

COMMUNITY GARDENS: GROWING CONTROL FOR
WOMEN EXPERIENCING FOOD INSECURITY
IN FOOD DESERTS

A DISSERTATION

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DEDICATION

For my grandparents, Roy and Sally Schonberger, and Austin and Amy O'Donnell. And for my parents, James and Joyce O'Donnell. You taught me to love and care for living things. You taught me how to care for myself. I am forever in gratitude for all you have given me.

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ABSTRACT

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COMMUNITY GARDENS: GROWING CONTROL FOR WOMEN EXPERIENCING FOOD INSECURITY IN FOOD DESERTS

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Food is a basic requirement of human life. More than 23 million people in the United States (U. S.) find it difficult to shop for food because they live in food deserts (United States Department of Agriculture, Agricultural Marketing Service, 2012). In 2010, it is estimated that 14.5% of households in the U.S, experienced low food security (Coleman-Jensen, Nord, Andrews, & Carlson, 2011). Those who live with food insecurity may be at risk for poor nutrition which affects physical and mental health outcomes throughout the lifespan (Cook & Frank, 2008). Some food insecure families may participate in community gardening as a means of supplementing meager food budgets (Lawson, 2005). Community gardening offers several benefits in addition to additional food for the gardeners including improved physical and mental health (Pretty, Peacock, Sellens, & Griffin, 2005), improved relationships with family members and community members (Patel, 1994), and beautification of blighted areas (Lawson). The two stage model of control explains how humans use primary and secondary control to make changes in their environment and to the self. These processes explain how humans act to change their environments as well as the cognitive processes used to make sense of their actions (Heckhausen & Schulz, 1995). This investigator conducted a qualitative study examining

seven food insecure women living in food deserts who participated in community gardening. Participants reported that gardening improved their diets during the gardening season due to an abundance of fresh produce. Participants also reported that their diets were improved during the off season. Participants noted improvements in mental health due to decreased worry about available food, increased self-esteem, and the therapeutic effects of gardening. Participants cited improved physical health as the result of improved nutrition and increased exercise. Family and community relationships were improved as the result of gardening. Perceptions of control were enhanced by community gardening. Implications of these results for theory, research, practice, and policy are discussed.

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CHAPTER I

INTRODUCTION

In the second decade of the 21st century, the topic of feeding poor people and hungry people has been front-page news. In December of 2011, a desperate mother shot and killed herself and her two children in a Laredo, Texas Health and Human Services office when she was denied food assistance several months after her initial application (Conger, 2011). In January of 2012, Newt Gingrich, in his campaign for the 2012 Republican Party presidential nomination, stated that rather than asking for food stamps, African Americans should demand jobs (Green, 2012). Weeks later, when speaking about welfare reform, Minnesota state representative Mary Franson compared food stamp users to wild animals in national parks who grow dependent on hand-outs (Brooks, 2012). Phoenix, Arizona mayor, Greg Stanton lived for one week on a food stamp budget to experience what it is like for more than one million food stamp users in Arizona who have little more than \$4 per day for food per family member (Kavoussi, 2012). The issue of feeding hungry people in the United States (U. S.) appears to be daily fodder for newspapers, blogs, and television newspapers.

Overview of Food Insecurity Issues

More than 23 million people in the U. S. find it difficult to shop for food because they live in food deserts (United States Department of Agriculture, Agricultural Marketing Service, 2012). A food desert was defined in H.R. 2419 (110th) : Food,

Conservation, and Energy Act of 2008, § 7527 as an “area in the U. S. with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities” (p. 389). Location of food deserts is affected by neighborhood socioeconomic characteristics, personal and household socioeconomic status, racial segregation, transportation infrastructure, and rurality (Ver Ploeg et al., 2009). The difficulty in obtaining food that is experienced by people who live in food deserts may have a significant negative effect on the health of those living in food deserts (Andreyeva, Blumenthal, Schwartz, Long, & Brownell, 2008).

It is most useful to examine food deserts in terms of three factors: accessibility, availability, and affordability (Sharkey, 2009; Ver Ploeg et al., 2009). Access has clearly been affected by shifting populations in urban areas. Following World War II, many White families left cities for the suburbs, creating a clear demarcation by race and class (Eisenhauer, 2001). As wealthier White residents left cities, supermarkets followed them to the more profitable suburbs, closing supermarkets in the urban core of cities (Bennet, 1992; Eisenhauer; Turque, Rosenberg, & Barrett, 1992). The closing of inner-city supermarkets has created a void for urban residents who must rely on smaller, independent grocers or convenience stores for many of their grocery needs (Cotterill & Franklin, 1995; Eisenhauer). The people who remain in urban areas are more likely to be ethnic or racial minorities and of low socioeconomic status (Jargowsky, 1997; Morland, Wing, Diez Roux, & Poole, 2002). Residents of primarily Black low-income

neighborhoods are less likely to have supermarkets in their neighborhoods than are primarily White neighborhoods (Morland et al., 2001; Powell, Chaloupka, & Bao, 2007; Shaffer, 2002).

Access to supermarkets and grocery stores can be difficult for urban dwellers who lack automobiles. Crumbling or non-existent sidewalks; empty, deteriorating buildings; and dangerous crosswalks can make traveling by foot difficult for parents with children, for elderly people, or those who rely on mobility devices (Bostock, 2001; Coveney & O'Dwyer, 2009; Ver Ploeg et al, 2009; Whelan, Wrigley, Warm, & Cannings, 2002). Crime and the threat of violence prevents many residents from walking to stores for groceries (Bostock; Neckerman, Bader, Purciel, & Yousefzadeh, 2009). In some areas, lack of public transportation or unreliable public transportation prevents residents from traveling out of their neighborhoods to supermarkets in other areas (Coveney & O'Dwyer, 2009).

Although one might associate rural America with an abundance of food, 98% of food desert areas are in non-urban areas (Morton & Blanchard, 2007). Rural populations declined during the 20th century as farming became more mechanized. More young people have left their rural roots for employment in cities (Irwin, Isserman, Kilkenny, & Partridge, 2010). Population loss has been greatest in a band of states in the Midwest and Corn Belt states with significant loss in Iowa, Nebraska, Kansas, North Dakota, and South Dakota. Other states that have several counties with more than 10% population loss are in the Mississippi Delta and parts of northern Appalachia (Mackun & Wilson, 2011). As

companies shift production to overseas plants, loss of manufacturing jobs in some rural areas has led to significant population loss (Glasmeier & Salant, 2006; Johnson, 2011). Declining population in many rural towns has led to the closing of the supermarkets and stores that have served those towns for generations (Bailey, 2010). Food shoppers in rural areas are more likely to have a convenience store than a grocery store in their town for food shopping (Liese, Weis, Pluto, Smith, & Lawson, 2007). Those without personal transportation have very little access to food that would contribute to a healthy diet (Bitto, Morton, Oakland, & Sand, 2003).

The availability of nutritious food is problematic for many food desert residents. Many low-income residents living in food deserts find that the healthy food choices available to them in their local small grocery stores is inadequate (Jetter & Cassady, 2006). Fresh fruit and vegetables are substantially less likely to be found in small markets. Some small markets lack adequate refrigeration or air conditioning which severely limits the quantities of fresh produce they can offer (Hendrickson, Smith, & Eikenberry, 2006). Shoppers in food deserts are less likely find fresh meat or dairy products, particularly low-fat versions of these foods (Jetter & Cassady).

Affordability is closely tied with accessibility and availability when considering challenges for those living in food deserts. A majority of research indicates that those living in poor neighborhoods pay more for food than do people living in suburban neighborhoods (Alwitt & Donely, 1997; Blanchard & Lyson, 2002; Chung & Myers, 1999; Hendrickson, Smith, & Eikenberry, 2006; Kaufman, MacDonald, Lutz, &

Smallwood, 1997; Talukdar, 2008). Food stores in food deserts tend to be small, independently-owned grocery stores that lack the economies of scale available to supermarkets and super-centers (Alwitt & Donely; Blanchard & Lyson; Ver Ploeg et al, 2009). Because the numbers of food stores in food deserts is so limited, little incentive exists for stores to reduce prices to gain a competitive edge (Smith & Morton, 2009).

Food insecurity is a concept closely connected to food deserts. Although one need not be of low socioeconomic status to live in a food desert, many who live in food deserts are also food insecure due to lack of financial resources. In the year 2010, it is estimated that 14.5% of households in the U. S. experienced low food security (Coleman-Jensen et al., 2011 Food insecurity is a condition in which “[h]ouseholds are considered food insecure when their lack of financial resources does not allow them to fully meet their basic food needs at all times” (USDA, Food and Nutrition Services 2012a, p.5).

Approximately 40% of households with income levels below the federal poverty line are considered to be food insecure. The majority of households experiencing food insecurity are those with children (Coleman-Jensen et al.).

The Supplemental Nutrition Assistance Plan (SNAP), Women, Infants’ and Children program (WIC), and the National School Lunch Program (NSLP) are federally supported nutrition programs that are available for individuals and families who struggle to meet their nutritional needs (Coleman-Jensen et al., 2011). The SNAP program has been existence for four decades. In 2011 the program provided food for 45 million people in the U. S. each month (USDA, Food and Nutrition Services, 2012a). SNAP benefits

the working poor as well as those who are unemployed, disabled or elderly; 40% of SNAP recipients are employed (Palmer, 2012). WIC programs provide important supplemental nutrition to pregnant, post-natal and nursing mothers, and their children up to age 5 (Fox, Hamilton & Lin, 2004). As well as financial support for better nutrition, participants in the WIC program receive nutritional guidance and health care referrals (Devaney, 2007). This program is important for many families because children who live in very low-income families are susceptible to malnutrition during the critical prenatal period, infancy, and preschool developmental periods which puts their physical and cognitive development at risk (Fox et al.). The NSLP is in operation in more than 100,000 schools and child care facilities in the U. S. Over 31 million children are served each day (USDA, Food and Nutrition service, 2012b). The NSLP is integral for the food intake of many children in the U. S. The NSLP offers free or reduced prices for lunch and breakfast for children who are eligible for SNAP benefits (USDA, Economic Resource Service, 2012b). For many children, the meals they eat at school will be the only meals available to them that day. For other children, school lunch programs will provide half of the calories eaten in a day (Letsmove.gov, n.d.). Approximately 60% of food insecure households in one survey reported that they had used the services of one these programs in the past month (Coleman-Jensen, et al.).

Many families find that their food budget is inadequate. Food insecure families may need to use food pantries, borrow food from neighbors or family (Morton, Bitto, Oakland, & Sand, 2008), or hunt for food in more rural areas (Walker, Keane, & Burke,

2010). Some food insecure families may need to resort to less socially acceptable means of food acquisition such as stealing (Hamelin, Habicht, & Beaudry, 1999), dumpster diving (Winne, 2008), eating food that has been discarded by others (Anater, McWilliams, & Latkin, 2011), finding roadkill, going to grocery stores for free food samples (Anater, McWilliams, & Latkin; Kempson, Keenan, Sadani, Ridlen, & Rosato, 2002), or eating non-food items such as paper or pet food (Walker et al.). Food insecure families may eat foods that have begun to rot, have become infested with insects or rodents, or they may extend foods such as milk or formula by adding water (Anater et al., 2002; Tarasuk, 2001b). These practices may put the health of food insecure people at risk, particularly the very old and very young members of the family.

Those who live with food insecurity may be at risk for poor nutrition which affects physical and mental health outcomes throughout the lifespan (Cook & Frank, 2008). Because food insecure people are likely to live in neighborhoods where a number of other factors such as poverty, crime, and violence may affect them, it is sometimes difficult to tease apart environmental factors and nutritional factors regarding health effects (Pachter, Auinger, Palmer, & Weitzman, 2006). Food insecure women are more likely to deliver low birth-weight or pre-term babies (Tanner & Finn-Stevenson, 2002), or babies with neural tube defects (Kirkpatrick & Tarasuk, 2008). Iron deficiencies, common in women and infants who lack insufficient nutrition (Rose-Jacobs et al, 2008), have been correlated with lower IQ scores in children (Lozoff et al., 2006). Infants in food insecure households are at risk for developing failure to thrive (FTT) syndrome

which is defined as weight for age that falls in the 5th percentile or loss of weight or slowed growth that crosses two percentiles (Cole & Lanham, 2011). Food insecure infants and toddlers are at a 2/3 greater risk for developmental problems than infants and toddlers in food secure households (Rose-Jacobs et al.).

Several studies have linked food insecurity and hunger to educational and emotional problems in school-aged children. Food insecure children and adolescents have been found to have significantly lower scores on standardized tests and have a greater likelihood of repeating a grade (Alaimo, Olson, & Frongillo, 2001). Anxiety rates in children who are food insecure have been found to be markedly higher than in food secure children (Kleinman et al., 1998; Slack & Yoo, 2005; Weinreb et al., 2002). Behaviors such as hyperactivity and aggression have been correlated with food insecurity in children even when other factors of poverty are controlled (Slack & Yoo). Adolescents who experience food insecurity are at significantly greater risk for symptoms of dysthymia and are significantly more likely than food secure adolescents to report symptoms that increase suicide risks (Alaimo, Olson, & Frongillo, 2002).

A number of studies have linked household food insecurity to poor physical health in adults (Gucciardi, Vogt, DeMelo & Stewart, 2009; Hamelin et al. , 1999; Olson, 1999; Siefert, Heflin, Corcoran, & Williams, 2001; Stuff et al., 2004; Tarasuk, 2001b; Vozoris & Tarasuk, 2003). Hypertension has been found to be significantly more likely for adults in food insecure households (Seligman, Laraia, & Kushell, 2010; Vozoris & Tarasuk). Food insecure adults also report higher levels of heart disease (Vozoris &

Tarasuk). High rates of diabetes have been reported among food insecure adults (Vozoris & Tarasuk). Single, food insecure mothers are significantly more likely to be overweight than are food insecure women without children (Martin & Lippert, 2011).

Food insecurity has also been associated with poorer mental health (Huddleston-Casas, Charnigo, & Simmons, 2009; Siefert et al., 2001; Tarasuk, 2001a; Vozoris & Tarasuk, 2003). Levels of unemployment, stressful life circumstances, domestic violence, and sex and racial discrimination are significantly higher in women who are food insecure (Siefert, et al.). Food insecure adults are significantly more likely to report symptoms of distress, depression (Siefert et al.; Vozoris & Tarasuk), and generalized anxiety disorder (Siefert et al.). Fear of losing their children due to an inability to provide adequate nutrition (Hamelin et al., 1999) and a loss of social support (Hamelin et al.; Wiig, Dammann, & Smith, 2009) contribute additional stress to the lives of food insecure women.

Food insecurity numbers appear to be somewhat lower for America's elderly population, but it appears that the numbers are growing (Ziliak & Gunderson, 2012). Elderly people may experience food insecurity in a different manner than younger populations. Elderly individuals may experience food insecurity due to the inability to shop for groceries due to physical frailty or infirmity (Wolfe, Olson, Kendall, & Frongillo, 1996). Others may find it difficult to stand long enough to prepare a meal for themselves, or use kitchen utensils such as knives or can openers due to arthritis (Wolfe, et al). Heating and cooling costs are more likely to affect the budgets of elderly people

than those of younger families (Nord & Kantor, 2006), causing them to sacrifice food for heat or air conditioning.

Community Gardening: A Potential Source of Assistance for Food Insecurity Issues

Gardening has been a means of providing fresh food and supplementing the food budget of many families (Lawson, 2005). Community gardens have been established in times of war and economic depression to provide food for hungry families and military personnel (Brown & Jameton, 2000; Hayden-Smith, 2006; Lawson). During the 1970s, community gardening gained popularity in blighted inner city areas as a means of providing food for residents and beautifying cities (Lawson; Schmelzkopf, 1995).

Community gardening is likely to improve the health of participants. Community gardening participants are 3.5 times more likely than non-participants to eat at least five servings of fruits and vegetables on a daily basis (Alaimo, Packnett, Miles, & Kruger, 2008). Children are more likely to eat a wider variety of fruits and vegetables when they participate in growing a garden (Lineberger & Zajicek, 2000). Gardening may increase levels of activity which has been correlated with lowered levels of cardiovascular disease, diabetes, cancer, hypertension, osteoporosis, and premature death (Warburton, Nichol, & Bredin, 2006). Blood pressure is lowered more significantly when engaging in physical activity in pleasant, green surroundings (Pretty et al., 2005).

Community gardening appears to affect the well-being of those who participate. Participants report improved relationships with children and other youth in the neighborhood (Teig et al, 2009; Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007).

Many gardeners report increased contact and trust with neighbors (Baker, 2004; Patel, 1994). Others report increased feelings of competency and pride in learning new things (Kingsley, Townsend, & Henderson-Wilson, 2009; Wakefield et al, 2007). The increased contact with neighbors when combined with improved self-esteem has led some community gardeners to band together to petition for improvements in their neighborhoods (Armstrong, 2000; Glover, 2003).

Two Stage Model of Control

Improved feelings of well-being and self-esteem may lead to improved feelings of control for people who live in food deserts and are food insecure. Community gardening allows people to have more control in their food choices, how they choose to share their food, and how they interact with others in the neighborhood. It may be safe to assume that most humans desire to have some level of control over their environments. A number of models have been proposed to explain how control is exerted in one's environment (Brandtstadter & Renner, 1990; Folkman, Lazarus, Dunkle-Shetter, DeLongis, & Gruen, 1986; Holahan & Moos, 1987). Control theories primarily seek to explain what steps humans must take to produce actions that affect their environments or manage the cognitions and emotions that arise as a result of living in their environments (Heckhausen & Schulz, 1995).

A theory of control by Rothbaum, Weisz, and Snyder (1982) contends that one's perception of control is based on a two-process construct that consists of primary and secondary control. Primary control is used to change the environment to suit an

individual's needs, while secondary control is used to adapt the individual to the environment. Heckhausen and Schulz (1995) observed that primary control can be considered control that is directed outward, while secondary control is directed inward. They state that primary control may be considered action, while secondary control is cognition. However, the two processes are intimately intertwined and difficult to tease apart. In order to engage in action, individuals must first have cognitions about the things they desire to change and plan how they will act. Having acted to make change, individuals must think about what they have done and gauge the effectiveness of their actions.

Not all attempts at primary control will be successful. Secondary control is therefore necessary to make sense of the failure and assuage damaged self-esteem. The cognitive processes involved in secondary control will help individuals assess the failure of their attempts at primary control and repair faulty logic or execution of their plans (Heckhausen & Schulz, 1995). Through their cognitions, they will be better equipped to make choices about how to best direct their efforts. Therefore, cognition initiates the motivation to attempt new actions through using primary control (Heckhausen & Schulz).

Purpose of the Study

People living in food deserts who are food insecure may not feel as though they have many choices or much control in their lives. Some people living in food deserts who are food insecure have been motivated to engage in community gardening to increase the amount of food that is available to them and their families. In doing so they may reduce

hunger, improve mental and physical health, and build better community relationships.

This researcher investigated how engaging in community gardening affected the participants' perceptions of control in their lives and how that changed the ways in which they ate, their relationships with others, and their physical and mental health.

CHAPTER II
REVIEW OF THE LITERATURE

Introduction

This review will cover food deserts, including a definition; an analysis of sociodemographic characteristics of those living in food deserts; an explanation of how food deserts came to be; and discussion of how those living in a food desert are affected. The review will also discuss food insecurity, the populations most likely to experience food insecurity, and food insecurity's effect on mental and physical health. A history of community gardening is included as well as an exploration of the benefits of community gardens to individual gardeners and their communities. Following this, information regarding the two-stage model of control will be presented. The literature review concludes with a summary and rationale for the study, as well as the primary research questions posed.

Food Deserts

Although the term *food desert* appears frequently in literature and most writers share a broad definition of the term, it seems that there is not a specific operational definition for the term. The term food desert appears to have been first used in the United Kingdom (U.K.) in 1995 in a government document in which the authors of a governmental report acknowledged that where one lives can affect access to healthy foods (Cummins & Macintyre, 2006; Wrigley, 2002). A food desert was defined in H.R.

2419 (110th) : Food, Conservation, and Energy Act of 2008, § 7527 (hereafter referred to as the 2008 Farm Bill) as an “area in the U. S. with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities” (p. 389). Results of a study conducted by the USDA indicate that neighborhood socioeconomic characteristics, personal and household socioeconomic status, racial segregation, transportation infrastructure, and rurality are factors that strongly predict low access to healthy and affordable foods (Ver Ploeg et al., 2009). The 2008 Farm Bill authorized a study and report of factors related to food deserts such as the “prevalence of food deserts” (p. 389), causes and characteristics of food deserts, how people living in food deserts are affected by limited access to healthy foods, and recommendations for remediating the causes of food deserts and the effects on those living in such areas (p. 389).

Results of a study of census tracts in the U. S. that was conducted by the Economic Research Service, a branch of the USDA (2012a), show that 6,529 census tracts in the continental U. S. meet the criteria. Results indicate that 13.6 million people have low access to a supermarket or large grocery store. Nationwide, 418 counties in the U. S. fit the food desert criteria. Of these counties, nearly 98% are in non-metropolitan areas and most exist in counties dotted with small cities and small towns with populations of fewer than 10,000 people (Morton & Blanchard, 2007).

As Adams, Ulrich, and Coleman (2010) observed, although the problem of food deserts has been studied by scholars in a number of disciplines, constructs, definitions

and methods of measurement vary widely. In a meta-analysis of food desert studies, Beaulac, Kristjansson, and Cummins (2009) concluded that the studies they reviewed primarily dealt with a lack of accessibility to healthy and affordable food. Overall, it appears that most examinations of food deserts study accessibility, availability, and affordability of healthy foods (e.g., Sharkey, 2009; Ver Ploeg et al., 2009).

Access

During the last half of the 20th century, social changes affected the food landscape for many urban dwellers. At the end of World War II many families left cities for new homes in the suburbs. This retreat from urban areas was made primarily by White residents. Throughout the latter half of the century, the separation of urban and suburban populations by race and class continued (Eisenhauer, 2001). White residents fled the city for the suburbs and the supermarkets followed (Bennett, 1992). Some corporations, having anticipated this population movement, purchased large tracts of land with ample room for large stores and parking lots and simply waited for the housing development to follow. Whereas many of the stores in inner-city areas tended to be small, family-owned stores, corporate ownership of suburban supermarkets along with ample space allowed these stores to offer a wider range of goods to shoppers (Eisenhauer). The wide-open spaces of the suburbs and exurbs allowed room to unload large trucks that carried large quantities of grocery stock (Pothukuchi, 2005). Intense competition between supermarkets led the reduced prices for goods in the stores (Eisehhauer).

In the 1970s, remaining inner-city supermarkets began to close their doors (Bennet, 1992; Eisenhauer, 2001; Turque et al.,1992), leaving behind empty stores and a void of opportunities to purchase fresh produce and meat for neighborhood residents. Industry representatives explained that it was too expensive to maintain urban stores citing low profit margins on perishables, theft, and higher utility and labor costs (Eisenhauer). This trend continued throughout the 1980s and 1990s. A 1995 study of 21 metropolitan areas revealed that the wealthiest 20% of neighborhoods had 44% more supermarket space than the poorest 20% of neighborhoods (Cotterill & Franklin, 1995).

During a period from the 1970s to the 1990s the poverty rates of inner-city urban residents increased and high rates of poverty were concentrated in particular neighborhoods (Jargowsky, 1997). The level of wealth in a neighborhood is closely correlated with the ethnicity of the neighborhood. In a study of four metropolitan areas, the numbers of Black residents in lowest wealth areas were more than eight times the number of Black residents living in the highest wealth areas (Morland, Wing, Diez Roux, & Poole, 2002).

Poverty rates in metropolitan areas vary widely. The highest rate of poverty in the U. S. is 35.2% in the Brownsville-Harlingen area of Texas. The metropolitan area with the lowest rate of poverty is the San Jose-Sunnyvale-Santa Clara, California area, with a poverty rate of 8.7%. Poverty rates for Black and Hispanic residents of the U. S. far exceed the average of White residents who live in poverty. The poverty rate for Black

populations is 36%, while Hispanic populations have poverty rates of 31.9%. White residents experience poverty at a rate of 12.3% (U.S. Census Bureau, 2015).

Race, ethnicity, and income appear to be correlated with the types of food stores that are available in neighborhoods. Several studies indicate that as rates of poverty in an area increase, numbers of supermarkets decrease (Powell et al., 2007; Shaffer, 2002; Walker et al., 2010; Zenk et al., 2005). Powell, et al. reported that those living in the highest income areas had fewer of all types of food stores. Presumably, proximity to a supermarket or other outlets for food is less problematic for those in higher income areas because of easy access to transportation. Not surprisingly, those living in medium wealth areas have the highest rates of access to supermarkets and convenience stores (Morland et al., 2002).

Perhaps more troubling is the research on racial inequities in food store availability. As the number of Black residents in an area increases, the number of supermarkets decreases. Conversely, a higher concentration of White residents in an area correlates closely with higher numbers of supermarkets (Shaffer, 2002). In a study of supermarket access in Los Angeles, Shaffer found that in areas with 60% to 90% Black population, there were no supermarkets. In impoverished neighborhoods in Detroit, people residing in primarily Black neighborhoods had to travel on the average 1.1 miles further to shop for food than people living in comparable primarily White impoverished neighborhoods (Zenk et al., 2005). Even when neighborhood income factors are controlled, Black residents have been found to have only half the number supermarkets in

their neighborhoods than comparable White neighborhoods (Powell et al., 2007). Those living in Black neighborhoods are 1.5 times more likely to have access to a non-chain supermarket and 1.7 times more likely to have an independently owned grocery store than a large supermarket chain in the neighborhood (Powell et al.). Nationwide, the ratio of supermarkets to residents in primarily Black neighborhoods is 1:23,582. The ratio for primarily White neighborhoods is 1:3,816 (Morland, Wing, Diez Roux, & Poole, 2002).

By comparison to information about inequalities in supermarket distribution between Black and White residents, relatively little research seems to exist about supermarket access for Hispanic and Asian populations. Powell et al. (2007) found that fewer supermarkets exist in predominantly Asian neighborhoods than predominantly White neighborhoods. There are however, significantly more non-chain supermarkets and grocery stores in Asian neighborhoods. The authors attributed this abundance of independent stores to specialization to accommodate specific cultural food preferences. These authors did not find a statistically significant difference between supermarket availability in Hispanic versus non-Hispanic neighborhoods.

Access to nutritious and affordable food can be limited for those who lack an automobile and must rely on public transportation, rides from friends, or family members with cars, walking, bicycling, or paid transportation such as a taxi (Ver Ploeg et al., 2009). A study of neighborhoods in Erie County, New York found that 42% of those living in owner-occupied homes in predominantly Black neighborhoods did not own a vehicle by comparison to predominantly White neighborhoods where 88% owned

vehicles (Raja, Ma, & Yadav, 2008). Results of another study indicate that overall vehicle ownership is significantly higher for White people than Black people across socioeconomic classes, but people living in higher income neighborhoods are much more likely to own vehicles than are those living in low-income areas (Morland, Wing, Diez Roux, & Poole, 2002). In rural areas, food deserts are defined by the USDA (Ver Ploeg et al.) as areas that are 10 or more miles from the nearest supermarket or large grocery store. By this definition, it would be extremely difficult for residents in these areas to walk to purchase food.

Those who must walk to supermarkets or rely on public transportation find that they must limit the amount of food purchased and may not be able to buy larger, more economical food packages because it is difficult for them to transport food, particularly for older shoppers who may find it difficult to carry heavy shopping bags (Whelan et al., 2002; Wiig & Smith, 2009). The inability to purchase larger quantities of groceries necessitates more frequent shopping trips for those who must rely on public transportation (Clifton, 2004). In order to save time and money by making larger food purchases, some shoppers incur the added costs of hiring a taxi to transport food purchases home (Clifton). Some who must rely on municipal bus services complain that the busses may not run on time, making it difficult for shoppers to make purchases of highly perishable foods, such as frozen foods (Coveney & O'Dwyer, 2009).

In urban neighborhoods that lack sidewalks or have poorly maintained sidewalks, the necessity of traveling by foot on busy streets can cause even a short trip to be difficult

to manage, particularly for elderly shoppers or shoppers with children (Bostock, 2001; Coveney & O'Dwyer, 2009; Ver Ploeg et al, 2009; Whelan et al., 2002). For those who must walk to do their food shopping, time may also be a consideration. A 15-minute trip for those traveling by car may allow travel to a store three to five miles away. Those traveling by foot are likely to only travel a distance of about a half mile in 15 minutes (Neckerman et al., 2009). Many small towns and villages in rural areas lack even a small grocery store (Sharkey, 2009), making it impossible for people living in those areas to travel by foot to purchase groceries.

Mothers of small children who must travel to food stores on foot with their children report a number of challenges. Because small children may lack the stamina to walk long distances, mothers may be forced to shop closer to home where food choices are limited and food prices are higher (Bostock, 2001). Weather conditions can limit when mothers and children are able to shop (Bostock). Mothers may have to walk with children through neighborhoods in which they fear crime or violence (Neckerman et al., 2009). They may risk injury due to crumbling buildings and sidewalks or dangerous debris such as broken glass or hypodermic needles left on sidewalks (Bostock). Additionally, managing bags of food on the return trip while keeping children away from busy streets may be a difficult task (Bostock).

The built environment, which is the human-made physical and social aspects of an environment such as sidewalks, curbs street crossings, and presence of lack of handicapped-accessible ramps at street crossings (Mojtahedi et al., 2008) as well as land use

patterns and transportation systems (Lake & Townshend, 2006) may deter shoppers with limited mobility such as parents with strollers and elderly shoppers or those who depend on wheelchairs or other mobility devices (Neckerman et al., 2009). Results of a study of stores in urban and suburban areas of Chicago indicate that in urban areas many stores that sell foods such as grocery stores and convenience stores do not meet minimum accessibility criteria for accessibility (Mojtahedi et al.).

Rural Food Deserts

Some rural areas of the U.S. are undergoing significant population changes that are leaving many small towns and villages without adequate access to food. Throughout much of the 20th century, there was a marked migration of young people leaving rural communities to seek employment in cities (Johnson, 2006). However, rural areas experienced modest natural increases in population as births outnumbered deaths (Johnson & Cromartie, 2006). During the 1970s, there was a marked change when rural population actually increased more rapidly than urban population. Following this brief period of increase, rural population decreased during the 1980s followed by a small rebound of rural populations in the 1990s (Johnson, 2006). Although it appears that rural population has increased in the 21st century (Johnson, 2011), population growth in rural counties is half that of the 1990s (Johnson, 2011). Currently in the rural U.S., so few young people remain in rural communities that births no longer offset deaths in many communities (Johnson, 2006).

Advancement in technology has allowed farms to become larger and has eliminated the need for human laborers in many sectors of the agricultural community (Albrecht, 2010; Irwin et al., 2010) . At the turn of the 20th century, the population of the U.S. that worked on farms was 42% (Irwin et al.). By the turn of the 21st century, it was estimated that only 1% (Irwin et al., 2010) to 6.5% (Johnson, 2006) of the nation's population are farmers.

Another change in rural populations has been from the loss of manufacturing jobs in rural factories that produced textiles and clothing, furniture, automobiles or automobile parts and computer parts (Johnson, 2006). Starting in the 1960s, many companies began to move factory operations to rural areas to take advantage of workers who were leaving employment on farms and to avoid hiring unionized workers (Albrecht, 2010). The slight increase in rural populations in the 1990s has been attributed to the increase of manufacturing jobs in rural areas (Johnson, 2011). At the turn of the 21st century, many of these factory jobs were outsourced to foreign countries to make use of less expensive labor (Johnson, 2011). Between 1997 and 2003, 1.5 million rural workers were displaced; 47% of those jobs were from the manufacturing sector (Glasmeier & Salant, 2006).

In the first decade of the 21st century, population growth in rural areas has been mixed. Growth in counties that depend on farm income had less than 1% population growth, and only 29% of farming counties reported any population growth (Johnson, 2011). Fifty-six percent of rural counties where mining is listed as the primary form of income reported population growth. Population in these counties increased by 2.7%

(Johnson, 2011). In both mining and farming counties, population growth was due to natural increase; that is, more births than deaths in the county (Johnson, 2011).

Manufacturing counties had a net population growth of 3.1%, with 57 counties showing population gains. Unlike farming and mining counties, 75% of growth was due to natural increase (Johnson, 2011).

A map of population losses in non-metropolitan areas (Mackun & Wilson, 2011) shows a band of states in the Midwest and Corn Belt states with significant loss, particularly in Iowa, Nebraska, Kansas, North Dakota, and South Dakota. Other states that have several counties with more than 10% population loss are in the Mississippi Delta and parts of northern Appalachia. A comparison of this map to a 2015 map of states with the highest rates of adult population over 65 that was prepared by the Administration on Aging (2015), shows a notable overlap. The map indicates that there are 43 states wherein more than 13% of the population is 65 years or older. Based on the information used to prepare these maps, one could conclude that much of the current population loss and losses in the coming decade will be due to natural decreases. It is probably reasonable to draw this conclusion, as older populations are less likely to change residences and when they do, they tend to remain close to their original home (Administration on Aging, 2015).

According to the Housing Assistance Council, the poverty rate for non-metropolitan areas in the U. S. for 2010 was 16.6%; this rate of poverty is higher than than the national rate of 15.1% (Housing Assistance Council, 2012). Poverty rates in

rural America show clear racial stratification. More than half of rural African Americans live near poverty, with incomes 150% below the poverty line. Hispanic populations fare marginally better with 47% living near poverty. White populations fare significantly better with 23.5% living near poverty, and Asian populations living near poverty are 19.9% (Housing Assistance Council). Rates of poverty for female headed households in non-metropolitan areas are 39.7% which is 10% higher than the rate for metropolitan area female headed households (Housing Assistance Council). The rural elderly are also more likely than metropolitan elderly to live in poverty. Rates of poverty for those over the age of 65 living in non-metropolitan areas is 10.4% compared to 8.7 % in metropolitan areas (Housing Assistance Council).

Some areas of the U. S, suffer from persistently high rates of poverty. These areas are Native American lands in Arizona and South Dakota, the Mississippi Delta, and central Appalachia (Morton & Blanchard, 2007). A particularly fast-growing food desert exists in the *colonias* on the Texas and Mexico border. The *colonias* are hastily constructed housing areas for migrant workers on the Texas-Mexico border. The housing is typically substandard, and the villages often lack paved streets, sewage systems or even running water (Sharkey, Horel, Han, & Huber, 2009). It is notable that all of these areas appear on a map of counties in the U.S. that are considered to be food deserts (Morton & Blanchard). In some areas of the *colonias*, more than 88% of the population has limited access to a supermarket or large grocery store; more than 47% of them live in poverty

(USDA, Economic Research Services, 2012a). Many of these residents must instead depend on convenience stores or fast food restaurants for meals (Sharkey, 2009).

The small, family-owned grocery stores that used to serve rural communities are becoming historical artifacts. Between the years of 2006 and 2009, 38% of the 213 small stores that served small towns in Kansas with populations of less than 2500 have closed (Blaney, 2010). More than half of the small grocery stores in Iowa closed between the years of 1995 and 2005 (Bailey, 2010). As rural populations are declining, the average population required to maintain a grocery store is increasing. In 2005 it was estimated that the average population of a town required to maintain a grocery store was 3,252 (O'Brien, 2008). Food shoppers in small, rural towns may be more likely to have a convenience store with limited or non-existent quantities of fresh foods in the community than a grocery store (Liese, Weis, Pluto, Smith, & Lawson, 2007).

In addition to reductions in population, other factors have contributed to the declining numbers of small grocers in rural areas. The addition of supercenters such as Wal-Mart to smaller towns in rural areas appears to be a setback for small grocers (Blanchard & Lyson, 2002; Procter, 2010). The addition of a Wal-Mart to a rural economy has been shown to reduce growth of small grocery sales by nearly 17% in the 2 years that follow its entry. Profit margins are very small for independent grocers and the reduction in the grocers' ability to attract sales is particularly problematic (O'Brien, 2008). Research indicates that the supercenters pull shoppers from a 30 mile radius from the store (O'Brien). As increasing numbers of those living in rural areas use non-farm

income as their primary source of income (Irwin et al., 2010), more people are shopping for groceries near their work places than at the local grocer (O'Brien). Small grocers also cite a number of business challenges that threaten their survival such as high operating costs, difficulty in finding and paying employees, low community support, and meeting minimum buying requirements (Procter, 2010).

Although those who work outside of their small towns and those with access to vehicles may be able to shop in bigger towns with supermarkets or supercenters, small town and rural residents who lack transportation and elderly populations are particularly affected by the loss of a grocery store in their town. Those who live in rural areas and lack adequate transportation tend to have the lowest levels of income and education (Bitto et al., 2003). Living more than four miles from a supermarket significantly negatively affects the diet of pregnant women (Laraia, Siega-Riz, Kaufman, & Jones, 2004). People over the age of 70 living in nonmetropolitan areas may depend on others to take them shopping or to purchase groceries for them (Bitto et al.). Older shoppers tend to have more loyalty to their preferred grocer than younger shoppers, but without the ability to obtain groceries in their communities, it seriously limits the possibilities for older residents to age in place (O'Brien, 2008).

Availability

Poor diet has been associated with heart disease (Campbell & Campbell, 2006), cancer (Gonzalez & Riboli, 2010; Levi, Pasche, La Vecchia, Lucchini, Franceschi, 1999), obesity (Lin & Morrison, 2002), and diabetes (Ernest, Linnér, & Svanborg, 1965). Eating

a diet high in fruits and vegetables has been correlated with better health (Campbell & Campbell; Gonzalez & Riboli). Healthy foods are much more likely found in supermarkets than in small independent retail food stores or convenience stores (Liese et al., 2007). Eating a healthy diet is difficult if health promoting foods are not available to purchase in stores or restaurants in one's neighborhood (Cheadle et al., 1991).

Having access to a supermarket is likely to increase fruit and vegetable consumption and those living with proximity to a supermarket are significantly more likely to meet dietary guidelines for fruit and vegetables (Morland, Wing, & Diez Roux, 2002). Many low-income residents living in food deserts find that the healthy food choices available to them in their local small grocery stores is inadequate (Jetter & Cassady, 2006). People who rank the availability of healthy foods in their neighborhoods as being very poor are 22 -35% less likely than those in neighborhoods with high availability to eat a healthy diet (Moore & Diez Roux, 2006). Smaller stores are less likely than supermarkets to stock whole grain breads, low-fat meats, poultry, or cheeses (Jetter & Cassady). Fresh fruit and vegetables are substantially less likely found in small markets. Some small markets lack adequate refrigeration or air conditioning which severely limits the quantities of fresh produce they can offer (Hendrickson et al., 2006). Even when fruit is available, it is more likely offered as canned fruit rather than fresh fruit. One study showed that 70% of fruit and vegetables offered at supermarkets are in fresh form, compared to only 32% of that offered in small markets (Bodor, Rose, Farley, Swalm, & Scott, 2008). Canned fruits are more likely packed in heavy syrup than in light

syrup or juice (Jetter & Cassady). Many people who shop at small stores report that they are likely to find that the non-perishable food items on the store shelves have passed their expiration dates (Zenk et al., 2011).

Even when fresh produce and meat are available, customers may find that they are of poor or inedible quality (Andreyeva et al., 2008; Hendrickson et al., 2006). When healthy items such as fresh produce is available it is not likely found in great quantity or variety (Hendrickson et al.). Customers limited to small markets near their homes for shopping report that when fresh fruits and vegetables are available, they are wilted and withered. They report that the retailers use deceptive tactics to disguise aging meat products, such as wrapping it with the spoiled portion on the bottom or heavily wrapping it to disguise the smell and poor appearance (Smith & Morton, 2009; Zenk et al., 2005).

Even more troubling is the deliberate marketing of unhealthy foods to particular ethnic and racial groups in some food desert neighborhoods. African American shoppers in a low-income area report that they believe the stores in their neighborhoods are intentionally arranged to market unhealthy foods to the shoppers in their neighborhoods by placing them at the entrances of the stores. They report that when they shop in supermarkets in other areas of their city, they notice that those stores in more affluent neighborhoods place their produce sections at the store entrances (Zenk et al., 2011). Research supports the shopper's reports that Black and Latino families are exposed to greater levels of marketing for high-fat, high-calorie foods than are White populations (Grier & Kumanyika, 2008; Yancey et al, 2009.).

Hosler, Rajulu, Ronsania, and Fredrick (2008) found that urban residents are less likely to find fresh fruits and vegetables in their neighborhoods than are rural residents. This finding was also reported by Hendrickson, Smith, and Eikenberry (2006). The Hosler et al. study, however, included local orchards and farms as possible sources for fresh produce. For rural residents without reliable transportation, a trip to an orchard or farm is unlikely. Results of their study indicate that only 28% of the rural county stores in a South Carolina county sold basic fruits and vegetables such as apples, oranges, or tomatoes. A similar dearth of high fiber whole grain foods in stores existed. Rural residents who may have to depend on convenience stores may experience difficulties in finding low-fat, rather than whole milk (Liese et al., 2007). Not surprisingly, it has been found that convenience stores, in general, are less likely to stock healthy foods (Andreyeva et al., 2008). Additionally, users of programs such as the Supplemental Nutrition Assistance Program (SNAP) or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) programs may be unable to use their benefits at convenience stores (Liese et al.).

Affordability

Affordability is closely tied with accessibility when considering challenges for those living in food deserts. A majority of research indicates that those living in poor neighborhoods pay more for food than do people living in suburban neighborhoods (Alwitt & Donely, 1997; Blanchard & Lyson, 2002; Chung & Myers, 1999; Hendrickson et al., 2006,; Kaufman, MacDonald, Lutz, & Smallwood, 1997; Talukdar, 2008). Cost of

food in small rural markets has been found to be more expensive when compared to prices in supermarkets in suburban areas (Morris, Neuhauser, & Campbell, 1992). Some researchers, however, have found no differences in food pricing between neighborhoods (Hatzenbeuhler, Gillespie, & O'Neal, 2012; King, Liebttag, & Behl, 2004) or have found higher prices in supermarkets (Andreyeva et al., 2008).

Some of the difficulty in determining if food is less affordable for those living in food deserts results from methodological differences in various studies. Some studies examined the costs of key items such as dry goods, milk, and dairy (Chung & Myers, 1999), while others used a suggested market basket based on the USDA's Thrifty Food Plan (Carlson, Lino, Juan, Hanson, & Basiotis, 2007), which is a nutritional standard from which families can develop a nutritious, low-cost menu. Stores may not carry identical items; they may differ by brand or size of package making cost comparison per unit more difficult (Chung & Myers; Kaufman et al., 1997). Prices may be inconsistent; that is, prices may vary by region of the country making it difficult to generalize about store types on a national level (Chung & Myers). Accessibility to stores may affect the prices that people pay for food in food deserts. Those without transportation may rely on food from convenience stores rather than small grocery stores, causing the price per unit of food to be significantly higher (Chung & Myers).

As previously mentioned, food stores in food deserts tend to be small, independently-owned grocery stores. Food prices on staple items tend to be less expensive at chain supermarkets than at small markets (Chung & Meyers, 1999). Small

stores are at a disadvantage when compared to larger, chain stores due to economies of scale which reduces their ability to receive larger discounts on wholesale food. Due to a smaller number of customers, the services offered by small stores come at a higher cost per customer than larger supermarkets (Alwitt & Donley, 1997; Blanchard & Lyson, 2002; Ver Ploeg et al, 2009).

Because there are few stores from which to choose in food desert areas, a lack of competition may cause higher prices in stores (Smith & Morton, 2009). Also missing from food desert areas are discount and wholesale club stores such as Wal-Mart, Sam's Club, or Costco. These stores are typically located in higher income areas, which allows higher income buyers to purchase larger quantities that lowers the cost per unit of food items (Alwitt & Donley, 1997; Blanchard & Lyson, 2002). Additionally, lower income shoppers may incur extra expenses as previously noted by having to hire a taxi to carry food purchases or to travel further outside of their neighborhoods to find lower food costs at suburban supermarkets.

Although people living in food deserts are not necessarily of low socioeconomic status, clearly the poor and/or elderly suffer the effects of living in a food desert most acutely. For people of higher socioeconomic status living in food deserts with ready access to transportation, life in a food desert may be a mere inconvenience. However, for others, even with access to transportation, the cost of feeding themselves and their families is beyond their financial means. Because of their low socioeconomic status, many people living in food deserts are also food insecure.

Food Insecurity

According to the USDA, “[h]ouseholds are considered food insecure when their lack of financial resources does not allow them to fully meet their basic food needs at all times” (USDA, Food and Nutrition Service, 2012a, p.5). Wunderlich and Norwood (2006) state that, “[f]ood insecurity exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain” (p. 4). Wunderlich and Norwood classified households as low food security or very low food security. Those who experience low food security may lack access to food, but have not needed to substantially change their eating habits. Those who experience very low food security report that at some point during the year, one or more family members find it necessary to alter their eating habits, such as skipping meals because the family lacks adequate financial resources to purchase food.

According to the USDA Economic Research Service, in the year 2010 approximately 14.5% of households in the U.S. had low food security for at least a portion of that year and approximately 5% of those families experienced very low food security. (Coleman-Jensen et al., 2011). Of households in the U.S. with children, approximately 9.8% or 3.9 million households experienced food insecurity in 2010 (Coleman-Jensen et al.). Approximately 40% of households with income levels below the federal poverty line are considered food insecure. The majority of households experiencing food insecurity are those with children (Coleman-Jensen et al.). Sixty-eight percent of food insecure households have at least one adult who works full-time and 10%

have at least one adult who works part-time (Nord, 2009). Educational attainment is very closely tied to food insecurity. Households with children in which no adults have completed high school are 10 times more likely to experience food insecurity than households where at least one adult has completed four years of college, and nearly twice as likely as households where at least one adult has completed high school or has received a GED (Nord). Food insecurity is more common in urban or rural areas than in suburban areas (Coleman-Jensen et al.).

Food insecurity rates are highest in the Southern and Western U.S.. The state with highest levels of food insecurity is Mississippi, with 19.4% of the population experiencing low food security, followed by Texas, with 18.8% low food security, and Arkansas, with 18.6% of its population experiencing low food security. Mississippi and Oklahoma have the highest rates of very low food security, with 7.5% of populations in that category. Rates of very low food security in Texas and Arkansas are at 6.9% of the population. North Dakota has the lowest rates of low food security and very low food security with rates at 7.1% and 2.7% respectively (Coleman-Jensen, et al., 2011).

Methods of Coping with Food Insecurity

Federal, state, and local food assistance programs are available to individuals and families who lack financial resources. Approximately 60% of food insecure households in one survey reported that they had used the services of one to three federal food programs in the previous month: SNAP, WIC, or the National School Lunch program

(NSLP) (Coleman-Jensen et al., 2011). In households with children, 81% reported using one or more of the programs (Nord, 2009).

The Supplemental Nutrition Assistance Program. The SNAP program has been existence for four decades. In 2011 the program provided food for 45 million people in the U.S. each month (USDA, Food and Nutrition Service, 2012c). Administrative duties are carried out by individual states and funding to individual users is provided by the federal government. Seventy-one percent of SNAP benefits go to households with children under the age of 18 and 8% of benefits go to elderly recipients. In order to receive benefits the net family income may not exceed 100% of the poverty level. About 20% of recipients who are eligible for SNAP benefits have no income sources from work or other aid programs (USDA, Food and Nutrition Service, 2012a). The rate of participants with no income has tripled between the years of 1990 and 2010. However, a sizeable portion of recipients are the working poor; 40% of recipients are employed (Palmer, 2012).

Governmental involvement with food insecurity and hunger has a history that is decades long. Action to prevent or repair food insecurity is closely tied to presidential administrations and the political zeitgeist that accompanies the shifting political climates that coincide with them. An early food stamp program was implemented in 1939. In addition to providing food for families, it was a means of distributing food surpluses in an equitable manner (USDA, Food and Nutrition Service, 2012a). Participants bought orange stamps that were used for any food item. Additionally, they received blue stamps

with which they could purchase particular commodity items (Goodridge & DeParle, 2010). This initial program ended in 1943 amidst declining participation and charges of corruption (USDA, Food and Nutrition Service, 2012a). In 1961 President John F Kennedy created an experimental food stamp program (Goodridge & DeParle). Participants in the program purchased food stamps that had a higher face value with which they could purchase food (Roth, 2012). The program was expanded and became a part of President Lyndon Johnson's War on Poverty in 1964 (USDA, Food and Nutrition Service, 2012a).

In 1967 the U.S. Senate became interested in hunger when senators Joseph Clark and Robert Kennedy toured the Mississippi Delta and found that childhood malnutrition was as bad as or worse than that found in many developing nations in South America and Africa (Eisinger, 1998) and that food assistance programs that were in place were not effective in alleviating hunger (Roth, 2012). At the same time, television documentarians filmed communities in Texas, Virginia, Arizona, and Alabama that exposed the conditions of people living in poverty. Viewers of the documentary were shocked to see signs of disease and extreme malnutrition in the children of poverty: many viewers found it hard to believe that these conditions existed in the U.S. (Eisinger; Goodridge & DeParle, 2010). A Senate Select Committee on Nutrition and Human Needs was established in 1968 to study hunger and to formulate actions to alleviate hunger in the U.S. One action that resulted from the committee was that the cost of food stamps to families was reduced. Families were still required to purchase the stamps; they were not

free (Roth). In 1977 during the Carter administration a law was passed that eliminated the need for people to pay for their food stamps (Goodridge & DeParle).

This coincided with the formation of the organization founded by Dr. Martin Luther King, Jr. and the Southern Christian Law Center named the Poor People's Campaign. The organization seeks to improve conditions that affect the poor, such as economic injustice, prejudice, hunger, and housing problems (Poor People's Campaign, n.d.). In the days following Dr. King's assassination, in a march organized by leaders of the Southern Christian Law Center called the Poor People's March, thousands of people marched to Washington, D.C. and established a well-organized encampment on the National Mall (Poor People's Campaign; Roth). Protesters remained in the encampment for 6 weeks, staging daily protests in which they asked for federal legislation that would improve the quality of life for poor people (Civil Rights Digital Library, 2011).

In spite of criticism from conservatives, during the 1970s, changes during the Carter Administration made it easier for people to get food by eliminating the need for them to purchase the coupons. Enrollment in the food stamp program grew throughout the latter half of the 1970s. A cut in food stamp funding of \$1 billion during the Reagan administration along with cuts to budgets for congregate meal sites that provided meals for the elderly led to an explosion of meal sites and food pantries organized by places of worship and other social agencies. These agencies scrambled to feed the poor and hungry who found themselves without a means to get food during these budget cuts (Winne, 2008). Food stamp enrollment rose nearly 50% during the early 1990s due to economic

recession (Goodridge & DeParle, 2010; USDA, Economic Research Service, 2012a). Deep cuts and tighter control over the food stamp program led to a significant drop in food stamp enrollment during the late 1990s. Food stamp enrollment has increased steadily since the year 2002.

Women, Infants, and Children program. The WIC program is another important program which provides nutrition to food insecure families. The WIC program serves five specific groups: pregnant women, infants, children up to their fifth birthday, breastfeeding women up to 1 year postpartum, and non-breastfeeding women for 6 months postpartum (Fox et al., 2004). The program is based on the premise that children who live in very low-income families are susceptible to malnutrition during the critical prenatal, infancy, and preschool developmental periods which puts their physical and cognitive development at risk (Fox et al.). Pregnant women who are nutritionally at risk are more likely to deliver preterm and/or low birth-weight babies (Devaney, 2007). The program provides not only supplemental nutrition, but also nutrition education and health care referrals to pregnant women, nursing mothers, and families with children up to age five (Devaney).

The impetus for the WIC program began in the Senate Select Committee on Nutrition and Human Needs that instituted changes in the SNAP program in 1968. A lack of food was being reported by pregnant women and women with small children who were visiting public health centers in the late 1960s. Demonstration programs were established in Atlanta and Baltimore to distribute food to pregnant women, infants, and children

through a commissary attached to public health clinics. In 1972, Congress authorized a 2 year pilot program that expanded the reach of the program beyond the initial sites. Some sites continued to use the commissary-type distribution; while other participants were given vouchers to use at grocery store. After an evaluation, the WIC program became a permanent program in 1974 (Devaney, 2007). In 1974 the program served 88,000 participants, in 2010, approximately 9.17 million participants were served (USDA, Food and Nutrition Services, 2012d).

WIC participants' gross income levels must fall at or below 185% of the U.S. Poverty Income Guidelines (USDA, Food and Nutrition Services, 2012d). In addition to meeting income requirements, participants must have one or more nutritional risks (Fox et al., 2004) which are based on the assessment of a nutritionist, physician, nurse, or other qualified health professional (Devaney, 2007). Depending on the age of the participant, WIC allows participants to purchase dairy products; protein products such as beans, tuna, or tofu; fruits and vegetables; whole grain products; fruit juices; infant formula; and cereals (USDA, Food and Nutrition Services, 2012d). WIC vouchers are also accepted at many farmers markets throughout the U.S. (USDA, Food and Nutrition Services, 2012d).

More than 50 studies have been conducted to determine the effectiveness of WIC programs in reducing the number of low birth-weight babies (Devaney, 2007). Evidence also seems to suggest that the numbers of preterm births have been reduced and that the numbers of very low birth-weight babies have been reduced (Devaney). The research

appears to indicate that participation in the WIC program is most beneficial for very low-income women in reducing the risk of preterm delivery and/or low birth-weight babies (Fox et al., 2004). Participation in the WIC program has been shown to significantly reduce cost of care to mothers who are on Medicaid due to the reduction in high-risk infants born to mothers who lack proper nutrition (Devaney).

Children's health appears to have been positively affected by participation in the WIC program. Rates of iron deficiency anemia have been significantly reduced in children since 1975 (Devaney, 2007). Height and weight in children from birth to 3 years of age have increased significantly (Cook et al., 2004; DeVaney). Although caloric intake for children enrolled in the WIC program does not appear to be higher than that of non-enrolled children, research has indicated that enrolled children have higher intakes of key nutrients and vitamins (DeVaney). Children who participate in the WIC program are more likely to have regular dental and physical check-ups and care. There is some evidence that low-income children who participate in the WIC program are more likely to receive immunizations on schedule than low-income children who do not participate (Fox et al., 2004). Food insecurity appears to be lower among those families who participate in the WIC program (Black et al., 2004).

National School Lunch Program. In Robert Hunter's book *Poverty*, which was published in 1905, he wrote about poverty's effects on children's educations. He noted the numbers of children who were arriving at schools in New York who were ill-equipped to learn because they lacked adequate food and nutrition and that many children

were working rather than attending school. His book precipitated a movement to provide hungry students with nutritious meals at school (Gunderson, 2003). A number of cities in the U.S. initiated school feeding programs in the early decades of the 20th century. The programs relied heavily on donated food, facilities, and labor from individuals and organizations in their communities. The number of students who were unable to make any financial contribution toward the cost of their meals increased during the Depression years. Legislation in several states made it mandatory for schools to provide lunch at cost for students. Students who were unable to pay were to be provided meals free of charge. Many school districts found the task of providing nutritious meals to students to be more costly than was feasible (Gunderson).

In 1932 and 1933, the Reconstruction Finance Company granted federal loans to several schools in Missouri to cover labor costs of food preparation for students. By 1934, under the guidance of the Civil Works Administration and the Federal Emergency Relief Administration, the program had expanded to 39 states (Gunderson, 2003). During the Depression in 1935, Congress passed a law that was beneficial to hungry children. It was also beneficial to farmers who were unable to sell what they had produced. The law made it possible to divert commodities from regular markets to school lunch programs, thus providing the farmers with a means of selling their products and providing low cost foods for school lunch programs. In 1935, school lunch programs received a substantial increase in federal money when the Works Progress Association provided money to hire unemployed women from the schools' communities to work by

cooking, serving, and planning of meals as well as performing clerical duties. In some areas, neighborhood residents were hired to work in garden projects to provide fresh produce to schools or to work in kitchens to can produce for use later in the year (Gunderson).

During the 1940s, school lunch programs expanded, aided by governmental cash subsidies provided to purchase food. School lunch programs were funded on a year-by-year basis, but in 1946, legislation made school lunch programs permanent in schools and funding was provided to support it with funding for facilities, food, and labor to produce the meals. In addition, specific guidelines were established regarding record keeping, nutritional standards, costs of meals to students, and a system to provide meals to students who could not afford meals (Gunderson, 2003). The Child Nutrition Act of 1966 made it possible for breakfast service to occur at many schools (Ralston, Newman, Clauson, Guthrie, & Buzby, 2008). The school breakfast program expanded following the pilot program. The same wave of legislative action that resulted in the expansion of the SNAP program and the development of the WIC program resulted in legislation that assured that all children who are unable to pay for school lunch or breakfast will receive it at lower cost or free (Gunderson). NSLP also makes snacks available to children who participate in after-school programs (Fox et al., 2004).

The NLSP is available to all children attending public and non-profit private schools and residential child care facilities. The NLSP is in operation in more than 100,000 schools and child care facilities in the U.S. Nearly 32 million children are served

each day (USDA, Food and Nutrition Service, 2012b). Families who qualify for SNAP benefits are eligible for free or reduced price breakfast and lunch at their schools (USDA, 2012b). About 69% of low-income households with children have received free or reduced-price meals through NSLP (Nord, 2009). About 35% of the households who receive free or reduced-price meals also participate in the WIC and/or SNAP programs (Nord). More than 5 billion school lunches were served in 2010; more than half were provided at no cost or reduced cost (USDA, Economic Research Service 2012b). For many children, the meals they eat at school will be the only meals available to them that day. For other children, school lunch programs will provide half of the calories eaten in a day (Letsmove.gov, n.d.)

As rates of childhood obesity rise, the NSLP has come under scrutiny. When school feeding programs were initiated in the early 20th century, the purpose of feeding programs was to increase the caloric intake to children whose families were unable to provide adequate food. Researchers indicate meals served by the NSLP contain excessive caloric intake for many students (Clark & Fox, 2009) which may be contributing to the growing numbers of children who are overweight or obese. Although schools participating in the program must meet federal nutrition guidelines (Ralston et al., 2008), meals served by the NSLP have been found to contain excessive levels of saturated fats and sodium (Clark & Fox). First Lady Michelle Obama has begun a campaign to make school lunches and breakfasts more nutritionally balanced (Letsmove.gov, n.d.).

Although school children may be eating unhealthy levels of fat and sodium, the majority

of children who eat school lunch have been found to have adequate intake levels of vitamins and minerals (Clark & Fox; Gleason & Sutor, 2003), and participation in the NSLP reduces the intake of additional sugar, such as that found in snack food or sodas (Gleason & Sutor).

Coping with Food Insecurity

Low income people living in food deserts or who are food insecure may mitigate problems in food acquisition by relying on a number of behaviors to acquire food. They may participate in informal, nonmarket systems such as food pantries, borrowing or trading food with neighbors or kin, or bartering services for food (Morton et al., 2008). Those who live in very rural areas may depend on hunting as a source for meat (Walker et al., 2010). Sometimes families engage in less socially acceptable activities such as stealing food (Hamelin et al., 1999), dumpster diving (Winne, 2008) or eating food that has been discarded by others (Anater et al., 2011), finding roadkill, going to grocery stores for free food samples (Anater et al.; Kempson et al., 2002), or eating non-food items such as paper or pet food (Walker et al.).

A study of families who experience food insecurity reported that families use a number of in-home measures to make the food last longer (Kempson et al., 2002). Some mothers with latch-key children reported locking the food in a cabinet while they are gone to prevent their children and their friends from eating food intended for meals. They report rationing food and limiting helping sizes at mealtime. Foods such as soups or milk may be extended by adding water. Extending foods is not likely harmful in most cases,

but the authors of the study point out that in the case of infant formula, the practice may be particularly deleterious to the health of infants.

The methods used to extend or conserve foods that are practiced could cause health risks to family members, particularly very young or elderly family members. These practices include removing moldy parts of foods and consuming the rest, washing slime from meats that appear to be spoiling, removing live and dead insects from cereals, or eating food that has passed its expiration date or has been discarded due to recalls (Anater et al., 2011; Kempson, et al., 2002; Tarasuk, 2001). As previously noted, some families may resort to eating food that has been discarded by others or preparing dead animals that have been killed on the road. In both cases, the food may contain dangerous levels of harmful bacteria due to lack of proper refrigeration.

A study conducted in urban, suburban, and rural areas of Iowa found that urban residents were much more likely to rely on community or school gardens and food pantries than were the rural residents. Senior citizens living in rural and urban areas reported greater access to home-delivered meals than those living in suburban areas (Garasky, Morton, & Greder, 2004). In another study, a senior citizen reported that she occasionally took advantage of pot-luck dinners at houses of worship that are offered free of charge to older residents (Morton, Bitto, Oakland, & Sand, 2005).

Some communities have in place programs such as Kids Café, which provides free meals and snacks to children at their schools, Boys and Girls Clubs, or houses of worship. Kids Café serves more than 122,000 children each year in approximately 120

sites in the U.S. (Feeding America, 2012). Feeding America programs also offer back pack programs. These programs send children home with a back pack filled with enough food to feed them during the weekend when they do not receive meals at school. In 2010, 70,000 children and their families were served by food pantries closely associated with the school by Feeding America partners (Feeding America). Unemployed adults living near schools also reported that they offered volunteer time in exchange for a meal (Morton et al., 2005).

Effects of Food Insecurity and Hunger

Effects of food insecurity are somewhat difficult to separate from other factors that may lead to physical, behavioral, or mental health outcomes. Although typically, those who are food insecure are of low socioeconomic status (SES), not everyone with low SES is food insecure and some populations whose income level is above poverty level may have other limitations that cause them to be food insecure (Cook & Frank, 2008). Those who live with food insecurity may be at risk for poor nutrition, which affects physical and mental health outcomes throughout the lifespan (Cook & Frank). Although research indicates that children living in high poverty areas exhibit higher rates of both externalizing and internalizing behavioral problems, it is difficult to tease apart the factors that contribute to these problems. Maternal behaviors and neighborhood environments, as well as social support or lack thereof mediate the direct influence of poverty on behavior (Pachter et al., 2006). Therefore, it is difficult to separate the effects

of poor nutrition caused by food insecurity from environmental factors when examining behavioral and emotional health.

Children. Food insecure children are more likely to live in a low-income family (Alaimo, Olson, Frongillo, & Briefel, 2001). Nearly 16% of children in the U.S. are food insecure at some point during the year (Nord, 2009). Food insecure households with children are three times more likely headed by a single female than food secure households (Nord).

Prenatal, Infants, and Toddlers. Parents of food insecure infants and toddlers are less likely to be over the age of 21 or to be employed than those of food secure infants and toddlers. Parents of food insecure infants and toddlers are less likely to have been born in the U.S. Parents typically also have low levels of education. They also have higher rates of depression than parents of food secure infants and toddlers (Rose-Jacobs et al., 2008).

Pregnant women who are food insecure have been found to be at higher risk for delivering babies with genetic heart defects, cleft palates, anencephaly, and spina bifida (Carmichael et al., 2007). Both nutritive and non-nutritive pathways have been implicated in this increased risk (Carmichael & Shaw, 2000; Carmichael, Shaw, Selvin & Schaffer, 2003; Rose-Jacobs, et al., 2008). It is difficult to disentangle these pathways as they are closely connected to living in poverty.

The non-nutritive risks for birth defects that affect many food insecure women result from living near or below the poverty line. Women who are food insecure have

fewer years of formal education and are more likely unemployed (Rose-Jacobs, et al., 2008). They are more likely to live in low-income neighborhoods where high crime rates, substandard housing, lack of transportation and failing schools may increase the amount of stress they experience on a daily basis (Miranda, Maxson, & Edwards, 2009). People in low-income areas are more likely to be exposed to poor air quality, high levels of lead and other heavy metals, and poor water quality (Miranda et al.). Exposure to these environmental teratogens has been correlated with higher rates of birth defects such as neural tube defect and fetal growth restrictions (Miranda et al.). Living in high stress conditions, such as living in areas with high crime rates, high unemployment, and environmental risks, has been found to increase levels of cortisol (Carmichael & Shaw, 2000; Montenegro, Palamino, & Palamino, 1995). Increased levels of cortisol before pregnancy and during the critical prenatal developmental period in the first trimester of pregnancy have been correlated with increased risk for limb abnormalities, orofacial clefts, neural tube abnormalities such as spina bifida and anencephaly, and congenital heart defects (Carmichael & Shaw; Carmichael et al., 2007; Montenegro et al.).

A number of nutritional factors may affect pregnancy outcomes for food insecure women. Adults living in food insecure households have been found to consume poor quality diets, marked by fewer servings of dairy, fruits, vegetables, and in some cases fewer nutritious sources of protein (Kirkpatrick & Tarasuk, 2008). Green leafy vegetables, fruit, protein in the form of legumes, and fortified cereals, are foods that are typically missing from the diets of food insecure adults. These foods are high in folic

acid, a key micronutrient important for proper formation of the neural tube and brain in the fetus in the first trimester of pregnancy (Carlson & Aupperle, 2007). Because folic acid is vitally important for the fetal development that happens during a period of time when women may not be aware of their pregnancies, the U.S. Public Health Service recommended that all women of childbearing years should take a vitamin supplement to augment levels of folic acid from the diet (Gahche et al., 2011). Although not all women intend to become pregnant, it is estimated that 49% of pregnancies occurring in 2006 were unintended (Finer & Zolna, 2011). Only slightly more than 34% of women in their childbearing years follow the advice of the CDC. Rates of folic acid supplementation are even lower for Latinas and African American women who are also at higher risk for food insecurity (Gache et al.).

In 1998 the Food and Drug Administration mandated that all grain products such as cereals and breads be fortified with folic acid in an attempt to reduce the incidence of neural tube defects (Robbins et al., 2006). Additionally, educational programs were instituted to inform women of the importance of folic acid supplementation (Meyer & Siega-Riz, 2002). Although it was hoped that these efforts would decrease the rates of neural tube defects by 50% to 70%, rates of decrease have been a more moderate 20% to 30% (Robbins et al.). Rates of spina bifida have decreased more significantly for mothers over the age of 30 with more than a high school education. Rates of decrease of neural tube defects have been less substantial for mothers under the age of 25, women with less than a high school education and women who use Medicare services (Meyer & Siega-

Riz). This is the group that is more likely to be food insecure. Researchers suspect that older, more educated mothers also have higher incomes and are able to purchase multivitamin supplements and eat more enriched cereals than lower income women (Robbins et al.).

Iron deficiency is the most common nutritional deficiency in women and children (CDC, 1998). Approximately 30% of low-income pregnant women have iron deficiency anemia (Kaiser & Allen, 2008). Children who are food insecure are significantly more likely than food secure children be iron deficient (Salicky et al., 2006). During the prenatal period, infants' brains overproduce neural connections, preparing them to take in their world, interact with it, and learn. For instance, the peak of production of synapses in the visual cortex is believed to occur in the fourth prenatal month (Thompson & Nelson, 2001). Iron levels may affect neurotransmitter synthesis and production of glial cells in the brain during prenatal and postnatal development (Lozoff et al., 2006). Changes in myelination due to impairment of prenatal glial cell production have been linked to deficits in the visual and auditory systems of infants (Lozoff et al.). Poor recognition memory has also been associated with prenatal iron deficiency; most likely due to damage to the hippocampus and related brain structures (Lozoff et al.). Increased blood volume during pregnancy puts even healthy food secure women at risk for iron deficiency and dietary changes as well as vitamin supplementation are necessary for pregnant women to maintain healthy levels of iron for the developing infant (CDC, 1998).

In addition, women who are malnourished are at risk for preterm deliveries and/or low birth-weight babies. Preterm and low-birth-weight babies have been found to have higher levels of neurological impairment and learning disabilities than full-term children (Tanner & Finn-Stevenson, 2002). Children who were preterm babies have also been found to have greater difficulty in emotional regulation than children who were born at full-term (Tanner & Finn-Stevenson). Therefore, it is important for food insecure women who are pregnant or at risk for pregnancy to receive proper nutrition through such programs as SNAP or WIC in order to promote healthy brain development in their children.

Iron sufficiency continues to be of importance to infants and toddlers. Infants from 9-18 months are at the highest risk of any age group in childhood of iron deficiency (CDC, 1998). Synaptic overproduction in the prefrontal cortex, the area of the brain that is important for self-regulation and cognitive processing, is at its peak when a child is approximately one year old (Thompson & Nelson, 2001). Iron deficiency in infancy has been correlated with lower IQ scores (Lozoff et al., 2006). Iron deficient infants and toddlers have also been found to have lower levels of physical activity. As it is important for infants and toddlers to reach some developmental milestones such as hearing and reproducing speech and developing binocular vision in particular sensitive periods in order to develop appropriately (Thompson & Nelson), it is imperative that they have sufficient nutritious food to support their bodies' nutrition needs for development. In food

insecure households, the amount of food available for consumption may be severely limited, which may increase incidences of iron deficiencies (Rose-Jacobs et al., 2008).

Infants in food insecure households are at risk for developing failure to thrive (FTT) syndrome which is defined as weight for age that falls in the 5th percentile, or loss of weight or slowed growth that crosses two percentiles (Cole & Lanham, 2011). FTT affects 5% to 10% of children under the age of 3 in the U.S. Familial poverty and food insecurity are strong predictors of FTT (Gahagan, 2006). When diagnosing FTT, physicians need to be cognizant that FTT can result not only from lack of food, but improper nutrition in available food and/or poor nutrient absorption (Cole & Lanham; Tanner & Finn-Stevenson, 2002), all of which may result from inadequate quantity or quality of food resulting from food insecurity. Parental mental illness, lack of nutritional knowledge, or abuse must also be considered when making the diagnosis of FTT (Gahagan).

Children under the age of 3, living in food insecure households are twice as likely as children in non-food insecure households to be reported as having poor to fair physical health, rather than good to excellent health (Cook et al., 2004). They are also more likely to be hospitalized in the first 3 years of life than are children living in food secure households (Cook et al; Salicky et al., 2006). An analysis of the Children's Sentinel Nutritional Assessment Program (C-SNAP) revealed that food insecure infants and toddlers are at a 2/3 greater risk for developmental problems than infants and toddlers in

food secure households (Rose-Jacobs et al., 2008). Boys, underweight children, and low-birth-weight infants and toddlers are at greatest developmental risk (Rose-Jacobs et al.) .

School-age children and adolescents. The problems of food insecurity that affect infants and toddlers, continue as children reach the school years. Food insecure children have more frequent stomachaches, headaches, and colds than do food secure children and are less likely to have health insurance and a regular source of health care (Alaimo, Olson, Frongillo, & Briefel, 2001). Food insecure children miss more days of school than food secure children (Alaimo, Olson, Frongillo, & Briefel, 2001). It is not clear if the absenteeism is only a result of illness. Food insecure families make more frequent household moves (Weinreb et al., 2002), which may result in missed days due to logistical problems or frequent school changes.

Food insecure children have been found to have lower IQ scores (Belsky, Moffitt, Arseneault, Melchior, & Caspi, 2010) . Food insecure children and adolescents have been found to have significantly lower scores on the Wide Range Achievement Test (WRAT) and the Weschler Achievement Scale for Children (WISC) (Alaimo, Olson, & Frongillo, 2001). Mathematics scores of food insecure children are lower than those of their food secure cohort (Alaimo, Olson, Frongillo, & Briefel, 2001). Food insecurity at kindergarten is a predictor of poor mathematics scores as the children progress through their school years (Jyoti, Frongillo, & Jones, 2005). Food insecure children are twice as likely as food secure children to have repeated a grade (Alaimo, Olson, Frongillo, & Briefel, 2001). Again, it may be difficult to determine if these academic markers are

caused entirely by food insecurity or by the impact that frequent household moves may have on the education of children. Research indicates that frequent school changes during the elementary years have been associated with significant reductions in the mathematics and reading scores of children (Burkam, Lee, & Dwyer, 2009).

Several studies have linked food insecurity and hunger to emotional problems. Anxiety rates in children who are food insecure have been found to be markedly higher than in food secure children (Kleinman et al. 1998; Slack & Yoo, 2005; Weinreb et al, 2002). Rates of anxiety are exacerbated when children are not only food insecure, but also experience hunger (Kleinman et al.). As rates of hunger increase, so do rates of anxiety. Anxiety scores for children experiencing severe hunger are more than twice the scores of children who experience no hunger (Weinreb et al.). A number of familial factors can affect the relationship between food insecurity and emotional problems. Children of parents who are cohabiting with a partner have been found to exhibit higher rates of internalizing behaviors (Slack & Yoo, 2005). Mothers of children with the highest levels of hunger are more likely to report symptoms of depression, post traumatic stress disorder, anxiety, or substance abuse (Weinreb et al.). These factors can be mediated by perceived levels of social support for the family, which decreases internalizing behaviors in children (Slack & Yoo).

Behaviors such as hyperactivity and aggression have been correlated with food insecurity in children even when other factors of poverty are controlled (Slack & Yoo, 2005). Scores on measurements for oppositional and aggressive behaviors are higher in

food insecure children (Kleinman et al, 1998). Symptoms of conduct disorder are 7 to 12 times higher in children who experience food insecurity with hunger than children who do not experience hunger (Kleinman et al.). Behavioral problems of all types appear to be exacerbated by hunger (Kleinman et al.). Food insecure teens are more than twice as likely as food secure teens to have problems relating to peers and are four times more likely to report that they have no friends. Food insecure teens are three times more likely to have been suspended from school (Alaimo, Olson, Frongillo, & Briefel, 2001).

A number of studies indicate that the social skills of children are affected by food insecurity (Alaimo, Olson, Frongillo, & Briefel, 2001; Howard, 2011; Jyoti et al. 2005). Moving from food insecurity to food security may not remedy the social skills problems of children. Howard found that children, particularly boys, who move from food insecurity in the first grade year to food security by the third grade year, do not make up for the deficit in social skills. During the early years of elementary education, a move downward in food security is likely to affect girls more negatively than it does boys, perhaps because girls are more likely to respond to stress and household financial difficulties with symptoms of depression and anxiety (Rudolph & Hammen, 1999).

As previously noted, parental factors may affect many behavioral characteristics of food insecure children. Belsky et al. (2010) sought to determine if these characteristics resulted solely from having experienced food insecurity, or if other factors that typically affect food insecure households were related, such as maternal personality attributes and poverty. Results of the study indicate that children living in food insecure households

were more likely to live with mothers who were insensitive to their children's needs. Mothers may also have been less likely to control impulses which may affect the amount of money available for food purchases or how much food is available at various times of the month. Not surprisingly, children in food insecure households with mothers whose behaviors put them at risk were more likely to experience behavioral and emotional problems than households with mothers without these risk factors.

Results of a study by Alaimo, Olson, and Frongillo (2002) indicate that when compared to adolescents living in poverty, adolescents who experience food insecurity are at significantly greater risk for symptoms of dysthymia and are significantly more likely than food secure adolescents to report symptoms that increase suicide risks. Food insecure adolescents were four times more likely to have symptoms of dysthymia and five times more likely to have made a suicide attempt than adolescents who live in poverty but are food secure. Many symptoms that are associated with depression and dysthymia (American Psychiatric Association, 2000) are replicated in people experiencing severe food restrictions. In a World War II study of the effects of starvation, volunteers were semi-starved for a 6 month period. During that time, the researchers noted that the volunteers showed an increase in apathy and depression, increased hysteria and neuroticism, and feelings of ineffectiveness. Volunteers suffered decreases in levels of concentration and attention, spontaneity and ambition, and a narrowing of interests in activities. They became less interested in interactions with others, levels of contentment and humor decreased, and they were reported to have difficulty with emotional control

(Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950). Polivy (1996) has reported that dieters who severely restrict food intake exhibit higher levels of dysphoria and emotional lability and demonstrate lowered levels of concentration and attention. The dorsal anterior cingulate cortex shows significant shrinkage in patients with anorexia nervosa (McCormick et al., 2008). Those with damage or lesions to the anterior cingulate cortex frequently show symptoms of apathy, inattention, and emotional distress (Bush, Luu, & Posner, 2000). Therefore, it is possible that extended food deprivation caused by food insecurity could lead to neurobiological changes in the brains of food insecure teens that could lead to higher rates of depression and suicidal thinking. The effects of the neurobiological changes in adolescents could be compounded by the effects of living in poverty and/or living with parents who are not sensitive their needs.

Adults

In 2010, 16.4% of all households in the U.S. were food insecure; 37.6% of all low-income households were food insecure. The highest rates of food insecurity in adults are for adults living with children. Rates of food insecurity for households with children are approximately 21%. For parents living below the poverty line, the rates rise to 43.5%. Single parent households have the highest rates of food insecurity with more than 48% of low-income households headed by single women being food insecure, and more than 41% of households headed by single men being food insecure. Rates of food insecurity drop slightly when two or more adults live together, but rise slightly for single men living alone (Coleman-Jensen et al., 2011). More than 44% of all family households in the U.S.

have their own children under the age of 18 living in them (U.S. Census Bureau, 2012); these figures do not include numbers of households in which grandparents are rearing children or children are living with relatives or with non-related adults. The households with related children experience food insecurity at rates of 20.1% (Coleman-Jensen et al., 2011). Because such a large portion of food insecure adults are living in homes with children, it becomes difficult in many instances to separate adult food insecurity from food insecurity that affects all members of the household. Because households headed by single women constitute the largest numbers of food insecure households in the U.S., nearly all of the existent literature on food insecurity in adults focuses on women and mothers. Perhaps because only 15% of single men without children are food insecure and the rate of food insecurity in households headed by single men is 25.4% compared to 35.1% of food insecure female headed households, there is a dearth of information about how food insecurity affects men and their families.

A number of studies have linked household food insecurity to poor health in adults (Gucciardi et al., 2009; Hamelin et al., 1999; Olson, 1999; Siefert et al., 2001; Stuff et al., 2004; Tarasuk, 2001; Vozoris & Tarasuk, 2003). Stuff et al. reported that with each \$10,000 increase of household income, there is a moderate increase in health. Not surprisingly, food security is related to better health. However, for food insecure households, self-reported rates of poor health are higher in White households than in Black households (Stuff et al.). The authors of the study hypothesize that the health of Black food insecure adults may not in fact be better, but that cultural factors may affect

how health is viewed. Cross-cultural studies of illness and disability have shown that some cultures view deterioration of health as an inevitable effect of aging (Groce, 1999; Groce & Zola, 1993). Therefore it is possible that health concerns in Black participants are similar to those of White participants, but due to the self-report nature of health, they are merely being perceived as being less severe.

Adults living in food insecure households are more likely to have multiple health concerns or health conditions that are chronic, or a disability (Tarasuk, 2001; Vozoris & Tarasuk, 2003). While reporting significantly more hospital admissions in the previous year, food insecure adults are significantly more likely than food secure adults to believe that their health care needs are unmet (Gucciardi et al., 2009) Older women and less educated food insecure women tend to report poorer health than younger women and women who have higher levels of education (Siefert et al., 2001).

While men who are food insecure tend to be underweight or to have normal weight, food insecure women are significantly more likely to be overweight or obese (Olson, 1999; Vozoris & Tarasuk, 2003). As rates of food insecurity increase, rates of overweight increase (Townsend, Pearson, Love, Achterberg, & Murphy, 2001). This is significant because obesity has been implicated as a risk for hypertension, stroke, coronary artery disease, and Type II diabetes (Kopelman, 2007). Hypertension is significantly more likely for adults in food insecure households (Seligman et al., 2010; Vozoris & Tarasuk, 2003). Food insecure adults also report higher levels of heart disease (Vozoris & Tarasuk). High rates of diabetes have been reported not only for food

insecure adults (Vozoris & Tarasuk), but also for food insecure children (Marjerrison, Cummings, Glanville, Kirk, & Ledwell, 2011).

As single food insecure women who are mothers are significantly more likely to be overweight than are food insecure women without children, motherhood may play an important role in their weight status. There appears to be little correlation between single parenthood for food insecure men and increased risk for overweight or obesity (Martin & Lippert, 2011). One longitudinal study examined if the tendency for single, food insecure women was related to metabolic changes brought about by pregnancy. Not only did results of the study indicate that there is little interaction between biological motherhood and weight, but women who parented children who were not their biological children were significantly more likely to be overweight or obese than women parenting only their own children (Martin & Lippert). Furthermore, the results of this research show that food insecure women who have given birth but do not live with their children are no more likely than women without children in the home to be overweight or obese.

The finding that the act of mothering increases the likelihood of overweight or obesity suggests that rather than biology, perhaps the gendered cultural expectation that women put the nutritional needs of their families ahead of their own (DeVault, 1991) may be responsible for this finding. Women who parent children have been found to suffer significant inadequacies in meeting daily requirements for several key vitamins and minerals such as folic acid, iron, and zinc (McIntyre et al., 2003). Their children, however, showed little or no nutritional inadequacies in these vitamins and minerals. A

probable cause of under nutrition for these women lies in the tactics they use to ensure that their children receive the best care that is within their abilities. Many women report that they feed their children first and then either eat what is left after the children eat, significantly reduce the amount of food they eat at mealtime, or completely skip the meal (McIntyre et al., 2003; Stevens, 2010; Wiig, Dammann, & Smith, 2009). The denial of personal needs to fulfill the nutritional needs of children has been called *maternal deprivation* (Basiotis & Lino, 2003).

Another factor that has been implicated in the high rates of overweight and obesity in food insecure women is related to ways in which some food insecure households manage limited food resources. Many women report that by the end of the month, when financial resources and/or SNAP benefits are very low, they and their children are more likely to experience hunger (Basiotis & Lino, 2003; Dietz, 1995; Stevens, 2010; Tarasuk, McIntyre, & Li, 2007). During these periods of hunger, families are more likely to consume energy dense, high calorie foods with lower levels of nutrition, such as pasta with oil, white rice, potatoes, or hot dogs to stretch meager food reserves. Mothers also reported that they were more likely to go without food as food supplies became very scarce (Basiotis & Lino; Dietz; Olson, Bove, & Miller, 2007). When the family is able to purchase groceries again after receipt of SNAP benefits or a paycheck, many women report food binges after several days of eating less or not eating (Basiotis & Lino; Dietz). Dietz hypothesized that based on human and animal studies of cyclical food deprivation, periods of food deprivation following periods of high energy

intake during the periods of time when larger quantities of food that are more desirable is likely to result in slow weight loss during the deprivation periods. Considering that the foods eaten tend to be of low quality and high in less nutritious calories when food is scarce in households, it is likely that these factors also inhibit weight loss.

Food insecurity has also been associated with poorer mental health (Huddelston et al., 2008; Siefert et al., 2001; Tarasuk, 2001; Vozoris & Tarasuk, 2003). In a study of food secure and food insecure adults in Canada, food insecure adults were nearly three times more likely to report feelings of distress and 3.5 times more likely to report symptoms of depression than were adults who were food secure (Vozoris & Tarasuk). Results of a study of food secure and food insecure women in the U.S. were similar (Siefert et al.). Levels of unemployment, stressful life circumstances, domestic violence and sex and racial discrimination were significantly higher in women who were food insecure. The food insecure women were significantly more affected by depression and generalized anxiety disorder than were food secure women. Food insecure women who were unemployed, had stressful life experiences, and had experienced domestic violence were significantly more likely to report symptoms of major depression, while poverty status and stressful life experiences were significantly more likely to predict symptoms of generalized anxiety disorder for food insecure women (Siefert et al.). Rates of depression and generalized anxiety disorder increase as levels of food security decreases (Whitaker, Phillips, & Orzol, 2006). Some women have reported that they experience distress caused

by the fear that their difficulty in providing adequate nutrition to their children will cause them to lose custody of the children (Hamelin et al., 1999).

Although the study by Siefert et al. (2001) did not look for interactions between domestic violence experiences and mental health disorders, it is highly likely that having experienced domestic violence increases the risks for depression and generalized anxiety disorders. Results of study by Tolman and Rosen (2001) of women who received financial support through a welfare program indicate that women who experienced domestic violence reported rates of depression, generalized anxiety disorder, and post-traumatic stress disorder at rates two to three times those of women in the general population. This finding confirms previous research which indicates that depression and post-traumatic stress disorder are the most commonly reported mental health conditions of victims of domestic violence (Campbell, 2002). Victims of domestic violence were significantly more likely to experience food insecurity than non-victims (Tolman & Rosen).

A number of physiological factors may affect the depression rates of food insecure adults. As previously noted, rates of diabetes are high in food insecure populations. Depression rates are twice as high for diabetics when compared to the overall population. Depression is the most common mental disorder associated with diabetes (Ismail, 2009). Studies indicate that meals in food insecure households are significantly less likely to include fresh produce such as leafy green vegetables (Martin & Lippert, 2012; Tarasuk, 2001). Women living in food insecure households have also been

shown to have serious deficits for the intake of folic acid and Vitamin B₁₂ (McIntyre et al., 2003). These nutrients are important for proper functioning of the central nervous system. Low levels of folate intake have been found to reduce the efficacy of antidepressants. Depression symptoms have been found to be more severe and long-lasting in those with deficits of folate (Bodnar & Wisner, 2005). Women in food insecure households have also been found to have diets deficient in Vitamin C, iron and zinc (McIntyre et al). Again the deficiencies are likely to result from the elimination of higher-cost foods such as produce, meat or fish. Inadequate intake of iron has been linked to post partum depression, fatigue, irritability, and concentration problems. Neurologically, iron is important for the proper synthesis and functioning of the neurotransmitters serotonin, dopamine, and noradrenalin. Zinc is believed to aid in synaptic transmission, as it is localized in some synaptic vesicles. Although the role of Vitamin C in the reduction of depressive symptoms is somewhat less clear, high dose Vitamin C supplementation has been found to reduce symptoms of major depressive disorders (Bodnar & Wisner).

Food insecurity also appears to affect social relationships of women. Some women lament the fact that they cannot afford to invite friends or extended family to meals (Hamelin et al., 1999) or feed the friends of their children who come to visit (Wiig, Dammann, & Smith, 2009). Some blame erosion of the family structure on food insecurity because family meal times are significantly reduced or are less enjoyable (Hamelin et al.). Food insecurity can lead to social isolation because families may need to

resort to less socially acceptable means of food provisioning such as the use of federal food programs to procure food (Hamelin et al.). A study by Hamelin et al. found that “psychological suffering related to food intensified the feeling of exclusion and powerlessness” (p. 527S). Feelings of powerlessness became barriers to overcoming situations that might place food insecure families in more socially acceptable situations.

Elderly

The numbers of food insecure elderly people in the year 2011 were lower than the numbers for the general low-income population, although numbers have been increasing substantially since 2007 (Ziliak & Gunderson, 2011). In 2011, 37.6% of all low-income population was considered food insecure. By comparison, 22.4% of low-income families with an elderly member and 19.8% of low-income elderly people living alone were food insecure. About 10% of all the elderly are food insecure (Coleman-Jensen et al., 2011). In 2009 nearly 4 million seniors lived with food insecurity (Ziliak & Gunderson, 2011). Numbers of food insecure seniors are expected to rise as the youngest members of the Baby Boom Generation reach age 60. In the year 2025 numbers of food insecure elderly people are expected to increase by 50% (Ziliak & Gunderson, 2009). Elderly people who are most likely food insecure are African American or Hispanic, have grandchildren living with them, and/or live in a southern state (Ziliak & Gunderson, 2009). In one study of food insecure elderly people, 60% were reported as functionally impaired, with 48% reporting difficulty in completing activities of daily living (ADL) (Lee & Frongillo Jr, 2001).

Food insecurity in the elderly population may be caused by different factors than those that lead to food insecurity in younger populations. Mobility or physical issues rather than financial issues may be the primary cause of food insecurity and hunger for some the elderly. Some elderly individuals report that they are unable to prepare food for themselves because they are unable to stand long enough to prepare meals (Wolfe et al.,1996) . Paralysis or arthritis may prevent the elderly from opening cans or being able to manage kitchen utensils such as knives (Wolfe et al.). Many physically impaired elderly people become dependent on paid caregivers or family members for meal preparation support. If their support system is unable to prepare meals for them, they may not eat for several hours or days (Wolfe et al.). Physical disabilities and consequent inability to cook may significantly impair the elderly's health, particularly those who are diabetic and must maintain a rigorous schedule of insulin and meal times (Wolfe et al.). Physical disability or lack of transportation may also affect the elderly's ability to shop for healthy foods. Many report that they must depend on others to buy groceries for them. Some elderly people report that when others do their shopping, the shoppers do not always buy the kinds of food they want (Wolfe et al.).

Household expenses can also significantly affect how much money is available to the elderly for food. Bhattacharya, DeLeire, Haider, and Currie (2003) found that a mere 10 degree drop in outdoor temperatures can significantly affect the amount of money that low-income families spend on food. Increased heating or cooling costs have been found to have a more profound effect on money available for food among elderly populations

than in households with no elderly members (Nord & Kantor, 2006). For low-income elderly people living in states with the most days in which homes needed supplemental heat, the odds of being in very low food security are 43% less during summer months. In areas of the country with high numbers of cooling days, the odds of having very low food security are 27% less likely during the winter months (Nord & Kantor).

A time honored method of food provisioning for individuals and families has been the planting and tending of a garden. Evidence suggests that humans began raising crops for human consumption around 8500 BCE (Garafalo, 2002). As previously noted, some food insecure rural dwellers make use of gardening to feed hungry families. The popularity of community gardening has ebbed and flowed in the U.S. over the past 150 years, but now appears to be enjoying popularity in some urban communities.

Community Gardens

The community gardening movement in the U.S. began at the turn of the 20th century. Beginning as early as the 1820s, middle class city dwellers began to move to suburban areas of large cities (Lubove, 1962). Economic considerations as well as restrictive covenants made it impossible for those in particular ethnic or racial groups to make the move. The houses that had formally sheltered those in the middle class were sub-divided to house laborers and recent immigrants and tenement apartments were built, creating densely populated urban neighborhood areas (Lawson, 2005). Substandard water quality caused by unregulated industrialization, poor ventilation, and inadequate sanitation and sewage management led to outbreaks of cholera, smallpox, tuberculosis,

and typhoid in inner-city neighborhoods. Conditions outside of the residents' homes were likely to be dirty and polluted as well. Before the exodus of the middle classes, city landscapes surrounding homes had contained beautiful gardens. As the homes were purchased to provide housing to laborers, the gardens were razed to create more space to build tenements (Lubove) or other businesses (Lawson). Land was occasionally purchased for later development by landlords who did not live in or frequent the neighborhoods. The land was untended and frequently became the dumping grounds for household trash (Lawson). Like modern food deserts, the neighborhoods contained a bounty of liquor stores and food retailers, selling low quality, even rotten, foods to residents of the neighborhoods (Lubove). Lacking governmental controls of food quality, feral cats and dogs, and rotting vegetables sometimes found their way into foods such as sausage (Lubove).

The Depression of 1893 resulted in massive bank and business failures in the U.S., which led to unemployment for millions of workers (Rezneck, 1953), many of whom lived in the apartments and tenements near the industries where they had been employed. The poor houses and shelters were inundated with requests and police stations were overfilled with vagrants, who were newly unemployed (Rezneck). Charitable organizations that had provided assistance to the poor were unable to provide for the newly poor. In 1894, Detroit's mayor Hazen Pingree was instrumental in the development of community gardens to allow unemployed workers and their families to grow gardens in vacant lots (Lawson, 2005). Pingree was able to acquire 450 acres of

land in the Detroit area in spite of resistance from wealthy Detroit residents and merchants. The acquisition of land allowed 975 Detroit residents, chosen from 3,000 applicants, to garden in plots near their homes (Lawson). Gardeners were provided seeds. Manuals were produced in three languages to guide the gardeners' efforts. Records indicate that the gardeners not only had enough food for their families but were also able to sell produce to others in their communities. By 1898, vacant lot cultivation had spread to 19 metropolitan areas in the U.S. (Lawson). The vacant lot garden projects were popular because it was believed that soup kitchen and other food aid programs would create dependence, thus perpetuating the need for welfare programs (Lawson).

Not only did the vacant lot gardens provide food for hungry families, but families living in sub-standard tenements were able to escape their stuffy, cramped quarters for fresher air and exercise. In some cities, gardeners were able to set up tents or other temporary housing in order to sleep near their plots during the summer to escape the heat. The gardening training that some men received allowed them to develop skills to find farm jobs. City lots that had previously been potentially dangerous eyesores became the pride of many neighborhoods. Children in many families developed sales routes to sell excess produce, thus helping provide additional monies to family coffers (Lawson).

In most cities, it appears that the vacant-lot garden projects ended around the year 1898, when the depression of that time period ended. The garden projects continued to flourish in a few cities such as Philadelphia, which continued the projects until about 1927. Cities that continued the garden projects into the 20th century were in good

standing when the eruption of World War I led to the initiation of similar projects (Lawson).

In the early decades of the 20th century, a profound population transformation was occurring. A shift from rural agrarian life to urban life was occurring, and by 1920 more of the nation's population lived in cities than lived on farms (Hayden-Smith, 2006; Lawson, 2005). This population shift led to labor shortages on farms, which in an era before petroleum powered tractors and machinery still relied heavily on human labor. Ninety percent of products produced by farmers were consumed by residents of the U.S. (Hayden-Smith).

Substandard housing conditions that plagued cities in the 19th century continued into the new century. Child labor reform meant that children were no longer forced to work long hours in dangerous factories. Crowded apartments with rubble-strewn vacant lots provided little space for children to play or to have contact with nature. Child advocates were concerned that children living in these conditions, and who were now spending many unsupervised hours alone while their parents worked, would be led to lives of crime (Lawson, 2005). Mandatory school attendance laws led to the doubling of the size of some schools (Trelstad, 1997). The vacant-lot gardens of the late 19th century had all but disappeared in many cities, but social reformers saw gardening as a means to address the educational, social, environmental, and moral needs of burgeoning school populations (Lawson). Children's gardens began to spring up in cities maintained under the guidance of civic organizations and garden clubs. In 1914, the Bureau of Education

developed materials in order to include gardening as part of the school curriculum (Hayden-Smith, 2006; Lawson).

By 1917, troops in need of provisions were being deployed in Europe. Widespread famine was occurring in France and Belgium as World War I continued. The war had taken its toll on European agricultural production. European men who had been farmers had been enlisted. Agricultural land and farm animals had been laid to waste by war. European countries became increasingly dependent on agricultural products from the U.S. at a time when production was doing little more than meeting domestic needs. Farmers in the U.S. suffered particularly low harvests in 1916 and 1917. Politicians began to worry that rising food prices in the U.S. would lead to domestic unrest and threaten war efforts in Europe (Hayden-Smith, 2006).

Building on the success of the garden programs in schools, the U.S. School Garden Army (USSGA) was developed by the Bureau of Education in an effort to increase the quantities of food produced in cities. Thus, gardens would provide a great deal of food at home while allowing farm produce to be sent to Europe for troops and for famine relief (Hayden-Smith, 2006; Lawson, 2005). Politicians promoted gardening as a means to quell potential domestic unrest due to food shortages and rising food prices (Hayden-Smith). Those who lived in homes with backyards converted them to gardens and raised poultry. Many factories provided land to employees for gardens. Land along railroads was opened for gardening and military personnel gardened both in the U.S. and abroad to provide for at least part of their needs (Lawson). Gardening was not only a

means of feeding one's family, but a form of patriotism (Hayden-Smith). Children's participation in the USSGA extended to the home. Mothers were instructed in methods to preserve garden produce and schools allowed families to use their kitchens and equipment to preserve their bounty. Teachers visited the homes of their students to offer gardening guidance (Hayden-Smith).

As the war came to an end, the gardens ceased to be called War Gardens, and began to be known as Victory Gardens (Lawson, 2005). Large populations of Europeans were still experiencing hunger, and would need food assistance from the U.S. during reconstruction (Lawson). Over time, interest and support for the gardens began to wane, lands were returned to their former purposes, and charitable organizations focused on other interests (Lawson).

During the Depression years before World War II, community gardening became a means of feeding and employing thousands of workers who had lost jobs due to the economic downturn. Gardening was seen as an antidote to idleness caused by unemployment. Many worried that unemployed, idle men would resort to gambling, drinking, and hooliganism to fill their idle hours. The less common type of gardening during this period was work-relief gardens. Unemployed workers were hired to work in gardens that provided food to relief agencies or for institutions. During this historical period, attitudes about poverty and unemployment shifted. Where previously, poor people had been considered a drain on society's resources, due to the drastic downturn in the economy, the poor and unemployed were considered to be victims of unfortunate

circumstances. Providing employment to unemployed workers was seen as a more humane method of providing relief than merely providing money or food (Lawson, 2005).

More commonly, the hungry and unemployed gardened in subsistence plots. Similar to the gardens of World War I, these gardens were set up in vacant areas. Unlike gardens of the Depression of 1893, the gardens were intended solely as a means of providing food to the families of the gardeners, and not intended for sale. The gardens were either divided for individual gardeners or the gardeners worked collectively to provide produce for the members of the collective. Gardening in this manner allowed gardeners greater access to tools, fertilizers, and knowledge than if they were gardening on their own. Funding for subsistence gardens was provided by philanthropic organizations, fundraisers, and municipal funds. In some cases, companies provided land and supplies to their laid-off workers. As the Depression continued and demand for public relief increased, in some areas, participation in subsistence gardens became mandatory for families applying for assistance from relief agencies. As New Deal policies provided jobs for unemployed adults and changed the nature of relief agencies, subsistence gardens lost funding and public interest. In spite of the lack of funding by the relief agencies that had previously sponsored the gardens, many continued to garden the areas individually (Lawson, 2005).

In the weeks following the bombing of Pearl Harbor in World War II, citizen groups and gardeners began to implement plans to replicate the garden programs of

World War I. Initially the government was reluctant to endorse the programs, fearing individual efforts to support food production would be too inefficient to make a difference (Lawson, 2005). Not deterred by the initial resistance, gardeners won over doubting government officials, and by the end of the war the director of the USDA reported that 40% of the nation's vegetable supply had been provided by the 18 to 20 million gardeners who kept Victory Gardens (Brown & Jameton, 2000; Lawson).

As it had been during World War I, gardening during World War II became a matter of patriotism. Colorful posters urging citizens to garden for the war effort adorned grocery stores, public offices, and store windows. Radio shows and short films offered gardening advice. Gardening competitions were arranged to promote friendly competition among gardeners. Children were once again encouraged to garden at home and in 4-H or scouting groups (Witkowski & Beach, 1998).

The USDA recommended 50 feet by 30 feet as the minimum square footage for a garden. It was recommended that gardeners who lacked space to garden at a community garden (Thone, 1943). As in previous eras, individual gardens sprung up in vacant lots and larger collective gardens were organized on donated lands. In order to preserve valuable resources such as petroleum and tires, gardens were arranged close to housing areas. Mothers brought play-pens for toddlers and shared gardening and child care. Women's magazines published garden plans for families, households with one or two single women, or gardens to be shared by families. Gardening was promoted as an enjoyable activity for individuals and families rather than a chore (Lawson).

As World War II ended, so did governmental and individual support. As people left cities for suburban neighborhoods with backyards, some continued to garden, considering it an enjoyable hobby. But those who remained in the cities found that the parks, vacant lots, and factory lots where they had previously gardened were no longer available to them (Lawson).

The Victory Gardens of World War II continued to inspire some gardeners to continue gardening recreationally and as a means of producing economic fresh produce for their families. Oil embargoes of the 1970s led to increased prices for groceries. Increasing concerns about the chemicals used in commercial farming led to a movement to organic gardening and to the first Earth Day in 1970. In 1976 more than half of those in the U.S. were tending gardens, 10% of them in community gardens. Gardening activists began to promote the personal and social benefits of gardening. Middle-class flight from cities to suburbs had left behind urban blight, crumbling buildings, and dirty and dangerous vacant lots. In hopes of creating renewed urban areas, cities removed large swaths of decaying property, razing dilapidated houses and apartments with the promise that the neighborhoods would be built anew. Unfortunately, renewal did not occur as quickly as demolition, leaving behind blocks of cleared land. Struggling to maintain the razed areas in blighted neighborhoods, many city governments began to develop programs to lease the lots to gardening groups for as little as \$1 a year (City of New York, n.d.; Lawson, 2005). Other cities simply did not object when squatters began to develop garden spaces on the vacant lots. Gardening of the lots not only removed the

responsibility of care from cities but by allowing gardening on formerly trash strewn lots, the appearance of neighborhoods was greatly improved. Residents gardening the lots were provided opportunities for recreation and a chance to interact with neighbors. Gardening allowed them to grow produce that was difficult to find in their neighborhoods and to have contact with nature in areas with few city parks (Lawson).

As the gardeners were typically poor, they relied on donated or found objects to create garden beds, fences, and gates. The gardeners and their children painted ugly walls of buildings. The garden plans included picnic areas, play areas, and small kitchens (Lawson, 2005; Schmelzkopf, 1995). Appearances of the gardens ranged from well-organized, park-like settings to chaotic amalgamations of dozens of gardeners (Schmelzkopf, 1995).

Gardening in razed and abandoned lots in high-crime areas was not without problems. Often, high lead content in the soil and air made the produce dangerous to eat, rather than promoting health. Particular care was needed to ensure that the soils in the garden were maintained at levels to prevent high lead content in the produce. Given the makeshift fences and gates that surrounded the gardens, theft and vandalism threatened the harvests. Careful garden planning was required to put tempting produce out of the reach of vandals and thieves. Some groups posted guards overnight to prevent crime (Lawson, 2005). Some gardens employed barriers of tall weeds on the borders of the gardens to conceal the gardens, while in other gardens, small houses or shelters were constructed to allow gardeners to spend the night in the gardens (Schmelzkopf, 1997).

Some gardens had strict rules regarding behavior to keep crime, such as drug dealing, away from the gardens (Schmelzkopf). Anecdotal evidence suggests that the presence of gardens in blighted areas reduced crime both in the gardens and in the neighborhoods (Lawson).

The success and popularity of small urban community gardens in cities like New York led some of the organizers of these gardens to form coalitions and non-profit organizations to expand the scope of the gardens to other neighborhoods (Lawson, 2005). Organizations such as New York's Green Guerillas began with members who were community gardeners and expanded into organizations that were staffed by paid employees to teach gardeners gardening skills as well as political and organizational skills (Schmelzkopf, 1997). Gardening organizations helped collect donated tools, seeds and money, and managed the distribution of the assets they collected. Some community gardens have transitioned into programs to provide job-training for neighborhood residents or at-risk youth (Lawson).

Benefits of Gardening

Urban residents who participate in community gardening projects have been found to increase their intake of fruits and vegetables. Community gardening participants were 3.5 times more likely than non-participants to eat at least five servings of fruits and vegetables on a daily basis (Alaimo et al., 2008). While mere availability of produce is likely to increase consumption (Wakefield et al., 2007), a number of factors also affect increased intake. In neighborhoods where cost and availability of fresh produce cause

many families to eliminate it from menus, gardening is a way to incorporate these foods into family meals, at least on a seasonal basis (Stein, 2008; Wakefield et al.). Many gardeners report that they prefer their garden-grown produce because it tastes better (Armstrong, 2000). Ethnic minority gardeners may be able to produce the vegetables that are traditional in the foods of their cultures. These foods may be difficult to find in the stores in their neighborhoods, may be too expensive, or may lack freshness. Having the ability to eat foods that are fresh and familiar has been cited as an incentive to eat more produce (Wakefield et al.).

Children who actively engage in gardening have an increased likelihood of eating more fruits and vegetables. The development of healthy eating patterns early in life is important as childhood eating patterns affect eating behaviors throughout the lifespan (Somerset et al., 2005). Children participating in a school-based gardening program were found to enjoy a wider variety of vegetables and were more likely to choose vegetables as a snack after participating in the program (Lineberger & Zajicek, 2000). The garden produce in some schools with gardening programs has been incorporated into the lunches served at the schools, thus encouraging students to try new foods that utilize the vegetables that they produced (Waters, 2008). Teachers have noted improved behavior for many students who participate in gardening programs at their schools (Somerset et al.).

Physical activity has been correlated with lowered levels of cardiovascular disease, diabetes, cancer, hypertension, osteoporosis, and premature death. Even

moderate amounts of exercise are believed to positively affect physical health outcomes (Warburton et al., 2006). Senior citizens who garden have been shown to significantly reduce Medicare expenses (Stearns et al., 2000). Some community garden participants cite the physical exertion of gardening as a means of relieving stress (Wakefield et al., 2007). Although exercise has been shown to reduce blood pressure, it is reduced more significantly when engaging in physical activity in pleasant, green surroundings. Engaging in exercise in natural settings also appears to increase levels of self-esteem while exercise in ugly, urban areas appears to lower levels of self-esteem (Pretty et al., 2005). Community gardens may provide a safe place to exercise in dangerous neighborhoods (Wakefield et al.). Providing verdant surroundings may increase the health benefits beyond those provided by exercise alone.

Gardening has been used as therapy or as adjunctive therapy for patients in mental institutions and for rehabilitation of wounded soldiers for more than a century. However, very little experimental research exists that directly measures the effects of gardening on specific mental disorders (Gonzalez, Hartig, Patil, Martinsen, & Kirkevold, 2009). Results of an influential study published in 1984 found that surgical patients who had a view of green spaces through their hospital windows had shorter healing times and used less pain medication than patients whose windows faced a brick wall (Ulrich, 1984). Using a form of horticultural therapy in which depressed participants volunteered on urban farms, researchers were able to reduce the Beck Depression Inventory (BDI) scores of 19 people an average of 9.7 points. This reduction was statistically significant. Three

months after treatment ended, 16 of the participants' BDI scores remained lowered at significant levels (Gonzalez et al., 2009). People whose levels of cortisol were increased by participating in a stressful situation returned to normal cortisol levels after 30 minutes of gardening. The control group participants who read a book while sitting inside did not experience cortisol reductions as fully as gardeners (Van Den Berg & Custers, 2011). Other research investigated the effects of participating in urban gardening for HIV positive participants with depression. Although participants' BDI scores improved, they failed to reach statistical significance, possibly because of small sample size. Participants also reported less cocaine and heroin use while engaged in urban farming (Shacham et al., 2011).

There appears to be strong evidence that participating in gardening is beneficial. Many gardeners report that creating a pleasant environment or the relaxation of working in the garden is more important than the products of gardening (Armstrong, 2000; Dunnett & Qasim, 2000). As is suggested by the previously noted studies, many gardeners, particularly those in urban areas report that working in a verdant, natural setting is soothing and calming. Others report that it is a time that they can spend working as a family with their children (Wakefield et al., 2007). Some report that their connection to nature increased their feelings of spirituality or a feeling of a connection to a higher power (Kingsley et al., 2009).

One of the important factors of community gardening that participants frequently report is a feeling of empowerment. Some gardeners report feeling as though gardening

allowed them to feel as though they had been successful at something (Wakefield et al., 2007). Others reported a feeling of pride in developing skills they did not know they possessed (Wakefield et al.), while others report feelings of satisfaction from learning how to do new things (Kingsley et al., 2009). For yet others, improving their neighborhoods allowed them to feel as though they were doing something important (Wakefield et al.).

Perhaps the most important influence on well-being for community gardeners is increased contact with their communities. These interactions occur on a number of levels. Some gardeners, particularly those in low-income areas, take satisfaction that their extra produce allows them to share it with neighbors (Wakefield et al., 2007). Gardening communally helps people feel less isolated (Kingsley et al., 2009; Wakefield). Working in the garden with neighbors allows gardeners to share personal experiences and support one another during difficult times (Kingsley et al.). Gardeners who recruited neighborhood teens reported levels of increased trust across generational lines that had not existed before sharing time in the garden (Teig et al., 2009).

Many minority and immigrant gardeners report that they enjoy working with others from their cultures in the gardens as a means of reconnecting with their cultural heritage (Wakefield et al., 2007). Community gardens can also serve as a vehicle to unify gardeners of different cultures. Gardeners from other countries can bring with them gardening methods that can be adopted by gardeners in the U.S. (Baker, 2004). The shared activity of gardening breaks down social barriers that may exist between gardeners

of different races or ethnicities (Teig et al., 2009). Gardeners from diverse populations who worked together in community gardens through the Rutgers Urban Gardening program reported that until they began working in the garden, they did not know many of their neighbors. Many gardeners reported that they had developed friendships that crossed racial and cultural divisions. As one gardener stated, “We forget race when we garden” (Patel, 1994, p. 403).

Increasing contact between neighbors can lead to positive changes that expand beyond the boundaries of the garden. Communication and cooperation among members is imperative for the operation of community gardening sites. Community gardeners in low-income areas are four times as likely as gardeners in higher-income gardeners to collectively address other problems in the neighborhood (Armstrong, 2000). In one Midwestern city, residents who had grown tired of the prostitution and drug dealing that occurred on a city-owned vacant lot, petitioned the city to lease the lot for a community garden. Residents stated that they believed growing a garden on the lot was a more peaceful means of controlling activity on the lot than engaging in a neighborhood watch program (Glover, 2003). Gardeners in a Denver community garden combined efforts to keep a large supermarket in the area, established community babysitting, and established a neighborhood association. Gardening participants reported that these changes occurred because they were able to become acquainted with neighbors who they would not have met without the garden (Armstrong).

Gardening has been used as a means of providing food during hard times and times of crisis. Gardening has helped individuals and indeed even the nation control the production of food when the usual systems of food production and distribution have been endangered by political or social forces such as war and poverty. Having the ability to produce food is likely to increase the amount of food that is available to gardeners and their families. Community gardening allows them more control in their food choices, how they choose to share their food, and how they interact with others in the neighborhood. Having these choices and opportunities may affect the perceived sense of control of gardeners.

Two Stage Model of Control

It may be safe to assume that most humans desire to have some level of control over their environments. A number of models have been proposed to explain how control is exerted in one's environment (Brandtstadter & Renner, 1990; Folkman et al., 1986; Holahan & Moos, 1987). Control theories primarily seek to explain what steps humans must take to produce actions that affect their environments or manage the cognitions and emotions that arise as a result of living in their environments (Heckhausen & Schulz, 1995).

In their control model, Rothbaum, Weisz, and Snyder (1982) contend that one's perception of control is based on a two-process construct that consists of primary and secondary control. Using primary control, one attempts to change the environment to suit his or her needs. Secondary control is used to attempt to modify self to adapt to the

environment. When using primary control, attempts to change the environment may result in success, but the situation one intends to change may be resistant, and those attempts may result in failure. Secondary control is used when primary control attempts fail. The authors state that the processes are intertwined and neither process is pure. One typically shifts from one process to the other based on challenges and circumstances.

Heckhausen and Schulz (1995) have expanded upon Rothbaum et al.'s (1982) model. They observe that primary control is directed outward, while secondary control is directed inward. They suggest that the processes should be thought of in terms of two attributes. The first attribute is the target of the control. Is the target the external world or the self? The second attribute is the process. Is one dealing with action or cognition? These authors contend that it is not always easy to classify actions and cognitions as primary or secondary. Many activities require both primary and secondary control. As an example, Heckhausen and Schulz explain that making social comparisons to raise one's self-esteem is typically considered to be secondary control because it is a form of cognition. However, action is also required to complete the process. One must seek out another to make the comparison. This action requires that one exert primary control by interacting with the external world. However, both the primary control of seeking another and the secondary control of making the comparison are directed at the self, to raise self-esteem. Therefore both primary and secondary controls are used.

While the original two-process model of control assigns only slightly more importance to primary control, Heckhausen and Schulz (1995) place more importance on

primary control. Attempts to change or control the environment have a higher value for the individual. They contend that interaction with one's environment in an attempt to change it to suit one's needs is necessary for the developmental process throughout the lifespan. They assert that the desire for primary control is a natural aspiration. The processes of secondary control significantly affect which primary controls are chosen for engagement and the volition to engage in primary control activities.

Not all attempts at primary control will succeed. Failures of primary control can result in loss of self-esteem and weaken one's perceptions of self-efficacy or mastery. If one is unable to mitigate feelings of failure, feelings of failure may lead to depression, pessimism, submissiveness or disengagement (Heckhausen & Schulz, 1995; Rothbaum et al., 1982). Secondary control helps explain and make sense of failure. Secondary control is necessary to buffer the negative effects of failed attempts at primary control to and protect emotional well-being (Heckhausen & Schulz). Secondary control is also important to renew motivation to use primary control in the future. They prevent abandonment of any attempt at control. Using secondary control helps humans assess their skills and strengths and evaluate how their previous attempts at primary control may have failed. This enables them to make choices about where their efforts to use primary control would be most reasonable and productive (Heckman & Schulz; Rothbaum et al.).

When considering how an individual uses primary and secondary controls to affect change, the validity of the individual's perceptions about self and interactions the environment must be considered. First the *veridical-illusionary dimension* must be

examined. The veridical-illusory dimension examines if the individual's perception of the causal relationship between action and outcome is realistic (Heckhausen & Schulz, 1995).

Primary Control

Evaluation of the efficacy of the veridical dimension in primary control should be examined by its level of functionality. Functional veridicality leads to efficacy that promotes both short-term and long-term control (Heckhausen & Schulz, 1995). For example, a student knows that receiving a high test score will increase the likelihood of passing a class. The student who studies for a test is likely not only to pass the test, but has a higher likelihood of passing the course. However, veridicality can also prove to be dysfunctional. It may help an individual reach a short-term goal, but jeopardize the likelihood of long-term success (Heckhausen & Schulz). If instead of studying for the test, the student chooses to cheat on the test, in the short-term the primary control has been effective because the likelihood of passing the test is high, but cheating jeopardizes the long term goal of passing the course if it is discovered.

Although it is logical to assume that using the veridical approach in viewing the world is most highly adaptive and functional, in some situations a veridical view of the world can be dysfunctional (Heckhausen & Schulz, 1995). If the negative conditions in one's environment that cause distress are too onerous, taking a veridical view of them may lead to despair and decrease the likelihood that one would attempt to make changes to the environment, thus gaining primary control. In this case, functional illusory control

can increase the likelihood of success (Heckhausen & Schulz). For instance, overestimating one's ability to complete a task may provide the impetus to engage in an activity that in the past one might have considered too difficult to complete. Even superstitious behaviors such as wearing a lucky token such as a rabbit's foot can be a use of functional illusory control if a student believes that the token has a significant likelihood of affecting the outcome of a test. The belief that the token has some power of protection or amplification of abilities may reduce the anxiety levels of the test taker, thus increasing the likelihood of success. Belief in a spiritual power such as God could be considered illusory control as well. Although God's existence cannot be definitively proven or disproven, the belief that a caring God exists gives comfort and strength allows many people to continue to work to make changes in their environment. Functional illusory controls increase belief of personal control over adversity. Conversely, illusory control is dysfunctional when it interferes with an individual's actions (Heckhausen & Schulz). As an example, if the student token wearer chooses to rely solely on the power of the token rather than preparing for the test, it is not likely that the token will provide the intended results. Heckhausen and Schulz contend that "illusory and dysfunctional control is the most harmful" (p. 287), because not only does it interfere with short-term goals, but when short-term goals are jeopardized, the likelihood of achieving long-term goals is significantly reduced.

Secondary Control

Secondary control supports primary control in terms of action management. Following a failure of primary control, the analysis and cognitive processing of the failure that occurs in the secondary control process may prevent the inertia that often occurs as a result of failure. Secondary control is also instrumental for goal setting and determining the value of attained goals. Therefore, secondary control strongly influences the internal motivation that precedes action (Heckhausen & Schulz, 1995). Heinz Heckhausen (1991) identified four action phases related to motivation: predecisional motivation, preactional volition, actional volition, and postactional motivation. In the predecisional motivation stage, an individual weighs the costs and benefits of various actions before making a decision about what to do. During the volitional stages, one gauges the appropriate time for action and then executes the action. The postmotivational motivation stage is a period of time in which the individual assesses the effectiveness of action, assigns causal attributions to the outcome, and considers the likelihood of success in future actions (Heckhausen, 1991). Attention to the veridicality of the situation is important during the predecisional motivation to select an appropriate goal. It is important during the postactional motivation action phase to clearly evaluate the outcome of actions (Heckhausen & Schulz, 1995). During the volitional stages, it may be more efficacious to use illusory control methods in order to overestimate the probability of success (Heckhausen & Schulz).

Predecisional secondary control strategies are used to as a means of predicting possible failure of primary control. By anticipating possible failure, the individual makes an attempt to avoid disappointment in the event of failure (Heckhausen & Schulz, 1995). Rothbaum et al. (1982) purported that acknowledging limited personal ability to complete an action allows the individual to complete the action to the best of his or her ability under difficult or stressful conditions. Attribution of limited ability allows the individual to adjust expectations for outcomes given the unpredictable nature of the task. Perceived control is particularly dependent on adjustment of expectations. Unmet expectations are likely to undermine perceived control while expectations that are fulfilled tend to increase the perception of control, a condition referred to as *predictive control* (Rothbaum, et al.). An individual can overestimate his or her lack of ability however and engage in self-handicapping or defensive pessimism (Martin, Marsh, & Debus, 2001). These activities all but assure failure, but because the individual avoids success by weak effort or engaging in actions that are counterproductive to success.

Volitional secondary control strategies are instrumental to the individual in initiating an action and continue to exert effort until the action is completed. In order to sustain volition, one must use attention selectively to focus on and encode information that is relevant to the completion of the action (Heckhausen & Schulz, 1995). Heckhausen and Shulz asserted that metamotivational strategies must be employed to prevent attention from being directed to actions that are in competition with the action

that one initially desired to complete. These strategies may include heightening the value of the desired action goal or exaggerating the probability goal attainment.

Following the loss of primary control, engaging in postactional secondary control strategies allows one to analyze and make sense of the loss. Using secondary control strategies during this phase typically results in one of two outcomes. People can either evaluate their efforts to modify aspirations or reconsider their goal hierarchies to lead themselves to believe that the goal was not one they had actually desired. In this case, failed outcomes may be attributed to external forces, thus avoiding self-blame (Heckhausen & Schulz, 1995).

In summary, primary control involves action directed at changing the environment which is external, while secondary control involves action directed at self. Although primary control is most commonly considered to involve action and secondary control to involve cognition, both primary and secondary controls can use action and cognition. The veridical-illusionary dimension allows one to determine if his or her interpretation of the world is valid and if it reasonably predicts outcomes. The functional-dysfunctional dimension is useful in determining if the behaviors used to reach a perceived goal are useful in terms of short-term and long-term goals. Finally, analysis of actions using secondary controls allows for analysis of actions to refine actions and predict future outcomes.

Summary, Integration, and the Current Investigation

Summary and Integration

People who live in food deserts often have difficulty finding affordable and nutritious food because there are no large grocery stores or supermarkets in their communities (Cheadle et al., 1991; Hendrickson et al., 2006; Jetter & Cassady, 2006; Morton & Blanchard, 2007; Ver Ploeg et al., 2009). Although not everyone who lives in a food desert is of low socioeconomic status, food deserts are most common in low-income areas and/or where racial or ethnic minorities live (Powell et al., 2007; Shaffer, 2002; Ver Ploeg et al., 2009; Walker et al., 2010; Zenk et al., 2005). Life in food deserts presents three primary problems: access, availability, and affordability (Beulac et al., 2009; Sharkey, 2009; Ver Ploeg et al., 2009). Access to food may be difficult due to lack of a personal vehicle or lack of dependable public transportation (Clifton, 2004; Coveney & O'Dwyer, 2009; Raja et al., 2008; Ver Ploeg et al., 2009). Accessibility may be limited by the built environment, particularly for those who must travel by foot with small children or for those who have physical limitations (Bostock, 2001; Coveney & O'Dwyer, 2009; Mojtahedi et al., 2008; Neckerman et al., 2009; Ver Ploeg et al., 2009; Whelan et al., 2002). The availability of food stores that stock fresh, nutritious foods is severely limited in many communities (Bodor et al., 2008; Hendrickson et al., 2006; Jetter & Cassady, 2006; Zenk et al., 2011). Those living in food deserts, particularly those who lack transportation, often have to depend on small food markets or convenience stores that are unlikely to stock fresh fruits, vegetables, whole grain

products, or fresh meat (Cheadle et al., 1991; Liese et al., 2007). Many of the retail outlets where food can be purchased in food deserts are small, independently-owned stores; these stores lack the economy of scale that is available to supermarkets. Because the retailer pays a higher wholesale cost, the prices in small stores are often higher for consumers (Alwitt & Donley, 1997; Blanchard & Lyson, 2002; Ver Ploeg et al., 2009). For low-income residents of food deserts, increased prices may mean their food budget is limited and they must limit the quantity of food served at mealtime.

It is not necessary to live in a food desert to be food insecure. However, many of the problems that people in food deserts face also affect those who are food insecure. The population characteristics of those living in food deserts and those who live with food insecurity are similar in terms of socioeconomic status (Coleman-Jensen et al., 2011). Food insecurity occurs when an individual or family lacks the financial resources to provide nutritionally adequate food in sufficient quantities to meet the health needs of each member of the household. Nearly 10% of all households in the U.S. with children are food insecure (Coleman-Jensen et al.). Food insecure families often rely on programs such as WIC, SNAP, or NSLP either for supplementation to their food budget or as the sole means of financial support available for food (Coleman-Jensen et al.). Even with the additional food that is available to low-income families through these programs, many families have a difficult time procuring enough food to meet the nutritional needs of all family members (Morton et al., 2008).

Living with the hunger that frequently accompanies food insecurity can affect physical, mental, and emotional growth during infancy, childhood, and adolescence (Alaimo, Olson, & Frongillo, 2001; Cole & Lanham; Cook & Frank, 2008; Lozoff et al., 2006; Rose-Jacobs et al, 2008; Skalicky et al., 2006; Tanner & Finn-Stevenson, 2002; Weinreb et al., 2002). Hunger, as well as the stress of living in poverty, may affect the mental health of adults, leading them to experience depression and/or anxiety (Gucciardi et al., 2009; Hamelin et al., 1999; Olson, 1999; Siefert et al., 2001; Stuff et al., 2004; Tarasuk, 2001; Vozoris & Tarasuk, 2003). Food insecure women with children in the home may sacrifice the quality or quantity of food they eat to provide better nutrition for the children (McIntyre et al., 2003; Stevens, 2010; Wiig, Dammann, & Smith, 2009). Their sacrifice may lead to the higher rates of obesity and diabetes reported in food insecure women as well as an exacerbation of other physical problems they experience (Martin & Lippert, 2011). Food security among elderly people in the U.S. may be somewhat less affected by income than younger people but may be more affected by other expenses such as heating or cooling costs (Bhattacharya et al., 2003). Food insecure elderly people may find it difficult to shop for food, cook food due to physical limitations (Wolfe et al. 1996).

Gardening has been a means of providing fresh food and supplementing the food budget of many families (Lawson, 2005). Community gardening in the U.S. has enjoyed popularity in times when families' food supplies were threatened by war or periods of economic hardship (Lawson). Gardening has provided not only food for families and

military personnel, but working in a garden has been occasionally considered an act of patriotism (Hayden-Smith, 2006; Lawson). Working in community gardens has increased the collective power of some communities (Armstrong, 2000; Glover, 2003). Working with previously unfamiliar neighbors, sharing gardening space and gardening tools has opened channels of communication between neighbors of different races, ethnicities, and cultures to foster greater cooperation among residents of housing complexes and neighborhoods (Patel, 1994; Wakefield et al., 2007). Community gardeners have been found to increase their consumption of fruits and vegetables (Alaimo et al., 2008). Improved nutrition has been correlated with improved physical and mental health (Campbell & Campbell, 2006; Gonzalez & Riboli, 2010). Many gardeners report that working in the garden increases their feelings of well-being and leads to greater feelings of empowerment and self-esteem (Armstrong, 2000; Dunnett & Qasim, 2000; Kingsley et al., 2009).

Healthy self-esteem may be necessary to recover from the inevitable failures that are a part of the human existence (Heckhausen & Schulz, 1995). The two-stage model of control asserts that one's perception of control of their environment consists of primary and secondary control (Heckhausen & Schulz). Primary control is used when someone makes an attempt to change the physical environment to suit their needs. Secondary control is used to modify oneself to adapt to the environment. Primary control may be seen as action, while secondary control is cognition, but in order to act effectively, one must use the cognition that is inherent in secondary control to effectively direct actions.

Therefore primary and secondary controls are so intimately intertwined, it is nearly impossible to use one form of control in the absence of the other. If the actions initiated using primary control are not successful, secondary control is necessary to make sense of the failure, protect emotional well-being, and provide motivation to make new attempts at changing the environment (Heckhausen & Schulz).

Rationale for the Current Investigation

Very few studies have looked at the psychological benefits of community gardening and more specifically, how community gardening may contribute to feelings of control. The studies that have been done have focused primarily on the dietary changes of community gardeners (Alaimo et al., 2008; Linberger & Zajicek, 2000), the physical health effects of gardening (Stearns et al., 2000; Watson & Moore, 2011) or the community benefits of gardening (Watson & Moore). Although these studies have examined specific factors of how community gardening affects the well-being of gardeners, most fail to incorporate dietary changes and individuals' perceptions of physical and mental well-being of participants and their families. None of the studies reviewed limited participation to those who experience food insecurity or focused specifically on participants living in food deserts. Some researchers have used quantitative methods to study health (Kendall, Olson, & Frongillo, 1996; Rose-Jacobs et al., 2008). Others have used information from databases to study how the local food environment affects health (Moore & Diez Roux, 2006; Morland, Wing, Diez Roux, & Poole, 2002). Some researchers have used a mixed method approach to study food

insecurity wherein they gathered information from participants in focus group from which a quantitative questionnaire was then developed (Hendrickson et al., 2006; Morton et al., 2005; Morton et al., 2007; Wiig & Smith, 2008). No studies were found where qualitative interviews were utilized to examine the effects of gardening on food insecure people living in food deserts.

No studies were found that have examined the role of community gardening on individuals' perceptions of control. This study filled a gap in the literature and increased understanding of how gardening affects not only issues of hunger and food insecurity, but how the act of gardening affects self-perceived control. This knowledge is useful for community gardening organizations to secure funding or land access. It provided information for public health agencies to promote gardening as a means of improving health and well-being. It is a tool that can assist counseling psychologists to better understand how some clients use primary and secondary control to resolve problems and build upon those skills for use in other areas of their lives.

Research Questions

This study examined how participating in community gardening affects the participants' perception of primary and secondary control in their lives. It also examined how shifting perception of control affects familial and community relationships, mental and physical well-being, as well as food choices and eating habits. The conceptual framework (Figure 1) illustrates how these factors may potentially relate. The conceptual

framework functioned not as a theory to confirm or refute, but served as a mental map to guide the researcher's work in the study.

The broad research questions of this study were as follows:

1. How does the act of community gardening affect the physical and mental health of those who participate in this activity?
2. What changes, if any, have community gardening participants experienced in their diets?
3. How, if at all, has the act of community gardening changed participants' relationships?
4. How, if at all, has the act of community gardening impacted participants' sense of control?

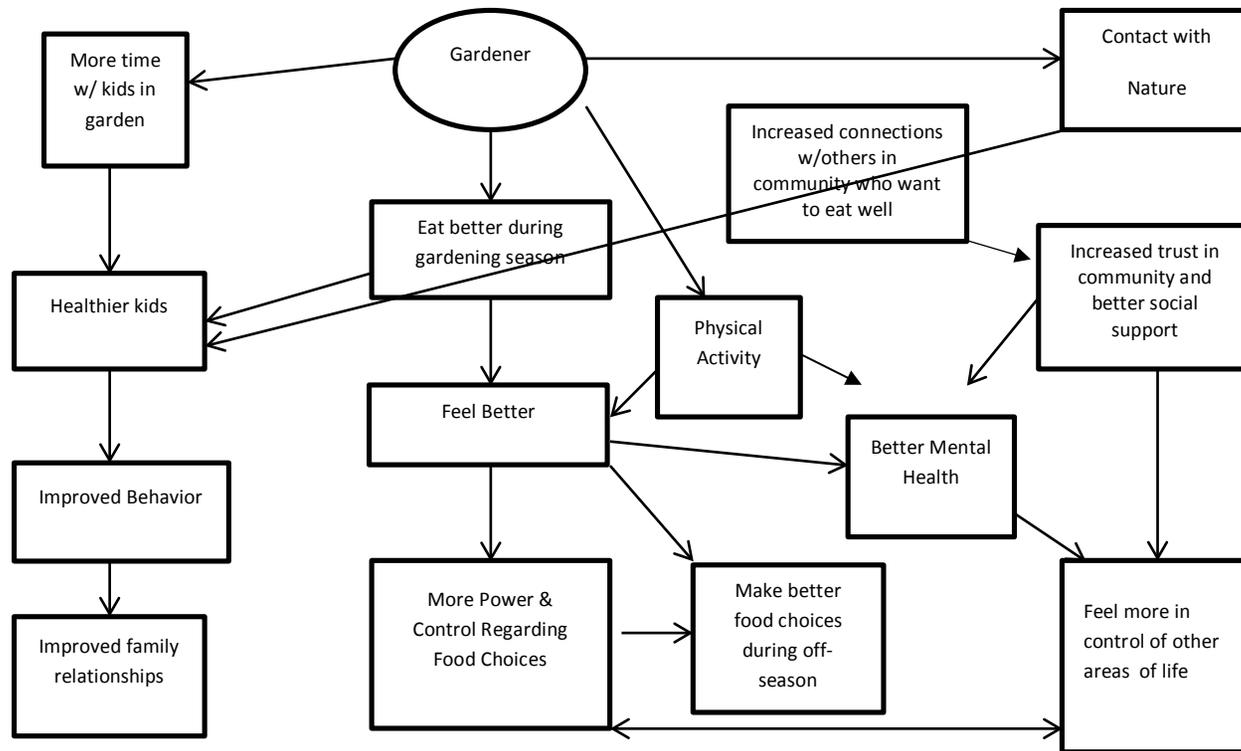


Figure 1. Conceptual map

CHAPTER III

METHOD

Method

Participants

Participants were recruited through community gardening sites in three states in the Midwest region of the U.S. via criterion sampling. The purpose of criterion sampling is to examine cases that meet a particular criterion (Patton, 2015). Participants needed to meet the following criterion; (a) they and/or their family had experienced food insecurity in the past 12 months, (b) they participated in community gardening, and (c) they lived in a food desert at the time they participated in a community garden. Participants needed to be at least 18 years of age with no upward age limitation. No restrictions were placed on the gender of the gardeners.

Seven women participated in the study. One other person expressed interest in participating in the study but later declined for unknown reasons. The average age of the overall sample was 57.57 years with a standard deviation of 18.23 years. The age range was 50 years, with the youngest participant 34 years old and the oldest participant 84 years old. One participant identified as Latina, two participants identified as Black, and four participants identified as White. The length of time that each participant had participated in community gardening varied from 1 to 30 years. Only one participant had

a child under the age of 18 living in the home. Only one participant was employed.

Demographic data are presented in Table 1.

Table 1

Participant Demographic Data

Participant	Age	Race	Relationship Status	Number In Household	Years of Participation in Community Garden	Education Level	Annual Income	Employment Status
Bessie	83	African American	Divorced	2	5 years	High School	\$10,476	Retired
Carlene	60	White	Divorced	1	30 years	Some College	\$8,796	Disability
Christine	34	White	Single	2	1 year	Some College	\$0	Unemployed
Ci Ci	39	Latina	Living with partner	2	1 year	No High School	\$0	Unemployed
Laura	52	White	Divorced	1	4 years	Some College	\$8,796	Disability
Nellie	84	African American	Widowed	1	1 year	High School	\$10,800	Retired
Sally Katherine	51	White	Single	2	1.5 years	Graduate Degree	\$32,000	Employed

Note. All names are pseudonyms

Instrumentation

U. S. Household Food-Security/ Hunger Survey Module. The U. S. Household Food-Security/ Hunger Survey Module (Bickel, Nord, Price, Hamilton, & Cook, 2000) was used by the researcher to determine the food security status of potential participants (see Appendix A). The U. S. Household Food-Security/ Hunger Survey Module contains 21 questions regarding the frequency with which individuals or families lack sufficient quantities or varieties of food for adequate nutrition. The measure also assesses the level of hunger in the household. For example, participants are asked to answer a multiple choice question about the reasons they do not have enough to eat. Responses include

financial difficulties; not enough time; problems getting to a store; lack of a stove; or health issues. Participants are also asked how often they worry their food will run out before they have the financial means to acquire more. Two internal screening mechanisms allow accurate measurement of food security for households with children and without children. All questions in the module are multiple choice. Brief analysis of the measure is quickly computed by using the table at the end of the questionnaire to determine the level of food security in participants' households. Using this assessment, the researcher quickly determined if the potential participants met the criteria for having experienced food insecurity within the past 12 months.

Demographic questionnaire. An author-generated demographics questionnaire (see Appendix B) was administered in order to collect descriptive information. The questions included information pertaining to the participants' age, ethnicity, relationship status, number of children living in the home and their ages, number of adults in the home, household income, food assistance programs used, and ownership of transportation. This demographic questionnaire contained multiple choice questions with the exception of the questions for age, income, and the number of children and ages, and number of adults in the home.

Interview guide. The researcher conducted interviews with the participants in a semi-structured interview using open-ended questions from an interview guide (see Appendix C). The open-ended nature of the questions allowed for the researcher to probe for more elaboration and/or clarification. The questions examined how participants

manage during times when there is little food in the house and how that affects them and their families, how and where they shop for food, how they perceive the food available to them where they shop and how the food available affects their diets. The questions also investigated how participants decided to become involved in community gardening, how gardening has affected their mental and physical health and that of others in the household, how gardening has affected their eating both during the gardening season and the off-season, and how gardening has affected personal and community relationships. Finally, participants were asked to add anything they believed was missed during the interview or anything they thought was important for the researcher to know or understand.

Procedure

After receiving approval from the Institutional Review Board (IRB), the researcher contacted 26 administrators of community gardens located in 24 food deserts to introduce the study and explain participants' roles in the study. The researcher searched internet websites about community gardens to find gardens in 35 locations. When possible, the researcher attempted to physically visit the garden to insure that the gardens were in operation as many of the gardens listed on websites were no longer being cultivated. Food deserts were determined using the USDA Food Desert Locator (USDA, Economic Research Service, 2012a). Recruitment advertisements (see Appendix D) were provided to community gardening administrators and organizations explaining the nature of the study and the required criterion for distribution to potential participants. Three

garden administrators needed to gain approval from larger administrative organizations before the advertisements could be distributed. One garden program manager of 12 community gardens in a small city refused to allow the researcher to interview gardeners in his gardens as he was collecting data for his own research. In two cases, the administrators posted the advertisement on the community garden web page. In another community garden, the researcher made a brief presentation to the gardeners about the research and arranged interviews with gardeners who were interested in participating in the study. The researcher also donated time by working approximately 3 hours per week in each of three community gardens over a course of 8 weeks, where she met some of the gardeners who were later interviewed for the study. The researcher gave recruiting advertisements to friends and co-workers to distribute at their places of worship and other community events. One gardener was recruited from the community garden managed by the researcher's workplace.

Three gardeners contacted the researcher via email to arrange interviews. One of these interviews was conducted in a private space in a public library, another was conducted in a quiet outdoor area near the participant's workplace, and the third was conducted in the participant's home. Two participants were interviewed at a community center following the presentation given by the researcher, one interview was conducted in a private room at the researcher's workplace, and one interview was conducted in a church multipurpose room near the community garden. Each participant was asked to read and sign a consent form (see Appendix E). The consent form explained the

voluntary nature of the study and indicated that participants could withdraw from the study at any time with no penalty or breach of confidentiality. Additionally, it addressed confidentiality of the information shared, potential risks and benefits of participation, purpose of audio recording, and the approximate time required to complete the interview. A referral list of names and numbers of health care professionals was available to participants in the event of any emotional discomfort caused by the interview (see Appendix F).

In individual face-to-face sessions, participants were asked to answer the questions in the U.S. Household Food-Security/Hunger Survey Module to confirm that their households were food insecure before the interview was started. All participants met the criteria for food insecurity. Participants were then interviewed by the researcher using the interview guide. The interview was completed when the questions were answered and participants had a chance to relay any additional information they wanted the researcher to know. The length of the interviews ranged from 34 minutes to 91 minutes.

A potential risk of participating in the study was a loss of time. In order to minimize this risk, the interviews were conducted at locations of the participants' choosing to minimize travel time and/or cost, and to arrange the interviews at a time most convenient for the participants. Participants received a \$20 gift card to Wal-Mart in appreciation of their time. Another risk of participating in the study included a potential loss of confidentiality. The interviews were conducted in private locations to provide the

highest level of privacy that was possible. The interviews were recorded using a digital audio recorder. Following the interviews, the researcher de-identified each participant and assigned a pseudonym. Digital recordings were stored in a password protected file on the researcher's personal computer. Transcripts of the recordings were prepared by the researcher. Transcripts were also stored in a password protected file on the researcher's personal computer. Digital recordings and transcripts will be destroyed after 5 years per the recommendation of the American Psychological Association (APA, 2002). Consent forms, demographic information, and completed U.S. Household Food-Security/Hunger Survey Modules were stored in a locked file cabinet in the researcher's home.

Psychological or emotional discomfort caused by being interviewed and sharing personal information was another potential risk. Reasonable accommodations were made to minimize discomfort by interviewing the participants in private locations of their choosing. A list of mental health providers was available for those who requested it (see Appendix F). Finally, fatigue was another potential risk. Participants were informed that they could discontinue the interview at any time.

During each interview and immediately after each interview, the researcher made field notes about details of the interview that may not have been evident from the recording, such as a physical description of the participant, notes about the interview setting, and details of conversations not included in the recording. In five cases, the researcher was able to visit the garden spaces tended by the participants either at the time of the interview or at a later date. Following each interview, the researcher made a

verbatim transcription of the interview. Reactions such as crying or laughing were also recorded. Transcriptions began as soon as the first interview was completed, and occurred concurrently with data gathering. Transcription of interviews allowed the researcher to look for themes in interviews as they arose which facilitated probes to the questions in subsequent interviews. The researcher made efforts to return each transcript to the participant so she could verify the content and to clarify or make changes. The researcher mailed copies of the transcripts to the participants' homes via the U.S. Postal Service, with a self-addressed, stamped envelope with instructions to note any changes, additions, or clarifications. Only three participants returned transcripts to the researcher, and no changes were made on those transcripts. Two participants did not return the transcripts, and two were returned as undeliverable.

Data Analysis

The data from this study were analyzed from a grounded theory framework as outlined by Strauss and Corbin (1998) and Fassinger (2005). Grounded theory utilizes the constant comparative method of coding of data. Coding is done concurrently with data collection. New data are constantly being compared to existing data until the researcher finds no new relationships, themes, or categories emerging from new data. The steps of coding are employed in this process: open coding, axial coding, and selective coding (Fassinger).

The first step in data analysis is open coding in which concepts and dimensions within the transcribed interviews are identified (Fassinger, 2005; Strauss & Corbin,

1998). The concepts are labeled with words or terms that are as similar to those of the participants as possible and the researcher begins to formulate initial ideas about how the concepts might be related to each other (Fassinger). These interpretative units are compared to others and gradually, these smaller units of meaning are incorporated into categories. As more data are collected, new units of meaning or conceptual categories emerge. The existing coded concepts are compared with emerging categories resulting in re-categorization or modification of some concepts (Fassinger).

Open coding is followed by axial coding (Fassinger, 2005; Strauss & Corbin, 1998). Strauss and Corbin explained that this step in coding is called axial because coding is centered “around the axis of a category” (p.123). The primary purpose of axial coding is to begin the reintegration of the data that was fractured during the process of open coding (Fassinger; Strauss & Corbin). There are four tasks for this step in the coding process (Strauss & Corbin). First, the researcher further refines and defines the categories created in open coding. Second, the researcher analyzes the data to characterize the conditions of the participants’ lives, the actions and tactics used by participants and their interactions with their environment and the studied phenomenon, and the consequences of their actions (Strauss & Corbin). Third, the researcher denotes how categories and subcategories are related by creating a series of relational statements (Strauss & Corbin). The final axial coding task is to find cues in the data that begins to explain how the categories relate to one another (Strauss & Corbin). The final step is important for the process of generating a theory about the phenomenon being studied

(Fassinger). Strauss and Corbin pointed out that open coding and axial coding are not done sequentially, but rather as a simultaneous process that adds depth and density to the developing theory.

The final method of coding is selective coding. In this stage of coding, the researcher's analysis of the data is integrated and refined and begin to take form as a theory (Strauss & Corbin, 1998). The purpose of this stage is to create core categories that integrate all the axial codes, and to articulate the relationships between them into what Strauss and Corbin call "an explanatory whole" (p. 146). The theory that emerges is compared to the collected data to ensure that it is grounded in the experiences reported by the participants. It is also compared to existing literature about the phenomenon being studied to deepen understanding (Fassinger, 2005).

Because identifying a core category may be difficult, it is frequently helpful for researchers to employ methods such as creation of diagrams and writing/reviewing memos (Strauss & Corbin, 1998). It is often useful for the researcher to review the memos that were written throughout the research process (Strauss & Corbin). Analytic memos are short notes written by the researcher during analysis to keep track of emerging ideas and to track researcher reactions to the emerging data. Memo writing is an integral part of grounded theory research. Daily records of ideas, insights, decisions, and procedures are maintained and incorporated into the collected data. Using this running log of impressions is useful to researchers to remind them of the salience of particular ideas or insights that may be integral to the formation of the core category (Fassinger,

2005; Strauss & Corbin). When the broad theoretical scheme has been outlined, the researcher refines the theme by reviewing it for internal consistency. Poorly developed categories are either subsumed by other categories or discarded. Gaps in logic are investigated and explanations are sought to fill the gaps (Strauss & Corbin).

The final step is validation of the theoretical scheme. The final theory is an abstract representation of the raw data, and so it becomes necessary to compare the raw data to the theory to ensure that the data fits and that the theory actually explains most of the cases. Comparison of the theory to the raw data also ensures that salient information or themes were not omitted from the final theory (Strauss & Corbin, 1998).

In order to provide validity, credibility, and rigor to the data analysis, grounded theory researchers recommend follow-up interviews with the participants wherein they are presented with copies of the findings (Cooney, 2011; Cresswell & Miller, 2000; Fassinger, 2005). This method of triangulation, which Cresswell and Miller call “member checking” (p. 127), involves meeting with the participants a second time to discuss the transcriptions and field notes with each participant, as well as discussing with participants the themes and categories developed from the data. Participants are asked for their input about the validity of the researcher’s conclusions. This feedback is incorporated into the final narrative (Cresswell & Miller). Unfortunately, because several of the participants lived with financial instability, they were difficult to locate following the initial interview due to issues of homelessness or changes in residence. Three participants returned transcripts to the researcher, two participants were unable to be located, and two were not

returned by the participants. Because the member checking step of data analysis was not possible in some of the cases, other methods of validity strategies were employed to ensure the validity of the collected data.

Methodological Rigor

Although validity in quantitative studies can be established by statistical means, researchers employing qualitative methods must employ other methods to ensure that the findings accurately represent the participants' realities (Cresswell, 2007). Because member checking was not consistently possible with the participants, other means of validation strategies were necessary to ensure data integrity. Creswell suggested utilization of at least two strategies to ensure data integrity. In this study, observations made in the gardens, notes taken during informal conversations with garden managers, member checking of some transcripts, and cross coding of data by an independent reviewer were employed.

The researcher made notes following each visit to a potential garden, each phone or personal conversation with a garden administrator, each session of volunteering in community gardens and each interview with participants. The researcher volunteered at three church-based community gardens which allowed conversations with garden administrators and other gardeners who did not meet criteria for the study. These conversations provided information about challenges that gardeners in those communities experienced, such as crime, failing schools, and transportation problems, among others. Conversations with gardeners and administrators aided the researcher in understanding

how gardeners and administrators interacted and what rules, explicit and implicit, existed in the gardens. One garden posted specific times in which the gardeners were allowed to be present. Two gardens required gardeners to allocate portions of their produce to be donated to food pantries and for sale at local farmers' markets to offset costs. Some gardeners explained arrangements they made to help one another maintain their plots. If one gardener could not make it to the garden for a few days, other gardeners pulled weeds or harvested produce that might otherwise go to waste. Although not an official rule, in one garden, the gardeners spoke of honoring one another's private and personal space in the gardens to allow for quiet, meditative time. When the gardeners wanted to speak to one another to ask for gardening advice, they waited until it was clear that the gardener with whom they wished to speak was not engaged in a quiet task.

Time spent in the gardens allowed the researcher to observe the culture of each garden in an unobtrusive manner. Handwritten notes filled approximately 15 pages of a journal. The researcher used some of the observations from these notes to create further probes when interviewing participants. For example, one garden manager stated that gardeners in her garden were harvesting what others might consider to be weeds or flowers as a source of food. In the interview with Sally Katherine, the researcher asked if she had used any of these non-traditional sources of food. Sally Katherine responded that she was eating amaranth and marigolds. Another garden manager stated that he had noticed non-gardeners coming in to the gardens and picking vegetables from the

gardeners' plots. This led the researcher to ask the participants if they had problems with theft from their gardens.

All recordings were transcribed personally by the researcher rather than being sent out to a transcription service. This allowed an early immersion into and analysis of the data. The recordings were transcribed within days of interviews. Broad themes appeared as the recordings were transcribed which aided the researcher in creating probes for subsequent interviews. As the recordings were transcribed, the data were compared to existing data in a process called constant comparison (Fassinger, 2005), with comparison of each piece of data building upon others to create broad categories of meaning. The researcher read and scrutinized the transcripts five times to complete open coding and axial coding. Transcript copies and the coding key, a list of categories and subcategories arranged by themes that were related to the research questions, were then provided to an independent reviewer.

The independent reviewer was a 32-year-old Taiwanese-American woman who is a graduate from the researcher's doctoral program in Counseling Psychology. The independent reviewer completed a doctoral-level course in qualitative research and has conducted research employing those skills. Although the independent reviewer does not have experience with community gardening, food insecurity, or food deserts, she works from a social justice framework. The independent reviewer provided feedback about the researcher's coding system after reading the transcripts and coding key. Working collaboratively with the independent reviewer, the researcher made relevant changes to

the coding key. Some sub-categories were collapsed into others and some categories were expanded to create a more finely tuned coding key.

When the researcher and independent reviewer agreed on the coding key, the researcher then coded the transcripts with the amended coding key. See Appendix H for a copy of the final coding key. These coded transcripts were then returned to the independent reviewer for cross-coding.

Qualifications as a Researcher

The purpose of this study was to understand the experiences of people living with food insecurity in food deserts and the effect that participating in community gardening programs has on their perceptions of control. I have several qualifications that were beneficial to this study. My training in a feminist, multicultural Counseling Psychology program has provided a strong background in the cultural and societal factors, including poverty that affect not only women, but also racial and ethnic minority peoples in modern culture (Cole, 2009). I believe that this knowledge and sensitivity enhanced my ability to understand the concerns of the population described in this study.

Additionally, as part of my graduate training, I have 6 years of clinical training. Three years of that training were conducted with clients in community mental health settings. I am currently employed at a rural community mental health center. The vast majority of the clients with whom I have worked in these settings have been of low socioeconomic status, and many were food insecure. These clients represented a cross-section of race, age, and educational levels. Working with clients in these settings has

allowed me to develop skills of rapport and the ability to discuss difficult topics in a sensitive manner. Both coursework in qualitative methods as a part of my graduate curriculum, as well as qualitative work on my Master's thesis, have provided me with a firm foundation in qualitative methods on topics in psychology. In my work as a research assistant on a research project studying food safety and food allergy reaction prevention, I completed 10 in-depth interviews with restaurant owners or managers about restaurant practices and training and about their attitudes concerning restaurants' levels of responsibility in preventing food allergy reactions.

My Biases

As a child, I lived on a farm with my family. Although my family was not food insecure, a great deal of the food that was consumed by my family was grown in a garden kept by my mother or picked from the orchard that had been planted on the farm by my grandparents. Many summer days of my childhood were spent with my mother in the garden, pulling weeds, harvesting vegetables, or helping prepare the harvest for preservation by canning or freezing. Although, admittedly at the time I disliked the work, it was the impetus of a life-long love of growing things. As an adult, I have not always been able to keep a garden due to limited space or work constraints, but I have always needed to have living plants in my environment.

Having had the opportunity to eat the freshest fruit and vegetables in my childhood has led me to raise a garden when I am able and to shop at farmers' markets. I have also become involved with a Community Supported Agriculture program, wherein

community members support a local produce grower by purchasing shares in his or her small farm or garden. I have volunteered my time at a community market that provides an opportunity for farmers and gardeners using sustainable agricultural methods to sell produce.

Spiritual and ethical beliefs as well as a life-long love of vegetables compelled me to become a vegetarian several years ago. After viewing the documentary *Forks over Knives* (Corry, 2011), I made the decision to adopt a purely plant-based diet, eliminating nearly all animal products from my diet. Shortly after making the change, many medical problems that had troubled me disappeared. Although there is not likely to be a cultural shift to plant-based eating, personal experience as well as scientific evidence (Campbell & Campbell, 2006), indicates that the introduction of more fruit and vegetables to the diet can lead to significant improvement in physical and emotional health.

Additionally, the current political zeitgeist has caused me concern that services such as WIC and SNAP will be reduced or eliminated for many families like those I saw in my clinical training. For many of these clients, hunger or the threat of hunger is very real. Clients have shared stories of needing to steal food or to turn to sex work in order to feed hungry children or grandchildren.

The gardening experience levels of the participants in this study varied widely. For one gardener, this was her first experience with gardening. All other gardeners had some previous experiences with gardening. I found that as a researcher, I connected most personally with the three oldest gardeners in the study. Those gardeners had childhood

experiences that were similar to my own and their answers to my interview questions had more resonance for me than the newer gardeners. I was aware of this bias as I coded the interviews. As a result, I made every attempt to monitor any bias during the validation process. I participated in three church-based community gardens while collecting data. Although two participants in the current study participated in one of those gardens, I did not interact with them in the gardens which reduced the likelihood of bias. The independent reviewer of the data was consulted about any biases she may have noted in data coding. No biases were noted by the reviewer.

CHAPTER IV

RESULTS

Data were analyzed using grounded theory methods (Fassinger, 2005; Strauss & Corbin, 1998). Thus, data were first analyzed in open coding. Concepts and dimensions within the transcribed interviews were identified. Themes within the data were then refined and compared to define axial categories. At the completion of axial coding, data centered around five core axes: Food Insecurity; Gardening; Diet; Health and Community; and Control. Nineteen subcategories were developed from the five core axes (See Appendix H). Descriptions of the five core axes follow. Participants' statements that define each of the subcategories of each axis are included.

Axis 1: Food Insecurity

This axis contains participants' challenges with meeting their basic food needs. Four subcategories emerged during data analysis: Availability; Accessibility; Affordability; and Personal Growth through Food Insecurity. Two of these four subcategories contained further subcategories. The subcategories in the Availability subcategory were: Food Quality/Prices; Food Pantry/Feeding Program Use; and Shopping/Sources of Food. The Affordability subcategory was further categorized as: Money/SNAP benefits, How Money is Spent for Food; Managing Without much Food; and Food Storage. The Personal Growth through Food Insecurity subcategory was further

categorized as: Food Insecurity as a Learning Experience; and Food Insecure People can Eat Well.

Availability

The availability subcategory examined sources of food for the participants, their perceptions about the quality of the food they obtained, and their use of food pantries or other sources of food. The table below indicates food programs used by the participants.

Table 2

Food Programs Used by Participants

Participant	Food Pantry	Feeding Program	SNAP	Back Pack
Bessie	X	-	-	-
Carlene	X	-	-	-
Christine	X	-	X	X
Ci Ci	X	X	-	-
Laura	X	-	X	-
Nellie	X	-	-	-
Sally Katherine	-	-	-	-

Food quality/prices. Results in this subcategory examined participants' views of the quality and prices of food that was available to them. Subcategories within this subcategory included: Limited or no access to fresh food or poor quality; Good quality; Too expensive; and Most value for SNAP benefits.

Limited or no access to fresh food or poor quality. Three participants reported that they had limited access to high quality, fresh food. Carlene, a 60-year-old, White woman with severe and persistent mental illness also lived with a chronic pain issue. Carlene agreed to be interviewed at a community mental health center that sponsored the community garden where she gardened. Trim and muscular, Carlene's long grey hair was

pulled into a ponytail which was tied together in several places along its length with elastic ties. She wore a worn baseball cap. Her face, in spite of being interviewed in November, was tanned. Her clothing was well-worn but clean. She lived in a rural area and stated that the Wal-mart near her home was “the only place within 50 miles that has fresh vegetables.”

Laura, a 52-year-old woman, invited the researcher to her home. A large cabinet contained family pictures of adult children and relatives. A large woman, she wore a colorful, loose fitting dress and dramatic make-up. Her service dog and another small dog greeted visitors with enthusiastic and friendly barking. She used an electric wheelchair for mobility due to a disability. Laura received the majority of her food from food pantries. She provided this description of much of the food she received, “Uh, it’s not so fresh. It’s old and the store’s discarded it because they couldn’t sell it anymore.”

Good quality. Five participants reported the quality of food where they shopped as being of good quality. Although five of the participants reported the quality of food at the places they shopped as good, two of those five reported that they were unable to afford the quality of food they desired.

Too expensive. Three participants reported that although the grocery stores nearest their homes had food of good quality, the prices for good quality food were too expensive. Laura, who had recently moved from one state to another, had experienced a drastic cut in her SNAP benefits and Social Security disability income. Although the move allowed her to live closer to a Wal-mart with groceries, the prices for fresh fruit,

fresh vegetables, and meat exceeded her limited budget. Of the prices at Wal-mart, she said:

Wal-mart, I mean, they have good food if you can afford to buy the good food. I buy the day old stuff, to where it's cheaper. Or bananas, sometimes they're on sale because they're almost gone. They're close to the rotten stage. But you know, if you can afford to eat quality food, then Wal-mart has it. But I can't afford to eat the quality foods. So I buy whatever I can afford.

Most value for SNAP benefits. Two participants reported that they attempted to limit the majority of their shopping to grocery stores where they could get the highest value for their SNAP benefits. Thirty-four-year-old single mother Christine was interviewed at a public library near her home where she used the internet to search for a job. Wearing a plush jogging suit, with her short hair held in place with plastic barrettes, she looked much younger than her stated age. She mentioned that she liked to buy particular items, such as fresh meat, at a higher end grocery store because it offered higher quality and freshness. However, the majority of her shopping for canned goods and non-perishable items was done once a month at a bargain grocery store that offered limited services such as grocery bags and baggers, in order to make her SNAP benefits stretch as far as possible.

Food pantry/Feeding program use. Two participants were heavily reliant on food pantries and used food pantries as their primary source of nutrition. With one exception, the other participants used food pantries as a supplement to other sources of

nutrition. Christine combined food pantry use, the Back Pack Program at her daughter's school, and SNAP benefits. One participant relied on a combination of sources, including food pantries, programs to feed homeless people, and SNAP benefits for her nutritional needs. Two participants reported food pantry use as a form of supplementation of food purchased from their own funds. One participant, because she owned a home and had recently returned to work after caring for an elderly relative, was not eligible for food pantry services in her area.

Food pantry primary source of food. For two participants, Carlene and Laura, food pantries were their primary food sources. Carlene stated that if transportation was available to her, she shopped one or two food pantries before deciding what to buy with her SNAP benefits. Carlene was largely dependent on others for transportation to the food pantry. The type and quantity of foods received at the pantry determined what foods would be purchased with her SNAP benefits. In regard to food pantry use, she stated:

If I'm lucky, I can hit two of them. It depends on if I have the gas, or if my car is running, or if I can catch a ride with a friend and we split the gas and drive her car. It depends on transportation a lot. And then what I get at the food pantry, I write everything and figure out what I'm going to eat every day. And I can go to the grocery store and get what I need.

Laura, who received much of the food she consumed from food pantries was largely dependent on aides to get her food from food pantries due to a lack of mobility. Her

dependence on others sometimes caused other problems. When discussing having her aides go to the pantry, she shared:

Sometimes, some of them are young girls and they get embarrassed to go to food banks. And sometimes they'll say that they're – that they were out of food. Which I don't think that was. So sometimes I don't get any. It depends on the aide I have. And some of them pick from your box, too.

Food pantry supplementary source of food. Two participants, Nellie and Bessie, were of retirement age and did not receive food assistance in the form of SNAP benefits. They used the food pantry at the community center where they attended programming for senior citizens on occasion to supplement food purchased from their retirement incomes. Nellie also volunteered at the Salvation Army where she had access to their food pantry when needed.

Back pack/Feeding program. Two participants used other programs to provide nutritional support. Christine's daughter received food to supplement their SNAP benefits from the Back Pack Program at her school. Ci Ci used food pantries in addition to feeding programs for homeless people and the SNAP benefits received by her partner.

Ci Ci, a 39-year-old Latina, had been homeless for more than a decade. She was interviewed in a church multipurpose room near the community garden. She was cheerful and upbeat during most of the interview, but became tearful when describing difficulties in her relationship with her partner that resulted from their disabilities and how their disabilities were exacerbated by lack of food. Ci Ci and her partner lived in the woods of

a large city. She had partial paralysis in her left hand and walked with a slight limp that were the result of a head injury she suffered as a child. She was missing several teeth. Her brown hair was bleached nearly blonde from the sun and curled around her shoulders. She was neatly dressed in bright pink knit shorts and an embroidered top. Her partner, who is several years older, also has a disability. She explained that they would like to get married, but she had been unable to track down the man to whom she is legally married. She was also hoping to complete her GED, but needed \$150 for the classes. Ci Ci and her partner lived with a family group that included a woman whom Ci Ci described as her sister, but later she revealed that they are not biological sisters, but sisters by choice. Ci Ci's family group also included her sister's partner.

Ci Ci's family group was largely dependent on organizations that provided feeding programs such as soup kitchens, sack lunches, and food pantries to homeless people. Ci Ci described an elaborate system in which family members travelled across the city to receive hot meals, sandwiches, or groceries. Ci Ci was in her first year of participation in a community garden that was sponsored by a church. In addition to providing a garden space to homeless participants, Ci Ci and her partner frequented the food pantry provided by the church. They also attended a church that invited homeless people for a meal and church services. Ci Ci said, "We find a lot of different areas where we can get food. Like churches. They take you to church on Sundays and they give you a good, healthy church environment and food." Ci Ci also reported that in some areas of her metropolitan area, laws prohibited organizations from giving out food to homeless

people where they lived in an attempt to prevent homeless people from congregating in certain areas.

Food pantry healthy. According to the participants who used food pantries, food quality from the pantries varied in quality. The food pantry most commonly used by Carlene was associated with a church whose members grew a cooperative garden in order to provide pantry patrons with fresh vegetables during the growing season. The community garden where Laura had gardened also had a food pantry for gardeners and others in the community who were unable to garden. Laura had moved away from the area where she had been gardening and found it necessary to find new food pantries. She told of food she once received from the food pantry. “And one time, um, I got some stew meat, which I’ve never seen in a food box. And she [her aide] said I acted like I won the lottery!” Laura also listed beans, rice, and peanut butter among the foods that she had received from food pantries.

Food from pantry unhealthy/spoiled. Although Laura listed some healthy foods she received from the food pantries, many of the foods she received were unhealthy or even spoiled. She described a particularly disappointing item received from a food bank in this way:

....you’ve got to be careful with the meat you get from the food bank because - one time I got a thing of pork chops. And I was so happy about it because I was gonna cut them up and put them in bags and make them last longer. And uh, when we opened and got them all defrosted and cooked them – they had the rancid

smell. So you couldn't smell it when it was frozen. But when it defrosted? It was like – oh my God! You were already set up for some pork chops and then – and you hadn't had any in a long time - and so you had to throw it away.

Ci Ci reported that she often gets high sugar foods such as granola bars and cookies and high fat foods such as beef jerky in the foods she and her partner receive from food pantries or from groups that distribute food to homeless people. She explained that these kinds of foods are problematic for her partner who has diabetes.

Shopping/Sources of food. All of the participants reported shopping in traditional grocery stores. Traditional grocery stores were the primary source of food for three participants. Three participants used traditional grocery stores to supplement food obtained from food pantries or other feeding programs. All of the participants who used traditional grocery stores reported that they limited the food they purchased at grocery stores to items that were on sale.

Nellie, an 84-year-old African American widow, purchased the majority of her groceries at the commissary on a military base near the small city where she lived. Nellie was interviewed at the community center where she attended programs for senior citizens. She was neatly dressed in a fleece exercise ensemble. Her greying hair was fashionably styled and her hands were beautifully manicured. She appeared to be much younger than her stated age. She explained that her late husband had been a military retiree which allowed her to shop at the commissary. Her grocery shopping occurred monthly.

Most of the time when I shop, it's when I get my medication. My husband was retired from the military. So, I still have privileges to go to the military to get my groceries. So when I get my – go to pick up my medication, then I shop at the commissary.

Christine, who did not own a car, sometimes shopped at drug stores and other types of stores for items such as milk and canned goods as these stores were in her neighborhood, within walking distance of her home. Sally Katherine reported that she often purchased milk in a store in her neighborhood that specializes in dairy products because although somewhat more expensive, the milk was fresher and lasted longer.

Accessibility

This subcategory examined the means of transportation available to the participants.

There is overlap in the subcategories as many of the participants used more than one type of transportation. Table 3 indicates the transportation available to participants.

Table 3
Available Transportation

Participant	Personal Car	Borrowed	Public Transportation	Depend on Others	No Means/ Wheelchair
Bessie	X	-	-	-	-
Carlene	-	X	-	X	-
Christine	-	-	X	X	-
Ci Ci	-	-	X	-	X
Laura	-	-	-	X	X
Nellie	X	-	-	-	-
Sally Katherine	X	-	-	-	-

Personal car. Three participants owned a personal vehicle. Two of these participants were retirees. The other participant with a personal vehicle was employed. All three participants with personal vehicles were over the age of 50.

Borrowed transportation. At the time of the interview, one participant was using a truck borrowed from a former partner to get to the community garden, grocery store, and food pantries.

Public transportation. Three participants relied primarily on public transportation to get to grocery stores and food pantries. Ci Ci, who lived in a large city, had an extensive network of public transportation available for her use. She reported using trains and buses to get to grocery stores and feeding programs.

Rely on others/Share rides/ Depend on others to shop. Three participants reported relying on shared transportation provided by friends or social organizations. Laura, who used a motorized wheelchair for mobility relied on aides for shopping at food pantries and some of the shopping done in grocery stores.

None/By foot/ Wheelchair. Four participants reported that they did not own a personal vehicle and therefore relied on other means of transportation for food shopping and for transportation to the community garden. Laura had recently moved to an apartment near a Wal-mart and had access by use of her motorized wheelchair to a grocery store. Ci Ci explained that she frequently walked to food pantries, and feeding programs.

Cost of transportation reduces money for food. Three participants revealed that the cost of transportation sometimes reduced the amount of money they had available to buy food. Ci Ci described her challenge in this way:

Yeah, 'cause I have to pay for a ticket to get on the bus and back. Then I have to carry all the groceries and walk. And it's nuts! If I had a little cart it'd be different. But a lot of times it is hard when you have to walk and....sometimes you don't even have the money to get the bus and you're just walking to the store.

That's a long walk.

She described having to balance the cost of a bus or train ticket with determining how it would reduce the amount of food she could purchase. Sally Katherine was tasked with purchasing food supplies for her job and she explained that she frequently purchased some of her groceries when doing the shopping for her employer in order to conserve fuel costs.

Affordability

The Food Insecurity axis additionally included themes of what funds were available to purchase food or other sources of obtaining food and how participants determined how available funds would be spent. Participants discussed how they managed when they did not have much food and how they stored food when they had more than was immediately needed. Many participants also explained how the ways in which they planned and prepared food saved money. This subcategory was further

separated into five more subcategories: Money/ SNAP benefits; How Money is Spent for Food; Managing Without much Food; Food Storage; and Resourcefulness.

Money/ SNAP benefits. This subcategory examined participants' thoughts about the funds available to them to obtain food. Four participants, Nellie, Bessie, Ci Ci, and Sally Katherine did not receive any form of food benefits. Nellie and Bessie relied on retirement benefits for food purchases. At the time of the interview, Sally Katherine had recently been employed following an absence from the workforce. Her income prevented her from eligibility for any form of supplemental income for nutrition. Ci Ci did not receive any benefits of her own and was largely dependent on the SNAP benefits received by her partner. Christine was eligible only for SNAP benefits. She had no income and was not eligible for unemployment benefits. Laura and Carlene both received Social Security disability benefits as well as SNAP benefits. Although she depended on SNAP benefits for food, Laura lamented that her SNAP benefits were not adequate to fulfill all of her nutritional needs. She stated, "Cause they just keep cutting my stamps. And they keep cutting everything. And I can't work."

Not enough money from SNAP benefits. None of the participants who received SNAP benefits were able to meet their nutritional needs solely with their benefits. Christine also relied on the Back Pack Program from her daughter's school. All participants who received SNAP benefits also used food pantries.

Not enough money from Social Security disability benefits. Carlene received Social Security Disability benefits due to severe and persistent mental illness and chronic

pain issues. Laura received benefits due to physical disabilities. Both women reported that their benefits had been reduced, which in addition to limiting funds for food, made other expenses such as utilities difficult to manage. Of her Social Security benefits, Carlene stated, “Because on the income you make from Social Security, you can’t even live. Seven hundred and thirty-three dollars does not go very far.”

No income. Aside from SNAP benefits, Christine had no source of income. She had left a job without giving two weeks’ notice and she was finding it difficult to find employment. Ci Ci, who was homeless and had a physical disability, had no source of income aside from \$100 that her mother sent her each month.

How money is spent for food. In this category, codes were generated from statements participants made about how they spent their SNAP benefits and their own money to purchase food. These categories included strategies participants used to stretch their food budgets in terms of meal planning, food preparation, cooking, and shopping. Two subcategories were created from this subcategory.

Make a detailed list/Buying only on sale. Four participants listed these as important means of stretching their food buying funds. Carlene had the most detailed method of stretching her budget. She stated:

...and then what I get at the food pantry, I write everything down I have in the cabinets and the freezer and then I can sit down with a piece of paper and figure out what I’m going to eat every day. And then I go to the grocery store and get what I need.

Nellie did the majority of her grocery shopping at the commissary on the military base, but supplemented her diet with items from a grocery store closer to her home. Of those purchases she explained, “I only shop when it’s up for sale. I never hardly buy anything if it isn’t on sale.”

Stockpile food when things are on sale. Three participants explained that they planned for leaner times by buying non-perishable food when it was on sale. Carlene said:

...you have to do that by watching the sales and – see like when vegetables are on sale for 29 cents a can or something. Then I get my hustle on and buy a case of whatever I can get. And I eat out of that. I seldom ever buy anything impulse.

A self-reported master at food planning, Carlene saved money to spend when food was advertised at a very good price. When she was able, she bought food in large quantities for times when she had little money for groceries:

Now this month, hamburger was on sale for about half price so I bought 30 pounds of hamburger. Put it in the freezer. And I’m eatin’ the hell out of hamburger this month. That’s good! Because hamburger’s high! I haven’t been able to buy hamburger for a few months.

Managing without much food. This subcategory examined how participants used limited resources to feed themselves. This subcategory was further divided into seven subcategories. These subcategories were formed based on specific methods that participants had devised to manage when there was little food available or to insure that

food that had been purchased or acquired from other sources would last until more food would be available.

Make do with what I have/Eat less. All participants described ways in which they manage when there is not much food in their homes. Bessie, who was interviewed at the senior citizens' center where she gardened, was dressed in exercise clothing and athletic shoes to participate in an exercise program that had been planned for the day. She wore a stylish grey wig. She spoke softly and seemed to be quite interested in the interviewer's program of study, asking several questions of the interviewer about her history. Of times when there was not much food in the house, Bessie stated, "I just cook what I have. It might not be what I want, but will fill me up."

Sally Katherine, a 51-year-old White woman, was interviewed in a quiet outdoor location near her workplace. Casually dressed in blue jeans, a t-shirt, and a bandana tied around her neck, she engaged quickly and easily with the interviewer. Sally Katherine, who has a master's degree, left her job to care for her grandfather who had Alzheimer's dementia when she realized his assisted living home was not doing enough to slow the progression of his dementia. Following his death, she was struggling to find full-time, permanent employment. She relied heavily on food from her garden and spoke of wanting a particular kind of salad, but she lacked the ingredients. She explained:

I want my tomato and my onion, and I want them all together. And it's like, my tomatoes aren't ripe. So I like a tomato cucumber salad and I don't have any tomato. And I'm looking at the cucumber and I'm going, 'So I just eat a

cucumber?’ Yeah, you can just eat a cucumber. I have a cucumber sitting on my microwave and I’m looking at it and it’s like, ‘Oh yeah, I can have a cucumber salad.’

Laura often cut down on the amount of food she ate to make available food last longer.

She said,

Yeah! So um, hot dogs – 88 cents a pack and I can make a pack of hot dogs last a couple of days. So say there’s like two hot dogs a meal – I probably have to cut down to one hot dog a meal. But, it’s something.

Learned to make do as a child. Four participants explained that they had learned as children to make do with the food available to their families. Bessie described growing up on a farm, where her family was largely self-sufficient for its nutritional needs. They grew vegetables, livestock, and crops such as grain. She explained that her family purchased very little food from stores. She credited her farm background and her knowledge of food preparation in allowing her to eat well without feeling as though she were deprived. Carlene explained that she had grown up in a large family of limited financial means. Lessons learned during childhood were carried into adulthood and allowed her to feed her grandchildren, who were frequent visitors in her home, in a manner that offered them an abundance of healthy food.

Stretch available food. Six participants described methods they used to stretch available food in order to allow it to feed more people or to make it last so it could be used for more meals. Although Bessie and Nellie no longer needed to do so, they

described cooking large quantities of pasta to stretch available protein in the diets of their children. Laura described making any fresh vegetables she purchased or received by cutting them and dividing them in meal sized portions.

Cooking from scratch/Creative use of available food. Five participants reported that they believed they used the food available to them most efficiently by cooking from scratch or by using the food that they purchased or received from food pantries in creative ways. Carlene described how she made do in the following way:

I can make anything out of anything! I can take a can of three or four vegetables and half a pound of some kind of meat and make soup. Or – you know – I’m a hell of a cook so I can make do.

Laura, who lived with a service dog, another dog, and a few pet birds explained that when times were especially tight for her, she had taken food she received from food pantries to make dog food. She also described how she used staple items received to make foods that she could not afford to purchase:

And you learn to be resourceful to make your own stuff. Like make my own cheese from the milk and stuff like that. You learn to do all that stuff. That’s how you get by in a pinch. You learn how to do stuff to where you can make it work. And sometimes you can’t afford to – sometimes you don’t even have a dollar to go buy some bread. Not even day old bread. There’s times that’s happened. Many, many times to me. Make some bread!

Kids make and take snacks. Christine was the only participant who had a child living with her. However, Carlene had several grandchildren who visited in her home. Christine's daughter was involved in play practice after school. Because she was at school for 12 hours a day, Christine sent snacks with her daughter because she did not have the resources to allow her daughter to buy snacks from vending machines at the school. Carlene's grandchildren participated in sports on weekends and often needed to eat between events. In addition to saving money, Carlene wanted to ensure that her grandchildren were eating healthy snacks:

And we try to eat healthy snacks at my house instead of just snacks. You know, cheese and crackers and – we made a lot of homemade Lunchables. Because a Lunchable is a dollar or two when all it is might be one or two slices of lunch meat and a little bit of cheese. Oh my God! It's crazy! And yet, it's – the kids like their Lunchables. You know? But I can't afford that! That's nuts! A dollar – a dollar for what? Six little squares of meat? So we save the containers. So I fill them up. And then, my 14-year-old had a basketball tournament, so, I had better crackers and cojack cheese and honey ham and we sat down and actually filled up that Lunchable container. And it had 3 times what you should have had in it. And it made a meal instead of just a little snack. I mean, what the hell's six little tiny pieces of ham and six little tiny pieces of cheese and six crackers gonna do for a 14-year-old? So I try make homemade copies of what they usually eat when somebody else buys them.

Food shared with/by others. Ci Ci, who sometimes shared food with other homeless people who lived near her, explained that they will often contribute various canned foods and pasta to make a soup or stew that would feed several people. Christine and her mother, who was also food insecure, stretched the food they had available by sharing meals. Of her mother, she said:

We share our meals. Once a week I'll go over to her place, you know. Like this Sunday, we'll go over because if I'm running out, she always shops a little better than I do. Wiser. So we'll go over to her place for meals, a supper. So it'll bounce back and forth.

Drink water to fill an empty stomach. Two participants revealed that when they lacked food to eat, they staved off hunger pains by drinking water. Laura spoke of drinking water when she had little food. Effects of her disability necessitated the use of adult diapers which added an additional cost. She said, "I drink a lot of water, which in return, means a lot of diapers. And that's been a problem, so....Sometimes you use water to fill yourself up. But that doesn't always work."

Ci Ci also sometimes drank water to fill an empty stomach. Because she was homeless, she did not always have easy access to water, so even that remedy for hunger came at a financial cost.

My tummy's not full. It's not full but it's not empty. I have something there. At least I can get water, so... It fills the stomach and it helps cook. Noodles without water, you can't cook! So sometimes we have to buy that, too.

Food storage. All of the participants spoke of methods used for storing food, particularly food they had grown in their gardens. As previously discussed, some participants stocked up on perishable foods when they could be purchased inexpensively.

None. Ci Ci, who was homeless, had no method of storing perishable foods. She and her partner used a cooler with ice to store perishable items, particularly milk and meat. During the interview, she told the interviewer that she had received a frozen turkey from a program that provided food to homeless people. She and her partner had no way to cook it and no way to store the turkey. They were able to take the turkey to the home of her partner's relative who allowed them to store it in a freezer and cook it when the weather got colder.

Canning. With the exception of Christine, the remaining participants preserved some of the extra food from their gardens by canning. Bessie and Nellie had grown up on farms where they learned to can from their mothers. Although she reported that she did not enjoy the task, Carlene had learned to can from a former partner. She reported that when they were married, she did the gardening and he did the canning. At the time of her interview, she had harvested several bushels of tomatoes and peppers and had canned dozens of jars of salsa to give as Christmas gifts. Sally Katherine had experimented by making jelly from the marigolds grown in her garden.

Freezer. Four of the participants mentioned that they froze extra food from the garden or extra food purchased on sale in the freezer. Christine and Nellie used the freezers on their refrigerators. Laura's compact deep freeze sat in the corner of the living

room of her apartment where she was interviewed. Although Carlene explained that she had a deep freeze, it was not energy efficient, and the cost of running it offset the money she might have saved by buying food that was on sale in bulk. She often tried to limit food purchases to what could be stored in the freezer in her refrigerator.

Other. Sally Katherine had access to a food dehydrator and mentioned that she had dried some tomatoes from her garden in past years. Carlene often picked tomatoes from her garden just before the frost killed the plants. She carefully wrapped the tomatoes in newspaper and stored them in her cool basement. She predicted that she would still have fresh tomatoes in December. Although neither was doing so at the time of the interviews, both Nellie and Bessie had experiences of storing meat from livestock raised on their family farms by heavily salting it and storing it in large crocks.

Personal Growth from Food insecurity

Some of the participants made statements about their perceptions of being food insecure that did not fit neatly into any of the categories previously discussed. The statements, however indicated that although being food insecure presented a number of challenges, it also offered them an opportunity for personal growth.

Food insecurity as a learning experience. Becoming food insecure forced Christine to learn to cook and to experiment with new ways of cooking to stretch the food she had available and to use food that she could purchase more affordably. Laura learned to make bread and food for her dogs with staples and other items she received from the food pantry. When she received more milk than she could use before it spoiled, she

learned how to make a form of cheese. Sally Katherine, who was not eligible for SNAP benefits or to receive food from the pantry where she gardened, learned to glean foods from the margins of the garden that many others considered to be a weed. She harvested the leaves of sweet potato plants, a portion that typically goes uneaten, and used it as a substitute for spinach in foods that she cooked. Being food insecure had led her to research various kinds of wild foods and ways in which to eat weeds that she had found growing in her yard. She also spoke of learning how to use leftover foods that typically might have gone to waste.

Food insecure people can eat well. Sally Katherine and Carlene asserted that being food insecure did not mean that people had to eat diets that were bland, boring, or unhealthy. Although their meals may have been somewhat meager on occasion, both found ways to make the food they had available to them interesting and delicious. Sally Katherine described taking home bread leftover from a restaurant meal to which she had been invited. With the leftover bread, she added a few ingredients to make a savory bread pudding that made several meals. She explained that she had built a small pantry of spices and condiments that made even meager ingredients into meals that seemed special and satisfying.

Carlene explained that being food insecure had been instrumental in teaching her children how to cook, how to budget, and how to eat well:

I mean, because my kids know how to make food. And they know how to make their money last. And they're very aware of what they eat. You know, they were,

I've always been a gardener and I always have tried to feed them as much fresh and homemade stuff as possible. I don't normally buy anything that's convenience food. So they have learned from life, how to eat better things and be more creative. And to make things due. You know, you can get by.

Summary

In summary, key ideas gleaned from Axis 1 were that the majority of the participants found the food where they shopped to be of high quality. However, not all participants were able to afford the high quality foods available to them. Most of the participants stretched their food budgets and SNAP benefits by shopping at low cost supermarkets, purchasing items about to expire, or buying only what was on sale. All but one participant frequented food pantries. The quality of food received from food pantries was variable. Only three of the participants owned cars to get to grocery stores or pantries. However, for three of the participants, the cost of transportation came at the cost of their food budgets. Participants who relied on SNAP or Social Security benefits were unable to purchase enough food to adequately meet their nutritional needs. All of the participants had devised methods to stretch available food in order make it last longer. All but one participant had the means to store extra food they had available to them. Some participants also mentioned that being food insecure did not mean they had to eat poorly and cited ways in which being food insecure had led them to learn new skills. All participants in this study were by definition food insecure and also community gardeners. Axis 2 reflects findings specific to gardening.

Axis 2: Gardening

This axis contains themes around the participants' experiences with gardening. Four subcategories emerged from data analysis: Experience with Gardening; Benefits of Gardening; Uses of Food from Garden; Lessons Learned from Gardening; and Problems with Community Gardens. Each of these subcategories was further subcategorized.

Experience with Gardening

Several gardeners discussed gardening within the context of connecting with previous generations of family gardeners. Others had a desire to share gardening with younger family members. For three of the gardeners, working in the garden conjured pleasant memories of gardening with now deceased parents or grandparents. Only one gardener had no previous experience with gardening before her participation in community gardening.

Benefits of Gardening

The participants listed a number of reasons they had chosen to garden.

Garden for food/save money. All of the participants used their gardens as a way to supplement food they purchased or received from food pantries. Depending on their gardening experience, skills, and physical abilities, the degree to which they depended on food from the garden varied. For Bessie and Nellie, who were in their 80s, the food from their gardens was not a primary source of food, but a way to add some fresh vegetables during the growing season. Christine and Ci Ci, who were in their first season of community gardening, were unable to predict the quantity of food that would be available

to supplement their diets, but both were enjoying supplementing their diets with vegetables from their gardens.

Sally Katherine, who was interviewed during the gardening season, did not receive any type of food assistance and relied on her garden. She stated, “I’m really trying to eat off what I’m getting out of my garden.”

Gardening gives time with family. Christine gardened with both her mother and her teenaged daughter. She valued the time spent in the garden because it allowed them time together without other distractions. Carlene used her time in the garden to connect with her grandchildren and to teach them valuable skills.

It’s kind of like passive learning. I am teaching them the whole time they’re out in the garden. But yet it’s in such a way that they don’t even know that they are learning lessons. It’s just part of it. And part of their lives is Nana’s garden. At my house, I was a baker for a living. So at my house, we garden and we bake. And it’s neat for them to know that every time they come to Grandma’s during the season, we will be in the garden and we will work! We will work! And we’ll bake at least a couple of times while they are there for the weekend. And it’s kind of neat for them to have the expectation of certain things – structure is so good for kids. And they know at Grandma’s there’s gonna be certain things that we do that they are probably not gonna do anywhere else. And they are a big part of the garden. Not just so much for the work but for something that we do at Nana’s house. And I love it! They bring their old clothes and old shoes along knowing

that we're gonna get dirty! And the youngest, my 4-year-old granddaughter, is proud to be a tomboy. And she'll tell you that she's gonna be a gardener like Nana. And I like that! I like to leave that legacy to them.

Gardening to help others. Four participants mentioned the importance of helping others who were food insecure by donating food from their gardens. This was particularly important for Laura, who was heavily dependent on donated food she received from food pantries. The food pantry on which she relied was connected to a community garden, which led her to become involved in the garden. After several years of receiving food from the pantry, she was delighted to be able to give back in the form of fresh produce. Of her involvement, she stated:

I was able to give to other people, so I was happier. Like I said, I pulled my little wagon around in Idaho, and some families couldn't make it because of their kids or kids sick. And even though I'm in the chair, me and my dog, we went and took some stuff to their doors. I mean there's a couple of families I did that for.

Because so many families have reached out to me, you know, you pay it forward.

Gardening gives purpose to life. Three participants explained that gardening was a means of adding purpose to their lives. For Carlene, who had struggled intermittently with homelessness, mental illness, and physical pain, she described gardening as her passion:

Oh yeah. Like I said, I've got a horrible back. I got hurt real bad when I was a kid.

And I probably shouldn't garden and that's what the doctors tell me. But, um, it's

my passion! My passion is gardening and I'm not gonna walk away from it. And, uh, I really think it's healthier for me to be out gardening than it is to be laying around on the couch like a lot of people who have chronic back problems do. It's gonna hurt anyway. So you might as well do something productive while it hurts. And I have a lot more trouble in the wintertime when I can't get around. And I almost freeze up. And I wish that there was something like gardening that I could do in the wintertime that is therapeutic both mentally and physically. And I've had a lot of people, including doctors, that ask me why the hell you do it? Well, I can't not! You know?

Gardening as prayer/meditation. For three participants, gardening offered them a peaceful place for prayer or meditation. Of her time in the garden, Sally Katherine said, "One of my problems is I don't stay in the moment. And being in the garden really lets me get into being in the moment. Like, 'Oh! I'm walking along. I can enjoy this bumblebee.'" "

Gardening gets me outdoors. Five participants described spending time outdoors as a benefit of gardening. Nellie stated:

I like working outside. Outside, rather than working in my house. That's sad! (laughing) I'll work any day outside! Then to go inside to do something! To get outside, to get fresh air. I love outside! I don't know why, I just love outside! I can work outside all day. And really, people think I'm crazy but the heat don't bother me that much.

Pride in accomplishment. Six participants described ways in which their gardens were a source of pride. For newer gardeners, planting their gardens and seeing seedlings emerge gave them satisfaction. For gardeners with more experience, feeding themselves and others was a source of pride

Gardening as therapy/ stress relief. Three gardeners used gardening as a means of therapy or stress relief. Carlene, who receives disability benefits due to her physical and mental illnesses, said of her garden:

Well, after a good day of working in the garden, I seem to have processed and worked through problems that if I was sitting at home, I wouldn't do. You know? Because I had the time and the inclination to do that. And you can turn things over in your mind just like you turn things over in the dirt. You dig deep for questions and answers and they seem to come to you while you're working.

Food is better from the garden/ I grow what I like. The quality of the food from their gardens and having the kinds of food they like were reasons cited by all gardeners for growing a garden. Laura said, "Another good thing about having a garden - you can eat what you like! You get to plant what you like. Grow what you like. Instead of eating that because it's all there is."

Uses of Food from Garden

Beyond feeding themselves and others who live with them, many of the gardeners used food in other ways.

Food shared with family. Two participants shared food with others in their family. Sally Katherine had an adult daughter who was financially independent of her but who shared her home. As their living arrangement was relatively new, the pair was working out how to share food in a way similar to that of unrelated roommates. Having food from the garden allowed Sally Katherine to have something to offer in return for the groceries her daughter purchased. Carlene's garden fed not only her, but also some of her adult children and several grandchildren. Her garden was an important food source for several family members during the summer. Ci Ci shared food with people to whom she was not biologically related, but whom she considered to be family.

Food shared with friends. Four participants reported that they enjoyed sharing extra food from their gardens with friends, coworkers and neighbors. For Sally Katherine, sharing extra eggs she received from working at her community garden with a neighbor was a way to make contact and connect with that neighbor after hearing a church sermon about the importance of loving our neighbors as ourselves.

Shared or traded with other gardeners. Four participants shared food with other gardeners or traded for things not grown in their own gardens. Laura recalled a time when she had an excess of watermelons from her garden patch, which she shared with a child whose family also participated in the garden.

I saw this little kid – the mother - because I grew some watermelons. And this little kid - she was Spanish and she gave him a watermelon to put in the car. He was so happy, he was dancing! Oh! That made my day! Just to see that!

Food donated. Five participants donated a portion of the food grown in their gardens. Sally Katherine and Ci Ci were required to donate a portion of their harvest to the food pantry affiliated with the church that sponsored their garden spaces. Laura's garden had a similar arrangement to which she happily donated because it gave her the opportunity to give back to an organization that had provided food to her during some particularly difficult times. Carlene spoke of donating food to others in her community who were struggling to feed themselves and their children.

Food bartered or sold for goods or services. Sally Katherine and Carlene were able to use the produce from their gardens as a means of currency to acquire goods and services they needed. Sally Katherine traded produce for lawn services when she was caring for her elderly grandfather. Carlene worked out a deal to provide produce to an acquaintance in return for a garden tiller.

Carlene, an experienced gardener, had used her garden as a means of supplementing her income for several years. She enjoyed taking her grandchildren out for fun activities when they came to her home for visits but doing so was beyond her ability on her income. In order to share some special activities, she sold produce from her garden:

So there's a lot of people who have been buying vegetables from me in this area for at least 10 years. And, uh, it's nice, I've gotten to know these folks. I've got my regulars that – actually I can count on several people every week that are gonna want X amount of tomatoes or something. That helps my income a lot. And

I know if I'm gonna have a bunch of grandkids for the weekend, I can get my hustle on and go to all my customers, and a lot of times I go to their homes to sell them stuff. And I can make what money I need to take all the kids to the swimming pool by getting my hustle on Thursday and Friday and get my stuff sold and I have some money.

Lessons Learned from Gardening

Themes emerged around life lessons learned from community gardening. Although these themes applied primarily to gardening, the participants often mentioned them within the context of other areas of their lives.

Some things are beyond my control. Four participants mentioned that part of gardening is understanding that things do not always go as planned. Drought, rain, heat, improperly marked plants, or actions of other gardeners were noted as factors that affected the outcomes of the participants' gardens. The participants noted that these factors were beyond their control and had to be taken in stride.

Gardening takes commitment and effort. Laura and Carlene expounded on the merits of gardening but admitted that in order to reap the benefits, one must put forth effort and remain committed to maintaining the garden. Laura told of being able to feed herself and to grow seed for her pet birds which led her to be fairly self-sufficient during the summer:

Yeah, you learn to be and that's all from the gardening. And a lot of people can get that way if they just make the effort to do that. And then there wouldn't be so much hunger but you've just got to garden!

Gardening takes patience. Ci Ci and Christine, who were the newest gardeners, both stated that a lesson they learned from gardening is that it takes patience. Both mentioned the anticipation and slight anxiety they experienced as they awaited the emergence of the seedlings from the seeds they planted. Christine stated that she was somewhat surprised by her patience.

Problems with Community Gardening

Although all participants spoke enthusiastically about their gardening experiences, there were some problems noted in the gardens by two gardeners.

Lack of commitment by gardeners. Two participants, Carlene and Bessie, were disheartened by the lack of commitment they experienced by some of the gardeners with whom they gardened. At the community center where Bessie gardened, volunteers had built sturdy, raised bed gardens to allow easier access for gardeners who attended activities through the senior center. Bessie stated that she was disappointed that only she and another gardener did the majority of the work at the garden.

Carlene's community garden was affiliated with the community mental health center where she received services and was open to clients with severe and persistent mental health concerns. Staff at the center reported that Carlene could be found at the garden nearly every day, tending not only her own garden, but helping other gardeners

with less experience. She expressed disappointment that younger, more able-bodied gardeners lacked commitment to keep their gardens tended, even with her help.

Stealing. Two participants, Laura and Christine, reported that other gardeners had taken vegetables from their gardens without asking. In Christine's garden, some gardeners had also taken tools that had been donated for all gardeners to use. It became such a problem that she and other gardeners had to arrange a meeting with garden organizers to make an effort to stop the thefts.

Summary

Themes included in Axis 2 examined participants' experiences with gardening before participation in their community gardens. All but one participant had some experience with gardening. Participants noted benefits of gardening beyond having fresh produce and saving money. Among added benefits were time spent with family and helping others, as well as therapeutic and health related benefits. Gardeners not only gardened to benefit themselves, but donated, shared, and sold extra produce. The participants described ways in which gardening had taught them important life lessons. Participants also described problems they had experienced at their respective community gardens. The participants described ways in which their diets were changed by gardening. Axis 3 reflects findings about the participants' diets and attitudes about food.

Axis 3: Diet

Themes in this axis included participants' ideas about their diets during the gardening season. As the participants all lived in areas where year-around gardening was

not possible, themes on this axis examined how their diets changed or how they anticipated their diets would change during the months when they did not garden. It also contains the participants' attitudes about food. This axis contains three primary subcategories.

Diet During the Gardening Season

In this subcategory, participants described ways in which their diets changed during the gardening season as a result of having access to fresh vegetables and fruit.

Healthier – more fruits and vegetables. Five participants stated that gardening allowed them to eat healthier. Carlene used her garden as her primary source of food during the summer.

I pretty much go vegetarian. I really do in the summertime...But gosh! I eat healthy in the summertime. Like I said, I grow everything I hunger for out of the garden. And uh, I eat good in the summertime. I love the garden stuff! There's nothing better than a fresh grown tomato!

Sally Katherine reported that she had gained weight while caring for her grandfather due to slipping into some poor eating habits. She noticed that she naturally began eating more healthily when she began gardening:

You know, I'm eating healthier. I ate a lot of cookies with Grandpa. So I gained some weight because that was our social time. So it's like, 'I'm not eating very healthy with Grandpa.' Um, so this is – the garden's helping me get back on track. It's just so nutrient dense.

Two participants, Nellie and Bessie, said gardening did not improve their diets significantly because they ate a produce rich diet all year.

An abundance of healthy food. Four participants reported that their diets were better during the gardening season because there was more food available to them that was healthy. For Laura, having a garden allowed her to eat enough every day and to eat vegetables, which helped her lower her cholesterol levels. Carlene discussed a previous year when being homeless had prevented her from gardening. During that year, she had been unable to participate in the community garden because other matters, such as finding shelter and transportation, took precedence. She explained;

But like last summer, I was between houses and didn't have a garden. It was terrible...It was tough, you know? We're used to eating as much vegetables as we want. Period. Everything! My whole family eats out of my garden. As do my friends. And we're used to having lots of veggies. And when you have that amount of vegetables - that is the basis for everyone's meals.

Diet During the Off Season

This subcategory examined participants' discussions of how their diets were changed in the months when gardening was not possible for them.

Healthier/ more produce than before they started gardening. Five participants stated that they believed that participation in community gardening either had led them to eat healthier during the off season or would lead them to eat healthier. Ci Ci, who was largely dependent on food pantries or feeding programs, was hoping to rely less on

cookies and granola bars and to try to find more fruit and vegetables. She said, “I’m going to start eating differently. I’m going to start eating more vegetables and less junky foods. Is what I’m going to accomplish this year.” For Carlene, after having vegetables during the gardening season, she craved the nutrients she received from the vegetables during the summer and therefore the way she ate during winter months.

But I guess that, in the wintertime – in the summertime I eat out of pleasure. I eat my own vegetables. In the wintertime I’ll buy the vegetables, not so much for pleasure but to know that I need that. My body is craving that. And I need that stuff. It’s just a different way of thinking. And I will buy fresh vegetables before I buy meat.

More aware of what I’m eating or cooking. Carlene and Christine said that participating in gardening led them to be more aware of what they were eating during the off season. For Carlene, a seasoned gardener, careful planning allowed her to continue to include vegetables in her diet and that of her grandchildren during the winter months. During the summer, she canned and froze vegetables and during the winter months, she described watching for vegetables that were on sale and buying as many as her budget would allow.

Christine, a novice gardener, explained that she had begun to look for new ways to prepare produce from her garden and it had inspired her to be more creative in her cooking and to find healthy ways to prepare food. She stated, “Like I usually – there was

never a recipe in a magazine. But now, it's like, 'Mmm, that sounds kinda good! I could make that!'"

Attitudes About Food and Diet

This subcategory includes themes about healthy eating that were endorsed by participants. This subcategory contains four subcategories.

Eating good food equals good health. Four participants endorsed ideas that support the idea that by eating healthy food, good health is promoted. Bessie observed,

There's so much stuff in the store, pre-cooked you know. They just buy that frozen stuff and I don't think it's healthy, because there's a lot of salt and stuff in it. So I think that has a lot to do, a lot of the children not being healthy.

Laura noticed that when she started eating vegetables she had produced from her garden, she didn't catch as many illnesses in the winter, which she attributed to building her immunity by eating a healthier diet.

Prefer healthy eating to eating junk food. Four participants stated that they prefer eating healthy foods instead of junk food or food of low nutritional level. Carlene had passed her preferences to her grandchildren. She stated, "My grandkids, I'm proud to say – we go to the store and if we don't have fresh stuff at home, they would rather have a big green pepper than a candy bar." Ci Ci, who was growing her first garden, was looking forward to having fresh produce to replace the foods distributed by the feeding programs that were high in calories, but low in nutritional value.

Learned how to eat well as a child. The three oldest participants in the study reported that they had learned to eat well as children. Bessie and Nellie lived on farms as children and their families were largely self-sufficient. Their families purchased very little food. Their parents preserved produce, meat, and grain for their families' consumption. As a child, Carlene's discipline for misbehavior was being sent to the garden, which she stated she secretly loved. Even as a child, she provided a great deal of fresh food for her family. As her family was of modest means, much of what was eaten by her family came from her garden and most of the food eaten by her family was prepared from scratch at home.

Taught children to eat well. The three participants who learned to eat well as children also cited the importance of teaching their own children to eat well. All of the women cooked from scratch for their children and taught them the importance of eating well-balanced meals. The women stated that they had children with few physical or emotional problems and they attributed the good health of their children in part to the healthy food they prepared for their children.

Summary

In summary, key ideas gleaned from Axis 3 were that the participants generally endorsed an interest in healthy eating. Many of the participants reported eating a healthier diet during the gardening season and having more food available to them during the gardening season. Several participants stated that gardening increased their interest in eating a more healthful diet during the off season. Generally, the participants endorsed

positive attitudes about eating well and how it affects health. Themes of health and community are explored in Axis 4.

Axis 4: Health and Community

Themes examined in this axis centered on participants' statements about their mental and physical health and how their health had been affected by gardening. It also examined participants' social supports, family relationships, and community relationships. Five subcategories were developed around the axis: Physical Health; Mental Health; Social and Emotional Support; Community Relationships; and Family Relationships.

Physical Health

This subcategory includes themes about statements made about how food insecurity affected the participants' physical health, how their physical health affected their ability to garden, and ways in which gardening improved their physical health. Four subcategories were included in this subcategory.

Health problems due to lack of food. Three participants cited problems that they experienced due to food insecurity. Ci Ci and her partner had preexisting medical conditions that were exacerbated when they did not have food. Ci Ci has been diagnosed with hypoglycemia and her partner with Type II diabetes. Both she and her partner were often unable to properly maintain their blood sugar levels when food was not available or when they were unable to obtain the types of food that helped them regulate their blood sugar levels.

Laura, who had been diagnosed with a seizure disorder and other serious medical conditions, needed to take medications several times each day to manage her disorder. When she was asked how food insecurity affected her physical health, she replied, “Not being able to take medication, I get really sick from throwing up because of my medication. I go into seizures because my medication comes back up. My levels get low.”

Low energy. Four participants cited having difficulty managing their lives because of low energy from lacking food. Ci Ci, who lacked personal transportation and often lacked money for public transportation, discussed that when she did not have food, she lacked the energy to go to the food pantry or feeding program for more food.

Sally Katherine’s low energy led her to isolate from friends and family. She stated, “Um, if I go too long without eating, I get too tired. Uh, so I know there’s other stuff I need to do. But it’s like, I don’t care! It’ll be there tomorrow to get done. So uh, my house is not as clean as it used to be but I’m not inviting anyone over... You know, I probably don’t socialize as much as I have in the past. It’s all tied to just having enough money for just the basic needs, you know?”

Gardening with physical limitations. Four gardeners reported gardening in spite of pain problems or other physical limitations. Both Nellie and Bessie were in their 80s and stated that bending, digging, and getting on the ground to work could be challenging for them. Both of them gardened at their senior center where volunteers at the center had built raised beds to reduce physical barriers for the gardeners. Carlene gardened in spite

of a back problem that caused nearly constant pain. Laura used a motorized wheelchair and gardened with the help of her service dog:

I learned since I had my service dog and the tools I can still clean around it and I can still put my chair low enough and I tell my dog to pull or tug and the dog will pull it up for me. So yeah! It worked.

Physical health improved with gardening. All participants made statements that indicated they believed their physical health had improved as a result of their participation in community gardening. As previously noted, Carlene gardened in spite of serious back pain. She believed that gardening actually relieved some of her pain because she was out in the warm sunshine and the movement kept her muscles from tightening, which led to pain. Christine and Ci Ci noted that they felt better by being in the sun to boost Vitamin D levels. Nellie used gardening as a means of exercise to keep active.

Mental Health

This subcategory includes themes about how food insecurity and gardening affected the mental health of the participants. Subcategories within this subcategory included: Worry and stress; Depression; People look down on me; Mental health improved by gardening; and Self-esteem improved.

Worry and stress. Four participants reported experiencing worry or stress as a result of being food insecure. Laura worried that when she did not have enough food, she would be unable to take medications, which would lead to seizures and illness. Carlene

worried that by lacking food, her grandchildren would be unable to visit her home, which would negatively affect their relationships.

Depression. Four participants said that food insecurity led to symptoms of depression. Laura described her symptoms, “A lot of times, you sleep a lot and you don’t get – you don’t feel hunger. So you’re just kind of sleeping everything away. When you wake up in pain, it hurts sometimes! When you don’t have enough to eat. You just sleep. That’s about all you can do.”

People look down on me. Ci Ci and Laura disclosed that they believed people looked down on them due to their economic status. Ci Ci recalled experiences in which strangers called her a “bum.” Laura described feeling as though she was a beggar:

You don’t want to admit to people, especially people you don’t know that you’re a beggar. And that’s what you feel like, with some of the volunteers at those food banks. They’re not very nice. They’re just people who are forced to do community time and they treat you like you’re a beggar, so imagine how they treat the people who are homeless. So, it’s not a good thing.

Mental health improved by gardening. All participants responded that participating in community gardening improved their mental health. Sally Katherine reported feeling more hopeful because she was beginning to believe that she could meet

more of her food needs in the future. For Carlene, gardening served as an adjunct to her regularly scheduled therapy appointments:

I think that my garden in the season is every bit as therapeutic as my therapist. I don't often even listen to music when I garden. Uh, I work things out – it's kind of like when you sleep and things work out in your brain while you're asleep and you wake up and you have the answer.

Self-esteem improved. Laura and Ci Ci both noted improved self-esteem as the result of participating in community gardening due to an increased ability to provide food for themselves. Laura said, “Oh man, I feel like I'm not an invalid. I can do this. I can still be independent. I can still be self-supporting. I can still help myself. I got all that from gardening.”

Community Relationships

This subcategory contains themes of how the participants gained relationships or changed relationships by their participation in community gardening.

Gained a sense of community. Two participants stated that gardening offered them a sense of community that had been lacking. Although Sally Katherine was caring for her grandfather willingly and with love, she came to value the community that was connected to the community garden to provide the friendship and support she needed for her self-care.

Laura described her community garden as a cooperative means of providing food in her low-income neighborhood. The gardeners in her neighborhood made efforts to

make sure that everyone in the neighborhood had access to extra food from the garden. Gardeners shared and traded food with one another. If gardeners missed a few days at the garden, others checked in with them to ensure they were safe and well.

Deepened relationships. Christine and Sally Katherine cited participation in community gardening as a means of deepening existing relationships. Christine credited her time in the garden for helping her develop relationships with church members who used the garden. She cited time spent in the garden as a way to spend time with church members with whom she may not have had the time to talk otherwise. Sally Katherine also gardened at a garden connected to her church. Although she had been a church member at the church that sponsored the garden for some time, the support she received from the gardeners while she was caring for her grandfather provided her with a strong social network that continued following his death.

Family Relationships

This subcategory examined how the participants' relationships with their families were affected by food insecurity and by community gardening.

Negative family relationships. Three participants described negative family relationships as the result of food insecurity. Carlene stated that she believed being food insecure when her children were living at home was "hard on them." Christine stated that at the time of her interview, she and her daughter were "going through some struggles right now." For Ci Ci and her partner, arguments sometimes erupted when the food they received from the food pantry was not enough to feed them both.

Positive family relationships. Interestingly, the same three participants who described negative family relationships as a result of food insecurity also listed positive effects on their family relationships. All three cited needing to work together to find food or to use the food they had to make it last as long as possible as ways in which their families connected and allied. Carlene was able to use her food insecurity as a way of teaching her children and grandchildren to cook, which allowed her to spend quality teaching time with them.

Family relationships improved. Carlene and Christine credited gardening as a means of improving relationships with family members. Christine valued her time in the garden as a time that she spent with her teenage daughter and her mother without the distractions of televisions or electronic devices. Carlene actively planned her garden for the different ages of her grandchildren so they could accomplish tasks that were suited to their ages and could spend time in the garden with her.

Social and Emotional Support

Themes around social and emotional support that was available to the participants were examined. The researcher asked questions about social support before gardening and after beginning to garden. Five subcategories were identified in this subcategory.

Family. Four participants listed family members as social and emotional supports. Nellie had a large extended family of adult children, grandchildren, and great-grandchildren who congregated at her home for holidays and other special occasions. Family members frequently check her well-being when she is not gardening or at other

volunteer activities. Bessie had an adult son who lived with her and other adult children with whom she had frequent contact. Carlene held the role of matriarch of a large extended family that included not only children and grandchildren, but also included siblings. Sally Katherine had an adult daughter living with her and had contact with other adult children.

Church or religious organizations. Four participants mentioned participation in churches or other religious organizations as important sources of emotional and social support. Nellie and Bessie participated in activities, including gardening, through a senior center that was affiliated with a religious organization. Both credited the activities they attended for keeping them physically and mentally active and engaged with others. Sally Katherine's church members had been very supportive of her while she was caring for her elderly grandfather. After Ci Ci started gardening, she cited the support she received from church members who managed the garden as an important source of emotional support.

Church members were regularly observed providing gardening guidance. Church members were also observed as non-judgmental listeners for gardeners who had been court ordered to participate in the gardens as the result of drug charges. A young woman who had initially been court ordered to the gardening program reported that although she had completed her probation, she continued to come to the garden because she found the support she received from the church members in the garden to be important in her continued recovery.

Social and emotional support improved with gardening. Five participants stated that their social and emotional support improved when they began participating in community gardening. Christine, who reported very limited social support before participating in gardening, felt as though she gained social support and companionship by talking with other gardeners and by participating in social functions sponsored by her gardening association. Carlene reported gaining social support from those with whom she shared extra produce from her garden. Sally Katherine began participating in community gardening as a means of keeping her grandfather engaged as his Alzheimer's dementia progressed. She spoke fondly of gardeners who took time to sit and visit with her and her grandfather when they were at the garden.

Social support gained from others like me. Two gardeners stated that they gained social support from interacting with other gardeners who shared similar situations and ideas. Laura mentioned that she found comfort in finding others who were struggling economically and chose to do something to change their situations. She stated:

Yeah, I talked to people more. I actually enjoyed it. Um, I got to know that I wasn't alone. That I wasn't the only one who was having a hard time. And there's those who would rather just sit there and dwell on having a problem, and then there's those who go out and do something about it. And I wanted to be one of the ones who go and did something about it. And there were others who did want the same thing and those were all the people in the gardens.

Summary

In summary, key themes from Axis 4 included problems the participants experienced as a result of not having enough food, including exacerbation of pre-existing medical conditions and low energy. Many of the gardeners also reported gardening in spite of problems with pain or other physical limitations. However, all of the participants stated their physical health improved as a result of gardening. The participants reported mental health concerns that resulted from their food insecurity including worry, depression, and feeling as though they were looked down upon by others. Some participants reported an increase in self-esteem and all participants stated that their mental health improved as a result of their participation in community gardening. Some of the participants reported gaining a sense of community from gardening or deepening existing relationships. Two participants found that participating in gardening improved family relationships. Participants who discussed how food insecurity affected family relationships related that food insecurity had affected those relationships both in positive and negative ways. Participants' ideas about their health and community relationships may affect their use of primary and secondary control which is discussed in the following section.

Axis 5: Control

Themes contained in this axis examined the participants' use of primary and secondary control. Themes of primary control were examined by participants' statements regarding actions taken to change their environment. Secondary control was measured by

assessing participants' methods of making sense of the failure to provide adequate nutrition, housing, physical limitations, or employment. Participants exercised secondary control to make sense of disappointment in relationships. Engaging in secondary control allowed the participants to formulate new goals and to evaluate the likelihood of success in future actions. Participants in this study sometimes achieved secondary control by comparing themselves with others whose lives they perceived as being worse than their own.

Primary Control

In this subcategory, participants' statements were evaluated for use of methods to make changes in their environments. Actions included the decision to garden to increase the amount of food available to them and their families. It also included statements made about participants' use of prayer, in which results cannot be directly attributed to action but are perceived by participants to occur as the result of prayer. Rothbaum, Weisz, and Snyder (1982) referred to prayer as a form of illusory control.

All participants used primary control in that they all made a decision to engage in gardening. Laura stated that she decided to get involved in community gardening when, "I got tired of sleeping!" She saw that food insecurity and hunger were problems in her community and she stated, "I wanted to be one of the ones who did something about it." Christine decided to get involved in gardening to prove to herself that she could do it. Nellie and Bessie got involved with gardening at their senior center in order to provide fresh produce for themselves and for others who attended programming at the center.

Carlene engaged in primary control not only by gardening to provide food for herself and her family, but by growing extra produce to provide income to supplement what she received from Social Security.

With the exception of Ci Ci, who was homeless, all participants exercised primary control of their diets by storing extra food produced in their gardens or purchased on sale. And although she was unable to store food as did the other participants, Ci Ci exercised primary control of her diet by seeking out sources of food such as food pantries and programs that fed homeless people. All of the participants mentioned ways in which they had changed or planned to change their diets as a result of gardening.

Sally Katherine's story was a good example of multiple uses of primary control. She chose to leave her job to care for her grandfather when she saw the care he was receiving at his assisted living facility was inadequate to slow the progress of his dementia. In order to keep him engaged in an activity he enjoyed and to keep her engaged with others, she began to participate in the community garden at the church she attended. After her grandfather's death, she worked in a series of temporary jobs to get back into her field of employment. Additionally, she worked with the public libraries in her area to teach juggling, her passion, in order to supplement her income. All of her decisions were examples of ways she used primary control to change her environment.

Nellie used primary control by changing not only her environment, but that of others in her neighborhood. She served as a volunteer at the Salvation Army in her neighborhood. She made appointments for people who needed financial assistance with

utility bills and families who needed food assistance for holiday meals, and she stuffed back packs for children of low socioeconomic status. She chose to get out of the house to participate in her senior citizens' program and to volunteer rather than "laying around all day," which she worried might slow her down due to arthritis. She also relied heavily on her religious faith and credited God for a great deal of her success. She and others listed prayer as a means of controlling events in their lives as a form of illusory control (Rothbaum et al., 1982).

Secondary Control

All of the participants engaged in some types of secondary control. As secondary control is used to attempt to modify self to adapt to the environment and is an important cognitive process following failure and for goal setting, all of the participants engaged in some form of secondary control. As the volitional stages of secondary control are an internal process, it is somewhat difficult to assess the various motivational processes, so in this study they were included in one broad category.

Ci Ci, who had been homeless for a decade, used secondary control to explain her inability to change her financial and residential status. She stated, "You gotta have money to get somewhere and you can't have money without a job and you can't get a job without an ID. And so it's like, 'OK. Can you tell me where to start?'"

Christine also used secondary control to explain reasons for her unemployment. Of her status as an unemployed woman she said, "I didn't plan on quitting the job. But it was just a lot of immaturity. And since I didn't give two weeks' notice, he put in a bad

reference.” She also used secondary control to prevent herself from considering herself to be a person who was not capable of employment by rationalizing that the employment from which she was receiving poor references was not her typical form of employment.

Yeah. And it was a position that I normally don’t do. Because I’m basically data entry, you know? On the computer. Because I worked at National Research for 6 years. From 2005 to 2011. So this was a housekeeping position. So – I couldn’t have been that bad because I worked there 9 months. I built rapport with all the residents. I just loved them, you know? But it was just certain people that were – I think I was stepping on their toes because I was doing my job above board. So it was a lot of nit-picky stuff. Unfortunate, but –

Carlene and Bessie used secondary control when describing gardening with some physical limitations. Bessie, who was in her 80s stated, “I can’t do what I used to do. But I do what I can.” Carlene had decided to keep active through gardening rather than to allow her pain to control her activity.

Sally Katherine, whose financial standing suffered after she took time off to care for her grandfather, used secondary control to illustrate how she was dealing with her lowered socioeconomic status:

So it makes me feel like, ok, I can have a very rich life that doesn’t have anything to do with money. The sing-alongs didn’t cost me any money. Um, the knowledge that I’m learning – you know, I go to libraries – so that hasn’t cost me any money.

The relationships haven't cost me – you know – it's the benefits we haven't fully explored.

Three participants compared their statuses to those whose lives were worse than theirs as a means of secondary control. Carlene and Bessie compared themselves to others who were younger but less able or willing to work hard to improve their lives. Laura, who complained that she was treated poorly by volunteers at a food bank, imagined how homeless people would be treated by the same volunteers. Ci Ci asserted that although she was homeless and without employment, she was not spending her limited financial resources on drugs or alcohol.

Summary

Results in this section indicated that the participants all exercised primary control by choosing to become involved in community gardening in order to increase the amount of nutritious food available to them. Most participants also chose to store extra food by stockpiling extra food by various means. Some cited prayer as a means of primary control. Sally Katherine and Carlene used unconventional methods to increase their incomes. All participants engaged in some form of secondary control to make sense of their current struggles with employment, homelessness, food insecurity, and physical limitations. In addition to these axes, some information that was relayed by the participants was salient, but did not fit neatly on any of the axes and will be discussed below.

Observations from the Gardens

Conversations with garden managers provided insight into the cultures that existed in the gardens. Managers of one urban garden spoke of their decision to start a community garden at their church as a calling from God. They spoke of managing the garden as a means of providing compassion for people who were less fortunate. Their kindness and compassion for others was evident in the egalitarian manner in which all gardeners, regardless of socioeconomic status, were treated. Another garden manager at a church garden prepared a weekly breakfast for young volunteers from area youth groups or other organizations. She was cognizant of garden volunteers who may have needed some extra food and they were sent away at the end of the morning with produce and food left over from the breakfast. Gardeners frequently described the manager as a good friend who upon whom they could depend for support. On mornings when breakfast was served, several elderly women brought food from their homes and were frequently observed listening to the concerns and problems of young volunteers. The accepting and inclusive attitudes of the garden managers appeared to set the tone for ways in which the gardeners and volunteers treated one another. In general, the gardens provided not only a place for growing food, but also a means of social support for gardeners and volunteers.

Unexpected Findings

All but one participant, Christine, had some connection to gardening from their pasts. For Sally Katherine, it was the fading memories her grandfather shared of his youth on a farm. Bessie and Nellie had grown up on self-sufficient farms in the south. Ci Ci

grew up in California, where her grandmother had been an avid gardener. Laura had spent some of her childhood summers on a farm with relatives. And Carlene had been a gardener since her childhood. All of the gardeners who had some previous experiences with gardening from their childhoods spoke of their time in the garden as a means of connecting with pleasant memories from childhood. For them, gardening connected them to relatives, some long since gone. This connection added an additional layer of satisfaction to their gardening experiences.

Themes of crime in the lives of the participants surfaced in some of the interviews and in conversations with women serving breakfast for volunteers at a church garden. Nellie related a story of having lawn equipment stolen from her home. She believed that it had been stolen by a neighbor, but she was unable to prove it to authorities, so she was unable to retrieve the equipment. Ci Ci mentioned that as a homeless person, her personal items were at risk of being stolen and that she sometimes worried for her personal safety. As they prepared breakfast for a group of adolescent volunteers who were coming to help with harvesting, volunteers at a church associated with one of the gardens discussed a drive-by shooting that had occurred the previous night. Although the crime was noteworthy because the victim had been White in a primarily African American neighborhood, the occurrence of such a crime did not appear to be out of the ordinary for the neighborhood. It was noteworthy that for the participants, the crimes they mentioned were unsettling enough to bear discussion, but not so unusual that they were perceived as being terribly unusual.

Additionally, participants reported information that was not found in other literature. Participants in the current study noted some positive aspects of being food insecure. Some participants reported that as a result of being food insecure, they had learned to cook, had learned to use available food in creative ways, and had learned to eat things that others may not consider to be food items. Other participants discussed ways in which being food insecure had been an asset in helping their families work together to insure that everyone ate well.

CHAPTER V

DISCUSSION

Summary of Major Findings

The purpose of this investigation was to provide a description of the experiences of food insecure individuals who lived in food deserts and participated in community gardening. This study examined how participating in community gardening affected the participants' use of primary and secondary control in their lives. It also examined how shifting perceptions of control affected familial and community relationships, mental and physical well-being, as well as food choices and eating habits. Data gathered were generally consistent with literature that studied each of these phenomena. In the Food Insecurity category, data provided a novel contribution to the existing literature.

Five axes emerged from the data: Food Insecurity; Gardening; Diet; Health and Community; and Control. Axis 1, Food Insecurity, included data related to the participants' inability to adequately provide for their nutritional needs on a consistent basis, as framed by availability and access to food as well as by affordability. The second axis was Gardening. Data on this axis examined the participants' experiences with community gardening, both positive and negative. The third axis was Diet. Themes in this axis included participants' ideas about their diets during the gardening season and when gardening was not possible, as well as participants' attitudes about food. The fourth axis, Health and Community, examined participants' statements about their mental and physical health and how their health had been affected by gardening, including social

supports, family relationships, and community relationships. The fifth axis was Control. Themes contained in this axis examined the participants' use of primary and secondary control.

Integration with Existing Research

The primary descriptors that arose from this study were food insecurity, themes related to gardening, diet, community and health, and control. Data gathered in each of these categories were largely consistent with current literature. Participant responses that indicated positive effects of food insecurity were not replicated in other studies and represent a new addition to existing literature.

Axis 1: Food Insecurity

Data from this study indicated that some of the participants had limited access to high quality, fresh foods. In some cases, high quality food was available but not within the financial means of the participants. Availability of high quality or fresh foods was somewhat dependent on the participants' access to transportation. The participants without means of personal transportation had the greatest difficulty obtaining quality fresh food that was within their financial means. These findings support those of previous researchers who have studied food insecurity (Chung & Myers, 1999; Jetter & Cassady, 2006; Sharkey, 2009; Ver Ploeg et al., 2009)

All of the participants did at least part of their grocery shopping in traditional grocery stores or supercenters such as Wal-mart. Recent research (Ver Ploeg, Mancino, Todd, Clay, & Scharadin, 2015) indicated that approximately 44% of households did

most of their grocery shopping at supercenters, and 45% of households did the bulk of their shopping at traditional supermarkets. Ninety percent of food insecure households and SNAP beneficiaries listed traditional supermarkets or supercenters as their primary source for grocery shopping. Approximately 6% of participants in the Ver Ploeg et al. study did not classify their primary source of shopping. The research indicated that most shoppers in the U.S. do not shop at the store closest to their homes. This was true for many of the participants in the current study who reported shopping where they received the best value for their SNAP benefits or food buying dollars.

One participant in this study was homeless and had no transportation. Little current research exists on the difficulties that homeless people experience in obtaining fresh, nutritious food in the U.S. However, research conducted with homeless youth in Toronto showed that that 79% of homeless males had inadequate vitamin A intakes as did 64% of homeless females. Vitamin C deficiencies were noted for both males and females as well as inadequate folate intakes. These deficiencies were attributed to low fruit and vegetable intakes and suboptimal intake of fortified grain products (Li, Dachner, & Tarasusk, 2009).

With one exception, all of the participants in this study used food pantry services. Research from Feeding America (2014), showed that 36% of users of their services used food pantries on a monthly basis or more often. Over half of the users of their services who received SNAP benefits frequented food pantries on a monthly basis or almost every month; several participants in the current study also used SNAP benefits.

Participants in the current study who used food pantries reported variance in the quality of foods they received ranging from those with high sugar and fat content, to spoiled foods, to those with high nutritional value, such as beans and peanut butter. Some research shows that food pantries are so strapped for food donations, they will accept and distribute foods without limitations on nutritional value (Farmer, 2011). Other research shows that food pantries are becoming more aware of the nutritional needs of their patrons and are limiting donations of high sugar foods such as sodas, and other foods of low nutritional value (Handforth, Hennink, & Schwartz, 2013).

The majority of the participants stated that nutritious food was available but they were unable to afford it. Their ability to find fresh, nutritious food in the places they shop counters research findings of other studies (Chung & Myers, 1999; Jetter & Cassady, 2006) which found that people living in food deserts were unlikely to find nutritious foods and fresh produce. The participants' ability to find nutritious, if unaffordable, food is likely due to the intersection of availability with accessibility. Four participants had their own vehicles or other means of transport which allowed them to shop in stores that were not in their own neighborhoods.

None of the participants who received SNAP benefits were able to adequately meet their nutritional needs solely with the funds they received from SNAP. Yaktine and Caswell (2014) reported that 40% to 50% of households using emergency food services such as food pantries were SNAP recipients. Yaktine and Caswell purport that a primary reason that SNAP benefits are insufficient is that many families lack the time to prepare

foods as suggested by the USDA for SNAP recipients. Therefore, many families, especially those in which the adults in the household are working, use their SNAP benefits for partially prepared foods that are faster to prepare but more expensive, thus reducing the amount of food that can be purchased with SNAP benefits. One participant was occasionally physically unable to prepare food from scratch due to physical limitations. However, two of the participants in the current study who received SNAP benefits cooked most meals from scratch and were still unable to meet all of their needs with their SNAP benefits which they attributed in part to not always shopping as wisely as possible, and sometimes feeding multiple extended family members.

Two participants receiving SNAP benefits also received Social Security Disability Insurance funding (SSDI). They both reported SSDI incomes of \$733 per month. This placed them well below the Federal Poverty Level of \$983 per month for single individuals as reported by HealthCare.gov (2016). From these funds, they had to pay rent and utilities. According to Livermore and Bardos (2014), 28% of individuals who receive SSDI do not qualify for additional Social Security income, but their SSDI benefits are low enough to categorize them as poor, based on the federal definition of poverty. Livermore and Bardos noted that many individuals in this group have serious health concerns, are less likely to be married, and have worked in low-income earning jobs or lack a job history. These characteristics were true of the participants the current study whose primary income source was SSDI.

Participants described making detailed lists, buying only foods that are on sale, and stockpiling food as methods of stretching food budgets. Mammen, Bauer, and Richards (2009) found these to be characteristics used by food insecure participants in their study. Participants in a study of low-income African American women living in urban areas also described checking grocery store fliers for specials and sales in order to stretch their food budgets (Jarret, Bahar, & Odoms-Young, 2014). Participants in the current study discussed buying only things on sale and stocking up on sale items or purchasing day-old or about to expire foods. Participants in studies by Seefeldt and Castelli (2009) and Anater et al. (2011) also discussed using this method as a means of saving money. Fifty-six percent of participants in a 2014 Feeding America study reporting using foods past their expiration date as a means of stretching food budgets. Using food that was expired was also listed as a means of coping by participants in studies by Anater et al., Kempson et al (2002), and Tarasuk (2001a).

Two participants reported shopping immediately after receiving their SNAP benefits in order to shop where they got the best value for their SNAP benefits. This result correlates with findings reported by Morrison and Mancino (2015), who found that 28% of SNAP recipients made their shopping trips once a month or less frequently compared to 8% of shoppers whose income was 185% of the poverty threshold.

Six of the participants in this study discussed methods of stretching available food. Some added pasta, rice, or other ingredients to stretch more expensive foods such as meat. This method was consistent with data from other research (DeMarco,

Thornburn, & Kue, 2009; Jarret et al. 2014; Mammen et al., 2009; Wiig & Smith, 2009).

Two participants depended on food sharing with family members or friends when they ran low on food in their homes. Food sharing with others was also listed as a method of managing low food supplies by participants in other studies (DeMarco et al.; Wiig & Smith). Participants in this study listed cutting down on the food they eat as a means of stretching food. Participants in the study by Seefeldt and Castelli (2009) also discussed limiting food for themselves and their children as a way of rationing food when it was in short supply.

When food was in short supply, two participants tried to fill their empty stomachs with water. Forty percent of participants in a study by Feeding America (2014) reported watering down beverages to extend them. Although drinking water can be a means of controlling food intake for people wishing to lose weight (Davy, Dennis, Dengo, Wilson, & Davy, 2008), excessive intake of water can lead to confusion, lethargy, muscle weakness or myoclonus, and seizures (Arieff & Guisado, 1976). This was particularly problematic for one current study participant diagnosed with a seizure disorder.

Four participants stated that they had learned to make do as children and five of the participants said they cooked from scratch as a means of stretching available food. Research supports the idea that teaching children to cook and involving them in food preparation improves dietary choices among children, teens, and young adults (Larson, Perry, Story, & Neumark-Sztainer, 2006; Woodruff & Kirby, 2013). As food preferences are developed early in life (Ventura & Worobey, 2013), it is likely that having learned to

cook at an early age not only affected the participants' willingness to cook from scratch, but also affected their desire to cook healthy meals. When children and teens are included in food preparation, they are less likely to eat fast food and to make better nutritional decisions (Woodruff & Kirby, 2013). The participants who reported having learned to make do as children all reported having limited financial means in their families of origin. Research indicates that there are intergenerational effects of poverty. A study by Ham, Hedman, Manley, Coulter, and Östh (2014) found that people who lived in high poverty neighborhoods during childhood are likely to live in similar neighborhoods during adulthood.

With the exception of one participant, all of the participants used various methods of preserving food they purchased on sale or grew in their gardens. Although little research exists on how food insecure people store food, one study showed that preserving food by means of canning or freezing was a strategy listed by participants in one study as a means of stretching food budgets (Mammen et al., 2009). It is possible that because several participants had some previous experience with gardening that the practices of canning and freezing excess foods were something they had learned in their youth.

Some of the data from the current study contradicts that found in other studies. Although the cited research indicated that people living in majority African American neighborhoods were less likely to have access to a supermarket (Morland et al., 2001; Powell, et al., 2007), that finding was not evident in this study. The African American participants had relatively easy access to a supermarket. It should be noted, however, that

the African American participants lived in the same neighborhood and both had personal transportation which allowed them to travel outside their neighborhood for shopping. At the time of the interview, a new Wal-Mart Supercenter had recently opened within a short driving distance from their neighborhood.

Although the participants may not have had a grocery store in their neighborhoods, for all but two of the participants, with some careful planning, accessibility was not a major deterrent to getting to a store. It should be noted, however that two of the participants used unusual means of getting to the store.

This intersection of accessibility with availability was most salient for Carlene, who had recently moved into a small town. Several researchers have found a lack of quality, affordable food for low-income residents living in rural areas who lacked transportation (Hendrickson et al., 2006; Liese et al., 2007, Ver Ploeg et al., 2009).

Procter (2010) and Blaney (2010) described rural areas in which small, independently owned grocery stores have been forced out of business by the introduction of a Wal-Mart store. This has been the case in the area in which Carlene lives. It is noteworthy that Carlene lived in a rural area that is heavily populated by Native American people. Neighbors who are members of the Kickapoo and Potawatomie Indian Nations are eligible for the Food Distribution Program on Indian Reservations program (FDPIR), a federally funded program that provides food to low-income Native American individuals and families living on or near tribal lands (USDA, 2016b), which appeared to have alleviated some of the problems with access for her former neighbors.

Four of the seven participants in this study did not own cars. They appear to be in the minority of SNAP recipients. Research by Ver Ploeg et al. (2015) found that 68% of SNAP recipients use their own transportation to shop, and only 19% use someone else's car or ride with someone else. Overall, approximately 70% of food insecure households use personal transportation to shop, compared to 91% of food secure households (Ver Ploeg et al., 2015). However, a number of participants in the current study discussed their transportation difficulties, and the trade-offs between spending money to get to a grocery store and the consequent reduction in funds available to buy food. Such problems have been documented by the writing for organizations that feed homeless people (Hamm, 2012). They cited lack of access to transportation as a reason that many homeless people choose to purchase low quality food at gas stations or convenience stores closer to the places they are living.

Several studies have mentioned the cost of transportation to grocery stores in general terms (Cassady & Mohan, 2004; Morland, Wing, Diez Roux, & Poole, 2002; Wiig & Smith, 2009). Few studies address transportation costs reducing the amount of money available for food. Women in a study by DiSantis, Hiller, Holaday, and Kumnyika (2016) often shopped near their homes or other routine destinations in order to reduce the cost of transportation. A study of women in Uganda who receive HIV treatment, found that cost of transportation to the clinic often prevented adequate treatment (Tuller et al., 2010).

Interestingly, food insecurity was the impetus for some positive developments. For example, one participant learned to cook and another to learn to use the food she received from food pantries in creative ways. Other participants asserted that just because one is food insecure, it does not mean that she has to eat poorly. These ideas seem to be spreading among food insecure people and organizations that serve them. There is a growing movement among governmental agencies to support low-income people and families in making better food choices and in learning to prepare nutritious foods. ChooseMyPlate.gov (2015) is a website developed by the USDA that provides tools for meal planning on a low budget using the ChooseMyPlate as a structure for planning well-balanced and affordable meals. In 2014, author Leanne Brown published an online cookbook, *Good and Cheap: Eating Well on \$4/Day*. The cookbook, which is available at no cost, provides recipes for healthy, inexpensive meals, using fresh ingredients. The recipes were created to fit within the daily allowance provided by SNAP benefits.

Finally as relates to Axis 1, participants in this study engaged in a number of coping techniques when there was not enough food in the house. These participants may have been somewhat unusual in that many of them had grown up in homes where they learned to stretch food budgets by cooking from scratch and by canning or otherwise preserving foods.

Axis 2: Gardening

With one exception, all of the participants in this study had some previous experience with gardening. Participants stated that gardening helped them feel connected

to family members, some now deceased, with whom they had shared gardening experiences. Gardeners in a study by Hale et al. (2011) also described gardening experiences from childhood that led them to connect with nature and memories through gardening.

All of the participants used their gardens as a way to supplement their diets with fresh vegetables and to save money. Previous research indicated that gardeners can save money by raising vegetables. Gardeners in San Jose, California saved approximately \$435 per garden in one gardening season of participation in community gardening (Algert, Baaumeur, & Renvall, 2014). Gardeners participating in a community garden in Laramie, Wyoming grew on average 128 pounds of food per garden plot. It was estimated that the produce would have cost the gardeners \$422 at a local farmers market. Additionally, the food that each gardener grew in another study was enough to supply the USDA recommended amount of daily vegetables for an adult for approximately 9 months (Conk & Porter, 2016).

Time spent with family in the garden was an important benefit for two of the participants in the current study. This finding was also reported in a study of community garden participants in Oregon, in which members of 38 of 40 families participating in the garden described time spent with family members in the garden as being an important aspect of their participation (Carney et al., 2012). In a study of urban and rural community gardeners in upstate New York, 65% of gardeners said they thought that gardening was a good family activity (Armstrong, 2000).

Many participants described the importance of gardening in order to help others, give back, or pay it forward by donating a portion of their harvest to their community garden organizations. This arrangement was also described in research by Conk and Porter (2016), in which gardeners in Laramie, Wyoming donated 31% of the food they grew in their garden plots. Two gardeners in the current study used extra produce to generate income or to barter for services. Ten percent of the gardeners in Armstrong's study (2000) of gardeners in upstate New York sold excess vegetables to generate income.

Some participants in the current study stated that gardening gave their lives purpose. Gardening helped them develop identities beyond that of people who were homeless or mentally ill. Instead they were able to see themselves as someone who was doing something productive and meaningful. Similar results were reported in a study of gardeners with early onset dementia (Hewitt, Watts, Hussey, Power, & Williams, 2013). The gardeners often struggled with loss of identity when they were forced into early retirement by their symptoms of dementia. Caregivers of the gardeners with dementia stated that working in the garden gave the gardeners a sense of purpose and helped them develop a new self-identity. Homeless women who participated in a community garden were noted to experience a sense of purpose and a sense of fulfillment as the result of their participation with the garden (Grabbe, Ball, & Goldstein, 2013).

Participants in the present study stated that working in the garden gave them a peaceful place for prayer or meditation. Gardening was described as being therapeutic

and an important stress reliever. These sentiments were described by gardeners in several other studies. Gardeners in a study by Hale et al. (2011) described their gardens as a place where they felt centered or a place to process difficult emotional situations. Pitt's (2014) study of community gardeners described therapeutic benefits the gardeners derived from their participation. They described the garden as a place where they could get away from the stresses of their everyday lives to be restored and to feel an increased sense of well-being. Participants in another study who were participating in horticultural therapy as part of inpatient treatment for mental disorders, described how being in green spaces and having contact with nature gave meaning to their lives and allowed them to feel as though they had a purpose in life (Adevi & Martensson, 2013).

Nearly all of the participants in this study described the pride they felt in planting their gardens, watching the seedlings emerge, and producing food. The more seasoned gardeners reported pride in producing enough food to feed themselves and others. Similar results were reported by Mecham and Joiner (2012) who studied college students involved with a community gardening project. The students in the project reported taking pride in growing something that tasted good. They reported taking pride in watching their gardens grow from seedlings to edible produce.

All of the participants in the current study listed growing what they liked to eat and enjoying the flavor of their produce as reasons to garden. These reasons for gardening were also reported in studies by Armstrong (2000), Carney et al. (2012), and Wakefield et al., (2007). Participants in those studies reported they enjoyed growing

foods that were important in their cultures or being able to grow foods they enjoyed but could not afford to buy. Participants in those studies described how much better the food tasted from their own gardens.

Participants in the present study reported that they had learned important life lessons from gardening. Participants in studies by Carney et al. (2012) and Wakefield et al. (2007) discussed learning lessons from other gardeners. Older adults in Wang and Glicksman's study (2013) remarked that participating in a community garden allowed them to learn new things.

Although all of the gardeners listed many benefits associated with community gardens, some of them also noted that there were some problems in their gardens. The problems that were noted were that vegetables were sometimes stolen from their plots and that gardening tools that were to be used communally were stolen. Other gardeners were disappointed by the lack of commitment by gardeners who abandoned their plots or did not give good effort to shared plots. These concerns were shared by gardeners in study by Wakefield et al. (2007) who reported that other gardeners or non-gardeners took vegetables from their plots without asking. A community garden manager at a church in a large city told the researcher in the current study that his garden was in an area of the city with a large homeless population. He stated that gardeners in his garden complained to him that they were losing a large portion of their vegetables to theft, presumably by homeless people who were hungry. He and the gardeners decided rather than to fence the

garden, as was done in Wakefield's study, the gardeners would contribute labor to a garden bed that would be designated for free picking for hungry people.

Overall, participants in the current study had positive experiences with gardening. Topics of discussion on this axis intersected with factors on all other axes. Prior to those discussions, Axis 3 results are integrated with the current literature.

Axis 3: Diet

In general, the participants who had access to SNAP benefits or some other financial means of acquiring food reported trying to eat a healthy diet rich in fruits and vegetables. However, five participants reported that they were able to eat a diet richer in fresh vegetables and fruits during the gardening season. Four participants reported that their diets improved during the summer months due to the abundance of food they were able to produce. One participant reported that she not only ate a healthier diet, but that she was able to eat every day, which was not always possible during the gardening offseason.

Participants in the present study reported that they tried to include fruits and vegetables in their diets when it was financially feasible. Gardening allowed them to increase their consumption of produce and for at least one participant, gardening allowed her to eat every day rather than having days in which she did not eat. Similar results were reported in a study by Carney et al. (2012), in which it was reported that the frequency of vegetable intake of "several times a day" (p. 876) increased from 18.2% to 84.8%. However, for participants in Carney et al.'s study, the frequency of skipped meals was

not statistically different during the off-season when compared to the gardening season. Another study found that community gardening participants were 3.5 times more likely than non-participants to eat at least five servings of fruits and vegetables on a daily basis (Alaimo et al., 2008). Other studies found that in neighborhoods where cost and availability of fresh produce cause many families to eliminate it from menus, gardening is a way to incorporate these foods into family meals, at least on a seasonal basis (Stein, 2008; Wakefield et al., 2007).

Participants in the current study reported that they believed participating in their gardening programs would lead them to eat a healthier diet during the winter months when fresh foods from their gardens were not available. Some of the participants stated that eating well during the summer gardening months had led them to become more aware of what they were eating and taking a greater interest in the quality of their diets in the off season. These results are similar to those found in other studies. Duncan et al. (2015) found that school children who participated in a school-based gardening program that also included education about diet significantly increased the fruit and vegetable consumption, even after their participation in the programming ended. Participants in another study discussed how growing new and unfamiliar types of vegetables in their gardens led them to try new cooking techniques (Northrop, Wingo, & Ard, 2013).

Participants in this study endorsed themes about healthy eating. All of the participants who stated that they learned to eat well as children and taught their children to eat well also endorsed the idea that eating healthy foods equals good health. Research

supports the idea that eating patterns developed in the early childhood years are affected by adult caregivers (Birch & Doub, 2014; Shutts, Kinzler, & DeJesus, 2013). The studies suggest that toddlers use social cues from adults to determine which foods are preferable or safe. A document stating the position of the Academy of Nutrition and Dietetics states that children naturally have a preference for sweet and salty foods, but with repeated experiences with bitter or sour foods, consumption can be increased, leading to a more well-rounded diet (Freeland-Graves & Nitzke, 2013). A longitudinal study tracking consumption of healthy cereal products, fruits, and vegetables showed that individuals whose diets were rich in those foods in adolescence tended to maintain those eating patterns in their 30s (Lake, Mathers, Rugg-Gunn, & Adamson, 2006). Eating a diet high in fruits and vegetables has been correlated with better health (Campbell & Campbell, 2006; Gonzalez & Riboli, 2010), so the participants' thoughts about their healthy diets leading to better health are supported by research.

Finally as it relates to Axis 3, all participants stated that their diets improved during the gardening season and that they were able to increase their intakes of fruits and vegetables at that time. Participants stated that gardening would lead them to eat a healthier diet during the winter months. Many of the participants stated that they had learned to eat well as children and that they taught their children to eat well.

Axis 4: Health and Community

Four participants responded that food insecurity had led to physical health problems. Among the problems they cited were the inability to take medication as prescribed and problems with blood sugar due to hypoglycemia and diabetes. Additionally, participants stated that they suffered from low energy levels when they lacked food. Research showed that food insecure people diagnosed with diabetes are significantly more likely to report poor glycemic control due to the difficulty they experienced in following a diabetic diet. The inability to properly maintain glycemic levels led to lowered feelings of self-efficacy in managing their diabetes (Seligman, Jacobs, Lopez, Tschann, & Fernandez, 2012). Iron deficiencies in the diet have been found to lead to fatigue (Agnihotri et al., 2007). Medication adherence among older people had been found to be negatively correlated with food insecurity (Sattler & Lee, 2013). A study of food insecure adults in Canada found that the risk of food insecurity rises with the number of chronic health conditions experienced by an adult (Tarasuk, Mitchell, McLaren, & McIntyre, 2013). In the current study, the participants who reported physical problems caused by food insecurity also struggled with physical disabilities and mental illness diagnoses which prevented employment.

Four participants in this study reported that they enjoyed gardening in spite of physical limitations. One study showed that physical inactivity is higher among people with physical disabilities, but walking and gardening are activities in which those with physical disabilities engage most frequently (Chiu & An, 2015). Another study found that

individuals with physical disabilities who live alone were less likely to engage in any type of physical activity which was likely to have a negative health outcome (Escobar-Viera, Jones, Schumacher, & Hall, 2014).

All participants stated that they believed that their physical health was improved by gardening. Gardening and other physical activity has been found to improve physical and mental outcomes for elderly adults (Germain, Vasquez, & Batsis, 2015).

Participation in activities such as gardening has been found to reduce the frequency of falls among people with Parkinson's disease (Bryant, Rintala, Jyh-Gong, & Protas, 2015). Elderly adults participating in a community gardening program listed improved physical health as an outcome of their participation (Wang & Glicksman, 2013). Participation in school gardens was found to reduce sedentary behavior in school children (Wells, Myers, & Henderson, 2014).

Participants described ways in which food insecurity had affected their mental health, including worry and stress, depression, and feeling as though others perceived them in a negative light because of their status as a food insecure person or a homeless person. Homeless women in a study by Grabbe et al. (2013) also reported that they felt as though they were "treated like pieces of trash" (p. 262) because of their homeless status. A positive correlation between depression and stress with food insecurity has been found in other studies (Leung, Epel, Willett, Rimm, & Laraia 2015; Ramsey, Giskes, Turrell, & Gallegos, 2012; Tarasuk et al., 2013).

However, all participants reported they believed that their participation in community gardening had improved their mental health. Two participants specifically cited an improvement in self-esteem as the result of their participation. These findings are consistent with previous research. A study of community gardeners with early onset dementia cited a reduction in reported anxiety (Hewitt et al., 2013). Older adults participating in a community garden described an increased sense of well-being, relaxation, and an escape from problems while gardening (Wang & Glicksman, 2013). Community gardening participants in a study by Carney et al. (2012) reported less worry because their food needs were being met. People who gardened as part of inpatient treatment for severe stress reported that seeing tangible results of their efforts in the garden increased their self-esteem (Adevi & Martensson, 2013). Research also suggests that a bacteria found in soil called *Mycobacterium vaccae*, has been found to activate a subset of serotonergic neurons in laboratory mice (Lowry et al., 2007). This finding suggests that engaging in gardening, when one has the chance of inhaling these bacteria may have a positive neurobiological effect on depression.

Participants in this study credited their participation in community gardening in helping them build a sense of community or for deepening relationships with people within their community. One participant who was caring for her elderly grandfather credited her gardening community for providing a social outlet for both her and her grandfather. Caregivers of people with early onset dementia who participated in a community gardening project echoed this sentiment, stating that the garden provided the

gardeners a safe space to interact with others while providing the caregivers a chance to interact with other adults (Hewitt et al., 2013). Another gardener in this study stated that the gardeners in her community made sure that no one went hungry and checked in with one another. This was also found to be true in Wakefield et al.'s study (2007). Firth, Maye, and Pearson (2011) described this interaction of people helping one another and making contributions to the community as the generation of social capital. A study by Alaimo, Reischl, and Ober Allen (2010) found a marked increase of social capital among community members who gardened together.

Some of the participants in this study stated that gardening helped them deepen existing relationships. Older gardeners in a study by Wang and Glicksman (2013) echoed this sentiment, stating that they were able to connect on a deeper level with apartment staff and other residents. This connection may be particularly salient for food insecure gardeners as community gardeners in low-income areas are four times as likely as gardeners in higher-income gardeners to use their relationships to collectively address problems in the neighborhood (Armstrong, 2000).

Participants described ways in which food insecurity affected their relationships with family. The negative effect of food insecurity on family relationships was also found in a study by Knowles, Rabinowich, Ettinger de Cuba, Cutts, and Chilton, (2016), whose participants described how the stress they experienced when making decisions between food, utilities, rent, and medical needs affected their relationships with their children. Additionally, many food insecure families lack space for a family table which prevented

them from sharing a family meal around a table to share family discussions (Harden & Dickson, 2015). Some participants listed positive effects of food insecurity on their relationships. They described having to work together as a family to find food or to make it last and teaching children to cook with limited food supplies which gave the participant more time with her children. These results are particularly notable as they were not replicated in other studies and represent new findings.

Two participants credited gardening as a means of improving relationships with family members. These results were found in another study. Carney et al. (2012) reported that of families with children in their study, 69% of the children gardened with their parents. The participants reported that time spent in the garden strengthened family relationships.

Three participants stated that they had no social or emotional support. One participant had recently moved and depended on her pets for support. A lack of social support can negatively affect mental and physical health, and even low levels of social support can provide a protective effect (Shor, Roelfs, & Yogev, 2013). Two studies found that elderly people who were socially isolated were significantly more likely to experience food insecurity than others (Locher et al., 2005; Lee & Frongillo, 2001). Another study found that support from pets can be beneficial for those who lack human social support (Bryan et al., 2014).

A participant noted that food insecurity affected her relationships because she felt as though she could not reciprocate when asked for a meal by a friend. She felt some

embarrassment that she lacked the resources to ask friends to her home for a meal and so she tended to turn down dinner invitations. This is consistent with results from Hamelin, Habicht, and Beaudry (1999), who reported that food insecurity has social implications, in that it can interrupt social life and lead to isolation.

The majority of participants stated that they received social support from their families. Family support has been found to be more important than support from friends in promoting health and longevity (Shor et al., 2013). Four participants cited their churches or religious organizations as being an important social support. Research on the role of religious social support for African American people indicated that participants who had the support of others through their churches consumed more fruits and vegetables, engaged in physical activity more frequently, and consumed less alcohol and tobacco than those who had social support but did not cite having religious social support (Debnam, Holt, Clark, Roth, & Southward, 2012).

Most participants in the current study stated that their social and emotional support improved when they began participating in community gardening. Two participants reported that they found support in interactions with others who shared similar life challenges. Participants in the study by Wakefield et al. (2007) also reported finding support from other gardeners. Gray, Guzman, Glowa, and Drevno (2014) found that gardeners formed relationships that transcended the garden and crossed ethnic or cultural boundaries. A meta-analysis of community gardening research by Okvat and Zautra (2011) found that community gardening reduced social isolation in older adults

and increased neighbor-to-neighbor assistance. Additionally, community gardening increased inclusivity among older gardeners and gardeners with disabilities.

In summary, participants discussed ways in which their health conditions had suffered as the result of food insecurity. Some of the participants discussed gardening in spite of physical and mental health issues. All of the participants endorsed themes of improved mental and physical health. Many of the participants stated that they felt as though they lacked support outside of their participation in community gardening, but all participants mentioned ways in which their support had been improved as a result of community gardening. Some of the participants discussed ways in which participating in gardening improved family relationships.

Axis 5: Control

Participants in this study engaged in primary control (Heckhausen & Schulz, 1995) to make changes in their environments in a number of ways. They all chose to engage in gardening to increase the amount of food available to them. Two participants were actively engaged in seeking employment or in seeking ways in which to supplement income. One participant chose to leave her job to care for her elderly grandfather when she saw that he was not receiving adequate care. One participant used primary control to change not only her own environment, but that of her neighborhood by volunteering at the Salvation Army. In a literature review of research on control, the authors of the study concluded that the desire for control is not a learned behavior, but rather an innate, biological drive (Leotti, Iyengar, & Ochener, 2010). In short, they stated, “We are born to

choose” (p. 461). They stated that if individuals did not believe they had the capacity to produce desired results, there would be little incentive to address challenges that arise and therefore a perception of having control is likely to be adaptive for survival. For the participants in this study, their choices to begin gardening were about survival. The participants who taught their children to cook and eat well also engaged in primary control that affected the health and welfare of their children.

While there is debate about whether or not prayer can be considered a primary or secondary form of control (Rothbaum et al., 1982; Krause, 2004), four of the participants used prayer in a way that appears to align with conceptualizations of primary control. The participants who mentioned using prayer credited God for people and events in their lives which they considered to be positive. A study by Krause (2004) examined older people from the U.S. who engaged in trust based prayer, that is, trusting that God will provide what is needed and that the response will come at the time when it is most needed. Krause’s study found that older African American participants were more likely than older White participants to have trust-based prayer expectancies and that tend to have greater feelings of self-worth than older adults who do not endorse these trust-based prayer expectancies. Furthermore, participants who have trust-based prayer expectancies demonstrated greater feelings of self-worth. All of the participants who mentioned prayer were over the age of 35. Two of the participants who discussed the importance of prayer were African American women over the age of 80. As discussed by Krause, using trust-based prayer as a means of control may increase as one ages.

All of the participants cited ways in which they use secondary control (Heckhausen & Schulz, 1995). Rothbaum et al. (1982) stated, “Because control is so valued, the quest for it is rarely abandoned; instead, individuals are likely to shift from one method of striving for control to another” (p.7). Rothbaum et al. assert that primary control occurs when people attempt to change their environments. Failing that, they engage in secondary control to change the self to make sense of failure and to fit into the environment.

Participants used secondary control to make sense of failures or disappointments they suffered, such as the inability to find housing or employment, or to adequately meet their nutritional needs. This type of secondary control has been defined as compensatory secondary control (Morling & Evered, 2006). Compensatory secondary control is used as a means of regaining primary control in the event of loss or challenge.

Some participants used secondary control as a means of keeping themselves motivated to reach their goals. For instance, one participant described rejecting the lure of drug and alcohol use that was prevalent in her community as a means of achieving her goal of earning her GED. Morling and Evered (2006) defined that type of secondary control as selective secondary control. Selective secondary control is means of secondary control that keeps people focused on gaining chosen primary control goals.

Two participants gardened in spite of significant physical disabilities and two others, who were in their 80s, gardened in spite of arthritic pain. All gardeners with physical challenges made statements that in spite of the challenges they faced, they found

that gardening was beneficial in terms of eating a healthier diet and staying active. Wrosch, Shulz, and Heckhausen (2002) called this type of secondary control, health engagement control. Health engagement control is utilized by those with health limitations but who still have some means of control over their health conditions. Wrosch et al. found that elderly people who use health engagement control have lower rates of depression than those who do not engage in that form of secondary control.

Finally, many of the participants used downward social comparison (Heckhausen & Schulz, 1995). This form of secondary control is engaged by comparing themselves with those who are worse off. One participant complained that the volunteers at the food pantry treated her poorly, but imagined that things would be worse if she were homeless and in need of food pantry services. Although secondary control may not have the outwardly visible power possessed by primary control, secondary control is important in facilitating goal achievement and is important in mood maintenance (Wrosch et al.)

Implications for Theory

There are a number of implications for theory as a result of this study. First, a theoretical model of the interactions between food insecurity, gardening, diet, and control is proposed.

Theory of Factors Affecting Control for Food Insecure Community Gardeners

The interaction of the factors within this study were examined primarily within the context of the participants' statements that indicated feelings of control and loss of control. When the participants made statements that indicated actions that were attempts

to change their environments, these statements were coded as primary control. Under the category of primary control, participants made statements in the categories of food insecurity, gardening, diet, and health and community changes as a result of gardening. Statements made that indicated perceived failures, loss, or other challenges faced by the participants were included in the category of loss of control. When participants were faced with lack of primary control, they engaged in secondary control. The model is depicted in Figure 2.

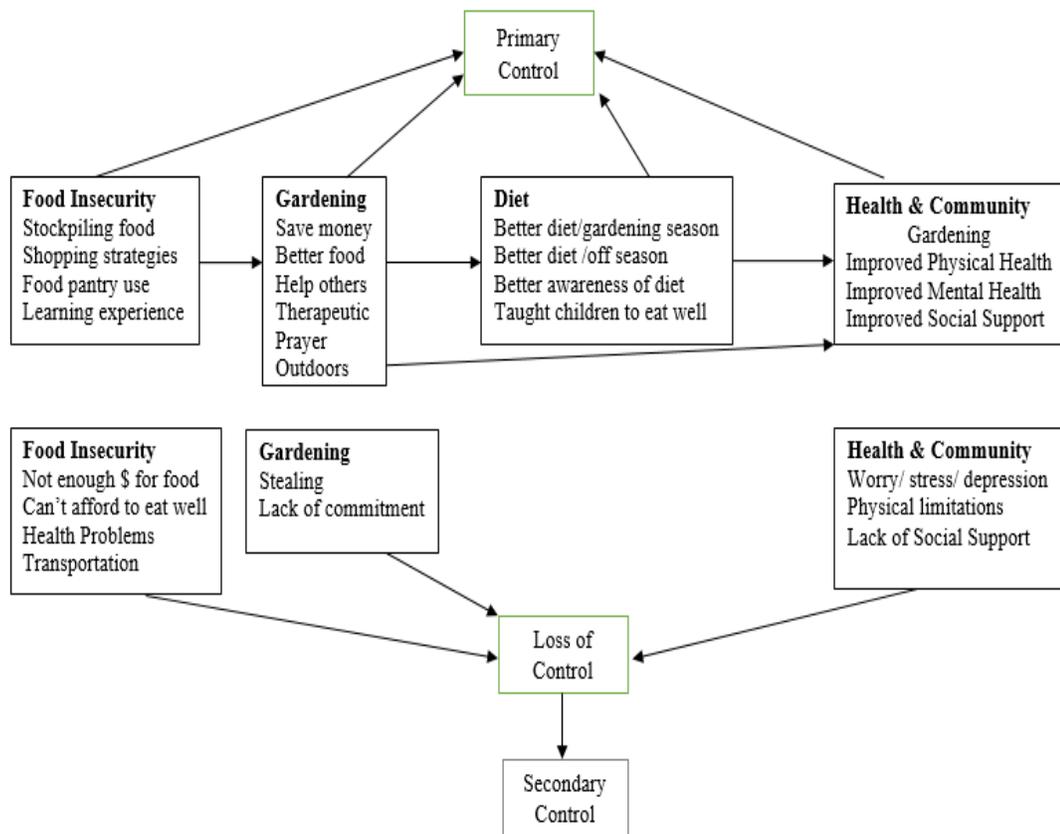


Figure 2. Theory of factors affecting control for food insecure community gardeners model.

Even when discussing their food insecurity, participants made statements that indicated they were making choices that changed their environments. Among the choices they made were stockpiling foods when they were able, using shopping strategies to extend their food budgets, and visiting food pantries for additional food. Some of the participants used their food insecure status to learn new ways of cooking and stretching available foods. Being food insecure led the participants to engage in community gardening to provide more nutrition.

Most of the participants noted that gardening saved them money and provided them with better quality food than they were able to afford. Some participants described gardening as therapy, prayer, or meditation. Others took pride in being able to share their bounty with others. Some discussed how being outdoors brought them pleasure and provided physical activity. Many of the factors listed as benefits of gardening affected diet factors and health factors.

All of the participants listed positive effects of their diets during the gardening season. Many stated that they either ate more healthfully during the gardening off season, or intended to do so. For some of the participants, having fresh vegetables as an ingredient during the gardening season led them to take more interest in their diets and ways that they could prepare healthier meals during the year. Finally, many of the veteran gardeners stated that they ate healthy diets and that they had taught their children to eat well. All of these factors intersected with improvements in the participants' health and community brought about by participation in community gardening.

The participants noted physical and mental health improvements as the result of their participation in community gardening. Some of these improvements were due to the increase in physical activity and engaging with nature. Some were likely due to the improvement in diet they experienced. Many participants described better social support from gardening peers and others associated with their gardens which improved their mental health.

In all of these actions described above, the participants were engaging in activities that changed their environments or the environments of others. In doing so, they were using primary control to improve their lives and the lives of others. Although the participants engaged in primary control in a number of ways related to decreasing their food insecurity, improving their diets, improving physical and mental health, and improving family and community relationships, it is not clear if the participants' use of primary control extended beyond the factor cited in this study.

In contrast, the lower portion of the model depicts ways in which the participants experienced loss of control. In the category of food insecurity, some of problems were lack of money for food and feeling as though they were unable to eat well, lack of transportation, and health problems exacerbated by food insecurity.

Although the participants listed many benefits of their participation in community gardening, there were a few problems associated with it. Participants cited stealing of produce from their plots or theft of gardening tools as a problem. Some mentioned lack of

motivation and commitment of some gardeners as a downside of their participation. Those who mentioned these problems felt some inability to change their situations.

In the category of health and community, some of the participants discussed the challenges they experienced with physical disabilities or limitations that resulted from aging bodies. Others discussed feeling as though they lacked social and emotional support aside from that they received from their participation in gardening. Many of the participants described feelings of worry, stress, and depression associated with being food insecure. The loss of control that the participants described in these categories sometimes led the participants to engage in forms of secondary control.

The format of the original conceptual map (Figure 1) changed somewhat with analysis of the data. In the original conceptual map, the participants' engagement in gardening was predicted to lead to improved diet during the gardening season and an increase in physical activity. The intersection of improved diet and physical activity predicted that participants would make statements indicating that they felt better. Their improvement in physical health was predicted to lead to better mental health, improved control regarding food choices, and making better food choices during the off season. Gardening was predicted to increase connections to others who wanted to eat well, which would increase social support and trust. Increased social support and mental health were predicted to lead the participants to feel more control in other areas of their lives. The original conceptual map also predicted that more time spent with children would lead to healthier kids, improved behaviors, and improved family relationships.

Many of the predicted relationships were validated. The participants did report eating better during the gardening season. Many reported increased physical activity, and experiencing physical and mental health improvements. They reported feeling as though they had more power and control in food choices and in making better choices during the gardening off season. Although they did not specifically mention increased connections with others who wanted to eat well, many participants stated that they had improvements in social supports.

As only one participant had a minor-aged child living with her, there was not enough data to verify or refute the portion of the map that addressed behavior and health changes in children. However, participants who gardened with children or grandchildren did report improved family relationships.

When considering the data from the current study, it seemed logical to conceptualize the connections in terms of primary control and loss of control, in which the participants used secondary control (Figure 2). The updated conceptual map recognizes the intersections of food insecurity with gardening. Also noted are the intersection of gardening with dietary factors and health and community improvements. Dietary factors also intersected with health and community factors. All of these factors indicated the use of primary control.

The participants also reported factors related to food insecurity, gardening, and health and community that indicated a loss of control. When the participants felt a loss of

control in their environments, they tended to engage in secondary control. The original conceptual map did not include areas in which participants noted loss of control.

Implications for Future Research

Women who experience high levels of food insecurity have been found to have experienced high levels of adverse childhood experiences, such as abuse, neglect, and instability in their homes (Chilton, Knowles, Rabinowich, & Arnold, 2015). They are also more likely to have experienced physical or sexual violence as children (Chilton, Rabinowich, & Woolf, 2014). Food insecure mothers are more likely to have less than a high school education and a higher number of children than mothers who are not food insecure (Hernandez, Marshall, & Mineo, 2013). Mothers in food insecure households are more likely than other women to experience intimate partner violence and symptoms of depression (Hernandez et al.).

Given that participants in the current study indicated that participating in community gardening increased the quantity of healthy food available to them, and improved their mental health, it may be feasible to engage women seeking domestic violence services in a gardening program to increase the amount of food available to them and their children. Gardening with their children could provide a framework for healthy interactions with their children. Children in the program would also be introduced to healthy foods with which they may not be familiar. The mothers in the study could receive education in nutrition, such as the program at ChooseMyPlate.gov (2015), budgeting, and meal preparation, which could potentially improve the quality and

quantity of food available to their families. Research on the effects of such interventions would be important.

Measures of depression such as the Beck Depression Inventory (Beck, Steer, & Brown, 1996) could assess the participants' reported levels of depression before, during, and after completion of the program to measure possible improvements in depressive symptoms. Assessments of self-efficacy or control could be developed to measure increases in these areas of functioning. If possible, a longitudinal study could determine if improved food security reduced the likelihood for future intimate partner violence for the women. If possible measures studying the children's outcomes in terms of mental health factors, high school graduation, and food security could be tracked.

When searching for community gardens that were listed on websites, the researcher found that many of the gardens were no longer in use. Gardeners and garden managers told the researcher that when community gardens lack a paid manager or a volunteer manager with strong organizational skills and ample time to dedicate to the project, gardeners typically abandon the garden after a year or two. Research in the area of community garden management may be useful to determine factors that contribute to the ongoing success of community gardens which would make them available to more people. Additionally, the current study could serve as a means of receiving support for community gardens from businesses or community partners. As the findings of this and study found positive physical and mental outcomes for people who participated in community gardening, further research could study how individual improvements in

health affect communities in which gardening has the support of businesses and community partners.

Implications for Practice

Results of this study indicate that some of the food insecure participants appeared to have been struggling with symptoms of depression and anxiety, although an official diagnosis was beyond the scope of the study. Research indicated that food insecurity is significantly associated with mental illness, particularly for those with depression (Ivers & Cullen, 2011; Muldoon, Duff, Fielden, & Anema, 2013; Siefert et al., 2001) and anxiety (Ivers & Cullen; Muldoon et al.). Chronic physical and mental illness is associated with a higher risk of food insecurity (Tarasuk et al., 2013). A study of participants with chronic physical or mental illness indicated that approximately 1 in 3 were unable to afford food, medications, or both (Berkowitz, Seligman, & Choudry, 2014).

Considering the results of these studies, it is clear that mental illness and food insecurity are strongly correlated and the causation may be bidirectional. Given this information, it would be prudent for therapists working with clients of low socioeconomic status to open a dialog with clients about their nutritional status and how it affects mental health symptoms, medication adherence for psychiatric and physical conditions, and as a possible life stressor.

Food insecurity is particularly problematic for women of low socioeconomic status. In that population, food insecurity has been associated with risky sexual behavior,

poor coping strategies, and negative pregnancy outcomes (Ivers & Cullen, 2011). The American Psychological Association's *Guidelines for Psychological Practice with Women and Girls* (2007) encourage therapists to develop therapeutic relationships with women and girls that nurture empowerment and self-efficacy. Therapists working with low-income women who may be food insecure should be cognizant of ways in which clients' food insecurity affect their decision-making processes.

Clients who live in poverty may experience humiliation, disgust, or discrimination from employees of the agencies from which they seek assistance (Smith, 2009). They are more likely to experience threats to their safety such as crime, victimization, or unfair policing practices (Smith). Therefore, it is imperative that low-income clients find the place they receive mental health services to be a safe and welcoming place. Therapists should be aware of their own relative privilege in the therapeutic relationship. Clients who have had these kinds of experiences may need coaching and modeling to advocate for themselves (Smith). Practitioners should be aware that low-income clients are often coping with food insecurity, and that if clients are not using community gardens, such gardens would be a valuable resource if available in their area.

Although providing specific nutritional advice is beyond the scope of a mental health therapist, therapists could make basic nutritional information available to clients and can refer them to low-or no-cost service providers with this expertise. Therapists can discuss with clients barriers to proper nutrition that they experience and how those barriers affect their mental health and physical symptoms or medication adherence.

Therapeutic interventions may be useful for some clients to begin to adapt more healthful ways of eating.

Mental health centers that serve people at risk for food insecurity may be able to provide some services beyond mental health interventions. Some mental health centers in larger cities are able to provide food pantry services to their clients. The researcher in this study worked at a center serving clients who were affected by HIV. At that center, in addition to medical, dental, and mental health services, clients had access to services by a registered dietitian and weekly access to food pantry services. The mental health center where the researcher is currently employed provides garden spaces for clients with severe and persistent mental illness.

School gardening programs have been found to increase vegetable intake, increase food preferences for vegetables, improve willingness to taste unfamiliar vegetables, and to increase self-efficacy in preparation of vegetables among children who participate in the programs (Davis, Spaniol Mackenzie, & Somerset, 2015). Participation in school gardens was found to reduce sedentary behavior in school children (Wells et al., 2014). As food preferences are formed early in life (Birch & Doub, 2014; Freeland-Graves & Nitzke, 2013; Lake et al., 2006; Shutts et al., 2013), participation in a school gardening program or other gardening program aimed at children and families could help families eat healthier diets which would likely have lifelong positive effects on the health and diets of the children. Community mental health centers that provide services for children could collaborate with schools to integrate gardening programs for children.

Implications for Training

Training programs for therapists who may work with clients who live with poverty and food insecurity should address issues that may affect the therapeutic relationship (Lavelle, 2014). Psychology students should have awareness that physical markers of class, such as their clothing, jewelry, office décor, or vacation photos may affect the therapeutic relationship. The difference in educational levels between therapists and clients may also indicate class differences. Clients who observe obvious differences in social class, as indicated by these markers, may find it difficult to connect with a therapist, believing that the therapist will not understand the challenges they face. Student therapists, their instructors and supervisors need to maintain awareness of language and non-verbal communication that might emphasize class disparities in the therapy room and in the classroom (Stabb & Reimers, 2012). Therapists who address social class content in therapy by having a willingness to address the financial struggles of their clients and to work with their financial challenges in therapy are more likely to form a therapeutic alliance with clients (Lavelle, 2014; Thompson, Cole, & Nitzarim, 2012). Addressing economic stressors in therapy has been found to improve therapeutic outcomes (Goodman, Pugach, Skolnik, & Smith, 2013).

Psychology students should receive training that addresses the stigma that low-income clients may experience. Low-income clients may lack basic services in their homes such as running water or electricity. Without access to such services, clients may present in therapy lacking personal hygiene. Students and therapists serving these clients

should take care to see a lack of personal hygiene as the result of poverty rather than a representation of psychopathology. Clients who are poor are very often marginalized. Those who are poor, mentally ill, members of racial or ethnic minorities, or members of sexual identity minorities may experience multiple forms of marginalization (Tummala-Nara, 2016).

Low-income clients are less likely to have a voice in mainstream societal experiences (Smith, 2013). As an example, the barriers to receive access to food resources may prevent those who are eligible from receiving needed services. Participants in a study by Dutta, Hingson, Anaele, Sen, and Jones (2016) reported needing to make several trips to offices to receive social services because they lacked documents or identification. The participants reported that the rules for obtaining services were difficult to understand and were not well communicated. They reported that the documents that were required were sometimes difficult to obtain. For instance, in order to obtain an identification card, one must have a birth certificate which might not be readily available. In some jurisdictions, those who have been charged with felonies are unable to receive SNAP benefits. Students who are in training to work with marginalized clients may need to adapt their therapeutic style to include advocacy for clients while allowing the client a measure of self-determination (Goodman et al., 2013). Therapists may need to check in with clients about their food security and provide them with community resources when necessary.

Clients who struggle with financial problems or food security problems may find greater benefit from therapy if they are allowed to guide the content of the sessions. When therapists and clients are divided by class, this act may provide a more egalitarian relationship. Furthermore, connecting with clients about feelings of hopelessness or desperation about their financial situations early on in therapy may build greater trust in the therapeutic relationship by clients (Goodman et al., 2013).

Psychologists who are training student therapists should be cognizant that hunger and food insecurity may also affect those who have traditionally been considered to be middle-class. Because they may own homes and cars, when middle-income earners experience job loss, they may be ineligible for services such as SNAP benefits or food pantry services, putting them at high risk for food insecurity and hunger (Dutta et al., 2016). Likewise, people experiencing sudden health crises may lose employment and incur exorbitant medical expenses that can lead to loss of their homes and lead to hunger and food insecurity (Dutta et al.).

Given the factors that may affect therapeutic relationships and outcomes, students who wish to become therapists need to have awareness of their attitudes about social class and poverty and their effects on mental health and therapeutic outcomes (Goodman et al., 2013). Student training should include practices that encourage students to examine their own relative privilege. They should be encouraged to explore their attitudes about race, sexual orientation, and class (Lavell, 2014; Smith, 2013).

Implications for Policy Change

The United Nations Universal Declaration of Human Rights (U.N., 2009), Article 25, states,

Everyone has the right to a standard of living adequate for the health and well-being of himself [sic] and of his [sic] family, including food, clothing, housing, and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.

As food is a basic right, regardless of employment, health, or physical ability status, it is imperative that all people have the ability to obtain enough food to maintain health and livelihood. As this study has shown, it is difficult for some members of society to meet their basic nutritional needs. More than 14 % of people living in the U.S. are food insecure (Coleman-Jensen, et al., 2011). Although SNAP benefits are an important means to supplement family budgets for disabled or elderly people who are unable to work, more than 58% of families receiving SNAP benefits have at least one family member who was employed in the month that they received SNAP benefits and more than 82% have had a family member working within a year of receiving benefits (Center on Budget and Policy Priorities, 2016). Currently, those receiving SNAP benefits receive \$4 per day per family member (Kavoussi, 2012). Yaktine and Caswell (2014) purported the reason that many families who use SNAP benefits struggle to meet their nutritional needs is the result of purchases of partially prepared foods which are more expensive than buying raw

ingredients. However, in families where one or more adults work outside the home, it may be unrealistic to expect that all meals are prepared from scratch. Parents may lack the time required for food preparation after work while also attending to the needs of their children. Therefore, it may be in the best interest of families to increase SNAP benefits to allow for the purchase of more partially prepared foods.

It would seem then, that families with a working member would benefit from a raise in the federal minimum wage. For families with a working member, for each dollar of increased income only 24 to 36 cents of SNAP benefits are lost (Center on Budget and Policy Priorities, 2016). An increase in the federal minimum wage from \$7.25 to \$10.10 could create a meaningful increase in money available for food or other household expenses for some families.

An increase in the federal minimum wage could potentially improve the mental health of families with a wage earner. When family income levels increase, psychiatric symptoms in children have been found to decrease, and their achievement scores increase (Smith, 2015). People working in low-wage jobs, such as fast food employees or janitorial jobs are likely to experience stigma from more affluent members of society which may potentially contribute to symptoms of depression (Smith). An increase in the minimum wage could not only improve financial well-being of families; it also has the potential to reduce the stigma associated with low-wage jobs (Smith).

Given the improvements in mental and physical health reported in the current study, it seems that greater availability to gardening spaces close to the homes of low-

income, food insecure people would be beneficial. Although the gardens in which the researcher volunteered were in food desert areas, many of the community gardens located on community gardening websites by the researcher were not in food deserts.

Some cities have made concerted efforts to improve access to gardening spaces for low-income residents. Some cities that participated in California Healthy Cities and Communities applied for block grants that allowed them to purchase land for gardens and to provide a small staff to manage the gardens (Twiss et al., 2003). Community partners from local businesses and civic organizations were included to provide funding and financial support for the purchase of tools and other needs. Volunteers with gardening experience were provided by business and civic organizations to contribute knowledge, skills, and experience. Garden spaces were made available at schools, day care centers, senior centers, on city land in pocket parks, and on private land. Some cities were able to provide a holistic approach to improve the health of their residents by providing nutrition education. Results of studies of the gardeners in the programs indicated an increase in physical activity and improved intake of fruits and vegetables.

Following this model, cities and towns could apply for grants to provide gardening spots for people, regardless of socioeconomic status. Data from the current study and others that have studied the benefits of community gardening may be helpful to gain the support of community partners to provide financial support or volunteers with expertise in the area of gardening.

Some farmers markets, individual farmers and community supported agriculture programs are now accepting SNAP benefits as payment (USDA, 2016a). An expansion of these markets could make fresh produce more available to low-income residents of food deserts. Making the equipment to accept SNAP payments affordable and easily accessible to farmers could increase the number of small farmers who accept the benefits.

Strengths and Limitations

Strengths

This study had a number of strengths. As the interviews were conducted in person, the researcher was able to build rapport with the participants which may have allowed the participants to speak more openly about the challenges and successes they experienced. Additionally, meeting face-to-face with the participants allowed the researcher to pick up on nonverbal cues and to view each participant as a whole person. The researcher was able to discuss how characteristics such as physical disabilities or age affected the participants' attitudes about topics of study. The researcher was able to visit some of the participants' garden spots which gave the researcher more information about the participant and how they used their garden. The researcher also volunteered in three community gardens over the course of a summer which allowed her to observe interactions between gardeners, between gardeners and the gardening administrators, and to observe the culture that existed in the gardens. The researcher was able to generate discussions with garden managers and administrators. Time spent in community gardens

allowed the researcher to develop prompts to questions to gain a better understanding of the participants' experiences.

Another strength of the study is that new findings emerged from it, adding to the small but growing body of literature on the impact of gardening for food insecure individuals. For example, some participants noted that food insecurity had positive effects on family relationships. They noted that their families had to work together to find food and to make it last longer. One participant credited her family's food insecure status as the impetus to teach her children to cook which allowed them to spend time together. These novel results were not replicated in other studies.

Limitations

A limitation of this study is the small sample size. In spite of the time spent volunteering in community gardens, finding eligible participants proved to be difficult. Many of the gardeners participating in the community gardens were not food insecure. The majority of the gardeners the researcher met were hobby gardeners who lacked space at their homes or lived in places where gardening was not possible. Gaining access to gardeners in some gardens was occasionally denied by garden managers or administrators. One small city near the researcher's home had an extensive community gardening network. When the researcher contacted the administrator of the network to ask for permission to contact gardeners, permission was denied because the garden administrator was conducting his own research with the gardeners. Other administrators needed to get approval from boards of directors and the requests by the researcher were

lost or a decision was not returned. For others, the paperwork required for the request proved to be unwieldy when it was unlikely that more than one or two gardeners would be willing to be interviewed. The researcher extensively researched community gardening websites in a number of cities and then attempted to visit the gardens to see if they were operational. A number of the gardens listed on the community gardens listed on the websites were no longer operational. In interviews with garden managers, the researcher learned that unless the gardens had a strong garden manager, organization of the gardens often disintegrated and the gardeners frequently disbanded after a season or two.

Revisiting Researcher Bias

Careful efforts were made to monitor any reactions to statements made by the participants during the interviews regarding differences of opinion about what the participants considered to be healthy diets when compared to my opinion as the researcher. In hearing the participants' stories about their struggles to obtain food, the researcher was aware of her own privilege as a relatively financially secure person who has the ability to maintain an eating style that may not be within the means of the study participants. She also tried to bear in mind the spectrum of food insecurity among the participants. Ci Ci, who was homeless and whose focus was primarily on acquiring protein, was at one end of the spectrum. At the other end was Sally Katherine, whose newly found employment meant she was on the brink of becoming food secure. Bearing in mind the relative differences in food insecurity among the participants aided the

researcher in understanding their struggles to eat what they considered to be healthy diets. Conducting this study gave her a better understanding of ways in which people's financial standing and length of time being food insecure affects their attitudes about healthy eating.

The researcher struggled with her decision to provide participants with a Wal-mart gift card in return for their time. Wal-mart has been criticized as receiving corporate welfare due to low wages paid to employees. Additionally, counties in the U.S. in which Wal-mart stores have high concentration have increases in poverty (McCauley, 2014). Although these criticisms of Wal-mart are valid, Wal-mart was the most easily accessible store for all of the participants. Accessibility was of high value to the participants given that many lacked means of transportation to other grocery stores. Additionally, participants could use the card to purchase seeds or tools for their gardens.

Conclusion

This study investigated the experiences of food insecure people living in food deserts who participated in community gardening. Results detailed the emotional, personal, and relational effects of food insecurity on their lives. Additionally, participants discussed the benefits and challenges of community gardening and how their participation in community gardening affected their food insecurity, diets, health and social support. All of these factors were examined within the context of the participants' feelings of control in their lives. These findings have important implications for the theory and practice of counseling psychology, particularly as it is practiced in community

mental health settings or other areas where clients are likely to be of low socioeconomic status. The themes provided by this study can help inform psychologists' knowledge base and help guide interventions with clients who are experiencing food insecurity. Further research is needed to gain a fuller understanding of ways in which improving diet and nutrition can improve the mental health functioning of clients.

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APPENDIX A

U.S. HOUSEHOLD FOOD-SECURITY/HUNGER SURVEY MODULE

**U.S. HOUSEHOLD FOOD-SECURITY/HUNGER SURVEY MODULE:
3-STAGE DESIGN (2 INTERNAL SCREENERS)**

Questionnaire transition into module--administer to all households: These next questions are about the food eaten in your household in the last 12 months, since (current month) of last year, and whether you were able to afford the food you need.

General food sufficiency question/screener: Questions 1, 1a, 1b (OPTIONAL:
These questions are NOT used in calculating the food-security/hunger scale.)

Question 1 may be used as a screener: (a) in conjunction with income as a *preliminary* screen to reduce respondent burden for *higher income households only*; and/or (b) in conjunction with the 1st-stage internal screen to make that screen "more open"--i.e., provide another route through it.

1. [IF ONE PERSON IN HOUSEHOLD, USE "I" IN PARENTHETICALS, OTHERWISE, USE "WE."]

Which of these statements best describes the food eaten in your household in the last 12 months: --enough of the kinds of food (I/we) want to eat; --enough, but not always the kinds of food (I/we) want; --sometimes not enough to eat; or, --often not enough to eat?

- [1] Enough of the kinds of food we want to eat [SKIP 1a and 1b]
- [2] Enough but not always the kinds of food we want [SKIP 1a; ask 1b]
- [3] Sometimes not enough to eat [Ask 1a; SKIP 1b]
- [4] Often not enough [Ask 1a; SKIP 1b]
- [] DK or Refused (SKIP 1a and 1b)

1a. [IF OPTION 3 OR 4 SELECTED, ASK] Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why YOU don't always have enough to eat. [READ LIST. MARK ALL THAT APPLY.]

YES NO DK

- [] [] [] Not enough money for food
- [] [] [] Not enough time for shopping or cooking
- [] [] [] Too hard to get to the store
- [] [] [] On a diet
- [] [] [] No working stove available
- [] [] [] Not able to cook or eat because of health problems

1b. [IF OPTION 2 SELECTED, ASK] Here are some reasons why people don't always have the quality or variety of food they want. For each one, please tell me if that

is a reason why YOU don't always have the kinds of food you want to eat. [READ LIST. MARK ALL THAT APPLY.]

YES NO DK

Not enough money for food

Kinds of food (I/we) want not available

Not enough time for shopping or cooking

Too hard to get to the store

On a special diet

BEGIN FOOD-SECURITY CORE MODULE (i.e., SCALE ITEMS)

Stage 1: Questions 2-6 --ask all households:

[IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND "YOU" IN PARENTHESES; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD;" IF UNKNOWN OR AMBIGUOUS, USE PLURAL FORMS.]

2. Now I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months, that is, since last (name of current month).

The first statement is "(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more." Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?

Often true

Sometimes true

Never true

DK or Refused

3. "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

Often true

Sometimes true

Never true

DK or Refused

4. “(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- Often true
- Sometimes true
- Never true
- DK or Refused

[IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q5 - 6;
OTHERWISE SKIP TO 1st-Level Screen.]

5. “(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- Often true
- Sometimes true
- Never true
- DK or Refused

6. “(I/We) couldn’t feed (my/our) child/the children) a balanced meal, because (I/we) couldn’t afford that.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- Often true
- Sometimes true
- Never true
- DK or Refused

1st-level Screen (screener for Stage 2): If AFFIRMATIVE RESPONSE to ANY ONE of Questions 2-6 (i.e., "often true" or "sometimes true") OR response [3] or [4] to Question 1 (if administered), then continue to Stage 2; otherwise, skip to end.

Stage 2: Questions 7-11 --ask households passing the 1st-level Screen: (estimated 40% of hh's < 185% Poverty; 5.5% of hh's > 185% Poverty; 19% of all households).

[IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK Q7; OTHERWISE SKIP TO Q8]

7. "(My/Our child was/The children were) not eating enough because (I/we) just couldn't afford enough food." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- Often true
- Sometimes true
- Never true
- DK or R

8. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

- Yes
- No (SKIP 8a)
- DK or R (SKIP 8a)

8a. [IF YES ABOVE, ASK] How often did this happen---almost every month, some months but not every month, or in only 1 or 2 months?

- Almost every month
- Some months but not every month
- Only 1 or 2 months
- DK or R

9. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

- Yes
- No
- DK or R

10. In the last 12 months, were you every hungry but didn't eat because you couldn't afford enough food?

- Yes
- No
- DK or R

11. In the last 12 months, did you lose weight because you didn't have enough money for food?

- Yes
- No
- DK or R

2nd-level Screen (screener for Stage 3): If **AFFIRMATIVE RESPONSE** to **ANY ONE** of Questions 7 through 11, then continue to Stage 3; otherwise, skip to end.

Stage 3: Questions 12-16 --ask households passing the 2nd-level Screen:
(estimated 7-8% of hh's < 185% Poverty; 1-1.5% of hh's > 185% Poverty; 3-4% of all hh's).

12. In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?

- Yes
- No (SKIP 12a)
- DK or R (SKIP 12a)

12a. [IF YES ABOVE, ASK] How often did this happen---almost every month, some months but not every month, or in only 1 or 2 months?

- Almost every month
- Some months but not every month
- Only 1 or 2 months
- DK or R

[IF CHILDREN UNDER 18 IN HOUSEHOLD, ASK 13-16; OTHERWISE SKIP TO END.

13. The next questions are about children living in the household who are under 18 years old. In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?

- Yes
- No
- DK or R

14. In the last 12 months, did (CHILD'S NAME/any of the children) ever skip meals because there wasn't enough money for food?

- Yes
- No (SKIP 14a)
- DK or R (SKIP 14a)

14a. [IF YES ABOVE ASK] How often did this happen---almost every month, some months but not every month, or in only 1 or 2 months?

- Almost every month
- Some months but not every month
- Only 1 or 2 months
- DK or R

15. In the last 12 months, (was your child/ were the children) ever hungry but you just couldn't afford more food?

- Yes
- No
- DK or R

16. In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food?

- Yes
- No
- DK or R

END OF FOOD-SECURITY

**HOUSEHOLDS WITH COMPLETE RESPONSES:
FOOD SECURITY SCALE VALUES AND STATUS LEVELS
CORRESPONDING TO NUMBER OF AFFIRMATIVE RESPONSES**

Number of Affirmative Responses:		1998 Food Security Scale Values	Food Security Status Level	
(Out of 18) Households with Children	(Out of 10) Households without Children		Code	Category
0	0	0.0	0	Food Secure
1		1.0		
	1	1.2		
2		1.8		
	2	2.2		
3		2.4	1	Food Insecure without Hunger
4		3.0		
	3	3.0		
5		3.4		
	4	3.7		
6		3.9		

7		4.3		
	5	4.4		
8		4.7		
	6	5.0		
9		5.1		
10		5.5	2	Food Insecure with Hunger, Moderate
	7	5.7		
11		5.9		
12		6.3		
	8	6.4		
13		6.6		
14		7.0		
	9	7.2		
15		7.4	3	Food Insecure with Hunger, Severe
	10	7.9		
16		8.0		
17		8.7		
18		9.3		

APPENDIX B
DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

1. Age _____
2. Ethnicity: _____ African/African American/Black
_____ Asian/Asian American
_____ Caucasian/White
_____ Hispanic/Latina /HispanicAmerican/Latina American
_____ Native American
_____ Biracial/Multiracial
_____ Other
3. Relationship Status: _____ Single
_____ In a relationship but not cohabitating
_____ Married/Live together
_____ Separated
_____ Divorced
_____ Widowed
4. Number of children under the age of 18 living in your home _____
- a) Ages of children _____

5. Number of adults (not including you) living in your home _____
6. Highest education level completed:
_____ No high school
_____ Some high school
_____ High school degree/GED
_____ Some college
_____ Associate's degree
_____ Bachelor's degree

Some graduate school

Graduate degree

7. Household Yearly Gross (before taxes) Income: _____

8. Food assistance programs used in the past 12 months:

WIC

SNAP/ Food Stamp Program

Reduced price or free school lunch

Back Pack Program or School Pantry

Food Pantry Program

Other

9. Do you own a car? Yes

No

10. How long have you been gardening in a community garden? _____

APPENDIX C
INTERVIEW GUIDE

Interview Guide

NOTE: Main questions are indicated with numbers: follow-up prompts are placed below each question

1). Tell me about your food shopping routine.

- Where? How often?

2). How do you get to the store?

- What problems have you had in getting somewhere to shop?

3). Tell me about the quality of the food in the store where you shop most often.

-What things do you wish you could buy there that are not available?

4). How do you manage when there is little food in your house?

5). What problems are caused by not having enough food?

-How does not having enough food affect you mentally/physically (Your family?)

-How has being food insecure affected your relationship with your family

(children, partner, parents or other adults in the home) if it has? How has that changed since you started gardening if at all?

6). How did you decide to become involved in gardening?

-How has gardening affected the way you eat during gardening season- if at all?

How does gardening affect the way you eat during the off-season- if at all?

What changes have you made in the way you and/or your family eats since beginning to garden if any?

7). Who do you have in your life who provides you with emotional/social support?

How has your social support system changed since gardening, if at all?

- 8). In what ways has gardening changed the way you think/feel about yourself?
- 9). In what ways has gardening affected your physical health? Mental health?
- 10). What changes, if any, have you noticed in your children since you began gardening?
- 11). How has gardening affected your community?
- 12). Beyond having fresh food, what benefits, if any, do you think gardening provides you (your family)?
- 14). What else would you like me to know about your experience with community gardening? What have I missed?

APPENDIX D
RECRUITMENT ADVERTISEMENT

Recruiting Community Gardeners who have Experienced Food

Insecurity

My name is Julie O'Donnell. I am a doctoral student in Counseling Psychology at Texas Woman's University. I am currently conducting a research study about the experiences of community gardeners who are food insecure and live in food deserts.

If you have had difficulty acquiring food for yourself and/or your family because of financial reasons in the past 12 months and you participate in a community gardening project, you may be eligible to participate in my research study.

Your primary involvement in the study consists of a two-part interview. I will arrange an appointment with you for the interview. The interview will be conducted in a private location that is convenient for you. In the first part, I will ask you questions to see if you have food insecurity. If you do not, your participation is over. If you are food insecure, we will continue with additional questions. If you do the full interview, it is expected to last between 60-90 minutes.

For more information or to arrange an eligibility screening, please

contact me at the garden, call me 817-xxx-xxxx or email me at

jodonnellgarside@twu.edu.

I look forward to the opportunity to learn more about your experiences. As a token of my appreciation, you will be given a \$20 gift card to a food store in your area. Only participants who complete the long interview will be eligible for this benefit.

Thank you for your time and interest.

Julie O'Donnell, M.A.

This study has been approved by the Texas Woman's University Institutional Review Board and is under the supervision of Sally Stabb, Ph.D.

APPENDIX E
CONSENT FORM

TEXAS WOMAN’S UNIVERSITY

CONSENT TO PARTICIPATE IN RESEARCH

Title: Community Gardens: Growing Control for People Experiencing Food Insecurity in Food Deserts

Investigator: Julie O’Donnell, M. A.....817-xxx-xxxx

Advisor: Sally Stabb, Ph.D.....940-898-2149

Explanation and Purpose of Research

You are being asked to participate in a research study for Ms. O’Donnell’s dissertation at Texas Woman’s University. The purpose of the study is to gain an understanding of how participation in community gardening affects the perception of your well-being and sense of control, for food insecure people living in food deserts.

Research Procedures

For this study, the investigator will conduct a face-to-face interview with food insecure people living in food deserts who participate in community gardening. This interview will be done at a private locations agreed upon by you and the investigator. You will be audio recorded during the interview. The purpose of the audio recording is to provide a transcription of the information discussed in the interview and to assure the accuracy of the reporting of that information. Your maximum total time commitment to the study is expected to be between 60 and 90 minutes.

Potential Risks

Potential risks related to your participation in the study include fatigue and physical or emotional discomfort during your interview. To avoid fatigue, you may take a break (or breaks) during the interview as needed. If you experience physical or emotional discomfort regarding the interview questions, you may stop answering any of the questions at any time without penalty. The investigator will provide you with a referral list of names and phone numbers that you may use if you feel as though you need to discuss this physical or emotional discomfort with a professional.

Another possible risk to you as a result of your participation in this study is release of confidential information. There is a potential risk of loss of confidentiality in all email, downloading, and Internet transactions. Confidentiality will be protected to the extent that is allowed by law. The interview will take place in a private location agreed upon by you and the researcher. A code name, rather than your real name will be used on the

audio recording and transcription. Only the investigator and her advisor will have access to the recordings. In addition to the investigator and her advisor, an outside analyst will have access to hard copy transcripts for the purpose of analysis. The recordings, hard copies of the transcriptions, and the CDs containing the transcription text files will be stored in a locked filing cabinet in the investigator's residential home office. The recordings and transcription CDs will be destroyed and the hard copies of the transcriptions will be shredded within 5 years of the completion of the study. It is anticipated that the results of this study will be published in the investigator's dissertation as well as in other research publications or presentations. No names or other identifying information will be included in any publication or presentation.

The researchers will try to prevent any problem that could arise because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Participation and Benefits

Your involvement in this research study is completely voluntary and you may discontinue your participation in the study at any time without penalty. A direct benefit of this study to you is that at the completion of the interview you will receive a \$20 gift card to a local food store. Due to the nature of the study and interview process you may gain greater insight and appreciation of the efforts you have made to provide food for your families. Your participation will also contribute to knowledge about the psychosocial effects of food insecurity and the benefits of participating in community gardening. You may contact the investigator at 817-xxx-xxxx or via email at jodonnellgarside@twu.edu and request to receive a summary of the results of this study. You may also note your address/email address below if you wish to request a summary in this manner.

Questions Regarding the Study

If you have questions about the research study you may ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University office of Research and Sponsored Programs at 940-898-3375 or via email at research@twu.edu. You will be given a copy of this signed and dated consent form to keep.

Signature of Participant

Date

If you would like to receive a summary of the results of this study, please provide an address or email address to which this summary should be sent:

APPENDIX F
MENTAL HEALTH RESOURCES

Mental Health Resources

Free or reduced cost mental health services in the Dallas area

Child and Family Guidance Center
The Stephen J. McManus Family Mental Health Clinic/Oak Cliff
210 West 10th St.
Dallas, TX 75208
214-351-3490

Galaxy Counseling Center
1025 South Jupiter Road
Garland, TX 75042
972-272-4429

Pastoral Counseling Center
4525 Lemmon Avenue, Suite 200
Dallas, TX 75219
214-529-6468

Resource Center Dallas
2701 Reagan Street
Dallas TX 75219
214-393-3680

Salesmanship Club Youth and Family Center
106 E. Tenth St.
Dallas, TX 75203
214-915-4700

UT Southwestern Psychotherapy Referral Service
5323 Harry Hines Blvd.
Dallas, TX 75390
214-648-7012

Mental Health Resources

Free or reduced cost mental health services in the Lincoln area

Catholic Social Services
2241 O St
Lincoln, Nebraska 68510
402-489-1834

Community Mental Health Center
2201 S. 17th St.
Lincoln, Nebraska 68502
402-441-7940

Lutheran Family Services
2900 O St.
Lincoln, Nebraska 68510
402-483-5117

UNL Psychological Consultation Center
325 Burnett Hall, UNL
Lincoln, Nebraska 68588
402-472-2351

Mental Health Resources

Free or reduced cost mental health services in the Omaha area

Heartland Family Service
2101 South 42nd Street
Omaha, NE, 68105
Phone: 402-553-3000

One World Community Mental Health Centers

4920 South 30th St.
Omaha, NE 68107
402-505-3907

4920 S. 120th St.
Omaha, NE. 68137
402-505-3907

4229 N. 90th St
Omaha, NE 68134
402-401-6000

APPENDIX G
CONTACT FOR FOLLOW-UP

Dear Participant,

Thank you so much for your time and cooperation with my study. It is important to me that the information I am using in my study is true to the information you have provided in my interview with you. Therefore, I would like a chance to meet with you to review the transcription of your interview as well as any notes I take at that time to ensure that they are consistent with your experiences. This meeting should take no longer than 30 minutes.

Please indicate below how you would like me to contact you for this follow –up visit.

Name & Address

Phone:

Email

Thank-you so much. I look forward to meeting with you again,

Julie O'Donnell

APPENDIX H

CODING KEY

FOOD INSECURITY

Availability

Food Quality/Prices

FQ-LF Limited or No Access to Fresh/Poor Quality

FQ-G Good

FP-E Too Expensive

FP-SNB Most Value for SNAP Benefits

Food Pantry/Feeding Program Use

FP-H Food pantry healthy

FP-PS Food pantry primary source of food

FP-S Food pantry supplemental/not primary

FP-UN Food from pantry unhealthy/spoiled

FP-BF Back Pack/Feeding Program

Shopping/ Sources of Food

FP-U Food pantry use/primary

FS-NG Non-grocery store

FS-G Traditional Grocery Store

Accessibility

Transportation

T-B Borrowed Transportation

T-C Personal Car

T-N None/by foot/ wheelchair

T-O Rely on others/Share rides/ Depend on others to shop

T-P Public transportation

T-RF Cost of transportation reduces \$ for food

Affordability

Money/ Food Stamps

MFS-FS Not enough \$ from SNAP
M-SS/D Not enough money from SS/ Dis
M- NI No source of income

How Money is Spent for Food

M-F-L Make detailed list/Buy on sale
M-F-S-S Stockpile when things on sale

Managing without Much Food

M-MD Make do with what I have/ Eat less
M-MD-C Learned to make do as a child
M-S Stretch available food
M-CS Cooking from scratch/ Creative use of food
M-SN Kids make/take snacks
M-SH Food shared with/by others
M-DW Drink water to fill stomach

Food Storage

FS-F Freezer available
FS-C Canning
FS-O Other
FS-N None

Personal Growth through Food Insecurity

FI-LE Food insecurity as a learning experience
FI-EW Food insecure people can eat well

GARDENING

Benefits of Gardening

G/F Garden for food/save money
G/FM Gardening gives time with family
G/HO Gardening to help others
G/LP Gardening gives purpose to life
G/MP Gardening as prayer/meditation
G/O Gardening gets me outdoors
G/P Pride in accomplishment
G/T Garden as therapy/ stress relief
G/FB Food is better from the garden
GFT-L I grow what I like

Experience with Gardening

PE-C Childhood
PE-N None
PE-MG Multigenerational

Uses of Food from Garden.

G-FS-F Food shared with family
G-FS-FR Food shared with friends
G-FS-OG Share w. other gardeners/traded
G-FD Food donated
G-FT-O Food bartered/sold for
goods or services

Problems with Community Gardens

PR-U Uncooperative Gardeners
PR-LS Lack of leadership/organization
PR-ST Stealing
PR-LC Lack of commitment by gardeners

Lessons Learned from Gardening

G-C Some things are beyond my control
G-C/E Gardening takes commitment/effort
G-TP Gardening takes patience
G-LE Gardening as a learning experience

HEALTH AND COMMUNITY

Physical Health

PH-HC Health problems due to lack of food
PH-LE Low energy
PH-G/P Gardening w/ pain or limitations
PH-HI Physical health improved w/ gardening

Mental Health

MH -W Worry/ Anxiety, Stressors
MH -D Depression
MH-HI Health improved by gardening
MH-LD People look down on me
MH-SE Self-esteem improved

Community

C-DR Deepened Relationships
C-GC Gained a sense of community

Family Relationships

FR-N Negative family relationship
FR-P Positive family relationship
FR-IM Family relationship improved

Social Support

SS-N None
SS-FA Family
SS-FR Friends
SS-CH Church/ Religious organizations
SS-IM Improved w/garden
SS-OLM Others like me

DIET

Diet Gardening Season

DGS-H Healthier/more fruit & veg

DGS-A Abundance of Food

Diet Off Season

DOS-H Healthier/ more produce than before

DOS-A More aware of what I'm eating/ cooking

Attitudes about food

AF-GF/GH Eating good food=good health

AF- PH Prefer healthy eating to junk

D-LC Learned to eat well as a child

D-TC Taught Children to eat well

CONTROL

PC – Primary Control

SC – Secondary Control

APPENDIX I
GARDEN PHOTOGRAPHS











