of community gardens' effect on health.

## **IMPLICATIONS AND FUTURE RESEARCH**

Winter Park Health Foundation has already agreed to use the information gathered through this thesis to evaluate the community gardens they support. Additionally, many community leaders have expressed interest in reading this thesis, for example, the Pine Hills community center director as well as others involved in the community garden movement. Therefore, it is possible that this thesis will encourage support for community garden programs and assistance in addressing community garden challenges.

A very clear implication can be drawn from this research. Community gardens should be encouraged in food insecure areas, especially those known to be food deserts. Previous research has shown that residents in low income neighborhoods without access to supermarkets are at higher risk for severe health issues, like obesity and high blood pressure (Neumark-SztLainer et al., 2002). However, this study showed that community gardens provide low cost and easily accessible healthy foods. It also showed that community gardens promote healthy lifestyles including increased physical activity and consumption of healthy foods, both of which help to reduce the risk of obesity and high blood pressure. It is possible that community gardens could improve food insecurity rates and reduce the health risks of residents of food deserts. Additionally, individuals and families that rely heavily on processed typically unhealthy foods and live sedentary lifestyles should be encouraged to participate in community gardens. This research showed that community gardens have positive impacts on health, despite the fact that the gardeners were largely already healthy individuals. Therefore, if community gardens were more widely available in food insecure neighborhoods and specifically promoted to unhealthy individuals the health impacts could be even greater.

Another implication that can be drawn is the need to address issues community gardens face. The research showed that waning participation and quality leadership clearly impact the success of the garden. However, there is lack of research on the keys to success and challenges gardens face. In the future, research should focus on what makes some gardens more successful than others, what challenges the community gardens must overcome, what causes these problems and possible solutions. This thesis identified challenges but it failed to examine the causes of these problems and ways to prevent the problems from happening or solutions once they occur. Research on community gardens has become increasingly popular. However, just like in this study better quantitative data is needed to strengthen the conclusions drawn from the research and a focus on garden challenges would increase the success of community gardens.

## **APPENDIX A: IRB APPROVAL LETTER**



University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

### Approval of Exempt Human Research

From: UCF Institutional Review Board #1  
FWA00000351, IRB00001138

To: Brittany M. Hanson

Date: October 06, 2011

Dear Researcher:

On 10/6/2011, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination  
Project Title: Central Florida Community Garden Study  
Investigator: Brittany M. Hanson  
IRB Number: SBE-11-07921  
Funding Agency:  
Grant Title:  
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 10/06/2011 03:24:13 PM EDT

IRB Coordinator

## **APPENDIX B: STRUCTURED INTERVIEW QUESTIONNAIRE**

Community Gardener Structured Interview

Demographics

- 1. Gender:       Male       Female
  
- 2. Race:       White       Black       Asian       Other: \_\_\_\_\_
- 3. Latino/Hispanic:       Yes       No
  
- 4. Age: \_\_\_\_\_
  
- 5. Family Composition:
  - Number of Children (6 and under) \_\_\_\_\_
  - Number of Children (7 - 12) \_\_\_\_\_
  - Number of Children (13 - 17) \_\_\_\_\_
  - Number of Adults (18 - 64) \_\_\_\_\_
  - Number of Adults (65 and over) \_\_\_\_\_

Gardening

- 6. Which community garden do you participate in? \_\_\_\_\_
  
- 7. How many others help you in your garden bed?
  - How many Children (6 and under)? \_\_\_\_\_
  - How many Children (7 - 12)? \_\_\_\_\_
  - How many Children (13 - 17)? \_\_\_\_\_
  - How many Adults (18 - 64)? \_\_\_\_\_
  - How many Adults (65 and over)? \_\_\_\_\_
  
- 8. What is the MAIN reason you decided to participate in this community garden? (Select One)
  - To save money on food       To learn how to grow fresh, seasonal vegetables
  - To teach my children how to garden       To support locally grown food and a sustainable lifestyle
  - To become more physically active       To meet and interact with neighbors
  - Other (please specify): \_\_\_\_\_
  
- 9. How familiar with gardening were you when you started?
  - Totally new       Tried before, but failed
  - Succeeded, enjoyed it, wanted more       Very familiar (grew up with it, did it at home multiple seasons, etc.)
  
- 10. On average, how often do you visit your garden bed?
  - Daily       Weekly       Monthly       Other (please specify): \_\_\_\_\_
  
- 11. How long do you spend at the garden during a routine visit?
  - Less than 15 minutes       15 to 30 minutes       More than 30 minutes
  
- 12. Since participating in the garden, has your consumption of fresh vegetables...
  - Increased       Decreased       Stayed the same
  
- 13. Since participating in the garden, has your consumption of fresh fruits...
  - Increased       Decreased       Stayed the same



Community Gardener Structured Interview

14. Rate the level of exertion (how hard you work) during each activity? (Circle one response for each activity)

Watering	Low Level (resting heart rate)	Moderate Level (some activity)	High Level (intense, prolonged activity)
Weeding	Low Level (resting heart rate)	Moderate Level (some activity)	High Level (intense, prolonged activity)
Planting	Low Level (resting heart rate)	Moderate Level (some activity)	High Level (intense, prolonged activity)
Harvesting	Low Level (resting heart rate)	Moderate Level (some activity)	High Level (intense, prolonged activity)

15. How often do you eat something you grew in your garden?

- Daily                       4-7 times per week                       1-3 times per week  
 Once Every other week                       One a Month                       Less than once a month

16. What do you do with the produce you grow in your garden? (please select all that apply)

- Cook/eat it at harvest                       Preserve it                       Give it to friends/family  
 Give it to those in need                       Other (please specify): \_\_\_\_\_  
 Sell it for money

17. How many neighbors did you know BEFORE participating in the garden (please specify a number)? \_\_\_\_\_

18. How many neighbors did you know AFTER participating in the garden (please specify a number)? \_\_\_\_\_

19. Rate your neighborhood on the following qualities: (Circle one response for each quality)

Safe	Very	Somewhat	Not
Friendly	Very	Somewhat	Not
Involved in community-based activities	Very	Somewhat	Not
Clean	Very	Somewhat	Not

20. Are you in a leadership position within your garden?

- Yes     Not currently, but have been  
 No, not yet                                       No, not interested

21. How important is the leadership in the success of the garden?

Very Important	Somewhat Important	Not very Important
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### Community Gardener Structured Interview

22. What are some improvements you would like to see made to your garden?

23. What are some challenges facing your garden? Barriers to success?

### Food Knowledge

*This is a survey, not a test. Your answers will help identify, which dietary advice people find confusing.*

24. Which option is the healthiest choice for protein in a meal?

- An hamburger patty       A ripe banana       A grilled chicken breast

25. Which option is the healthiest choice for a dessert?

- 1 chocolate pudding cup       1 slice apple pie       1 bowl low fat ice cream

26. Which do you think is the healthiest choice for a snack between meals?

- One serving size of potato chips       ¼ avocado       An apple

## **APPENDIX C: SEMI-STRUCTURED INTERVIEW SCHEDULE**

Leadership Semi-Structured Interview

Garden they are the leader of: \_\_\_\_\_

1. Do you consider yourself a leader of the garden?
  - a. What do you mean you by leader?
  - b. What does being a leader entail? What is your role in the garden on a day to day basis?
  - c. What does the garden leadership structure look like? Is there a hierarchy? Who are the other leaders and what are their positions?
2. How long has the garden been operating?
  - a. How long have you been a leader of the garden?
3. If they have been a leader since the beginning ask... what was your role in the conception and start of the garden?
4. Was there any neighborhood resistance or organized opposition to the garden (i.e. zoning issues)?
5. What was the main reason to start the garden?
  - a. Has this changed?
6. Currently, what purposes does the garden serve to the gardeners and the community?
7. What is the main reason YOU wanted to participate in the garden?
8. Did you receive any funding for the startup of this community garden?
  - a. Did/Do you receive any donations of money or supplies?
9. Who is allowed to have a garden bed?
10. Is there a fee? If so, how much?
  - a. What does the fee go to?

#### Leadership Semi-Structured Interview

11. Does the garden advertise?
12. What type of wood was used in the construction of the beds?
13. Does the garden allow the use of pesticides (chemicals to discourage weeds and pests)?
14. What challenges has the garden faced?
  - a. What challenges is it currently facing?
15. How often do you visit the garden?
  - a. How long do you stay?
16. Do you use gardening as a form of exercise?
  - a. Is this your main form of exercise?
  - b. Do you feel gardening is a sufficient form of exercise?
  - c. Do you participate in any other forms of exercise?
17. What type of produce has the garden grown in the past?
  - a. Currently, what type of produce is the garden growing?
18. How often are you able to eat something that was grown in the garden?
  - a. How much has this affected your diet?
19. Do you ever share produce from your garden with others?
  - a. Who do you share with?
20. Does the garden ever have skill building opportunities?
  - a. Speakers
  - b. Workshops
  - c. YES – How important are these activities to the success of the garden?
  - d. NO – Would you like to provide skill building opportunities?

Leadership Semi-Structured Interview

i. YES – What is keeping you from doing so?

ii. NO – Why not?

21. How often do gardeners get together in the garden?

a. Does the garden ever have work days?

b. Do gardeners ever get together for social events?

22. Is there ever any discussion between gardeners of community issues?

a. Community food supply

b. Neighborhood cleanliness

c. Crime

d. Financial security

23. Are there any farmer's markets in the community?

a. Do gardeners attend?

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