2017

# Community gardens: Exploring race, racial diversity and social capital in urban food deserts

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# Community gardens: Exploring race, racial diversity and social capital in urban food deserts

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

by

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# Acknowledgements

First, and foremost, I want to thank my husband Roy who has been my partner in this process through thick and thin. Every step of the way, you provided humor and insight to the many discussions we had; of which, you willingly engaged in. You kept the house clean, cooked for me, and made sure I ate. You held me when I cried and then told me to "suck it up, buttercup" when I needed to hear it. You say you could have done more. I say I could not have done this without you. You simply loved me unconditionally.

To Mary, my dissertation chair who is so much more. The few words I write here will never be enough to express my gratitude for your loving support, guidance, enthusiasm, time, and essential feedback that was both critical and constructive. You helped me explore an area that is new to social work, never an easy task in any discipline, yet immediately recognized that food-related disparities are intimately related to social, economic, and environmental justice. I am lucky to have you as a mentor, colleague, and friend.

To my committee members, I am not sure you are aware of how much each of you has had a unique impact on this dissertation and in the development of my scholarship. Pat, you let me explore the many ways I could "slice and dice" the data. I thought I understood before, but I now have such an appreciation for the art in applying statistical techniques. It has been a privilege to work with you. Meghan, your expertise in urban planning was invaluable. You pointed me in the right direction and helped me begin "talking back to the literature" as I

explored the vast, vast – truly, it bears repeating, vast – sustainable development literature. Last, but certainly not least, Betsy your suggestions have made this a better study, pure and simple. I can only hope to be as quick witted as you are in both research abilities and humor.

To my family and friends, I am forever grateful for your encouragement and support. I especially want to thank VCU's Division of Community Engagement and Design Management Association. You both have been my home away from home.

Lastly, thank you to all the gardeners who shared their time, stories and food with me. I could not have done this without your enthusiasm and assistance. Your generosity of spirit and deed continues to amaze me.

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# Abstract

COMMUNITY GARDENS: EXPLORING RACE, RACIAL DIVERSITY AND SOCIAL CAPITAL IN URBAN FOOD DESERTS

By Jennifer F. Jettner, Ph.D.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Social Work at Virginia Commonwealth University.

Virginia Commonwealth University, 2017

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**Study purpose.** The purpose of this study was to examine race and racial diversity in community gardens located in Southern urban food deserts, as well as the capacity of community gardens to generate social capital and promote social justice. In addition to addressing gaps in the literature, this study aimed to provide social work guidance on specific cultural and structural issues they can help to address as an example of environmental social work. **Methods.** This study used a mixed-methods approach to describe the characteristics of gardeners and community gardens located in urban food deserts, as well as test Social Capital Theory hypotheses. Largely using snowball sampling, a convenience sample of 60 gardeners from 10 community gardens was

obtained and used in analyses. Gardener characteristics were collected from surveys. Community garden characteristics, and their rationale, were obtained from semi-structured interviews with leaders. **Analyses.** Univariate and bivariate statistics were used to describe gardeners and gardens. Leader rationales for garden characteristics were analyzed using thematic analysis. Cross-level analyses were used to examine individual and organizational characteristics on an individual gardener's social capital in sequential multivariate regression models. **Results.** Gardeners were racially diverse across the sample; however most community gardens were racially segregated. The majority of gardeners also appeared to be middle-class. This study indicated that community gardens could indirectly enhance community food security, largely through the efforts of people of color, and less so directly as few gardeners involved were food insecure. Community gardens also exhibited limited potential to advance social justice, based on the few resources that could potentially be exchanged between gardeners. **Implications.** This study highlights specific cultural and structural issues that practitioners and scholars can help address, particularly social workers interested in environmental social work. This study calls for: greater dialogue around gentrification concerns; the development of culturally appropriate engagement practices sensitive to historical trauma rooted in slavery, as well as not repeating past mistakes with involuntary youth labor; increased focus on entrepreneurial opportunities; and, obtaining the missing voices – those from non-participating low-income residents – to better understand how to create community gardens located in food deserts that benefit multiple communities.

# Chapter 1. Introduction

## Problem Statement

Community gardens have surged in popularity throughout the U.S. and across the world since the early 2000s (Birky & Strom, 2013). It is difficult to say exactly how many community gardens there are; however, the American Community Garden Association (ACGA) estimates that there are over 18,000 community gardens in the U.S. and Canada alone (n.d.) as of January, 2017. Community gardens are undergoing similar revivals in the UK and Australia (Firth, Maye, & Pearson, 2011; McClintock, 2013; Turner, Henryks, & Pearson, 2011). Moreover, community gardens have gained legitimacy as interventions that can (a) increase community food security, (b) broadly promote community wellbeing, and (c) address environmental concerns (Draper & Freedman, 2010; Okvat & Zautra, 2011). Given the multiplicity of needs that can be addressed, it is no surprise that there are national funding streams dedicated to developing community gardens (see USDA People's Garden Grant for example) as well as the growing availability of resources from nonprofits and local governments (Firth et al., 2011; Thibert, 2012). Based on these trends, one could argue that we are in the midst of a national, if not global, community garden renaissance.

This renaissance of community gardens has been due largely to the efforts of various alternative food movements (AFMs), the most prominent four being: local and organic; community food security; food justice; and food sovereignty. Together, these food movements

have made remarkable strides in bringing food issues to the nation's attention (Pollan, 2010). In particular, they have successfully promoted the development of local food systems, defined as food grown and consumed within a geographic region, as well as the idea of alternative food initiatives (AFIs), such as community gardens and farmers' markets. By reconnecting people, place and nature, the development of a local alternative food system promises to address a host of issues, not the least of which are increasing community food security, rejuvenating democracy, and advancing social justice (Levkoe, 2006).

However, as community gardens continue to capture the hearts and minds of the nation, some scholars have begun to question the promises made by proponents of local food systems. Critiques about political consumption (Hinrichs & Allen, 2008), white privilege (Alkon & McCullen, 2010; Guthman, 2011, 2008a,b), and the devolution of state responsibilities (Alkon & Mares, 2012; Allen, 1999; Allen & Guthman, 2006; Guthman, 2008c) threaten to tarnish the current romance with community gardens, particularly around assumptions that community gardens inherently advance social justice. The larger question that has emerged is, has the solution become the problem? More specifically, to what extent and how does the development of local food systems reproduce existing social inequities or create new ones, such as a two-tiered food system (Allen, 1999)? Critical work done by scholars has suggested that the 'local' is not inherently just; an assumption that is prevalent amongst proponents of local food systems (Born & Purcell, 2006; DuPuis & Goodman, 2005). Thus, the fear is that without an explicit focus on social justice, some practitioners and scholars may unintentionally confuse the means with the end, working towards "just a local food system rather than a just food system at the local level" (Agyeman & Simon, 2012, p. 89).

To date, the community garden and food movement literatures have largely ignored each

other. The community garden literature promotes the multiple and extensive benefits of these interventions for individuals and communities (see Draper & Freedman, 2010; Okvat & Zautra, 2011 for reviews). McClintock (2013) provocatively characterizes this literature as 'Polly Anna-ish' because community gardens are framed by community garden researchers as radical solutions for food insecurity, global warming, a neoliberal capitalist system, and a supposed fraying social fabric. What these community garden scholars neglect to address is the incomplete nature of current research findings. Most studies tend to ignore the variation within and among community gardens (Firth et al., 2011; McClintock, 2013) and often assume that the 'community' within community gardens is the same as the surrounding community (i.e., neighborhood) that these gardens are located within (Firth et al., 2011). However, it is not always clear who is the community in these community gardens nor whose community benefits from these interventions.

On the other hand, the food movement scholarship has been critical of and highly suspicious of all forms of AFIs, including community gardens, in terms of advancing social justice (Alkon & McCullen, 2010; Allen, 1999, 2008; DuPuis & Goodman, 2005; Guthman, 2008a,b,c). Unfortunately, food movement scholars neglect to recognize what community gardens may offer in addressing concerns about economic access; concerns that have been highlighted in studies on farmers' markets and other market-based initiatives (i.e., vote with your fork). In the face of these contrasting positions about the impact, or lack thereof, that various forms of AFIs have in promoting social justice, we run the risk of "throwing the proverbial baby out with the bathwater" (McClintock, 2013, p. 11). A few scholars now suggest that the food justice and food sovereignty movements, the most recent food movements, may help practitioners and scholars alike understand the meaning of social justice within the realm of local

food systems and thus, bring greater clarity in how to promote social justice across a range of AFI efforts (Allen, 2014; Block, Chavez, Allen, & Ramirez, 2012; Holt-Giménez & Wang, 2011; Mares & Alkon, 2011; Meenar & Hoover, 2012).

Bringing these literatures together raises the following critical concern – in what ways and how might community gardens promote social justice through the lens of food justice and food sovereignty? This concern has become increasingly important to answer, as community gardens are becoming 'de rigor' as solutions for increasing healthy food access for individuals living in food deserts, a problem which primarily affects low-income communities and communities of color.

**Role for Social Work**

Over the past decade, social work scholars have argued that the profession can advance social justice and human rights through environmental social work, defined as assisting "humanity to create and maintain a biodiverse planetary ecosystem" (Ramsay & Boddy, 2017, p. 78; see Gray, Coates & Heatherington, 2013 for review of social work and environment literature). In an age of climate change, environmental degradation, and the alarming use of non-renewable resources, social work scholars have warned that the adverse impact of these issues will harm the poor, women and children, racial minorities, and indigenous peoples the most and on a global scale (Besthorn, 2012a; Coates & Gray, 2012; Dominelli, 2012; Gray et al., 2013; Mary, 2008; Miller, Hayward, & Shaw, 2012; Peeters, 2012a; Schmitz, Matyók, Sloan, & James, 2012).

Social and economic justice have long been a core part of social work values. It is only recently that social work has recognized environmental justice – along with social and economic justice – as a core competency for the profession (CSWE, 2015). Environmental injustice refers

to vulnerable and marginalized groups being disproportionately exposed to environmental harms – pollution, toxic waste sites, and so on – as well as their inequitable access to environmental goods, such as green spaces and healthy food (Taylor, 2011). In essence, environmental social work attends to the injustices and inequities in the relationship *between* humans and nature, which often mirror the injustices and inequities in relations *among* humans. As such, critical attention to environmental justice is simply an extension of social work values and ethics applied to the physical and natural world that supports human life (Miller et al., 2012).

Incorporating nature as part of social work's 'person-in-environment' remit is no longer in debate; however, examples of environmental social work are still evolving (Gray et al., 2013; Ramsay & Boddy, 2015). Scholars maintain that to engage in environmental social work practice, social workers must creatively apply their social work skills. In a recent review of the literature, the most common social work skills deemed critical were "empowerment, team building, community development, management, culturally competent and anti-oppressive practice, multilevel assessments, holistic interventions, and relational practice" (Ramsay & Boddy, 2015, p. 72). Nevertheless, Gray and colleagues (2013) astutely note that "the search is on for theoretical frameworks, examples, and case studies of what social workers are doing, or might do, in relation to environmental and educational initiatives" (p. 13).

**Study Relevance for Social Work**

Community gardens have been cited as exemplars of environmental social work practice (Dominelli, 2012; Gray et al., 2013; Miller et al., 2012). Few social work scholars, however, have engaged with food issues (Besthorn, 2012b; Freedman & Bess, 2011; Jacobson, 2007; Kaiser, 2011; Polack, Wood, & Bradley, 2008; Shepard, 2013). The majority of whom have conducted literature reviews that raised concerns about the current food system and informed

social work about the role community gardens and other forms of alternative food initiatives (farmers' markets) could play in advancing social justice (Besthorn, 2012b; Kaiser, 2011; Polack et al., 2008). Only one study specifically explored community gardens. This case study demonstrated how community gardens were used as a creative organizing tool to mobilize gardeners across multiple community gardens against redevelopment in low-income neighborhoods (Shepard, 2013).

Clearly more research is needed to provide a nuanced understanding in how community gardens may or may not promote social justice. Such an understanding would provide greater specificity on the cultural and structural issues in this context, and what social work skills may be necessary to address said issues. This study will begin to provide a more nuanced understanding of what environmental social work might look like by critically examining race and racial diversity within community gardens and the capacity of community gardens to generate social capital and promote social justice.

**Study Overview**

**Chapter 2.** Chapter 2 reviews the literature in three sections beginning with setting the context for the rise of community gardens. In Section I, problems with the current industrial food system and the rise of the four alternative food movements – local and organic, community food security, food justice, and food sovereignty – are discussed. To make sense of social justice critiques from food movement scholarship, the relationship between sustainable development and social justice are reviewed. In theory, sustainable development incorporates the three Es – equity, environment, and economic (Agyemon, 2005). In practice, sustainable development initiatives have been criticized for being 'green, and profitable' rather than 'green, profitable, and fair' (Campbell, 1996). Social justice criteria: distribution, recognition, and participation

(Schlosberg, 2004), are then used to trace how social justice has been understood, enacted, and evolved through the four alternative food movements.

Section I ends with concluding that food justice and food sovereignty represent a way forward to develop local food systems that are not only environmentally sustainable, but that advance social justice in the fullest sense. Food justice and food sovereignty scholars have identified structural racism and neoliberalism as root causes for multiple food-related inequities and disparities, and highlighted the ways privilege can reproduce inequities within AFI efforts.

Section II of Chapter 2 reviews the empirical literature on the many benefits of community gardens and identifies gaps in the literature, which inform this study's first two research questions. Community gardens have been promoted as ideal interventions that inherently strengthen poor communities and communities of color; however, these interventions have not been subjected to the same critical analyses as other AFI efforts.

An overarching gap in the literature is that no studies have explored the characteristics of gardeners and communities gardens in the South, which may have a unique impact on who becomes involved. Specific gaps in the literature are that little is known about the characteristics of gardeners and community gardens specifically located in low-income neighborhoods. Low-income neighborhoods were operationalized as food deserts in this study. Food deserts are by definition low-income areas where the closest grocery store is more than a mile away in urban areas or more than 10 miles in rural areas (USDA, 2009). Assumptions that community gardens enhance community food security was particularly salient to explore in food deserts.

Given concerns raised by food movement scholars, particularly around white privilege, this study focused on the racial characteristics of gardeners and the racial make-up of each community garden. Community garden scholarship has also suggested that some garden

characteristics may be viewed as exclusionary, such as having a fence (Glover, 2004); however little is known about why community gardens are organized in the different ways that they are. Further, some scholars have argued that racial minorities in leadership roles may organize a community garden differently that would increase the participation of poor communities and communities of color based on their knowledge of cultural and structural barriers (Ghose & Pettygrove, 2014; White, 2011). After a review of the community garden literature from a food justice and food sovereignty perspective, Section II ends with this study's two research questions, which were:

1. What are the characteristics of gardeners involved in community gardens located in Southern urban food deserts (Richmond, VA)?
    a. Do gardener characteristics differ by race?
2. What are the characteristics of community gardens located in Southern urban food deserts (Richmond, VA)?
    a. What is the rationale for variations in garden characteristics (provided by leaders)?
    b. Do garden characteristics differ by the race of the garden leader?

Section III of Chapter 2 proposes a conceptualization of how community gardens might advance social justice through the development of social capital, which refers to resources embedded in, and derived from, relationships (Portes, 1998). Social Capital Theory has been the predominant theory used to understand the nature of community gardens and the range of benefits derived from the gardens that enhance wellbeing for individuals and communities (see Glover, 2005a for example). Based on this review, the author argues that community gardens can

promote social justice by providing a space and place for oppressed groups to access resources through social capital.

Social capital, however, needs to be equitably accessible to all garden members (Glover, 2004) and be beneficial to neighborhood residents to realize its social justice goals (Firth et al., 2011). Given that a community network and resources are necessary before community gardeners can generate long-term benefits, such as advocating for policy change, this study's conceptual models and related hypotheses examined individual gardeners' access to social capital by virtue of belonging to a community garden.

Two indicators of social capital were used in this study: Sense of Community and Resources Accessible. Sense of Community referred to the emotional bonds one had with fellow gardeners and the community garden as a whole, that is, the relationships or the 'social' of social capital (see Shinew, Glover, & Parry, 2004 for example). Resources Accessible referred to the number of instrumental resources a gardener could potentially access based on who they have met within their community garden, that is, the 'capital' of social capital. Instrumental resources, such as knowing someone who can provide career advice, are considered valuable for economic and social mobility (Lin, 2000; Foster & Maas, 2014).

Section III ends with a review of multiple predictors at the individual and organizational levels known to have a relationship with a gardener's social capital. However, the majority of previous studies were qualitative. This study is the first to quantitatively examine how individual gardener and organizational community garden characteristics may predict an individual's Sense of Community and Resources Accessible. Specific hypotheses between identified predictors and the two social capital outcome variables, Sense of Community and Resources Accessible, are summarized in Table 2. In general, this study focused on race, perceived racial differences, as

well as a garden's racial make-up as predictors for an individual's Sense of Community and number of Resources Accessible.

**Chapter 3.** Chapter 3 provides an overview of this study's methodology. This study used a mixed-methods approach to answer two descriptive research questions and test a set of hypotheses informed by Social Capital Theory. The study design was non-experimental with data collected from primary sources. Individual gardener characteristics were collected from gardener surveys. Community garden characteristics were collected from semi-structured interviews with garden leaders, defined as those involved with the direct management of the community garden. Inclusion criteria for community gardens were: (1) located in Richmond City, (2) located in a food desert, and (3) public – meaning that anyone could join. Inclusion criteria for gardeners in these community gardens were: (1) being 18 years of age or older, and (2) able to speak English. This study employed Smith's (2000) multi-method technique to identify relevant community gardens and gardeners, largely using snowball methods, and obtained a convenience sample.

Community gardens had multiple leaders, which were differentiated into primary and secondary leaders. A primary leader was defined as those who were most heavily involved in the direct management of the community garden, while the remaining were classified as 'secondary' or 'co-leaders'. Based on the organizational literature (Klein & Kozlowski, 2000), responses from primary leaders were used for descriptive statistics about community gardens, such as how many members they had and the racial make-up of their garden. However, qualitative responses from all leaders were analyzed to understand the rationale for various garden characteristics, such as why leaders thought they were or were not racially diverse, and to generate themes from multiple perspectives.

Social Capital hypotheses were tested using two sequential multivariate regression models. Cross-level survey data were used to test hypotheses in a contextual analysis, meaning that organizational characteristics were 'linked' to individual gardeners. Contextual analyses using cross-level data is appropriate to infer how variations in garden characteristics (e.g., gardening practice, enclosure strength, events for members, etc.) is related to variations among people – in this case, an individual gardener's social capital (James & Williams, 2000).

Study measures are described in detail in this chapter and summarized in Table 8 at the end of Chapter 3 for easy reference. A community gardens' racial diversity relative to its neighborhood was a critical variable in describing community gardens. It should be noted that Census data was used to obtain the racial make-up of the neighborhood in order to compare how racially diverse each community garden was in relation to the neighborhood.

**Chapter 4.** Chapter 4 reports on the results of this study. Overall, this study found that gardeners were racially diverse across the sample; however, the majority appeared to belong to the middle-class. Key racial differences were that people of color were more likely to use their community garden to enhance community food security than white gardeners. Nevertheless, few gardeners were food insecure, which questions assumptions that community gardens directly address food insecurity.

While gardeners were racially diverse across the sample, community gardens were largely racially segregated. 'Mainly White' community gardens were located in racially diverse neighborhoods, while 'mainly Black' community gardens were located in predominantly Black neighborhoods. Despite such varied outcomes, the quantitative and qualitative data did not point to any differences in community garden characteristics by leader race or by a garden's demographic make-up. Regardless of a garden's racial composition, black and white leaders

struggled to engage people of color from the neighborhood who they perceived as low-income. In large part, leaders thought they were not as race and/or class diverse because of structural barriers (e.g., working several jobs) and general life circumstances (e.g., having a family) that low-income people of color face. Notably, gentrification was cited as a reason for being or not being race and/or class diverse. A few black leaders also discussed specific cultural and structural issues around historical trauma, lack of entrepreneurial opportunities, and the inability to secure one's harvest as additional disincentives for low-income African-Americans to participate in community gardens.

Results from the Social Capital models indicated that community gardens in this sample exhibited limited potential to advance social justice. On the one hand, community gardens appeared to be excellent vehicles for fostering a sense of community among gardeners, regardless of one's race or the racial make-up of a community garden. On the other hand, it took longer and more effort – one had to be a leader – to obtain more resources. Further, few instrumental resources were potentially accessible, even among a largely middle-class sample.

**Chapter 5.** Chapter 5 relates this study's findings to the literature, discusses practice implications, research limitations and directions for future research, and conclusion. Overall, this study indicated that community gardens do not automatically benefit low-income communities, who are often people of color, nor did they appear to advance social justice, based on the number of resources one could obtain. However, this study was limited in several important ways. First, this study was limited by its small and convenience sample; thus, not all hypotheses were tested and results should not be viewed as generalizable to all gardeners in community gardens located in urban food deserts. Second, many of the standardized measures used were adapted; thus, previous psychometric properties around reliability and validity no longer apply. This was done

due to the broad nature of the research questions based on gaps in the literature. Third, this was a correlational study; thus, this study cannot address issues of causality.

Despite such limitations, this study identified important cultural and structural issues that social work practitioners and researchers can help to address. These issues were gentrification concerns; historical trauma and potential stigma around gardening for African-Americans; and, the lack of entrepreneurial opportunities and ability to secure one's harvest. In addition, this study raises questions on the use of involuntary youth labor in community gardens. A discussion is offered that specifies how social work practitioners and future research can address these issues, as well as methodological limitations and additional questions raised by this study.

# Chapter 2. Literature Review

From the perspective of food justice and food sovereignty, the major issue of concern is to explore race and racial diversity in community gardens located in low-income neighborhoods, as well as the capacity of community gardens to generate social capital and promote social justice. The literature salient for this topic draws from multiple disciplines that define and describe the relationship between sustainable development and social justice; the rise of alternative food movements, various alternative food initiatives, and social justice critiques; community gardens as multi-level interventions with multiple benefits; and the relationship between social capital and social justice in the context of community gardens. The literature review of this dissertation addresses this major concern within the following three sections.

Section I provides context for community gardens by describing the problems with the global industrial agrifood system and explaining how the development of a local food system has been promoted by scholars and activists as a more just and sustainable alternative to the agrifood industry. This section will differentiate how social justice is understood among the four food movements.

Section II describes community gardens highlighting the many benefits these gardens 'produce' for individuals and communities based on empirical studies. In particular, community gardens have been promoted as ideal interventions that strengthen communities. This section ends by identifying gaps in the literature from these studies and discusses how these gaps inform

the first two questions of the study.

Lastly, Section III presents Social Capital Theory as a theoretical framework to situate what is known and not known about the capacity of community gardens to promote social justice. Social Capital Theory has been the predominant theory used to understand the nature of community gardens and the range of benefits derived from the gardens that enhance wellbeing for individuals and communities (Alaimo, Reischl, & Allen, 2010; Comstock, Dickinson, Marshall, Soobader, Turbin, Buchenau, & Litt, 2010; Firth et al., 2011; Glover, 2004; Glover, Parry, & Shinew, 2005a; Kingsley & Townsend, 2006; Kingsley, Townsend, & Henderson-Wilson, 2009; Ohmer, Meadowcraft, Freed, & Lewis, 2009; Poulsen, Hulland, Dalglish, Wilkinson, & Winch, 2014; Saldivar-Tanaka & Krasny, 2004; Shinew, Glover, & Parry, 2004; Tieg, Amulya, Bardwell, Buchenau, Marshall, & Litt, 2009; Wakfield, Mattson, & Zajicek 2007). Section III ends with a conceptual model derived from Social Capital Theory, which informs specific hypotheses about the relationships between characteristics of gardeners and community gardens and social capital.

**Section I. Industrial Food System & Rise of the Alternative Food Movements**

Food – its production, distribution and consumption – has become a significant moral and political issue for the 21st century (Levkoe, 2011). Questions regarding 'where, what, and how we eat' are voiced by scholars and activists around the world (Gottlieb & Joshi, 2010). A multitude of concerns, ranging from environmentally damaging farming practices and farm worker rights in the countryside to the prevalence of food insecurity in the inner city to the nation's obesity epidemic all the way to the global stage where nations are demanding sovereignty over their own food system, are coalescing under the banner of the 'food movement'. Pollan (2010) notes that 'food movements' – emphasis on the plural – may be the

better term since these social movements do not always agree on the root causes of the problem or on potential solutions. Despite various conflicts, the food movements are united by their singular observation that the current global industrial agrifood system harms human and planetary health and does not provide 'food' or 'security' or 'justice' in any sense (Alkon & Agyeman, 2011; Allen, 2004; Gottlieb & Joshi, 2010; Holt-Giménez, 2011; Holt-Giménez & Shattuck, 2011; Holt-Giménez & Wang, 2011; Levkoe, 2011; Nestle, 2013; Patel, 2012; Pollan, 2008).

**The Problem: Global Industrial Food System**

Since the mid-1990s, scholars and activists have been discussing various concerns about the conventional food system (see Gottlieb & Fisher, 1996a for example). A comprehensive 'seed to plate' approach that examines issues that occur within and across the production, distribution and consumption of food has dominated this discussion. Hence, the term 'agrifood' is used by scholars to refer to agricultural production as well as food distribution and consumption systems (i.e., supermarkets) that affect what and how we eat and, to some degree, who gets to eat (Allen, 2004; Gottlieb & Joshi, 2010). This food system has also been referred to as 'productionist' and a 'corporate food regime', terms which describe two different, yet key, features of the conventional food system that contribute to a variety of environmental and social problems.

The productionist term refers to the industrialized methods used to increase efficiency within this food system (Freedman & Bess, 2011; Lyson, 2005). Industrial agriculture relies heavily on fossil fuel consumption, pesticides, chemical fertilizers and large monocultures that, while these industrial processes may increase the output of food, also produce negative effects such as greenhouse gases, toxic run-off, soil erosion and reduced biodiversity (Besthorn, 2012b;

Freedman & Bess, 2011; Polack et al., 2010). Similarly, food is distributed on a global scale. The average 'food miles' is estimated to be between 1000 to 1300 miles, which consumes more fossil fuels than if the food had been locally sourced (Andreatta, Rhyne, & Dery, 2008). In addition, these long-distance foods often need preservatives to survive the trip and are more likely to be "exposed to contagions along the way" (Andreatta et al., 2008, p.119).

The term 'corporate food regime' highlights the socio-politico-economic dimensions of the conventional food system (Holt-Giménez& Wang, 2011). Food regime analyses specifically call attention to global corporate conglomerates that utilize their political power within a vast marketplace to concentrate wealth for the few through the commodification of land, water, genetic materials, and other natural resources usually perceived as public goods or the 'commons' (Holt-Giménez& Wang, 2011; McMichael, 2009; Patel, 2012). These corporate conglomerates have lobbied for and taken advantage of neoliberal policies that have reduced environmental regulations and labor unions' power (Gottlieb & Joshi, 2011; Patel, 2012). As a result, farm laborers increasingly experience higher levels of poverty and exposure to toxins (Gottlieb & Joshi, 2011). Farm laborers are not the only ones directly harmed by such policies. Through the use of corn, soy and wheat subsidies, the industrial agrifood system produces cheap, processed 'food-like substances' (Pollan, 2008) that are linked to rising obesity rates and other diet-related diseases in the US (Nestle, 2013).

In essence, food activists and scholars have argued that, due to the need for profit, 'food' has become standardized to achieve global economies of scale controlled by food oligopolies (Gottlieb & Joshi, 2011; Grey, 2000; Patel, 2012). In the colorful vernacular of food activists, farms have become large-scale 'factories' and farmers, the few that remain, have become 'food manufacturers' (Grey, 2000). Similarly, 'neighborhood' grocery stores have become large

supermarkets that are primarily located in suburban areas resulting in urban and rural food deserts (Gottlieb & Joshi, 2011) where residents lack easy access to healthy and affordable food (USDA, 2009).

Activists and scholars also assert that, in addition to harming human and planetary health, the industrial food system harms democracy in the sense that the lack of transparency erodes citizens' abilities to make informed decisions about their food choices and lessens consumers' likelihood of taking political action about the lack thereof (Levkoe, 2006, 2011). The idea of 'consumer choice' by the diverse array of food brands available in supermarkets is misleading as most conventional foods are simply reconfigured soy, wheat, or corn amalgamations (Pollan, 2008) and the majority of brands are owned by only 10 companies (Oxfam, 2013). Given the complexity of the global industrial agrifood system, henceforth referred to as the 'industrial food system', citizens often do not know where their food comes from, who or what might have been harmed in the process, or even what they are eating (Kloppenburg, Hendrickson, & Stevenson, 1996; Levkoe, 2006).

**The Solution: Local Alternative Food Systems**

It is within this milieu of the industrial food system that the four alternative food movements – local and organic, community food security, food justice, and food sovereignty – have emerged. Each movement shares the critique that the industrial food system is environmentally unsustainable and socially unjust. Each has also turned to the development of local food systems, composed of a variety of alternative food initiatives (AFIs), as viable alternatives. There is no easy way to define AFIs other than by exclusion – that is to say, AFIs are not part of the industrial food system (Levkoe, 2014). Examples include farmers' markets, community supported agriculture, and community gardens. The overarching idea among

proponents of local food systems is to link these varied alternative food initiatives (AFIs) in order to develop an alternative food network (AFN) that connects the food system – its production, distribution, and consumption – within a locality (i.e., a local food system). In sum, the alternative food movements (AFMs) promote the development of AFNs that inspire AFIs.

AFIs are also referred to as 'urban agriculture' in the literature because 'greening' cities are also a sustainable development concern (Colesanti, Hamm, & Litjens, 2012; Thibert, 2012). However, the term 'urban agriculture' naturally limits analyses to urban areas when AFIs like community gardens (Armstrong, 2000), farmers' markets and community supported agriculture (Andreatta et al., 2008; Pilgeram, 2011) occur also in rural areas. Food deserts, also, are located in both urban and rural areas (USDA, 2009). Community gardens, specifically those located in food deserts, are the focal point of this dissertation. Hence, the broader term 'AFI' will be used although much of the research on community gardens has been drawn from urban areas.

**The Solution Questioned: Social Justice within the Alternative Food Movements**

Despite sharing the broad critique of the industrial food system and proposing the development of local alternative food systems, each of the alternative food movements identifies the primary problem or root cause of food issues differently, and differs particularly in their treatment of social justice. These differences are related to larger debates about the most appropriate interpretation of sustainable development (Agyeman, 2005; Alkon, 2008, 2012); thus, making the topic of sustainable development an important topic in this discussion.

Sustainable development is an ambiguous term with no accepted meaning (Hopwood, Mellor, & O'Brien, 2005). The most cited definition of sustainable development, provided by the United Nations' World Commission on the Environment and Development (WCED) report, is "development that meets the needs of the present without compromising the ability of future

generations to meet their own needs" (WCED, 1987, chapter 2, para 1). Succinctly stated, sustainable development is concerned with how a global society should be organized such that earth's resources are available for everyone, everywhere, for all time. Sustainable development requires that environmental and social consequences be included in economic and political calculations in all realms of social life; a calculus that can be fraught with tension and contradictions (Campbell, 1996; Connelly, 2007; Hopwood et al., 2005; Peeters, 2012a; Willmington & Millington, 2004). For example, is it better to denude a forest to provide jobs and lumber for affordable housing or to preserve said forest for environmental reasons (Campbell, 1996)?

According to Agyeman and colleagues, social justice must be the foundation for a sustainable global society (Agyeman, Bullard, & Evans, 2002; Agyeman & Evans, 2003; Agyeman, 2005). Agyeman and colleagues (2002) argue that

> The basis for this view is that sustainability implies a more careful use of scarce resources and, in all probability, a change to high-consumption lifestyles experienced by the affluent and aspired by others…The altruism demanded here will be difficult to secure, and will probably be impossible to achieve if there is not some measure of perceived equality in terms of sharing common futures and fates. (p. 78)

In spite of such radical implications, the simultaneous attention to economic, environmental, and equity issues (the Three Es) – in order to promote sustainable development has become theoretically and rhetorically accepted by scholars, activists and politicians (Connelly, 2007; Hopwood et al., 2005; Williams & Millington, 2004). However, Agyeman (2005) has noted that the majority of sustainable development policies and projects within the US largely interpret sustainable development solely as a 'green' concern. More concerned with

preserving the environment, policymakers and activists often neglect how such policies can be enacted to address both social and environmental issues. Thus, what should be 'green, profitable, and fair' in practice simply becomes what is 'green and profitable' (Campbell, 1996). Consequently, not only are economically and racially marginalized populations harmed the most by environmental degradation, they are also least able to afford environmental benefits (Agyeman, 2005; Taylor, 2011).

The same differential attention to social justice can be seen within the food movements, despite food activists' general motivations for sustainable development. AFM proponents argue that localizing food systems through AFIs are models that exemplify what it means to integrate the Three E's of sustainable development (Kloppenburg et al., 1996; Lyson, 2005). Theoretically, a local food system that does not employ industrial means can simultaneously be more environmentally sound and stimulate a local economy that improves community wellbeing (i.e., increase jobs and healthy food access) because this food system is under community control (Gottlieb & Fisher, 1996a; Lyson, 2005). However, the local and organic and community food security movements labor under the assumption that the 'local' is inherently just, which enables activists to assume that these small-scale AFIs automatically and equally benefit all members of a community (Agyeman & Simon, 2012), an assumption that has not been thoroughly explored or documented.

In contrast, the food justice and food sovereignty movements articulate a deeper understanding of social injustices – injustices that are anchored in structural systems of oppression. These movements have questioned which community controls AFIs and who benefits from them as well as the strategic limits of AFIs to produce food as a global human right (Alkon & Agyemon, 2011; Gottlieb & Joshi, 2010). While all of the food movements agree that

localizing food systems are more environmentally sustainable, they essentially differ in how social justice is understood and integrated within various AFIs. Before differentiating between the four food movements then, it is necessary to first define social justice.

Although there are many ways to understand social justice, Schlosberg (2004) offers a relatively simple framework that informs this discussion on alternative food movements. According to Schlosberg (2004), there are three criteria for social justice: distribution, recognition, and participation. The distributional criterion is best understood through John Rawls' A Theory of Justice (1971), which defines social justice as a fair distribution of 'goods' and 'bads' within society (as cited in Schlosberg, 2004). What determines a fair outcome or distribution is determined by Rawls' veil of ignorance – the idea that people should theoretically choose what is fair without any notion of how they will personally benefit in reality. That is, they do not know their gender, race, ethnicity, class, and so on. The distributional criterion of social justice is primarily concerned with a fair set of procedures that promote equal opportunities, not necessarily equal outcomes. In the common vernacular, the distributional criterion is about leveling the playing field so each person can advance based on his or her motivation and hard work (Schlosberg, 2004).

Recognition refers to – well, recognizing that social 'goods' and 'bads' are not randomly distributed, but that 'maldistributions' primarily affect specific social groups which, "mirrors the inequities in socio-economic and cultural status" within broader society (Schlosberg, 2004, p. 522). Recognition, in this sense, is based on an understanding of historical and cultural systems of oppression and privilege that affect political processes and material outcomes (Allen, 2014; Schlosberg, 2004).

Participation, Schlosberg's third criteria of social justice, requires attending to power

issues so that oppressed groups are able to voice their concerns and have their experiences respected and addressed in order to "challenge a range of cultural, political, and structural obstacles constructed by cultural degradation, political oppression, and lack of political access" (Schlosberg, 2004, p. 523). The assumption here is that those harmed the most can speak to the various ways that they have been oppressed and help develop processes, interventions, and policies that are more likely to rectify unfair distributional outcomes. In sum, Schlosberg (2004) argues that social justice is a 'trivalent concept' that is defined by three criteria:

1. A fair distribution of resources and opportunities,
2. A recognition of deeply embedded systems of oppression that lead to unfair outcomes, and
3. The authentic participation of oppressed groups in order to develop more fair systems.

**The Four Food Movements & the Evolution of Social Justice**

Traditionally, the work of social movements has been to articulate various injustices and to advocate for remediation, which advances social justice (Allen, 2014). The following discussion uses Schlosberg's (2004) trivalent framework to explore the evolution of social justice in each of the food movements. Included in the discussion is each food movements' perception of the primary problem with the industrial food system, the main strategies to address said problem, a basic timeline of each movement's emergence, the degree of institutionalization in US mainstream culture, and the critiques of each of the movements. This information is summarized in Table 1, which follows the discussion.

**Local and organic.** The local and organic food movement has mounted a critique against the industrial food system for environmental and public health reasons. Underlying these

concerns are: (a) a deep mistrust of multi-and trans-national agrifood corporations that pursue profit above all else; (b) a cynicism towards the ability of government to regulate or control these corporations (i.e., protect the commons); and, (c) an agrarian vision that locates the good life in small communities where the model of the farmer working cooperatively with nature extends to "a cooperative model in human relations" (Agyeman & Simon, 2012; Allen, 2004, 2010; Alkon & Agyeman, 2011; Guthman, 2004; Shreck, Getz, & Feenstra, 2006, p. 440).

Proponents of the local and organic movement advocate for a de-centralized system of small-scale farmers who utilize organic agricultural methods, minimal processing, and distribute food to consumers within a short distance (Allen, 2004; Guthman, 2004; Mares & Alkon, 2011). Activists and scholars of this movement argue that the formation of a place-based network solves food issues by re-linking, re-localizing and re-ethicalizing the food system. That is, by reconnecting the dis-articulated globalized food system whose adverse environmental impacts span space and cross time into place, local producers and consumers can develop a reciprocal relationship (i.e., know where their food comes from) based on trust and thus, create an ethical community and a moral economy (Kloppenburg et al., 1996; Levkoe, 2006; Lyson, 2005). Juxtaposed against 'Big Agro' and cheap food, advocates within the local and organic food movement exhort the public to 'vote with their fork' and 'to pay the real cost of food' to support local farmers as the main strategy to affect social change (Alkon & Agyeman, 2011; Guthman, 2008a; Hinrichs & Allen, 2008).

Several historical focal points have contributed to the local and organic movement's canon: the counter-culture movement (1960s), the environmental movement (1970s), and the farm crisis that occurred during the 1984 recession (Allen, 2004; Guthman, 2004). However, it was not until the 2000s that concerns about the food industry came to the nation's forefront due

to popular media figures such as Eric Schlosser, Marion Nestle, and Michael Pollan – all of whom are New York Times bestselling authors (Alkon & Agyeman, 2011; Allen, 2008; DeLind, 2011; Mares & Alkon, 2011). No one has elevated these concerns more so than Michael Pollan, journalist and author of *The Omnivore's Dilemma* (2007) and *In the Defense of Food* (2008). Alternatively praised (DeLind, 2011) and criticized (Guthman, 2007), Pollan has become the public face of this movement. His lucid writing style as well as simple rules for eating such as, eat 'real' food, nothing your grandmother wouldn't recognize, has inspired the public to consider eating locally as the healthy, wise, and ethical choice (Alkon, 2012). The USDA now certifies organic products and large corporations, such as Wal-Mart, offer said products (Bean & Sharp, 2011; Cloud, 2007). All this is to say that 'local and organic' is not a fringe movement, but rather has become institutionalized as part of mainstream culture.

However, the local and organic movement has been widely criticized as elitist and reactionary. Prominent among the critiques are concerns about political consumption, white privilege, and romanticizing the 'local'. Political consumption refers to defining social action in terms of one's consumer choices (i.e., vote with your fork) (Hinrichs & Allen, 2008). Without actual change in government policies (i.e., farm subsidies), local and organic products will continue to be more expensive than their conventional counterparts are in the industrial food system. Consequently, the 'political' activity of purchasing from small farmers has created a niche market that is accessible primarily to an affluent, and often white, class (Alkon & Agyeman, 2011; Guthman, 2008a; Hinrichs & Allen, 2008).

White privilege refers to the 'culture of whiteness' within this movement and explains how the predominantly white, affluent social group perpetuates racism, often unintentionally, due to their own colorblindness and universalistic assumptions derived from their privilege

(Alkon & McCullen, 2010; Guthman, 2008a,b; Slocum, 2007). For example, when asked about the lack of diversity in a study of participants in farmers' markets and CSAs, a prominent reason given by white participants was that racial minorities did not understand or care about environmental issues and that those who did not support various AFIs needed to learn how to budget so that they too could 'pay the true cost of food' (Alkon & McCullen, 2010). And while the 'local' is romanticized as an inherently 'good community', scholars contend that the accolades used to describe the conviviality of community gardens, farmers' markets and other AFIs are symptomatic of middle-class anxieties over modern life and a nostalgic desire for community (Agyeman & Alkon, 2011).

In terms of Schlosberg's framework, the distributional criterion of social justice applied to the local and organic movement would be the support of small farmers so that they have a 'level playing field' in the face of the corporate food regime. However, because this movement does not recognize distributional inequities beyond that of small farmers, the third criterion of social justice, participation in the movement, is limited to those with white privilege.

It should be noted that 'whites' are not a monolithic entity and that the 'whites' in this context generally refers to those who are also highly educated and endorse both progressive social values and environmental concerns (Alkon & McCullen, 2010). Without the recognition of their own privilege and unearned advantages due to historical and institutionalized racism, the predominately white participants in the local and organic movement risk ignoring the many structural and systemic barriers (e.g., poverty, unemployment, etc.) that people of color disproportionately face (Alkon, 2008; Alkon & Agyeman, 2011; Alkon & McCullen, 2010; Guthman, 2008a,b). Furthermore, it is argued that this privileged group bestows a false sense of moral virtue upon what is presumed to be an equal sacrifice in 'paying the true cost of food'

(Guthman, 2008a). In effect, Allen (1999) warns that local and organic food movement participants may not only be creating an 'alternative' food system that mirrors larger inequities in society, but more importantly, creating new inequities with the construction of a two-tiered food system (alternative and conventional). The lack of attention to affordability in this movement is deemed particularly egregious given the rising prevalence of food insecurity in the US, particularly since the 2008 economic recession (Agyeman & Alkon, 2011).

**Community food security.** The community food security (CFS) movement builds upon the concerns of local and organic advocates, but integrates an anti-hunger perspective. The critical area of concern for CFS advocates has been the rising prevalence of food insecurity and food-related health issues (e.g., obesity, diabetes, etc.) in the US, particularly among low-income populations. CFS scholars have identified two areas related to public policy and the industrial food system that contribute to these concerns. First, although food security is defined by the USDA as an individual household having adequate access to nutritious and safe food (2012), public policies for addressing food insecurity have traditionally been geared towards increasing the quantity of food available for low socioeconomic individuals. Little attention has been given to the quality of food. The 'caloric bias' of public policies is problematic since cheap, processed food is often high in calories, yet has little nutritional content (Hamm & Bellows, 2003).

Secondly, public policies do not address food access issues. Large big box supermarkets are often located in suburban areas due to cheaper land (Walker, Keane, & Burke, 2011). What results is the development of 'food deserts', defined as high poverty areas where the closest grocery store is more than a mile away in urban areas or more than 10 miles in rural areas (USDA, 2009). Food deserts are at times referred to as 'food swamps' (McClintock, 2011) or 'food mirages' (Breyer & Voss-Andreae, 2013) since these areas are often inundated with

unhealthy food options (e.g., fast food). Thus, individuals experiencing economic hardship face additional barriers to healthy and affordable food due to the outmigration of supermarkets to wealthier suburbs that the poor cannot easily access (Walker et al., 2010). Subsequently, the combination of food insecurity and food deserts creates the paradox of poor people being malnourished and obese at the same time, a paradox that further perpetuates the many health inequities among poor communities and communities of color (Patel, 2012).

Advocates argue that 'community food security' can address this paradox as well as focus attention on social justice. Community food security is defined as "a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice" (Hamm & Bellows, 2003, p. 40). Food insecurity is also recognized as a community-level problem, not just an individual issue (Gottlieb & Fisher, 1996a; Mares & Alkon, 2011). The main CFS strategy for integrating social justice with the development of a sustainable food system is by improving access to healthy and affordable food. Primarily, this has meant subsidizing local small farmers and promoting the development of alternative agriculture (e.g., community gardens, farms stands, etc.) in food deserts (Gottlieb & Fisher, 1996a).

Similar to the local and organic food movement, the CFS movement can also be considered as institutionalized within mainstream culture as evidenced by advocates' success in influencing various public policies and nonprofits. The movement began when the Community Food Security Coalition (CFCS), a national nonprofit initially composed of 250 member affiliates, was founded in 1994 (Holt-Giménez& Wang, 2011; Mares & Alkon, 2011). The most prominent policy achievement for this movement was when the 1995 US Farm Bill allocated $16 million for CFS projects (Allen, 1999; Gottlieb & Fisher, 1996a,b). Highly visible CFS projects

include the USDA support of SNAP benefits (formerly known as food stamps) being accepted at local farmers' markets (Young, Karpyn, Uy, & Glyn, 2011). Former First Lady Michelle Obama's 'Let's Move Campaign' and the White House garden have been attributed to CFS advocacy efforts (Holt-Giménez & Wang, 2011). At a local scale, more and more cities have conducted community food security assessments, which analyze environmental barriers to healthy food in addition to the prevalence of food insecurity, and have instituted food policy councils, which are composed of community members responsible for recommendations (Harper, Shattuck, Holt-Giménez, Alkon, & Lambrick, 2009). While it is difficult to document a direct relationship, it seems likely that these CFS policy successes and public funding availability has encouraged the growing prevalence of nonprofits implementing a variety of AFIs to increase access to healthy food for low-income groups (Colesanti et al., 2012; Firth et al., 2011; McClintock, 2013; Thibert, 2012).

Despite these successes, the CFS movement has not escaped scholarly critiques. The main concerns have to do with perpetuating the devolution of state responsibilities and subtle forms of white privilege. Concerns over the 'devolution' refer to broader critiques of neoliberalism in which the government transfers its responsibilities for providing various public services and goods deemed necessary to meet basic needs to nonprofits and charity groups (Alkon & Mares, 2012; Allen, 1999; Allen & Guthman, 2006; Guthman, 2008c; McClintock, 2013). In this context, the US has drastically cut its budget for a variety of food aid programs (Allen, 1999), which unduly burdens communities that lack necessary resources to meet gaps (Allen, 1999; McClintock, 2013). Consequently, there is an uneven distribution in meeting food needs, as some CFS organizations are more successful than others, and all efforts are held hostage to the whimsy of public and foundation funding (Allen & Guthman, 2006; McClintock,

2013). Just as important is the observation that as communities are kept busy with meeting immediate needs, little time is available to devote towards large-scale efforts in changing public policies (McClintock, 2013).

Subtle forms of white privilege can be recognized in the exclusionary effects of the 'missionary zeal' of some CFS advocates (Guthman, 2008a,b, 2011). For example, some AFIs are initiated without consultation with resident stakeholders or with inappropriate engagement strategies that can be offensive (e.g., get your hands dirty) to the communities of color they are trying to serve due to historical agricultural systems of oppression (i.e., slavery) (Guthman, 2008a,b). In addition, what is deemed 'healthy' is generally defined by a white privileged class (Allen, 2014) and thus, what is grown for 'others' is often unfamiliar (e.g., arugula vs. collards) (Kato, 2013). For instance, Slocum (2006) reported on the pervasive stereotypes in comments on the CFCS listserv in which some activists argued that the cultural foods of people of color were not healthy. Apparently, all 'they' liked was fried chicken.

In terms of Schlosberg's framework, one can argue that the distributional criterion of social justice in the CFS movement has expanded beyond small farmer issues to include inequities for healthy and affordable food. However, the recognition of such 'maldistributions' is merely at a surface level. There appears to be little recognition or understanding among CFS advocates of their own race and class privilege. Rarely do CFS advocates delve further into structural analyses of institutional racism or neoliberal economic restructuring that have produced racialized geographies characterized by disinvestment and social exclusion – not simply food deserts (Alkon & Norgaard, 2009; Guthman, 2008a,b,c; Slocum, 2006). Thus, the participation of oppressed groups in AFIs is negatively affected by the assumption among privileged CFS activists "that knowledge, access, and costs are the primary barriers" to healthy

food rather than inequality; often resulting in culturally insensitive engagement strategies due to the missionary impulse to bring good food to 'others' (Guthman, 2008b, p. 432). In addition, scholars have noted that social justice has been narrowly defined as 'increasing food access' by the CFS movement and does not recognize other injustices, such as the exploitation of farmworkers, that occur throughout the industrial food system.

**Food justice.** The food justice movement argues that food insecurity is, at its essence, symptomatic of historical and structural systems of racism and classism (Holt-Giménez & Wang, 2011; Mares & Alkon, 2011). The critical issue for food justice advocates has been to 'discover' and explain a variety of race and class disparities across the production, distribution and consumption of food with the use of cultural and structural theories of oppression. To this end, scholars and activists have made 'visible' various groups such as minority farmers and farmworkers and issues such as institutional racism and labor rights that had not been considered in the prior food movements (Agyeman & Alkon, 2011; Gottlieb & Joshi, 2010). Moreover, food justice advocates have been largely responsible for articulating the race and class disparities that occur within the local and organic and the community food security alternative food movements (Agyeman & Alkon, 2011; Gottlieb & Joshi, 2010).

Food justice is defined as "communities exercising their right to grow, sell, and eat healthy food. Healthy food is fresh, nutritious, affordable, culturally appropriate, and grown locally with care for the well-being of the land, workers, and animals. The practice of food justice leads to a strong local food system, self-reliant communities, and a healthy environment" (Just Food, n.d.). Food justice advocates frame food as a human right (Mares & Alkon, 2011). Similar to the CFS movement, the primary strategy employed to advance food justice is to create and implement AFIs with members from poor communities and communities of color (Mares &

Alkon, 2011). The key difference between the CFS and food justice movements is that, for food justice advocates, oppressed groups must not only be involved, but must also exercise decision-making power in the development of AFIs, as it is their right to 'have a seat at the table', under the assumption that oppressed groups can create community interventions that meet their needs (Mares & Alkon, 2011).

The food justice movement has only recently emerged. Food justice was first introduced in an article published by Alkon and Norgaard in 2009; subsequently, questions about the intersection of race, class, and food systems have become more commonplace in the literature. Gottlieb and Joshi's (2010) *Food Justice* and Agyeman and Alkon's (2011*) Cultivating Food Justice: Race, Class, and Sustainability* are good examples of publications that provide theoretical grounding and case studies of food justice. It is important to note that food justice was initially promoted by scholars. Indeed, in some cases, scholars identified local food organizations as 'food justice' exemplars because of their strong record for including people of color in leadership roles, even if these organizations and activists did not identify as such (Agyeman & Alkon, 2011). Moreover, the food justice movement has strong ties with the CFS movement. For example, Robert Gottlieb, co-author of *Food Justice*, has been a prominent CFS figure who has written several seminal pieces promoting CFS (Gottlieb & Fisher, 1996a,b). Now though, it appears as if 'food justice' has become the new 'community food security' among food activists. Mares and Alkon (2011) warn that some local food organizations may be "re-labeling themselves as food justice organizations, even without leadership from communities of color" (p. 76).

The entanglement of CFS and food justice activism perhaps explains the main criticism of the food justice movement; it does not challenge neoliberalism and capitalism. While lauding

the inclusion of oppressed groups, scholars argue that the creation of an alternative local food system – currently conceived as an alternative market with subsidized activities so that local and organic foods are affordable – will not rectify structural systems of racism and classism (Allen, 2014; Guthman, 2008d; Holt-Giménez& Wang, 2011; Mares & Alkon, 2011). Mares and Alkon (2011) state that "despite food justice's radical rhetoric naming food a human right, the prioritization of market-based provisioning casts food as a commodity disproportionately accessible to those who can pay" (p. 77). Thus, the same concerns about unduly burdening communities without adequate resources in the name of 'self-reliance' and the lack of large-scale political advocacy apply to the food justice movement as well as the CFS movement.

In many ways, the food justice movement provides an ideal illustration of how social justice can be understood 'trivalent-ly' by movement activists per Schlosberg's framework and yet, be incomplete in their analyses. In addition to distributional inequities of food access, food justice advocates also highlight several instances of food-related maldistributions that occur throughout the industrial food system (e.g., farmworker exploitation) and within the local and organic and CFS movements, such as the apparent lack of oppressed groups participating in and benefiting from various AFIs. Food justice advocates recognize that these unfair distributions are related to broader systems of oppression; namely historical, institutional and cultural racism. Consequently, food justice advocates argue that the participation of oppressed groups in leadership roles is necessary to develop AIFs that meet community needs.

A good example of community-based knowledge and cultural sensitivity derived from authentic participation would be D-Town Farm, a 7-acre urban farm established and operated by African-American gardeners in Detroit, MI (White, 2011). D-Town Farm has been successful in engaging minority residents because it: (a) doubles as a community center providing educational

workshops and community-building activities, (b) provides economic opportunities for local youth, and (c) acts as a forum to discuss the painful history of slavery in connection to gardening (Thibert, 2012; White, 2011). Some African-American participants state that gardening has empowered them to reclaim their historical status of being the best farmers in the world (Thibert, 2012).

Nevertheless, the solution – that is, the participation of oppressed groups in AFI leadership roles – advanced by food justice advocates does not match the range of problems (i.e., maldistributions) that have been identified. For instance, it is difficult to see how farmers' markets, community gardens, and the like can address the economic exploitation of farmworkers. Guthman (2008c) argues that it is precisely the emphasis on creating an 'alternative' market that has resulted in the 'anemic' nature of food politics. The majority of food justice activists are engaged in AFIs rather than collective action for policies, such as living wages, that could address many of the structural inequities created and exploited by a neoliberal capitalist system (Alkon & Mares, 2011; Guthman, 2008c; Holt-Giménez& Wang, 2011; Mares & Alkon, 2011).

**Food sovereignty.** The food sovereignty movement parallels the food justice movement in that racial injustices are recognized. However, food sovereignty advocates argue that the variety of food-related social injustices and environmental problems are primarily due to, "decades of destructive economic policies based on the globalization of a neoliberal, industrial, capital-intensive and corporate-led model of agriculture" (Wittman, Desmarais, & Wiebe, 2010, p. 2). Neoliberalism is a political economy theory that argues that human wellbeing is best achieved through the market; the role of the state is minimal (Harvey, 2005). While the ill effects of neoliberalism are many, food sovereignty advocates specifically call attention to international organizations like the World Trade Organization and international policies (e.g., trade

liberalization, structural adjustment) that support the corporate food regime while displacing millions of rural farmers in developing countries, sometimes referred to as the Global South, effectively stripping entire countries of control over their land, food system, and ways of being (Patel, 2012; Wittman et al., 2010).

Food sovereignty is most commonly defined as "the right of nations and peoples to control their own food systems, including their own markets, production modes, food cultures, and environments" (Wittman et al., 2010, p.2). However, this definition does not quite convey the transformative scope of the movement. Food sovereignty advocates argue that democracy and social justice are directly linked (Wittman et al., 2010) and that food sovereignty is the precondition for global food security, meaning that everyone has the right, and must be able to exercise that right, to participate in the development of local to global sustainable systems where food is humanely produced and provided as a human right (Fairbairn, 2012; Patel, 2009). The ability to exercise that right – the right of participation – requires that systems be restructured so that all forms of oppression are eradicated (Patel, 2009). The primary strategy to implement food sovereignty has been political action aimed at changing international and national agricultural and food policies (Alkon & Mares, 2012; Holt-Giménez& Wang, 2011; Wittman et al., 2010). Food sovereignty activism calls for solidarity among all stakeholders affected by the corporate food regime, with a special focus on advocating for the rights of indigenous peoples, racial minorities, workers and women (Alkon & Mares, 2012; Wittman et al., 2010).

Food sovereignty was first articulated by La Via Campesina, also known as the international peasant's movement, during the 1996 World Food Summit (Patel, 2009). Since then, the movement has grown on an international level and boasts a membership of 164 organizations that represented 73 countries as of 2017. Although four of the organizations are

located in the US (La Via Campesina, n.d.), the food sovereignty concept and movement has only recently been discussed and contrasted in the literature within the context of other existing US-based food movements (see Holt-Giménez& Shattuck, 2011; Mares & Alkon, 2011).

The greatest challenge for food sovereignty is appropriately interpreting and implementing the movement within a US context (Fairbairn, 2012). Alkon and Mares (2012) note that activists' understanding of neoliberalism is rather underdeveloped and abstract, as evidenced by their denunciation of 'Big Agro'. According to several scholars, the lack of a neoliberal capitalist critique explains why food activists' responses across the US-based food movements have the tendency to reproduce neoliberal subjectivities by embracing the tenants of individual responsibility and self-help, and viewing inclusion in market-based initiatives as *the* means to advance social justice (Allen & Guthman, 2006; Alkon & Mares, 2012; Holt-Giménez & Wang, 2011). Alkon and Mares (2012) claim that deeply engaging "with the ideas and practices of food sovereignty may help to radicalize community food security and food justice projects" (p. 351). However, food sovereignty was born in a different context – the struggles of peasant farmers in the Global South (Fairbairn, 2012; Patel, 2009). Having 'power over one's food system' has often been interpreted by U.S. food activists as having 'local control' of an alternative food system rather than political action (Fairbairn, 2012; Kato, 2013).

Despite these challenges, food sovereignty is perhaps the food movement that best embraces the fullest meaning of social justice as articulated by Schlosberg. Multiple 'maldistributions' for various oppressed groups are not only recognized, but eradicating inequalities requires all peoples to participate in the development of a truly just and sustainable food system. Indeed, activists argue that "food sovereignty is only possible if it takes place at the same time as political sovereignty of peoples" (Neyleni, 2007, p.5 as cited in Wittman et al.,

2010, p. 7). And while patriarchy, racism and classism are important lenses to view and understand injustices, the food sovereignty movement is politically focused on dismantling the global corporate food regime and the neoliberalism that supports it. In addition to political efforts for macro change, food sovereignty advocates "challenge neoliberalism on a micro-scale by refusing to adopt its individualizing and commodifying language" (Fairbairn, 2012, p. 222). In essence, food sovereignty "demands that we treat food not simply as a good, access to which and the production of which is determined by the market, it demands that we recognize the social connections inherent in producing food, consuming food, and sharing food" (Handy, 2007 as cited in Wittman et al., 2010, p. 4).

**Food Justice & Food Sovereignty: A Way Forward Towards Advancing Social Justice**

Differentiating between the four food movements illustrates how activists and scholars have approached the meaning of social justice within the realm of local alternative food systems. Schlosberg's (2004) dimensions of distribution, recognition and participation provided a useful framework to analyze how attention to social justice has evolved over time. Moreover, these dimensions are interconnected in the following ways: (a) which 'maldistribution(s)' is or are recognized affects who participates in and benefits from AFI efforts, and (b) who participates in AFI efforts affects which 'maldistribution(s)' is or are recognized (Schlosberg, 2004).

To recap (see Table 1), the local and organic food movement frames the primary problem with the industrial food system as environmental degradation that also poses a threat to public health. Motivated by 'green values' and a distrust of 'Big' business and government, white, middle-class activists exhort the public to support the ostensibly 'moral' family farmer by purchasing local and organic foods. What is ignored or unrecognized is the plight of oppressed groups who do not have the economic means to 'choose' healthier food, not to mention the many

other food-related inequities that occur throughout the industrial food system. The result has been the development of a local and organic 'alternative' niche market that is generally accessible primarily to white, middle-class participants who also endorse 'green' values.

The community food security movement frames the primary issue as food insecurity. CFS activists, who generally also belong to the same social group as the local and organic movement, work to make healthy (i.e., local and organic) food more accessible to oppressed groups. However, the CFS group defines social justice narrowly as food access; the devolution of state responsibilities is perpetuated as more effort is given to 'bringing good food to others' by those with privilege than is given to political advocacy to make healthy food affordable. The cultural insensitivity of some CFS advocates can offend some oppressed groups and thus, essentially exclude these groups from participating in and benefitting from AFIs. Other 'maldistributions', such as the exploitation of minority farmworkers, recognition of various structural causes (e.g., institutional racism) and large-scale political advocacy for more radical reforms (e.g., living wages) are ignored.

The food justice movement frames the primary problem as inequity due to structural racism and classism. From this standpoint, food justice advocates have moved beyond food access 'maldistribution' issues to recognize the rights of minority farmworkers and farm owners as well as have revealed how white privilege exists and excludes oppressed groups within AFIs promoted by the local and organic and CFS movements. Food justice advocates argue that individuals in oppressed groups must have leadership roles in order to develop AFIs that meet the needs of poor communities and communities of color. However, food justice advocates often fall prey to the 'local' trap (Born & Purcell, 2006) by focusing mostly on their inclusion in and ownership over local food system efforts in order to rectify the apparent 'unbearable whiteness'

among AFI participants (Guthman, 2011). What is ignored or unrecognized is the need for political advocacy to address neoliberal capitalism that also contributes to the multiple issues or 'maldistributions' that food justice advocates raise.

The food sovereignty movement frames the primary problem to be a neoliberal capitalist system that enables the industrial food system not only to create social and environmental problems on a global scale, but also to create the conditions that allow them to do so, through policies (e.g., trade agreements) that exploit a variety of oppressed groups (e.g., minorities, women, peasants from the Global South, etc.) as well as entire nations. Food sovereignty advocates argue that a two-pronged attack is necessary to begin the development of alternative food systems that are environmentally sustainable and socially just. One, political advocacy is needed to restructure political and economic neoliberal systems at an international scale. Two, recognition of various forms of oppression and privilege across multiple social groups worldwide is necessary to gain the participation of various stakeholders to develop an inclusive global social movement that has the solidarity and power to eradicate inequality. However, food sovereignty is an ambiguous movement and often is misinterpreted by US activists as 'local control' rather than political advocacy.

In sum, the food justice and food sovereignty movements represent a way forward to develop local food systems that are not only environmentally sustainable, but that advance social justice in the fullest sense. Mostly, these later movements have clarified, and in doing so, expanded the meaning of social justice beyond 'voting with their fork' or bringing 'good food to others' to addressing multiple and intersecting factors of injustice within the industrial food system, and by 'revealing' how various structural systems act as root causes. Perhaps more importantly, they have also highlighted the ways privilege can reproduce inequities within AFI

efforts and thus, have placed a stronger emphasis on political action, democratic decision-making, and leadership roles for oppressed groups as ways to, if not eradicate, at least lessen the possibility of reproducing such inequities. The recognition of privilege is particularly important for helping those with relative privilege work with oppressed groups to enact transformative change on a global scale (Allen, 2014; DuPuis & Goodman, 2005).

The importance of people working together across relative privileges and oppressions cannot be overstated. The tone of some of the criticisms raised by food movement scholars' risks alienating those with privileges – specifically the white middle-class – by inducing 'white guilt' to the point of discouraging their (the white middle-class) involvement because of the fear of perpetuating systems of oppression (Slocum, 2007). White guilt can lead to paralyzing guilt, placing those with privilege who want to be involved in a seemingly impossible position that is unproductive and ignores the "power and effectiveness of [previous] white middle-class reform movements" (DuPuis & Goodman, 2005, p. 362). The emphasis on 'white privilege' can also paint a picture of victims as those of color who are all poor and lack resources while ignoring poor whites. For transformative change to occur on a global scale, it is necessary that advocates from all the food movements work together in what Agyeman (2005) calls 'movement fusion' that integrates top-down and bottom-up approaches. In practical terms, this means combining the political power, skills and resources of the middle-class – who are often white, but not always – with the assets and intimate knowledge of what the problems are 'on the ground' from members of poor communities – who are often people of color, but not always.

Promisingly, and due to the food justice and food sovereignty movements, more alternative food organizations are focusing on issues of equity and social justice (Allen, 2014). Thus, AFIs could raise awareness of multiple food-related injustices, increase civic engagement

amongst citizens, and encourage diverse social groups that span the local to global spectrum to work together to advance social justice (Allen, 2014; Block et al., 2012). Allen (2014) argues that, "there are so many axes of injustice in the [industrial] food system that no one can work on them all, and a diversity of approaches is required" (p. 67).

Table 1

*Evolution of Social Justice among the Four Food Movements*

| | Local & Organic | Community Food Security | Food Justice | Food Sovereignty |
|---|---|---|---|---|
| Primary Problem | Environmental degradation & Public health | Food Insecurity | Structural Race & Class Inequities | Capitalism & Neoliberalism |
| Strategies/ Approaches | Support local small farmers that practice organic methods of agriculture | Connect small farmers to urban areas that are food insecure; create local food economy | Redress barriers for people of color to own and participate in local food economy | Restructure economic & political systems at international level |
| Emerged/ Institutionalized in US | Emerged 1960s/ Institutionalized 2000s | Emerged 1990s/ Institutionalized 2000s | Emerged 2010s/ Not yet institutionalized | Emerged 1996/ Not yet institutionalized |
| Criticisms | Perpetuates white privilege through politics of consumption; neglects food insecurity | Promotes devolution of state responsibilities; social justice narrowly defined as food access | Does not challenge capitalism; utilization of market-based methods will not rectify structural racism | Ambiguous; difficult to translate for US context |
| View of Social Justice | Redistributive *(very limited)*, Participatory *(very limited)* | Redistributive*(limited),* Participatory *(limited)* | Redistributive, Participatory, Recognition | Redistributive, Participatory, Recognition |

*Note.* Adapted from Mares & Alkon (2011).

## Section II. Community Gardens

Community garden advocates have promoted the many and extensive benefits that community gardens can 'produce' for individuals and communities. As community gardens have grown in popularity, so too has research on various claims. Empirical evidence suggests that the "community garden is exceptional in its ability to address an array of public health and livability issues across the lifespan" (Twiss, Dickinson, Duma, Kleinman, Paulsen, & Rilveria, 2003, p.

1435). Consequently, community gardens have gained prominence as a strategy to address critical issues raised by the food movements such as environmental issues and community food security (Agyeman & Simon, 2012; Colesanti et al., 2012). For example, community gardens assist with environmental concerns by being a part of a local food system and enhance community food security by increasing access to healthy and affordable food.

Increasing food security is not a trivial matter. According to the USDA (2016), 12.7% of households (29.1 million adults; 13.1 million children) were food insecure in 2015, meaning they experienced limited access to nutritious and safe food. Higher costs of living, increasing food prices, and rising levels of un- or under-employment due to the 2008 fiscal crisis all contribute to people facing hunger for the first time (Hoefer & Curry, 2012). In particular, it has been the poor, women and children, and racial minorities as well as those living in major cities and rural areas within the South who have been impacted the most (USDA, 2016). According to the USDA (2009), 23.5 million people lived in food deserts in 2009; 11.5 million of which were low-income people that lacked easy access to a grocery store, which is an added barrier to healthy and affordable food in addition to poverty.

Community gardens can also strengthen communities through the generation of social capital and economic development (Glover et al., 2005a; Firth et al., 2011). Thus, community gardens have been viewed as promising interventions for low-income groups because of all the benefits they can provide (Draper & Freedman, 2010; Ohmer & Zautra, 2011). Subsequently, more nonprofits, churches, and public agencies are involved in organizing and managing community gardens. In addition, there is a diverse range of community garden participants that span the spectrum of race and class, even in gardens located in low-income neighborhoods (Birky & Strom, 2013; Reynolds, 2014; Ghose & Pettygrove, 2014; Meenar & Hoover, 2012).

Thus, it has become difficult to discern "whether community gardens are run for the community, by the community, or that they just happen to be located in some communities" (Firth et al., 2011 p. 557).

To begin to unpack whose 'community' benefits and who in the community benefits, a brief overview of community gardens and research findings are in order. This section will proceed as follows. First, a definition and description of community gardens will orient the reader to the myriad of configurations that fall under the heading of 'community garden' followed by a brief history that explains why community gardens are generally presumed by researchers to benefit and empower disadvantaged communities. Next, a review of the research literature will cover what is known about the multiple benefits from community gardens. This section ends by identifying gaps in the literature from these studies and discusses how these gaps inform the first two research questions of the study.

**Definition & Description**

Community gardens are loosely defined as "any piece of land gardened by a group of people" (ACGA, n.d. as cited in Milburn & Vail, 2010, p. 71) that are in some way "public in terms of ownership, access and degree of democratic control" (Ferris, Norman & Sempik, 2001, p. 560). This definition encompasses a wide array of community gardens. For example, community gardeners usually grow food and herbs, but this is not always the case (Guitart et al., 2012). They may be located in a variety of public settings (e.g., neighborhoods and parks), institutional settings (e.g., income-based housing), or on private property, such as churches or land donated by a citizen (Firth et al., 2011; Guitart, Pickering, & Byrne, 2012; Milburn & Vail, 2010; Pudup, 2008; Twiss et al., 2003). Often, community garden groups do not own the land they garden on; land is usually donated or rented for a limited time from a public, private, or

public-private entity. Examples include vacant city lots (i.e., public), church grounds (i.e., private) and city lots managed by a public land trust (i.e., public-private), in which a third party owns and manages city land (Eizenburg, 2012). Consequently, community gardens also vary in how long they will be available to gardeners or what the literature describes as 'land tenure security' status (Guitart et al., 2012; Milburn & Vail, 2010).

Community gardens vary by who organizes and manages them, which ranges from informal community groups or civic associations to formal organizations such as nonprofits and city agencies (Birky & Strom, 2013; Guitart et al., 2012; McClintock, 2013). Community gardens are usually managed with volunteer labor where a gardener or a core group of gardeners take on various leadership roles, often described as 'garden leaders', to handle logistics, such as recruitment and waitlist management (Milburn & Vail, 2010). Community gardeners who are not 'garden leaders' are 'garden members'.

Funding for community gardens has become increasingly available from the government, nonprofits, and foundations (Colesanti et al., Thibert, 2012). Further, organizational arrangements have become more complex and formal compared to grassroots community or civic groups that manage community gardens. With the help of nonprofits, some community gardens are staffed with employees who handle logistics and some community gardens provide stipends to volunteers, usually youth, to tend the community garden (Milburn & Vail, 2010; Ghose & Pettygrove, 2014; Ober-Allen, Alaimo, Elam, & Perry, 2008). Some agencies (e.g., nonprofits, government, etc.) also serve as 'umbrella' agencies and manage numerous community gardens (Milburn & Vail, 2010). Sometimes described as 'community garden coordinators' (Armstrong, 2000), staff from these umbrella agencies act like case managers that provide support and indirect oversight to numerous community gardens, each of which has its

own garden leader(s) and members (Glover, Parry & Shinew, 2005b; Milburn & Vail, 2010).

Community gardens can also differ in their physical architecture and in their range and type of social offerings. Community gardens can include multiple individual plots, typically rented by individuals or families, or one large communal plot where each participant tends the garden (McClintock, 2013; Milburn & Vail, 2010). Community gardens can also differ in how physically accessible they are to the public; some are fenced, gated and locked, and others are open to everyone (Milburn & Vail, 2010; Reynolds, 2014; Tieg et al., 2009). Lastly, some community gardens may host social events or educational activities, acting as community centers for area residents in addition to gardening spaces while other gardens focus exclusively on food production (Firth et al., 2011; White, 2011).

**Brief History**

Community gardens have a history of being a social response to large-scale crises. In the US, community gardens have historically served numerous purposes – ranging from supplying food for war efforts during the First and Second World Wars, to beautifying industrial cities during the Progressive Era as well as assimilating immigrants, to supplementing charity during multiple economic recessions (Lawson, 2004). Most scholars suggest that the contemporary period of community gardens began during the 1970s (Lawson, 2004; Pudup, 2008), when residents of inner city neighborhoods reclaimed space (i.e., vacant lots) in areas high in crime and blight for communal gardening, initiating a grassroots movement whereby citizens enacted their 'right to the city' (Staeheli, Mitchell, & Gibson, 2002; Schmelzkopf, 1995). Because of this so called 'contemporary' period, community gardens are generally thought to be grassroots initiatives that empower disadvantaged individuals to participate in civic life and foster social cohesion within low-income communities (Milburn & Vail, 2010).

More recently, Pudup (2008) argued that community gardens have entered a new period in response to a new set of global crises, specifically climate change and rising inequality. The reasons for individual and organizational involvement in community gardens has expanded from personal interest in reconnecting with nature and 'saving the earth' to the development of collective power to demand transformative change. Much like previous food movement critiques, Pudup (2008) warned that while these two views on the purpose of community gardens – connections with nature and vehicles for social change – do not necessarily conflict, neither do they necessarily align.

**Research Findings: Harvesting Multiple Benefits from Community Gardens**

Much can be expected from the humble community garden. Research has suggested that community gardens provide both individual- and community-level benefits, directly and indirectly, across a myriad of domains: physical, mental, economic, social, and civic. To a large degree, the majority of studies examined the multiple benefits of community gardens and these benefits intersected across levels. Nevertheless, for clarity, the following research review first enumerates findings at the individual-level and then focuses on those at the community-level. Inclusion criteria for the literature review were: (a) empirical research on community gardens, (b) published journal articles, and (c) studies located in the US or in countries similar to the US. Dissertations, literature reviews, and articles based on research conducted in 'developing' countries such as the Philippines or Africa were not included. Based on these criteria, 55 journal articles were found that reported community garden research results in the US (41), Canada, (4), Australia (4), the UK (5), and Germany (1). Of these studies, the majority employed qualitative methods (67%) whereas the remaining utilized quantitative methods (16%) and mixed-methods (16%). See Appendix A for summary table.

**Physical benefits.** Several studies have explored the effect of community gardens on physical health; namely nutrition and food security. In terms of nutrition, quantitative studies have found that adults (Alaimo, Packnett, Miles, & Kruger, 2008; Litt, Soobadeer, Turbin, Hale, Buchenau, & Marshall, 2011) and youth (Lautenschlager & Smith, 2007) involved in community gardens consumed more fruits and vegetables compared to non-gardening adults and youth. Interestingly, Litt and colleagues (2011) found that community gardeners consumed more fruits and vegetables compared to home gardeners. As to why this may be the case, qualitative studies have revealed that adults (Corrigan, 2011; Hale, Knapp, Bardwell, Buchenau, Marshall, Sancar, & Litt, 2011; Mundel & Chapman, 2010; Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007) and youth (Ober-Allen et al., 2008) involved in community gardeners often reported that the food they grew tasted better than what they get at a grocery store, they felt a sense of pride in growing their own food, and had an emotional connection to their food source (Corrigan, 2011). While the experience of growing their own food may explain why gardeners were more likely to eat fruits and vegetables than non-gardeners, it is not clear why community gardeners were more apt to consume fresh produce over home gardeners.

In reference to food security, studies have found that community gardens can directly improve food access, to a certain degree, and indirectly increase access to healthy foods. Community gardens provide places where people can grow their own food; thus, alleviating economic barriers to fresh produce. Community gardeners have reported that growing their own food has reduced their grocery costs (Armstrong, 2000; Hanna & Oh, 2000; Wakefield et al., 2007) with some stating that they get all of their produce – at least during growing seasons – from their community garden (Hanna & Oh, 2000). One innovative study found that on average, community gardeners grew $435 dollars' worth of produce per plot and saved $1.53 per pound

of produce (Algert, Baameur, & Revnall, 2014). While these studies indicated that community gardens could directly improve food security for low-income groups, other studies have found that few low-income individuals and families participated in community gardens (Loopstra & Taruska, 2013) due to time barriers (e.g., working several jobs) (Loopstra & Taruska, 2013; Macias, 2008; Meenar & Hoover, 2012) as well as lack of knowledge about community gardens (Loopstra & Taruska, 2013). Other studies have found that the use of technology for communication (e.g., emails, Facebook, etc.) (Meenar & Hoover, 2012) and the lack of available plots and educational workshops to help novice gardeners (Evers & Hodgson, 2011) may also be barriers to community gardening for low-income groups.

In addition to the mixed picture regarding improving direct food access, several studies have revealed how community gardens can indirectly improve food security for low-income groups. Many community garden coordinators and community gardeners reported that they often donated surplus produce to local food-aid organizations (Corrigan, 2011; Hannah & Oh, 2000; Meenar & Hoover, 2012; Tieg et al., 2009). It is difficult to assess the impact of these food donations for low-income groups because the amount donated was not often reported; however, some studies indicated that a substantial amount of produce had been donated to charities on an annual basis; approximately 9,700 lbs. in Oakland, CA (McClintock, 2013) and 18,712 lbs. in Philadelphia, PA (Meenar & Hoover, 2012).

**Mental health & cognitive benefits.** Participating in community gardens, as well as interacting with nature in some way, has been shown to improve mental health and cognitive functioning. In various qualitative studies, community gardeners reported that gardening allowed them to ‘escape’ and reconnect with nature in a way that they viewed as spiritual (Hale et al., 2011; Kingsley et al., 2009; Mundel & Chapman, 2010; Wakefield et al., 2007). For example,

time slowed down as community gardeners became more in tune with cyclical and seasonal growing patterns (Hale et al., 2011). Studies have also found that community gardens could be effective health interventions for groups that have more spiritual connections to 'Mother Earth' than traditional Western societies (Mundel & Chapman, 2010).

The notion that interacting with nature could improve one's overall health has inspired research from various Western disciplines. Medical studies have found that hospital patients that had window views to nature (i.e., trees, plants, and water features) recovered more quickly from surgeries compared to patients that did not (Ulrich, 1986) and that views of nature lowered heart rates and improved stress recovery, mood and concentration (Laumann, Garling, & Stormark, 2003; Ulrich, Simons, Losito, Fiorito, Miles, & Zelson, 1991, Van Den Berg, Koole, & Van Der Wulp, 2003). Outside of healthcare settings, studies have found that nearby trees and green spaces in public housing improved the mood and coping skills among adult residents as well as reduced aggression, increased social interaction, and reduced fear of crime when compared to public housing residents without access to green spaces (Kuo, 2001; Kuo & Sullivan, 2001a,b). Similarly, studies have found that interacting with nature (i.e., parks) or simply views of nature improved children's concentration and impulse control, decreased symptoms of ADD, reduced aggression, and increased creative play (Strife & Downey, 2009; Taylor, Kuo, & Sullivan, 1998; Taylor, Kuo, & Sullivan, 2001).

Findings on the positive impact of nature on mental health and cognitive functioning have inspired the development of therapeutic community gardens located in prisons and hospitals (Ferris et al., 2001; Pudup, 2008). Various theories have been proposed, such as Attention Restoration Theory (Kaplan & Kaplan, 1989) and Biophilia Theory (Wilson, 1984), that essentially argue that humans have evolved with nature. Thus, we have a deep need to affiliate

with nature. Specific natural features, such as water and greenery, invoke a sense of safety and tranquility because these were areas that provided for the immediate needs of our ancestors. Access to green spaces in general (Cutts, Boone, & Brewis, 2009) and community gardens in particular (Milbourne, 2012) has been considered as a civil rights issue within the environmental justice movement. Advocating for environmental 'goods' is notable because the environmental justice movement has traditionally been focused on the disproportionate exposure to environmental harms (e.g., pollution) for poor communities and communities of color (Taylor, 2011).

**Employment & human capital benefits.** The community garden literature abounds with praise about the potential of community gardens to contribute to a 'green, profitable and fair' local economy; however, there are few studies that have explored this aspect. The few studies that have explored employment outcomes described a variety of workforce development activities in which micro-enterprise projects were incorporated into the community garden (Kaufman & Bailkey, 2000; Vitiello & Wolf-Powers, 2014). Often, organizers connected gardeners to farmers' markets or developed farm stands where gardeners could sell surplus produce and/or provided business training for gardeners to create and market value-added products (e.g., salad dressing from produce grown) (Kaufam & Bailkey, 2000; Vitiello & Wolf-Powers, 2014). In some cases, these entrepreneurial activities had remarkable outcomes. For example, one program that served homeless and formerly incarcerated individuals found that 70% of their 250 graduates were employed in full-time jobs and 95% of their formerly incarcerated participates had not returned to prison (Vitiello & Wolf-Powers, 2014). Nevertheless, studies have also indicated that it was difficult to assess economic benefits, particularly employment outcomes, largely due to varying business skills among organizers and

the lack of consistent funding for these entrepreneurial activities (Kaufman & Balkey 2000; Vitello & Wolf-Powers, 2014).

Other studies have found that community garden participants gained human capital, defined as skills, education, and knowledge valuable for employment (Macias, 2008), including self-confidence to apply such skills (Jones, 2012). For example, in programs that provided low-income youth stipends for managing aspects of the community garden, parents reported that their children learned responsibility in addition to various skills (Ghose & Pettygrove, 2014) In a case study of community gardens in low-income areas, community gardeners reported that they felt more confident and had gained new skills (Wakefield et al., 2007). Studies have also found that more women were involved in community gardens (Buckingham, 2005), particularly in leadership roles (Parry, Glover, & Shinew, 2005). Similarly, some women garden leaders reported gains in their self-confidence had led to greater confidence in other life domains, such as going back to school to obtain a higher degree (Parry et al., 2005).

**Social benefits.** Multiple studies have explored the capacity of community gardens to foster a sense of community and trust among neighbors. Indeed, Parry and colleagues (2005) have noted that "community gardens may be more about community than they are about gardening" (p. 180). In numerous qualitative studies, community gardeners reported that connecting with others and building a sense of community was their main reason for participating (Glover et al., 2005a; Kingsley et al., 2006, 2009; Ohmer et al., 2009; Poulsen et al., 2014; Tieg et al., 2009). In addition, community gardeners often reported that one of the main benefits of the community garden has been their ability to 'meet others they otherwise would have not met' (Poulsen et al., 2014).

In terms of who is meeting whom, studies have indicated that community gardens can act

either as places where diverse social groups can meet or as places where homogenous groups express their culture. For example, in several qualitative studies gardeners reported that inter-racial, cross-cultural, cross-socioeconomic, and multi-generational interactions occurred within community gardens (Ghose & Pettygrove, 2014; Firth et al., 2011; Ober-Allen, 2008; Poulsen et al., 2014; Tieg et al., 2009). Some community garden coordinators have reported that food was used to relieve racial tensions and build 'bridges' across various ethnic groups (Firth et al., 2011; Ghose & Pettygrove, 2014). Similarly, elderly community gardeners reported that they felt a sense of responsibility towards involved youth and mentored them on general life issues, even when some did not particularly like youth as a general rule and did not have a history of being involved with youth (Ober-Allen et al., 2008). One potential explanation for this was that elderly community gardeners stated that they felt a sense of pride in being able to transfer knowledge to a new generation (Ober-Allen et al., 2008; Ghose & Pettygrove, 2014).

Studies have also indicated that community gardens can be places where specific racial and ethnic groups celebrate their own cultural heritage. Several qualitative studies have found that Latinos, refugees, immigrants, and indigenous groups often utilized community gardens to grow familiar foods, cultivate a sense of 'home' and safety, and essentially socialize with others similar to themselves (Barraclough, 2009; Mundel & Chapman, 2010; Salvidar-Tanaka & Krasny, 2004; Schmelzkopf, 1995; Wakefield et al., 2007). Moreover, the ability to transfer cultural knowledge about how to grow food to their children and grandchildren was deemed particularly important by minority community gardeners in a nationwide survey (Waliczek et al., 1996).

Other studies have found that community gardeners can intentionally (Schmelzkopf, 1995) or unintentionally (Glover, 2004) exclude individuals along racial, ethnic, class, and

gender lines. For example, community gardeners, who were predominantly white, noted the lack of racial diversity within their garden, despite being located in a racially diverse and mixed-income neighborhood (Glover, 2004). Community gardeners attributed the lack of racially diverse participation to the community garden being fenced and locked, and the decision to plant ornamental plants rather than vegetables (Glover, 2004). The decision to fence in the garden was made for safety concerns and the decision to plant ornamentals was made based on input from the 'core' group. Although neither of these decisions were intended to exclude people of color, some community gardeners reported that the fence and the lack of community input unintentionally sent an exclusionary message that contributed to the lack of racial diversity.

Consequently, there is a mixed picture over the degree to which community gardens facilitate diverse social interactions. Scholars have suggested that the degree of diversity within a community garden may be a function of the demographics of the neighborhood and the intention of community gardeners to be open to 'Others' in the first place (Salvidar-Tanaka & Krasny, 2004; Schmelzkopf, 1995). Only one study has quantitatively assessed the degree of interracial interaction between Blacks and Whites within community gardens and whether one's sense of community and trust in others differed by race or by level of interracial contact (Shinew et al., 2004). Shinew and colleagues (2004) used a stratified sampling method to randomly recruit community gardeners in St. Louis, MO. Community gardeners were identified from a listing from a nonprofit that helped support the establishment of community gardens in moderate- to low-income neighborhoods. The listing was stratified by zip code to achieve a sample with adequate representation of Black and White community gardeners. A total of 180 community gardeners participated in telephone interviews; 52 were Black and 128 were White. Response rate was not provided nor did the authors indicate how many community gardens were

represented in the sample.

In this study (Shinew et al., 2004), participants were asked about the racial demographic make-up of their community garden (e.g., 75% White, 25% Black). Low interracial contact for White gardeners was defined as "20% or less of the people involved in their garden were Black" whereas high interracial contact was defined as "more than 20% were Black". Low and high interracial contact for Black gardeners was defined in the same way with respect to White gardeners (Shinew et al., 2004). The authors stated that "the 20% mark was selected after carefully examining the data, and matches the percentage Floyd and Shinew (1999) used to represent "racially mixed communities" (p. 344). No other rationale was provided nor additional information obtained from Floyd and Shinew's (1999) study for the 20% mark.

Shinew and colleagues (2004) found that there were no differences by low and high contact groups or by race for one's sense of community and trust in others (Shinew et al., 2004). The authors explained these results by the fact that community gardens 'require people to work together', thus, fostering community and trust regardless of race. However, the authors also suggested that their perceived racial diversity measure might not have measured the degree of interracial contact effectively. They note that a racially diverse community garden does not necessarily mean that racial groups actually socially interacted or that social interactions were positive.

Shinew and colleagues (2004) also found that on average White gardeners reported living in mixed neighborhoods (49% White) but that their community garden was comprised of primarily White gardeners (72%). In contrast, Black gardeners reported living in predominantly Black neighborhoods (80%) and that their community garden was comprised of primarily Black gardeners (74%). These findings suggest that while diverse demographics groups have been

involved in community gardens, each community garden may not be demographically diverse, even when located in racially diverse neighborhoods.

Lastly, studies have also indicated that gardeners received personal benefits from increasing their social network. Community gardeners often reported that mutual aid occurred because of the trusting relationships built within the garden (Glover et al., 2005a; Kingsley & Townsend, 2006; Tieg et al., 2009; Poulsen et al., 2014). Mutual aid took place within the context of gardening (e.g., tips on how to compost) and beyond the garden. For example, community gardeners reported receiving social support from fellow gardeners ranging from help with mundane tasks (e.g., fixing a sink) to being available during times of profound crises or loneliness (Glover et al., 2005a), such as helping when a fellow gardener's loved one had Alzheimer's (Kingsley & Townsend, 2006) or bringing a fellow gardener dying of cancer to the community garden one last time (Tieg et al., 2009).

**Civic engagement benefits.** Studies have also found that involvement in community gardens can increase civic engagement and values among gardeners. Civic engagement refers "to the ways in which citizens participate in the life of a community in order to improve conditions for others or to help shape the community's future"; it often involves individual and collective action (Adler & Goggin, 2005, p. 236). Community gardeners have often reported that they had learned about other community issues through informal conversations with fellow gardeners and initiated actions to address these needs (Glover et al., 2005a; Tieg et al., 2009). For example, community gardeners have developed informal programs using their own resources or undertook political activity to address local needs, according to community garden coordinators (Armstrong, 2000). As to why this may be the case, studies have found that members' involvement in community gardens was associated with higher individual levels of perceived

informal social control, collective efficacy (Alaimo et al., 2010), and neighborhood attachment (Comstock et al., 2011) compared to non-gardeners. Moreover, studies have also found that community gardening was associated with volunteering in other organizations (Ohmer et al., 2009) and that garden leaders had higher democratic values compared to garden participants (Glover et al., 2005b).

A few studies have explored whether involvement in community gardens could lead to 'ecological citizenship' meaning increases in a conservation ethic and ecological knowledge as well as civic engagement. The literature presents a mixed picture of the relationship between environmental and civic domains and community garden participation. One quantitative study found that a conservation ethic was not associated with community garden participation whereas civic engagement (i.e., volunteering) was (Ohmer et al., 2009). Another study found that there appeared to be a trade-off between the breadth and depth for environmental and civic domains among community gardeners (Bendt, Barthel, & Colding, 2013). In other words, a small group of gardeners could commit to learning deeply about the local ecology (e.g., soil conditions, wind patterns, etc.) and thus, spend less time on engaging others with community-building activities. Whereas a more fluid group of gardeners may spend more time engaging others by providing a plethora of social, cultural and political activities (e.g., BBQs, art shows, etc.) with the community garden; however, each gardener gained less ecological knowledge.

**Community-level benefits & consequences.** In addition to providing multiple individual-level benefits, studies have also explored the capacity of community gardens to provide community-level benefits. For example, knowledge about community problems coupled with collective efficacy and a sense of community often led the gardening group to engage in civic activities and neighborhood revitalization efforts, such as successfully lobbying for

neighborhood parks or grocery stores that benefited the gardeners as well as the wider community (Armstrong, 2000). Notably, studies have found that gardeners in community gardens located in low-income neighborhoods were more likely to address neighborhood needs compared to those located in higher income areas (Armstrong, 2000).

Neighborhood revitalization and increased safety have been the most prevalent community-level outcomes or benefits explored within the community garden literature. In earlier studies, combating urban blight and crime had often been reported as the impetus for inner city residents to develop community gardens (Glover, 2003; Schmelzkopf, 1995, 2002; Staeheli et al., 2002). Some residents reported that they considered community gardens less confrontational and a more positive response to crime compared to neighborhood watch patrols (Glover, 2003). These earlier case studies documented how residents were able to 'drive out' crime with community gardens as residents made it known that certain behavior was not tolerated within their neighborhood. Scholars explain these results as being due to increased informal social control or more 'eyes on the street' that deterred crime (Tieg et al., 2009; Glover, 2003; McClintock, 2013; see Jacobs, 1961/2011 for excellent overview of the interaction between physical design, social contact and social wellbeing).

A few quantitative studies have also suggested that community gardens can improve neighborhood conditions. Been and Voicu (2006) compared the property values of census tracts with and without community gardens. They found that census tracts with community gardens were associated with higher residential property values compared to tracts without community gardens; moreover, this difference was greatest for low-income areas. Crossney and Shellenberger (2012) compared 2010 census tracts variables that had community gardens to 2000 census tract variables. They found that over time, tracts with community gardens had increased

levels of college graduates and higher housing property values and decreased levels of poverty and vacant housing.

Community gardens can lead to land use conflicts as property values increase. Case studies in New York (Schmelzkop, 1995, 2002; Staehli et al., 2002) and Los Angeles (Barraclough, 2009) have documented conflict between community gardeners and city officials as the land that community gardens were located on became valuable for more permanent ventures. For example, in New York, city officials indicated that redevelopment was necessary to provide affordable housing; however, the city did not require specific proportions of affordable housing in developer contracts (Schmelzkop, 1995; Steahli et al., 2002). In response, community gardeners from across the city organized together and staged community-wide protests to redevelopment efforts that successfully brought national attention to their issue; even Bette Milder was involved (Schmelzkopf, 1995, 2002; Staeheli et al., 2002). Despite these efforts, the majority of community gardens in New York's low-income areas were torn down. Consequently, secure land tenure remains a significant barrier for the longevity of community gardens (Milburn & Vail, 2010) as well as fair procedures ensuring that other social needs are met (i.e., affordable housing) should community gardens in low-income areas be redeveloped (Eizenburg, 2012; Steahli et al., 2002).

**Community Gardens as Ideal & Idealized Interventions**

In sum, the 'community garden renaissance' has been associated with the efforts of the alternative food movements to raise awareness about a variety of interconnected social and environmental issues with the industrial food system. Moreover, community gardens are increasingly organized or supported by formal agencies to address a variety of issues (e.g., healthy food access, etc.) and also attract diverse participants whose reasons for involvement

range from environmental, health, to social concerns (Birky & Strom, 2013; Pudup, 2008). These two trends – greater formal organizational involvement and greater participation by diverse groups, including the white middle class – differ from prior community garden movements in which, during economic crises, government agencies donated land to the poor to meet basic needs, such as fresh food. Once the economic crisis had passed, so did government support (Birky & Strom, 2013; Pudup, 2008). Birky and Strom (2013) have suggested that current trends could lead to community gardens becoming a permanent feature that benefit multiple constituencies, particularly oppressed groups.

Food movement scholars caution that those with privilege can emphasize environmental sustainability over social justice (i.e., vote with your fork) and/or exclude oppressed groups from participating in and benefitting from AFIs due to colorblind assumptions and the desire to 'bring good food to others' (i.e., missionary zeal). In response, the food justice and food sovereignty movements have emerged to advocate for the recognition that oppressed groups must be involved and have leadership roles in AFIs under the belief that those most affected can shape these initiatives with those with privilege to more effectively to advance social justice.

The community garden literature and activists have largely promoted community gardens as ideal interventions often without regard to the ways privilege may operate and exclude members of oppressed groups, even in community gardens located in low-income neighborhoods (Ghose & Pettygrove, 2014; Meenar & Hoover, 2012; Reynolds, 2014). An oft unexamined assumption within the community garden literature is that community gardens automatically benefit everyone. However, the few studies that have explored how community gardens 'produce' multiple benefits suggest that the assumption of automatic and equal benefits is naïve (Glover, 2004; Glover et al., 2005a; Firth et al., 2011; Kingsley & Townsend, 2006).

Moreover, the community garden literature often ignores the variations within the realm of community gardens. Thus, it is not always clear who the 'community' is in community gardens or what characteristics of community gardens might be associated with these gardens providing benefits for multiple communities.

## Gaps in the Literature

**Overarching gap.** No study has explored community gardens within the Southern region of the US. Community garden research has drawn from studies in the Northeastern, Midwestern and the Northwestern regions of the US (see summary table in Appendix A). Because many food movement activists are concerned with developing a sustainable food system, the lack of studies in the South is somewhat ironic given that the Southern US has one of the most optimal growing climates and has a history of being an 'agriculture' powerhouse. However, this agriculture history has also been 'colored' by slavery, which may uniquely affect who becomes involved (see Kato, 2013 for example of how history of racial segregation influenced race and class diversity in another AFI in New Orleans). To begin to address this gap, this study's research questions will focus on community gardens in Richmond, VA.

**Specific gaps.** First, the literature is quite clear that various demographic groups are involved in community gardens and that these community gardens can be located in neighborhoods that vary socioeconomically. What is not always clear is who is involved in community gardens located in low-income neighborhoods. Research studies often report the demographics of community gardeners (Glover et al., 2005b; Hale et al., 2011; Ohmer et al., 2009; Parry et al., 2005; Salvidar-Tanaka & Krasney, 2004; Tieg et al., 2009; Waliczek et al., 1996), or the neighborhoods (Armstrong, 2000) but not both (see Meenar & Hoover, 2012; Shinew et al., 2004 for exceptions). In some cases, demographics of gardeners and/or

neighborhoods were described anecdotally by researchers (Glover et al., 2005a; Firth et al., 2011; Kingsley & Townsend, 2006; Wakefield et al., 2007).

Relatedly, few studies have examined racial differences among community garden members; a critical variable according to food justice and food sovereignty scholarship. In particular, differences by race in values and perceived benefits of community gardens are important to examine further. Some qualitative community garden studies have indicated that there is a 'white, middle-class' who are involved primarily out of 'green' concerns while communities of color are involved primarily to improve community food security and their neighborhood (Firth et al., 2011; Ghose & Pettygrove, 2014; Kingsley & Townsend, 2006). The two studies that have quantitatively examined differences by race supports these observations. These studies found that people of color were more likely to state that it was important for their community garden to provide benefits to the wider community (i.e., provide food for others, improve neighborhood) compared to white community gardeners (Shinew et al., 2004; Waliczek et al., 1996).

On the other hand, some scholars have suggested that once aware of their own privilege, this 'white, middle-class' could effectively work across racial differences (Reynolds, 2014). While the community garden literature does not speak explicitly about the values of gardeners involved, it seems reasonable to infer that environmental values is analogous to 'green' concerns and that social justice values is analogous to being aware of systems of oppression and privilege and attempting to be more inclusive based on that understanding. These findings lead to some interesting questions. What are the environmental values and social justice values of community gardeners, and do they differ by race? To what extent do gardeners perceive their community garden to benefit the environment, themselves, and their community? And, do their perceptions

differ by race?

Second, the literature indicates that community gardens can vary across several dimensions (Milburn & Vail, 2010), but little is known about the nature and type of variation or whether these differences have an impact on garden outcomes. One study in the UK found that community gardens differed in terms of their size, number of gardeners, funding sources, and provision of social and educational activities (Pearson & Firth, 2012). In their mixed-methods study in Philadelphia, Meenar and Hoover (2012) found that community gardens vary in how economically accessible they are (i.e., membership fees), outreach methods (i.e., use of internet), and whether food is donated and if so, to whom and how (i.e., informally given to friends or formally donated to food banks). Few studies have explored the rationale for organizational differences among community gardens; for example, why have a fence? Some community garden organizers (i.e., individuals that manage or representatives from nonprofits that indirectly manage community gardens) have stated that a fence was for security purposes while others have stated that a fence was exclusionary and indicative of "outsiders" of a neighborhood managing a community garden (Meenar & Hoover, 2012).

In addition, the community garden literature provides a wealth of evidence that multiple demographic groups participate in community gardens. What is less clear is how racially diverse each community garden is, particularly those in low-income neighborhoods. In some qualitative and mixed-method studies, gardeners (Kingsley & Townsend, 2006), garden leaders (Glover, 2004) and community garden coordinators (Meenar & Hoover, 2012; Ghose & Pettygrove, 2014) have reported that community gardeners were predominantly White. The few studies that have quantitatively compared community garden demographics to the neighborhood (Shinew et al., 2004) or the city (Meenar & Hoover, 2012) have found that community gardens located in

racially diverse neighborhoods were also predominantly White. Given concerns about 'white privilege' in community gardens in low-income neighborhoods, it becomes important to clarify how racially diverse these community gardens are relative to the neighborhood.

Relatedly, the literature suggests that the minority status of community garden leaders may influence how community gardens operate, which, in turn, may influence who becomes involved (Meenar & Hoover, 2012; Holland, 2004). Food justice and food sovereignty scholarship in particular argues that minorities in leadership roles may organize a community garden differently because of their understanding of structural barriers. For example, minority leaders may be more likely to implement a collective leadership model (i.e., multiple co-leaders), communal plots, have no membership fees, and use different modes of communication for outreach. One can belong to a minority or oppressed group based on multiple identities; however, this study will focus on racial minorities in leadership, as differences by race is critical to understand from a food justice and food sovereignty perspective.

**Research Questions**

Thus, thus study's research questions were:

1. What are the characteristics of gardeners involved in community gardens located in Southern urban food deserts (Richmond, VA)?
    a. Do gardener characteristics differ by race?
2. What are the characteristics of community gardens located in Southern urban food deserts (Richmond, VA)?
    a. What is the rationale for variations in garden characteristics?
    b. Do garden characteristics differ by the race of the garden leader?

## Section III. Social Capital, Community Gardens & Social Justice

Social Capital Theory has been the predominant theory used to understand the nature of community gardens and the range of benefits derived from the gardens that enhance wellbeing for individuals and communities (Alaimo et al., 2010; Comstock et al., 2010; Firth et al., 2011; Glover, 2004, 2005a; Kingsley & Townsend, 2006; Ohmer et al., 2009; Poulsen et al., 2014; Saldivar-Tanaka & Krasny, 2004; Shinew et al., 2004; Tieg et al., 2009; Wakfield et al., 2007). Importantly, Social Capital Theory can help us understand the role community gardens might play in promoting social justice or reproducing existing inequalities. This section first will provide a brief overview of Social Capital Theory, apply Social Capital Theory to community gardens, and then discuss the relationships among community gardens, social capital, and social justice. Section III ends with two conceptual models derived from Social Capital Theory, which informs specific hypotheses about the relationships between characteristics of gardeners and community gardens and social capital.

### Social Capital Theory

Social capital refers to resources embedded in social relationships. Resources are available to individuals and communities through various social networks that are developed through the process of building trust and sharing norms and values among individuals (Loeffler, Christiansen, Tracy, Secret, Ersing, Fairchild, & Sutphen, 2004). Social capital is only valuable to the extent that individuals or groups are able to access resources they otherwise would not have (Glover, 2004).

It is important to distinguish between the process of developing social capital and the product of social capital (Foster & Maas, 2014; Glover, 2004; Glover et al., 2005a; Hawe & Shiell, 2000; Portes, 1998). The process of developing social capital refers to people socializing,

building trust, and honoring shared norms and values resulting in strong emotional bonds between individuals, or simply put relationships. Sense of community has been used in several studies as a social capital indicator for a person's emotional connection to community members and the community as a whole (Carpiano & Hystad, 2011; Kingsley & Townsend, 2006; Ohmer et al., 2009; Poulsen et al., 2014; Shinew et al., 2004). The product of social capital refers to relationships (i.e., the social) as well as the resources (i.e., the capital) embedded in, and derived from, these relationships. Indeed, Portes (1998) notes that "To possess social capital, an individual must be related to others, and it is those others, not himself, who are the actual source of his or her advantage" (p. 7). Put another way, Foster and Maas (2014) state that "For something to be considered capital, it must represent a stock of assets that have utility; for capital to be social, it must inhere in social relations" (p. 2).

Resources derived from relationships can take on several forms; namely social support and instrumental resources. Social support refers to relationships that enhance wellbeing, such as friendships (Hawe & Shiell, 2000). For example, gardeners can share personal issues and gain emotional support (i.e., sick parent) with fellow gardeners thereby enhancing their mental health and wellbeing (Kingsley et al., 2009). Instrumental resources, such as information and contacts, are conducive to being converted to other forms of capital (i.e., human, cultural, financial, political, and physical capital) and thus, are useful for upward economic and social mobility (Coleman, 1998; Foster & Maas, 2014; Lin, 2000). Instrumental resources are used by individuals for purposive actions that benefit themselves or the group (Glover, 2004). For example, gardeners can obtain skills or contacts that lead to future employment (Vitello & Wolf-Power, 2014), or a gardener can learn of grants to apply for that helps the gardening group as a whole (Glover et al., 2005a).

In sum, as each person develops a relationship with another – within the context of trust, and shared norms and values – a community network is formed. Individuals may have more resources simply because they have increased their social ties to others that include the potential of additional resources that he or she can now access. The group itself may have more resources simply because an individual who joins brings his or her own resources that are potentially valuable to the group. Resources embedded in these social networks can then facilitate coordinated actions among community members that benefit individual members, the community group and the broader community (i.e., neighborhood) and thus, explain the 'flow' of benefits from individuals to communities (Putnam, 2000).

Typically, social capital has been differentiated into bonding and bridging social capital within the literature (Putnam, 2000). Bonding refers to relationships between individuals or groups who share a social identity, such as demographics, common interests, or shared values (i.e., homogenous) whereas bridging refers to relationships between individuals or groups who differ (i.e., heterogeneous) (Lin, 2001; Putnam, 2000; Wakefield & Poland, 2005). Often, 'homogenous' and 'heterogeneous' are defined by demographics. For example, ties between individuals who are of the same race have been referred to as bonding social capital while ties between individuals who are not of the same race have been referred to as bridging social capital (Firth et al., 2011; Kingsley & Townsend, 2006). Scholars have argued that bridging social capital (e.g., ties that cross race, etc.) is more valuable for members of oppressed and minority groups because it is assumed they will be able to access more instrumental resources useful for upward economic and social mobility than what is available from their own community (Foley & Edwards, 1997; Hawe & Shiell, 2000; Lin, 2000).

There are challenges, however, to distinguishing bonding and bridging social capital based on demographic diversity alone. Scholars have found that the current definitions of bonding and bridging social capital may be inadequate to capture the kinds of relationships formed within community gardens (Firth et al., 2011; Kingsley & Townsend, 2006). For example, if a community garden brings together individuals that form relationships that cross racial boundaries, should these be classified as bonding or bridging social capital? In essence, some community gardens have served a 'bridging' function in which gardeners developed strong bonds that cross demography, likely because they shared values or a common interest, and resources were potentially accessible from these bonding-bridging relationships (Glover, 2005a; Kingsley & Townsend, 2006).

The complex array of relationships that can form in community gardens suggests that associations between demographic diversity and shared values on relationships (i.e., the social), and resources from relationships (i.e., the capital) should be assessed separately (Glover, 2005a; Foster & Maas, 2014). With respect to the 'social' of social capital, the relational demography literature differentiates between surface-level differences (i.e., demographics) and deep-level similarities (i.e., shared values) (Harrison, Price, Gavin, & Florey, 2002). Surface-level differences are defined as differences among individuals on "overt demographic characteristics" while deep-level similarities refer to sharing similar values, beliefs, attitudes, and worldviews (Harrison et al., 2002). Such a distinction would be helpful for us to understand the extent to which relationships formed in community gardens are based on demographic similarities and/or shared values.

With respect to the 'capital' of social capital, demographic diversity as a proxy indicator for valuable resources assumes that poor communities and communities of color do not have

resources of value, which may be an erroneous assumption. Glover (2005a) argues this point well, stating that "without some knowledge of the content of ties, and of the specific resources available through networks, we have no way of judging how much capital an individual or group actually has at its disposal (p. 453). Examining the demographic make-up of a community garden's network separate from resources potentially available to gardeners in that community garden's network would allow us to test this assumption.

Given this context, the author follows Glover's (2004, 2005a) lead in eschewing the bonding/bridging distinctions typically used with Social Capital Theory because they cloud rather than clarify the kinds of relationships formed and resources available in community gardens. Thus, the following discussion focuses on two indicators of social capital: sense of community and resources accessible. Building trust, and shared values and norms among gardeners result in relationships or sense of community (i.e., the social) among gardeners and resources potentially available (i.e., the capital) to gardeners embedded in, and derived from these relationships.

**Social Capital Theory & Community Gardens**

Theoretically, community gardens act as informal 'third' places (following the home as first and work as second) that allow individuals to socialize in a common endeavor (Glover, 2004). By working together, members can develop trust in each other, and shared norms and values (Glover, 2004); thus, constructing a 'community' where members generate and benefit from social capital (Colcough & Sitamaran, 2005). Because gardeners share at least one common interest (i.e., gardening), it is possible that this shared interest facilitates building trusting relationships that cross differences. Furthermore, depending on the assets of individuals who

become involved, community gardens can create social capital available that benefit individual gardeners, the gardening group, and the neighborhood.

Empirical evidence also suggests that community gardens have acted as places that facilitated the development of social capital. Gardeners have oft reported that by working together on a common endeavor, they built trust, mutual respect, and shared norms or group standards for what was acceptable behavior among gardeners (Glover et al., 2005a; Kingsley & Townsend, 2006; Kingsley et al., 2009; Ohmer et al., 2009; Poulsen et al., 2014; Tieg et al., 2009; Wakefield et al., 2007). Gardeners have also reported that they perceived other gardeners to share similar 'green' values like themselves (Kingsley & Townsend, 2006). Notably, community garden participation has been significantly and positively associated with trust towards neighbors (Alaimo et al., 2010) and there were no differences by race in trust towards neighbors (Shinew et al., 2004). These findings suggest that community gardens can help people build relationships that cross demographic divides, likely because gardeners share similar values or common interests.

Strong emotional bonds have been the predominant social capital outcome reported in community garden studies. A majority of gardeners indicated that they felt a sense of community with other gardeners (Kingsley & Townsend, 2006; Ohmer et al., 2009; Poulsen et al., 2014; Tieg et al., 2009; Wakefield et al., 2007) and that the desire for a sense of community was their main motivation for joining (Glover et al., 2005a; Kingsley & Townsend, 2006). Furthermore, some studies indicated that the network was demographically diverse, crossing race, class, and age (Firth et al., 2011; Ghose & Pettygrove, 2014; Ober-Allen et al., 2008; Tieg et al., 2009). Gardeners have oft reported that they have met people they otherwise would not have because of the garden (Kingsley & Townsend, 2006; Poulsen et al., 2014).

Gardeners have been able to mobilize social capital through the garden network to: establish and maintain the community garden (Glover, 2004; Glover et al., 2005a; Kingsley & Townsend, 2006; Firth et al., 2011); benefit individual gardeners outside of gardening purposes (Glover et al., 2005a; Kingsley & Townsend, 2006; Tieg et al., 2009); and, benefit surrounding neighborhood residents who do not garden. With respect to individual benefits, gardeners have indicated that they received social support from friendships formed (Glover, 2005a; Kingsley & Townsend, 2006; Tieg et al., 2009) and instrumental resources, such as fixing a sink and moving furniture, from these relationships (Glover, 2005a).

With respect to neighborhood benefits, gardeners have reported learning about neighborhood issues by talking with other gardeners and mobilized resources within the garden network to address needs (Tieg et al., 2009), such as successfully lobbying the city for a park and playground (Armstrong, 2000). More often than political advocacy, community gardens have been utilized by members to provide activities for non-gardening neighborhood residents (Firth et al., 2011; Salvidar-Tanaka & Krasney, 2004; Tieg et al., 2009). In this way, the community garden facilitated the development of social capital among neighborhood residents by increasing their social ties and access to potential resources derived from these relationships (Firth et al., 2011).

**Social Capital, Community Gardens & Social Justice**

Community gardens can promote social justice by providing a space and place for oppressed groups to access resources through social capital. Social capital has the potential to connect the multiple and immediate individual benefits of community garden members (e.g., partial food security, mental health, etc.) with civic engagement and community organizing to further social justice initiatives. Evidence suggests that community gardens can act as catalysts

for civic engagement that benefit low-income neighborhoods and thus, may also be effective 'breeding grounds' for building a more inclusive food movement that can successfully advocate for humanely and sustainably produced food as a human right (McClintock, 2013).

We cannot assume, however, that community gardens generate social capital that is automatically and equally accessible to gardeners involved or that non-gardening residents benefit (Glover, 2004; Firth et al., 2011). According to Schlosberg (2004), advancing social justice requires attending to three criteria – fair distribution of resources and opportunities, recognition of deeply embedded systems of oppression that lead to unfair outcomes, and the authentic participation of oppressed groups in order to develop more fair systems. Unless all three criteria are attended to, social injustice can be perpetuated rather than diminished.

For example, both white and minority community gardeners have reported that some community garden efforts appeared to be 'white-led' (Ghose & Pettygrove, 2014; Meenar & Hoover, 2012; Reynolds, 2014) and were initiated out of environmental concerns (Firth et al., 2011; Kingsley & Townsend, 2006) and/or community food security concerns (Block et al., 2012; Cohen & Reynolds, 2014; Ghose & Pettygrove, 2014; Meenar & Hoover, 2012; Reynolds, 2012). These 'white-led' efforts have been associated with top-down approaches in which non-gardening neighborhood residents were not consulted about establishing the garden (Firth et al., 2011; Kingsley & Townsend, 2006) or what should have been grown (Glover, 2004). Presumably, non-gardening residents were not consulted because white organizers thought they were 'bringing good food to others' (Guthman, 2008b). Consequently, these 'white-led' efforts have primarily attracted white gardeners as participants who desired a sustainable lifestyle (Firth et al., 2011) even in community gardens located in low-income and primarily minority neighborhoods (Firth et al., 2011; Meenar & Hoover, 2012).

Studies have also indicated that white-led gardening groups have been able to access more resources compared to minority-led gardening groups (Ghose & Pettygrove, 2014; Meenar & Hoover, 2012; Reynolds, 2014). For example, white-led groups were able to obtain more funding, as much as $1 million in grants, compared to minority-led gardening groups, who often relied on church bake sales (Reynolds, 2014). Scholars warn that social injustice can be reproduced if participants are unaware of their own privilege. One white community gardener summed these concerns best, stating that

> there are two very unique and distinct aspects of this…movement that's going on…One is very middle class and white, and one is not. One is of color and very low-income. And they are…very separate. Unless they are brought together, I don't know that the success of either is going to continue. (Reynolds, 2014, p. 13)

In sum, some white-led community garden groups may assume these gardens are inherently beneficial and that they are helping to solve a problem when in fact a community garden in a low-income neighborhood may only be serving a niche, white middle class interest group while masking structural issues (e.g., poverty).

Fortunately, not all ostensibly white-led community gardens reproduce social inequities. Because of the awareness raised by the food justice and food sovereignty movements, more organizations and citizens with white privilege are focusing on social justice. For example, some organizations offer anti-oppressive trainings for community garden organizers, and engage in policy development and advocacy work to raise awareness about the structural roots (e.g., racism, classism, etc.) for various food-related issues (Reynolds, 2014). Thus, there is some evidence that critical attention to who benefits from community gardens can lead more privileged participants to understand structural inequities while simultaneously enabling all

stakeholders to ‘re-imagine’ what is possible, effectively pool their resources, and thus, more successfully advocate for policies that advance social justice.

## Conceptual Models: Predictors of Social Capital

Community gardens have the potential to generate social capital that benefit individual members, the gardening group, and neighborhood residents (see Glover et al., 2005a for example). Social capital, however, needs to be equitably accessible to all garden members (Glover, 2004) and be beneficial to neighborhood residents to realize its social justice goals (Firth et al., 2011). Given that a community network and resources are necessary before community gardeners can generate long-term benefits, such as advocating for policy change and engaging in other social justice initiatives, this study examined what is known and not known about community gardens that may be related to social capital. Specifically, this study’s conceptual models and related hypotheses examined individual gardeners’ access to social capital by virtue of belonging to a community garden. Recall that there are two indicators of social capital: sense of community (i.e., the social) developed among gardeners and the resources (i.e., the capital) embedded in, and derived from, those relationships.

Few studies have quantitatively examined predictors for community gardeners’ sense of community (Ohmer et al., 2009; Shinew et al., 2004) and none have examined gardeners’ access to potential resources within community gardens. Following is a discussion of the major concepts and relationships suggested in the literature as important individual and organizational predictors of social capital and ends with a summary table of hypotheses (see Table 2).

Individual predictors are:

1. Perceived racial differences and deep-level similarities,
2. Socializing across race, and

3. Perceptions of organizational processes (i.e., democratic decision-making and leadership opportunities).

Organizational predictors are:

1. Demographic make-up of the garden's network (i.e., Racial Network Diversity)
2. Leadership (i.e., race of garden leader and shared leadership), and
3. General garden characteristics (i.e., gardening practice type, enclosure type, and events provided).

**Individual Predictors**

**Perceived differences & similarities.** The community garden literature has presented mixed results regarding the effect of racial diversity on social capital. Some studies have found that community gardens foster trust and sense of community across diverse groups (Firth et al., 2011; Ohmer et al, 2009), while other studies have found that community gardens can be exclusionary along racial, ethnic, and class lines (Glover, 2004; Saldivar-Tanaka & Krasny, 2004).

Understanding 'relational demography' can help disentangle these mixed effects. The relational demography literature distinguishes between surface-level differences and deep-level similarities. Surface-level differences are defined as differences among individuals on "overt demographic characteristics" while deep-level similarities refer to sharing similar values, beliefs, attitudes, and worldviews (Harrison et al., 2002). Studies in this literature have found that perceived racial differences had a negative relationship on trust and sense of community (Portes & Vickstrom, 2011; Shemla, Meyer, Greer, & Jehn, 2014; Stolle & Rochon, 1998), but that perceived deep-level similarities had a positive relationship on trust and sense of community (Elfenbein & O'Reilly, 2007; Harrison, Price, & Bell, 1998; Harrison et al., 2002). Furthermore,

perceptions of differences and similarities were more salient than actual differences and similarities (Harrison et al., 2002).

The relationship between perceived racial differences, shared values, and resources potentially available to gardeners has only been explored, sometimes partially, in two qualitative studies in the literature (Glover, 2005a; Kinglsey & Townsend, 2006). In Kingsley and Townsend's (2006) case study, gardeners perceived little racial differences (predominantly white) and that all shared the same 'green' values. However, resources these gardeners obtained primarily took the form of social support; very little instrumental resources, such as job referrals, were obtained. Kingsley and Townsend (2006) suggested that time may be a factor related to accessing instrumental resources. In contrast, gardeners reported receiving social support and instrumental resources in Glover's (2005a) qualitative study with 13 gardeners from multiple gardens, seven of whom were persons of color. However, perceived racial differences and shared similarities to other gardens were not assessed (Glover, 2005a). From this evidence alone, it is difficult to come to any conclusions.

Assuming then that demographic diversity indicates diverse resources, then perceived racial differences should be associated with greater resources, particularly those accruing to racial minorities (Lin, 2000). Further, if perceived deep-level similarities help relationships form that cross race and other demographic divides, then perceived deep-level similarities should be associated with greater resources, particularly those accruing to racial minorities in demographically diverse community gardens. Thus, the author hypothesized the following:

> Ind_H1a: An increase in gardeners' Perceived Racial Differences will be associated with a decrease in gardeners' Sense of Community and an increase in potential Resources Accessible.

Ind_H1b: An increase in gardeners' Perceived Deep-level Similarities will be associated with an increase in gardeners' Sense of Community and an increase in potential Resources Accessible.

**Socializing across race.** The community garden literature has also presented mixed effects for the relationship between socializing across race and social capital. Qualitative studies have indicated that community gardens have been places where diverse groups socialized and fostered Sense of Community (Firth et al., 2011; Kingsley & Townsend, 2006, 2009; Poulsen et al., 2014; Tieg et al., 2009; Wakefield et al., 2007) and potential Resources Accessible for gardeners (Firth et al., 2011). However, one quantitative study found there were no differences for trust and sense of community between high and low interracial contact groups for gardeners (Shinew et al., 2004). In this study, interracial contact was defined by participants' perceived racial diversity; low interracial contact was defined as when a gardener perceived there to be 20% or less involved in their garden were of a different race whereas high interracial contact was defined as when a gardener perceived there to be more than 20% involved in their garden were of a different race. The authors note that perceptions of a racially diverse community garden does not necessarily mean that racial groups actually interacted or that social interactions were positive.

The importance of social interactions has been supported in the literature on relational demography (Harrison et al., 1998, 2002). Time spent with diverse others was a significant variable in these studies; the more that people interacted with those who differed demographically, the more they found common interests and developed trust and emotional ties (Harrison et al., 1998, 2002). Furthermore, it was important that these interactions were viewed positively (Portes & Vickstrom, 2011). To better understand these effects, two types of social

interactions have been included in the model: meeting racially diverse others in the garden (MEET) and mixing socially with racially diverse others outside of the garden (MIX). Thus, the author hypothesized the following:

Ind_H2a: An increase in gardeners' meeting others who differ racially will be associated with an increase in gardeners' Sense of Community and an increase in potential Resources Accessible.

Ind_H2b: An increase in gardeners' mixing socially outside of the garden with gardeners who differ racially will be associated with an increase in gardeners' Sense of Community and an increase in potential Resources Accessible.

Ind_H2c: Mixing socially outside of the garden with gardeners who differ racially will have a stronger relationship with gardeners' Sense of Community and potential Resources Accessible compared to meeting gardeners of a different race within the garden.

**Perceived organizational processes.** Democratic decision-making processes and opportunities for taking on leadership roles or tasks are important components of community gardens engaging gardeners (Glover, 2004; Kingsley & Townsend, 2006; Milburn & Vail, 2010) and should have a positive association with Sense of Community and potential Resources Accessible. Specifically, democratic-processes and leadership opportunities helped build trust as members were encouraged to have a voice, learned to negotiate conflict and were empowered to contribute their skills to the garden in various ways (Holland, 2004; Kingsley & Townsend, 2006; Milburn & Vail, 2010; Tieg et al., 2006).

Further, gardeners, particularly those who were racial minorities, lacked power to access resources from a community garden's network because they were excluded from participating in

decision-making processes and did not have opportunities to develop leadership 'status' within the group (Glover, 2005a). The lack of democratic decision-making has been associated with 'top-down' approaches in both community gardens managed by formal entities (i.e., nonprofits) (Firth et al., 2011; Kingsley & Townsend, 2006) and by informal groups (i.e., neighborhood association) (Glover, 2004). These findings suggest that democratic decision-making and leadership opportunities are the most salient predictors for social capital, not type of entity. Thus, the author hypothesized the following:

> Ind_H3a: An increase in gardeners' perceptions of democratic decision-making will be associated with an increase in gardeners' Sense of Community and an increase in potential Resources Accessible.
>
> Ind_H3b: An increase in gardeners' perceptions of leadership opportunities will be associated with an increase in gardeners' Sense of Community and an increase in potential Resources Accessible.

**Organizational Predictors**

**Racial Diversity.** No community garden study has examined the relationship between the racial composition of a community garden on members' perceived social capital (see Shinew et al., 2004 for perceived racial diversity on social capital). However, studies from relational demography and social capital have indicated that the more racially diverse a group is, the lower Sense of Community will be for its members (Lawrence, 2011; Stolle et al., 1998).

Social Capital Theory predicts that greater racial network diversity is more likely to lead to higher levels of potential Resources Accessible to its members. Yet, Social Capital Theory also suggests differential effects for racial network diversity and social capital. Predominantly white groups will likely have access to greater levels of potential Resources Accessible than

groups who are predominantly composed of people of color. Hence, scholars have argued that racially diverse groups are more important for racial minority members to access instrumental resources (Firth et al., 2011; Foley & Edwards, 1997). Thus, the author hypothesized the following:

> Org_H1a: Gardeners' Sense of Community will be higher for 'homogenous, mainly white' community gardens and 'homogenous, mainly people of color' community gardens compared to 'heterogeneous, evenly mixed' community gardens.
>
> Org_H1b: Gardeners' access to potential Resources will be higher for 'homogenous, mainly white' community gardens and 'heterogeneous, evenly mixed' community gardens compared to 'homogeneous, mainly people of color' community gardens.
>
> Org_H1c: Gardens that are "Homogenous, mostly white" will have a stronger relationship with gardeners' potential Resources Accessible compared to "Heterogeneous, evenly mixed" community gardens.

**Leadership.** Racial minorities in leadership roles and shared leadership are expected to have a relationship with social capital; however, this relationship is complex. Studies have described how minority leadership can increase racial diversity of community gardens (Ghose & Pettygrove, 2014; White, 2011) and in other urban agricultural projects (Sherriff, 2009; Kato, 2013) because of their cultural sensitivity and relevance of specific garden practices (i.e., what to grow). Increased racial diversity of a community garden may lead to lower levels of Sense of Community among gardeners. Alternatively, studies have found that racial minority leaders, particularly women, often implement shared forms of leadership (i.e., multiple co-leaders) (Parry et al., 2005) which may increase Sense of Community because they are more inclusive forms of

decision-making (see also Ospina & Foldy, 2009 for review of race and leadership not specific to community gardens).

With respect to potential Resources Accessible, multiple studies have described how minority gardeners (leadership status unknown) had difficulty maintaining the garden and desired more resources and support than what was available (Ghose & Pettygrove, 2014; Reynolds, 2014; Wakefield et al., 2007). Thus, it appears that minority leadership may have a negative relationship with potential Resources Accessible. In contrast, Social Capital Theory predicts that greater diversity is more likely to lead to higher levels of potential Resources Accessible. The relationship between shared leadership and potential Resources Accessible has not been explored in community gardens. However, in a review of leadership and race, Ospina and Foldy (2009) found that shared leadership helped racial minorities effectively pool resources to obtain goals.

Thus, the confusion here on directionality appears to be from conflating a leader's race with the racial composition of a community garden and shared leadership. If those variables were accounted for, then would a leader's racial minority status have an effect on an individual's Sense of Community and potential Resources Accessible? This researcher hypothesized that there will be no relationship, stated as follows:

> Org_H2a: Garden leader's race will have no relationship with gardeners' Sense of Community and potential Resources Accessible once a garden's racial diversity and shared leadership are accounted for.
>
> Org_H2b: Gardeners' Sense of Community and potential Resources Accessible will be higher for community gardens with shared leadership compared to community gardens that do not have shared leadership.

**General garden characteristics.** General Garden Characteristics refer to gardening practices, enclosure type, and community events. As suggested by the literature, these characteristics may also be related to gardeners' social capital.

***Gardening practice.*** Community gardens can vary in the degree to which gardeners garden individually or collectively (Pudup, 2008; White, 2011). To a degree, this can be assessed by plot types. Community gardens can offer individual plots, typically rented by individuals or families, or one large communal plot in which everyone collectively gardens (Milburn & Vail, 2010). However, in the author's experience, some community gardens offer a mixture of both plot types where individuals rent their own plot and gardeners collectively take care of communal areas, often intended for the broader community (i.e., non-gardeners) to freely harvest from. Further, some community gardens have several individual plots, but these plots are gardened collectively – that is, no one person 'owns' a plot.

The key distinction, then, is the degree to which gardeners garden individually or communally. On one end of the spectrum, individual gardening would be represented by a community garden that only offers individual plots. On the other end of the spectrum, collective gardening would be represented by a community garden that offers communal plot(s) only. A community garden that offered a mixture of individual plots and communal areas would be in the middle of this spectrum.

The level of trust and shared norms of responsibility seems high for gardens that practice collective gardening versus individual gardening; thus, collective gardening may be positively associated with gardeners' Sense of Community. It is unknown how individual or collective gardening would be related to potential Resources Accessible for gardeners. If we assume that Sense of Community (i.e., relationships) is a necessary pre-condition for potential Resources

Accessible, then we can expect the relationships to be similar. Thus, the author hypothesized the following:

Org_H3: An increase in collective gardening will be associated with an increase in gardeners' Sense of Community and increase in potential Resources Accessible.

***Enclosure strength.*** The literature has indicated that being fenced and locked can decrease the Sense of Community within a community garden by decreasing trust among members, particularly if one perceives the fence to be exclusionary (Glover, 2005a). In the author's experience, community gardens vary in how enclosed they are. Some community gardens are completely open, some only have a fence, some have a fence and gate that is never locked, and, some are fenced, gated, and locked. The key distinction here then is the degree to which these enclosure types exclude non-gardening residents. On one end of the spectrum, no fence represents no barrier to non-gardening residents. On the other end of the spectrum, a fence with a locked gate represents the strongest barrier to non-gardening residents.

It is unknown how enclosure type would be related to potential Resources Accessible for gardeners. Again, if we assume that Sense of Community (i.e., relationships) is a necessary pre-condition for potential Resources Accessible, then we can expect the relationships to be similar. Thus, the author hypothesized the following:

Org_H4: An increase in barrier strength will be associated with a decrease in gardeners' Sense of Community and a decrease in potential Resources Accessible.

***Events.*** Multiple studies have indicated that some community gardens host community events for their members, such as socials and/or workshops. Such events have enabled gardeners to socialize with each other and build trust, resulting in a sense of community and access to resources from relationships formed (Glover, 2005a; Firth et al., 2011; Kingsley & Townsend,

2006). Thus, the researcher hypothesized the following:

Org_H5: Gardeners' Sense of Community will be higher for community gardens that host events for their members compared to those who do not host events for members.

Table 2

*Summary of Social Capital Hypotheses*

| | Social Capital | |
|---|---|---|
| | Sense of Community | Resources Accessible |
| Individual characteristics | | |
| *Perceived differences & similarities* | | |
| Perceived racial differences (PRD) | Negative | Positive |
| Perceived deep-level similarities (DEEP) | Positive | Positive |
| *Socializing across race*[a] | | |
| Meeting gardeners inside garden (MEET) | Positive | Positive |
| Mixing socially with gardeners outside garden (MIX) | Positive | Positive |
| *Perceived organizational processes* | | |
| Democratic decision-making (DEC) | Positive | Positive |
| Leadership opportunities (TASK) | Positive | Positive |
| Organizational characteristics | | |
| *Racial Diversity*[b] | | |
| Homogenous, mainly white | Positive | Positive |
| Homogenous, mainly people of color | Positive | Negative |
| Heterogeneous, evenly mixed | Negative | Positive |
| *Leadership* | | |
| Racial minority status of leader | None | None |
| Shared leadership *(multiple leaders)* | Positive | Positive |
| *General characteristics* | | |
| Gardening practice (collective) | Positive | Positive |
| Enclosure type *(locked fence)* | Negative | Negative |
| Socials &/or workshops for members | Positive | Positive |

*Note.* [a] MIX will have a stronger relationship with both social capital indicators compared to MEET.
[b] "Homogeneous, mainly white" community gardens will have a stronger relationship with Resources Accessible compared to "Heterogeneous, evenly mixed" community gardens.

# Chapter 3. Methodology

This study used a mixed-method approach to answer two descriptive research questions and test a set of hypotheses informed by Social Capital Theory. The study design was non-experimental with data collected from primary sources. This chapter provides an overview of study design: inclusion criteria, study population and recruitment, data collection methods, instrumentation, data analyses, and human subjects' protection.

## Study Inclusion Criteria

### Community Gardens

To be eligible for consideration in this study, community gardens met the following criteria: (1) located in Richmond City, VA, (2) located within a food desert, and (3) publicly accessible to anyone who wants to garden. Richmond City is defined by the city's municipal boundaries. Richmond City's *Parcel Mapper* is a public Geographic Information Systems (GIS) interactive map, and was used to determine if a community garden's location was within the city's municipal boundaries (Richmondcity.gov).

Food deserts are defined as low-income communities where a major supermarket is not easily accessible for the majority of low-income residents (USDA, 2009). The USDA uses the census tract as its geographic unit. A census tract qualified as a low-income community if it has a poverty rate of 20% or greater or the median family income was at or below 80% of the area median family income (USDA, 2009). The USDA provides several criteria for defining low

access to a major supermarket. This study used the ½ mile criteria for urban areas as this has been cited as the most sensitive geographic measure for "low access" to supermarkets using Census data (USDA, 2009). The *Food Access Research Atlas*, a web-based mapping tool provided by the USDA, was used to determine whether a community garden was located in a food desert using the ½ mile criterion. Data sets that fed into the Food Access Research Atlas were 2010 list of supermarkets, 2010 Decennial Census, and the 2006-2010 American Community Survey (USDA, n.d.).

Public accessibility referred to community gardens that are open to the general public, such as those in neighborhoods, parks and church grounds. Community garden must be open to any who voluntarily wish to join in order to fairly assess how demographically diverse these community gardens were as well as examine whether demographic diversity and other gardener and garden characteristics were associated with social capital. Gardens located in schools, prisons, and hospitals that were accessible only to a specific clientele were excluded. Public accessibility was determined by information available online and verified by community garden leaders.

### Gardeners

To be eligible for consideration in this study, gardeners met the following criteria: (1) were currently involved in community gardens that met study criteria described above, (2) were 18 years or older, and (3) were able to speak English. Gardener inclusion criteria were verified by self-report during the consent process.

## Study Population Identification

In this study, the researcher interviewed garden leaders from community gardens that met the inclusion criteria and then surveyed both garden leaders and members from the same

community gardens. Because there was no single database or registry of community gardens, the researcher identified all community gardens in Richmond City, using the Smith multimethod approach described below, to determine which of those were relevant for this study. Community gardens are generally grassroots associations, meaning they are often established informally and maintained by volunteers. Smith (2000) has referred to these organizations as the "dark matter" within the nonprofit and civic sector and has recommended a set of strategies to systematically identify and develop a comprehensive list of grassroots organizations for research purposes. To that end, Smith's (2000) multimethod approach was used in this study to systematically develop a list of community gardens that were considered comprehensive for Richmond City. This approach occurred in three iterative phases. Phase 1 describes how the initial list was created, and Phases 2 and 3 describe how the list was further refined based on the study criteria and expanded by a snowball sampling method The final list of community gardens identified and that met the study criteria is discussed after Phases 1-3 are described.

In Phase 1, the researcher created an initial list from 4 sources: online listings from known relevant community garden organizations; online searches; contacting representatives from neighborhood associations; and, contacting representatives from public housing. Relevant community garden organizations were the City's community garden program and two non-profits that help establish and support community gardens. All three organizations provided a list of the community gardens they support ($n$=16). Community gardens can also have an online presence via websites, blogs, or social media. The researcher searched online using Google as a search engine and "community gardens Richmond, VA" as search terms. Six additional community gardens were found using this method.

Neighborhood associations and the City's public housing department were contacted because studies have shown that these organizations sometimes establish community gardens. The researcher attempted to email and/or call all 110 of the neighborhood association contacts, which were publicly listed on the City's website, and asked if they had a community garden in their area, and if so, appropriate contact information. Twenty-two of the 110 associations were unable to be contacted for the following reasons: 15 did not provide contact information or contact information was not in service, 2 had community gardens already known to the researcher and on the list, and 5 were business associations located in industrial areas unlikely to have a community garden (personal communication, Mark Flanary, GIS Analyst in Planning & Development Review department, June, 30, 2015). Of the 88 associations that were contacted, 52 (59%) responded. Of these, 11 indicated that they knew of a community garden in their area; 4 of which were new to the researcher. A representative from the City's public housing authority indicated that there were no community gardens in public housing. Based on these sources, the initial list was comprised of 26 community gardens in Richmond, VA.

In Phase 2, the researcher refined the list using Richmond's *Parcel Mapper* and the *Food Access Research Atlas* to determine whether community gardens identified above met the two of the study criteria of being in Richmond City and food desert. In cases where a street address was not provided for a community garden, Google maps was used to obtain an estimated physical address that could be used with the interactive mapping tools and/or the researcher physically verified the location and nearest address (e.g., house next door).

In Phase 3, the researcher called or emailed the contact for each community garden that met study criteria thus far to verify whether or not the community garden was publicly accessible and to confirm the physical location of a community garden. In addition, the researcher used a

snowball sampling strategy and asked all community garden contacts to identify additional community gardens they knew of in the Richmond area. The researcher also spoke with representatives from relevant community garden organizations to verify that their online listing was current and asked if they knew of additional community gardens.

Community gardens identified through snowball strategy were added to the initial list created in Phase 1. The researcher determined whether additional community gardens met inclusion criteria using the same processes outlined in Phases 2-3. Because snowballing was an iterative process, the researcher included any information or "leads" suggested by snowball contacts. The researcher followed up on partial information with other snowball contacts, online searches, and physically verifying a community garden's existence and/or location. Eleven additional community gardens were identified by snowballing bringing the final count to 37 identified community gardens that may potentially meet study criteria.

Of the 37 identified potential community gardens, 22 were dropped because they did not meet study criteria: one was not in Richmond City; six were not in a food desert; 14 were not publicly accessible; and one was gardened by an immigrant group that did not speak English. Public accessibility could not be determined for one community garden due to non-response and was excluded (included in not public count). In total, 15 out of 37 identified community gardens met study criteria.

## Recruitment

Once it had been determined that a community garden met study criteria, the researcher first recruited garden leaders and then recruited their non-leader members with the assistance of leaders (see Figure 1).

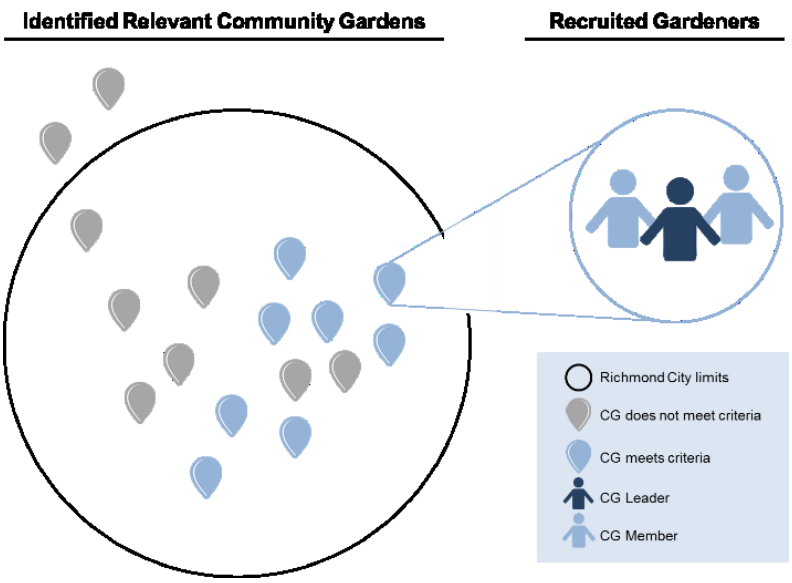


*Figure 1.* Recruitment

Community garden leaders were defined as those who directly managed some aspect of the garden (e.g., waitlist, collect dues, pay bills, recruit, etc.). Community gardens can have multiple leaders; thus, leaders were differentiated into two groups: primary and secondary. Primary leaders were defined as those who were most heavily involved in the direct management of the community garden. As such, self-identified primary leaders were asked to consent to an interview, a survey, and to assist the researcher in surveying their members. Self-identified secondary leaders were asked only to consent to the interview and survey. Garden members were asked only to consent to the survey.

Primary garden leaders had to consent to all three study components, complete at least the interview, and assist with member recruitment in order for a community garden to be included in the study. Secondary leaders did not have to consent to participate in the study in order for a community garden to be included in the study. Secondary leaders only had to complete an interview to be considered a successfully recruited study participant. Recruitment details are described next. See Appendix B for Recruitment Materials.

## Community Garden Leaders

To identify a garden leader or leaders, the researcher sent an initial email to the 15 community garden contacts. In the initial email, garden contacts were informed about the study details, asked whether they were involved in directly managing some aspect of the garden, and asked to provide a convenient time for a follow-up phone call or face-to-face meeting. Garden contacts were also asked to indicate if there was another person who would be more appropriate than themselves to answer questions about the community garden. All 15 of the garden contacts responded and stated that they were a garden leader and that they were the appropriate person with whom to speak about their community garden.

**Recruiting primary leaders.** To continue the recruitment of self-identified leaders, the researcher emailed the consent form and study details prior to the agreed upon phone call or face-to-face meeting for their review. Of the 15 contacted, 11 garden leaders consented to participate in the study. The other four declined to participate due to lack of time. All 11 of the garden leaders also self-identified as the primary leader; each represented one community garden.

**Recruiting secondary leaders.** Eight of the 11 community gardens recruited indicated that they had 18 secondary leaders in total. Identified secondary leaders were contacted through email, phone, and/or face-to-face. Email recruitment occurred in the same manner as with primary leaders, but with the primary leader, rather than the researcher, forwarding the initial email. No more than three attempts were made to recruit secondary leaders via email. The researcher also recruited secondary leaders by attending a garden leadership meeting for one community garden or when interviewing primary leaders. In total, 13 secondary leaders of the 18

identified were recruited and self-identified as secondary leaders. The 13 secondary leaders recruited represented 7 of the 8 community gardens that had secondary leaders.

**Community Garden Members**

Garden non-leader members were recruited and surveyed with the assistance of primary leaders. Member recruitment and data collection were highly intertwined in this study. This section focuses on how members were recruited, who did the recruiting, and how surveys were delivered to members. Data collection will focus on how surveys were collected by the researcher, particularly paper surveys.

Primary leaders could choose whether recruitment and survey materials were distributed online or face-to-face and whether the researcher or the primary leader directly recruited members. These options were selected based on balancing the burden of recruitment among garden leaders with protecting the privacy of garden members. Recruitment materials included the following items: a brief recruitment statement about the study through either email or flier; the consent form, which provided study details; the survey through either a survey link or paper; and, the researcher's contact information. In the brief recruitment statement, members were asked to participate in a 10 to 15-minute survey about their community garden and informed that their participation was voluntary and confidential. That is, their leader(s) would not know if they participated or their responses. All members were instructed to contact the researcher if they had additional questions.

For online recruitment, materials were sent in an electronic format. The brief statement was the body of a recruitment email or social media post, the consent form was included as an email attachment, and the email or social media post had the survey link. For face-to-face recruitment, materials were in a paper format and packaged in manila envelopes. The brief

statement was in the body of a recruitment flier taped to the outside of each envelope and enclosed was a consent form and a paper survey.

***Online, researcher recruited members.*** Primary leaders from 2 community gardens indicated that an online survey distributed via email would be the best way to communicate with members, and provided the researcher with a list of member emails. Out of concern for privacy, the researcher provided these leaders with a 'permission email' to forward to members. The permission email included a brief statement about the study and asked members to let their leader know by a certain date, no less than one week, if they did not want their email released to the researcher. No members indicated that their email should not be released. Once member emails were received, the researcher sent recruitment emails to garden members ($n$=36); no more than 2 follow-up emails with non-responders were conducted. Using this method, 24 garden members (67%) from 2 community gardens were recruited.

One primary leader for one community garden elected to have the researcher recruit their members using Facebook, as this was their primary method of communication. The researcher posted on this group's Facebook page. The recruitment post included the same information as the recruitment email. The post also included the survey link; however, attachments were not allowed. The inability to include the consent form as an attachment was not detrimental since the online survey reviewed the consent form and electronic consent had to be obtained before a participant could enter the survey. The researcher conducted two follow-up Facebook posts. Using this method, none of the 10 members for one community garden were successfully recruited, despite leaders 'liking' the recruitment posts.

***Online, leader recruited members.*** Primary leaders from 4 community gardens indicated email was the best way to communicate with their members, but that they would prefer not to

release members' emails. Instead, these primary leaders forwarded the recruitment email to their members (*n*=10). Leaders were asked to forward the email twice. Follow-up forwarded emails indicated that they were only for non-responders. Using this method, 7 members (70%) from 3 community gardens were successfully recruited.

***Face-to-face, researcher recruited members.*** Primary leaders from 4 community gardens indicated that paper surveys were best for all or some of their members (*n*=10). The researcher attended 3 workday sessions for 3 community gardens to recruit 7 members face-to-face. The researcher also individually recruited 3 members from 2 community gardens that primary leaders indicated would need assistance with the survey. Primary leaders arranged a time for the researcher to speak with the member or indicated ideal times for the researcher to stop by the community garden or member's homes. All 3 members lived by the community garden and leaders assured the researcher that face-to-face recruitment would not be an intrusion. No more than 2 follow-up contacts were made for individual recruitment. Using this method, 9 members (90%) from 4 community gardens were successfully recruited.

***Face-to-face, leader recruited members.*** One primary leader indicated that they would prefer to pass the manila envelopes to their 5 members. In addition, manila envelopes were provided to 2 leaders of 2 community gardens to give to 2 garden members not in attendance at workday sessions. Primary leaders were instructed to review the recruitment flyer with the relevant 7 members and to direct them to the researcher if they had any further questions. Using this method, one member (14%) was successfully recruited.

**Total Recruited**

Eleven out of 15 community gardens that met study criteria were recruited into the study. A total of 100 gardeners were involved in these 11 community gardens; 29 were leaders and 71

were members. A total of 64 gardeners out of 100 were recruited into the study; 24 out of 29 were leaders and 40 out of 71 were non-leader members. Of the 24 leaders recruited, 11 were primary and 13 were secondary leaders. Each primary leader represented a unique community garden. The 13 secondary leaders and 40 members represented 7 community gardens. Only 8 community gardens had secondary leaders and one community garden had no current members to survey at the time of the study. The researcher was unsuccessful in recruiting members from 3 community gardens. Notably, unsuccessful recruitment occurred when the researcher was unable to directly recruit members, either online or face-to-face, or when online methods were impersonal (e.g., Facebook post). See Table 3 below for recruitment details by community garden.

Table 3

*Recruited Study Participants by Community Garden*

| CG | Leaders | | | | All Leaders | | Non-leader Members | | Total Gardeners (leaders & members) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Primary | | Secondary | | | | | | | |
| | Recruited | Total | Recruited | Total | Recruited | Total | Recruited | Total | Recruited | Total |
| 1 | 1 | 1 | 1 | 1 | 2 | 2 | 11 | 17 | 13 | 19 |
| 2 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 5 | 5 |
| 3 | 1 | 1 | 2 | 2 | 3 | 3 | 0 | 2 | 3 | 5 |
| 4 | 1 | 1 | 4 | 5 | 5 | 6 | 0 | 4 | 5 | 10 |
| 5 | 1 | 1 | *NA* | 0 | 1 | 1 | 2 | 4 | 3 | 5 |
| 6 | 1 | 1 | *NA* | 0 | 1 | 1 | 6 | 6 | 7 | 7 |
| 7 | 1 | 1 | 2 | 2 | 3 | 3 | 0 | 10 | 3 | 13 |
| 8 | 1 | 1 | 2 | 2 | 3 | 3 | 14 | 20 | 17 | 23 |
| 9 | 1 | 1 | 0 | 1 | 1 | 2 | *NA* | 0 | 1 | 2 |
| 10 | 1 | 1 | 1 | 4 | 2 | 5 | 1 | 1 | 3 | 6 |
| 11 | 1 | 1 | *NA* | 0 | 1 | 1 | 3 | 4 | 4 | 5 |
| **TOTAL** | **11** | **11** | **13** | **18** | **24** | **29** | **40** | **71** | **64** | **100** |

## Data Collection

In this mixed-method study, qualitative and quantitative data was collected from garden leaders (primary and secondary) through semi-structured interviews. Quantitative data was collected from garden leaders (primary and secondary) and from garden non-leader members

through surveys. See Appendix C for Consent Forms, Appendix D for Semi-Structured Interview, and Appendix E for Final Survey.

**Semi-Structured Interviews**

Semi-structured interviews with 24 garden leaders were used to collect data about community garden characteristics. Interviews were conducted face-to-face at a place and time that was mutually convenient and took about an hour per interview. At the interview, the researcher re-reviewed the study details and obtained verbal consent. Interviews were audio recorded with 23 leaders. One declined to be recorded. For this person, the researcher took notes and transcribed the interview based on notes and memory within 24 to 48 hours of the interview. Two married couples were secondary leaders and elected to be interviewed at the same time, as this option was more convenient for them. The 24 garden leaders interviewed represented 11 community gardens; 11 leaders were primary and 13 were secondary. The researcher was able to complete an interview with at least one secondary leader for 7 of the 8 community gardens that had secondary leaders.

**Surveys**

Surveys with self-identified garden leaders and garden non-leader members were used to collect data about individual gardener characteristics and indicators of social capital. Leaders and non-leader members had the same survey options: online or paper. Online surveys were built and distributed using Qualtrics and included three sections: consent, screening questions, and the survey. Participants had to provide electronic consent indicating that they understood the information, were 18 years and older, and could speak English before they were able to enter the survey. The screening section included questions to ensure that respondents gardened at a specific community garden and role status (i.e., leader vs member). Role status was determined

based on whether the respondent had been interviewed for this study. Online surveys were distributed in three different ways: personalized survey links based on email addresses, anonymous link that was embedded in forwarded emails, and an anonymous link posted through Facebook.

Paper surveys mirrored online surveys; however, consent forms were separate from the survey. Paper surveys were packaged in manila envelopes that included the following items: two consent forms, one to keep and one to return to the researcher; the paper survey; and, a sticker to seal envelopes. Paper surveys were distributed and collected by the researcher or by leaders. To protect against coercion, particularly if leaders collected surveys, each manila envelope was self-addressed and stamped. All participants who received paper surveys were instructed to seal their envelope with the sticker provided and that they could mail their survey rather than hand it to their leader. Lastly, participants who received paper surveys were not asked for written consent as this would not be comparable to electronic consent. Participants were only asked to check their consent, as suggested by IRB communications. The researcher assumed that completed surveys indicated consent when consent forms were not returned.

Variations in survey methods may introduce measurement bias; however, selecting one survey method over another may introduce sampling bias in the sense that study participants may not fully represent the population of interest (Drake & Johnson-Reid, 2008). For instance, electronic surveys may be more accessible to a white middle-class (Perrin & Duggan, 2015), and thus introduce selection bias (Weigold, Weigold, & Russel, 2013). Either decision by the researcher – one survey collection method or multiple survey collections methods – can introduce bias into the study. Given this outcome, the researcher argues that it is more important to obtain as many gardener 'voices' by offering various survey options. Further, one study found

that paper and online versions of the same survey were equivalent in terms of means, interitem correlations for scales, response rates, and amount of missing data (Weigold et al., 2013). However, how each survey was completed (online or paper) was coded to examine differences in responses for outcome variables (indicators of social capital). To increase consistency across the sample, every leader (primary and secondary) was presented with the same set of survey options, and each primary garden leader was presented with the same set of survey options to survey non-leader members.

**Garden Leaders.** Because garden leaders are also community garden members who may accrue social capital, surveys were provided to leaders after interviews were completed. Twenty leaders selected the online survey and 4 selected paper. Online surveys were sent to leaders via emailed personalized links with 2 weekly follow-up emails for non-responders. Paper surveys in manila envelopes were provided to 4 leaders directly after the interview. Manila envelopes were self-addressed and stamped; however, the researcher arranged for pick-up with 2 leaders. A total of 22 leaders completed the survey. One primary leader did not complete an online survey and one secondary leader did not mail in or arrange for pick-up with the researcher despite two follow-up phone calls.

**Garden members, non-leaders.** Garden members who were non-leaders were provided with an online or paper survey based on primary leaders' preferences related to recruitment as described above. Fifty-five members from 7 community gardens were sent an online survey with 2 weekly follow-up reminders: 36 with personalized survey links, 9 with anonymous survey links (i.e., primary leader forwarded email), and 10 with an anonymous survey link embedded in a Facebook post. A total of 30 members completed online surveys: 24 with personalized links and 7 with anonymous links forwarded by leaders. None were completed via Facebook.

Sixteen members from 5 community gardens received paper surveys from the researcher (*n*=10) or by primary leaders (*n*=6). Ten paper surveys were completed. Three were collected by the researcher, two of which were administered by the researcher. The remaining 7 were collected by the primary leader who arranged for pick-up with the researcher. No member mailed their survey. Both survey options (online and paper) were provided for non-leader members in 2 community gardens and one community garden had no non-leader members. See Table 4 for member survey option per community garden.

Table 4

*Non-leader Members Surveyed by Community Garden*

| CG | Online | | Paper | |
|---|---|---|---|---|
| | Completed | Recruited | Completed | Recruited |
| 1 | 11 | 17 | | |
| 2 | 2 | 2 | 1 | 1 |
| 3 | 0 | 2 | | |
| 4 | | | 0 | 4 |
| 5 | | | 2 | 4 |
| 6 | | | 6 | 6 |
| 7 | 0 | 10 | | |
| 8 | 13 | 19 | 1 | 1 |
| 9 | -- | -- | -- | -- |
| 10 | 1 | 1 | | |
| 11 | 3 | 4 | | |
| **TOTAL** | **30** | **55** | **10** | **16** |

**Sample Summary**

Recruitment and data collection began April 2016 and ended August 2016. Eleven out of 15 community gardens that met criteria were recruited into the study. One community garden recruited did not have any members and was dropped from the study, particularly since Social Capital hypotheses focused on a gardener's sense of community and resources accessible in relation to other gardeners. Thus, a total of 98 gardeners were currently involved with these 10 community gardens either as leaders (n=27) or non-leader members (n=71). Overall, twenty-three (85%) garden leaders participated in interviews; 10 were primary and 13 were secondary

leaders. Sixty-one surveys (62%) were completed; 21 by leaders and 40 by non-leader members. See Table 5 for sample summary.

Table 5

*Sample Summary*

| | Leaders | | Non-leader Members | Total | Overall Response Rate |
|---|---|---|---|---|---|
| | Primary | Secondary | | | |
| Interviewed | 10 | 13 | | 23 | 85% |
| Surveyed | 9 | 12 | 40 | 61 | 62% |

On average, these 10 community gardens had 9.8 gardeners total (*sd*= 6.5, median = 6.5, min =5, max = 23), and an average of 6.1 gardeners per community garden completed surveys (*sd*= 5.0, median = 4, min = 2, max = 17). The average survey response rate per community garden was 63.8% (*sd*= 24.7%, median = 60%, min = 15%, max = 100%). Forty-eight (79%) surveys were completed online and 13 (21%) were completed using pen and paper. According to independent samples t-tests, there were no statistically significant differences between survey format for Sense of Community, $M_{diff}$ = -2.48, 95%CI [-5.11, -5.24], $t_{(58)}$ = -1.889, $p$ = .064, and Resources Accessible, $M_{diff}$ = -1.52, 95%CI [-3.76, .72], $t_{(58)}$ = -1.357, $p$ = .180.

## Instrument Pilot

Prior to the study, survey data collection methods were reviewed by 2 community members, one staff member from a local nonprofit that helped establish community gardens and one community garden leader from a Richmond City community garden not located in a food desert. No additional survey options were recommended.

The survey instrument was pilot tested with social work doctoral students and research colleagues (*n*= 5) and gardeners (*n*= 6) from a community garden in a food desert in a county adjacent to the intended data collection site. Prior to the pilot, scales (discussed below) were revised to be approximately between 5$^{th}$ to 7$^{th}$ grade reading levels using the Flesch-Kincaid

reading assessment tool in Word as recommended (Williamson & Martin, 2010). The survey was piloted first with colleagues, all of whom had a master's degree or above in social work, nursing, or public health. The main critique was the length of survey (approximately 20 minutes to complete). The survey was shortened and simplified based on feedback.

Next, the revised survey was piloted with community gardeners in Henrico, VA. This site was selected as an ideal place to pilot because the demographics of gardeners should be similar to the study site by virtue of being in a food desert and located near Richmond, VA. Piloting with gardeners took place over three sessions, with different gardeners each time, and the survey was revised iteratively based on feedback (e.g., wording on some items, simplified a few response sets.). On average, it took gardeners 12.5 (*sd*= 2.23) minutes to complete revised surveys. Approximately a third (33%) were Black, 67% were female, 33% had a high school diploma or less, 33% were employed full-time, and 33% had experienced food insecurity in the past year. Based on these demographics and that no additional feedback was provided in the third session, the researcher determined that the revised survey was accessible for various persons and could be completed in a relatively short amount of time (i.e. 10 to 15 minutes).

## Final Instrument

In this study, individual and organizational characteristics were measured to answer the study's two research questions and respond to the set of hypotheses. Variables were measured by: (1) items or scales developed by the researcher; (2) items or scales used by other researchers that were adapted by the researcher; (3) standardized scales adapted by the researcher; and, (4) standardized scales. All variables were used descriptively to answer the research questions. Select variables, informed by Social Capital Theory, were used as predictor and outcome variables for hypotheses testing.

Gardener surveys generated the data about individual gardeners. Closed-ended questions from primary leaders' semi-structured interviews generated most of the data (all but 3) about the garden organization. The primary leader's response was used since he or she identified as the one who was most heavily involved with the day-to-day management of his or her community garden. This was consistent with the literature in which scholars obtain organizational characteristics from one expert per organization, particularly for 'global properties', defined as "relatively objective, descriptive, and easily observable" characteristics (Klein & Kozlowski, 2000, p. 215). However, the researcher reviewed responses among primary and secondary leaders per community garden for discrepancies. Few were found as closed-ended questions were about concretely observable aspects of the garden (e.g., do you have a fence?).

This following section discusses how each variable was measured and used in the study, beginning with individual gardener characteristics followed by organizational garden characteristics. When relevant, the reliability and validity of scales are discussed, including how scales or items were adapted by the researcher. According to DeVellis (2012), Cronbach's alpha of .60 or above indicates that a scale has adequate reliability – that is, items 'hang' together. Psychometric properties for standardized scales are invalidated when adapted. Cronbach's alpha was used to assess each adapted scale's internal consistency as a measure of reliability, which will be discussed in Chapter 4. For ease of reference, a summary table of variable measures is provided at the end of this chapter (see Table 8).

**Individual Gardener Characteristics**

Multiple gardener characteristics were measured. These variables were organized into broad categories and described in the following order: demographics, garden-related

characteristics, values and perceptions about the community garden that include social interactions, and social capital outcome variables.

**Demographics.** Several demographic variables were measured: age, gender, race, ethnicity, education level, post-secondary enrollment status, employment status, homeownership, and minority group membership. Post-secondary enrollment status was included because a few studies have indicated that there is a 'young college educated crowd' motived by 'green concerns' involved in community gardens, particularly in low-income community gardens (Meenar & Hoover, 2012). Minority group membership referred to whether an individual identified as belonging to a minority and/or oppressed group or groups, however they defined that for themselves. A follow-up question was provided in which participants could identify which minority group or groups they belonged to using an open-text response format. This variable was included to describe how many gardeners generally identified as belonging to an oppressed group – separate from being or not being a racial minority, a researcher imposed definition of a minority/oppressed group.

Demographic variables were measured at the nominal or ordinal level with single item, closed-ended, multiple-choice questions constructed by the researcher, except for the follow-up question about minority group membership. The researcher used the same race and ethnicity categories as the 2010 Census, which defined race separately from Hispanic ethnicity. The 2010 Census also allows for selecting multiple races. The researcher created a "bi/multiracial category" to keep this measure as a single response option. See Table 8 for Measurement details.

Race was also used as a control for hypotheses testing. Control variables are variables that may have a relationship with the outcome separate from predictors of interest (Tabachnick & Fidell, 2007). In regression, variance from control variables are "controlled" such that the unique

contribution of subsequent predictors on the outcome are examined (Tabachnick & Fidell, 2007). Shinew and colleagues' (2004) study has indicated that there is no relationship between race and one's sense of community; however, no community garden studies have examined the relationship between race and resources accessible. Social Capital Theory predicts or suggests that people of color may have less access to resources due to historical and structural systems of oppression. Race was selected as a control variable to account for this relationship, if it existed within the sample, in order to assess whether predictors had an additional relationship to one's social capital. As a control variable, race categories were collapsed into two groups: White (0) and People of Color (1). See Table 8 for measurement details.

**Gardener-related characteristics.** Gardener-related characteristics referred to characteristics that described individuals as gardeners. Several gardener-related characteristics were measured and were organized into the following groups: basic traits; food security, harvest, and productivity; and, gardening history, skills, and skill improvement. Food security is not a gardener-related characteristic; however, conceptually it made sense to group this variable with a gardener's harvest and productivity.

***Basic traits.*** Five basic traits were measured: garden tenure (i.e., how long a gardener had been at their community garden); garden role (i.e., either leader or member); garden frequency (i.e., how often a gardener went to their community garden); garden elsewhere (i.e., whether an individual also gardened at home or at another community garden); and, whether a gardener lived in the neighborhood of their community garden. Each variable was measured at the nominal level, other than garden tenure, which was an interval level variable, with single closed-ended questionnaire items constructed by the researcher. Each variable was used to describe the sample.

Garden tenure and garden role variables were also used as controls in hypotheses testing. Studies have found that time may be a salient factor for individuals developing relationships and accessing resources (Kingsley & Townsend, 2006). Studies have also found that leaders socialized more often than non-leader members did (Glover et al., 2005), which may lead to leaders developing more relationships and subsequent resources accessible. See Table 8 for measurement details.

***Food security, harvest and productivity.*** Five variables in the "food security, harvest, and productivity" group were measured. Food security is defined as an individual household having adequate access to nutritious and safe food (USDA, 2016). Food security was measured at the ordinal level by 1 questionnaire item, close-ended, adapted by the researcher from the 6-item Brief Food Security survey (USDA, 2000). Gardeners were asked how often they could not afford to buy food. Response categories were on a 3-point Likert scale that ranged from "never" (1) to "often" (3); an "I don't know" response was provided. Two harvest variables were measured at the nominal level with single questionnaire items constructed by the researcher. Gardeners were asked what they usually grew (i.e., vegetables only, flowers only, both, or other) and what they usually did with their harvest (i.e., eat themselves, share with friends, donate to others, sell some, other, and 'NA – I don't grow food'). If 'other' was selected, participants could write in their response.

Two garden productivity variables were measured by single questionnaire items constructed by the researcher, one at the ordinal level and the other at the nominal level. To assess productivity, gardeners were asked how often they grew enough food to reduce grocery costs. Response categories were on a 4-point Likert scale that ranged from "never" (1) to "always" (4); an "NA – I don't grow food" option was provided. Gardeners were then asked

what would help them grow more food. Response categories were at a nominal level and several closed-ended options were provided (i.e., more space, more education/training, more time, more supplies, other, and 'NA – I don't grow food'). Participants could select as many options that applied, and write in their response if 'other' was selected. Each variable was used to describe the sample. See Table 8 for measurement details.

***Gardening history, skills, and improvement.*** Four variables in the "gardening history, skills, and improvement" group were measured by 3 questionnaire items constructed by the researcher. To measure history, gardeners were asked when they began gardening and response categories were at a nominal level (i.e., before they joined their garden or at their garden). Gardening skills – before and now – were measured at the ordinal level. Gardeners were asked what their gardening skills were before they joined their community garden and now, since they had joined. Response categories were on a 4-point Likert scale that ranged from "beginner" (1) to "expert" (4). Higher values indicated greater gardening expertise. Definitions were provided for response categories. Skill improvement was measured by the difference in before and now gardening skills, and categorized into 3 ordinal levels: skills worsened, skills stayed the same, and skills improved. Each variable was used to describe the sample. See Table 8 for measurement details.

**Environmental values.** Environmental values refer to a belief system that individuals have about how the earth should be treated to preserve it for current and future generations. Environmental values were measured by the New Ecological Paradigm for Children (NEP-C) scale developed and tested with 5$^{th}$ to 7$^{th}$ grade children by Manoli and colleagues (Manoli, Johnson, & Dunlap, 2007). The NEP-C was ideal as reading levels were already appropriate for a general population and demonstrated better psychometric properties than the original NEP scale

(see Hawcroft & Milfont, 2010 for review of critiques). The NEP-C scale measures the degree to which individuals endorse a New Ecological Paradigm (NEP), a worldview that scholars have argued is necessary to shift human behavior to develop a more sustainable society (see Dunlap & Van Liere, 1978 for original NEP scale). The NEP covers beliefs about the earth being in an eco-crisis (e.g., being treated poorly), the rights of animals and plants to live, and human exceptionalism (e.g., humans can solve environmental problems with technology and not behavior change). The NEP-C has eleven items and response categories are on a 5-point Likert scale that range from strongly disagree to strongly agree; higher scores indicate greater environmental values.

The NEP-C has demonstrated adequate reliability and validity. Manoli and colleagues (2007) tested the NEP-C with children ages 10-12 ($4^{th}$ to $6^{th}$ grade) twice. Confirmatory factor analysis (CFA) with the second study revealed a good fit for a three-factor structure (GFI=.96, RMSEA = .066) and a one-factor solution (GFI=.94, RMSEA=.085). According to the authors, parameter estimates, whose values ranged between .86 and 1.0, indicated that the three factors (i.e., subscales) had strong relationships with each other and has been found to have acceptable reliability in other studies ($\alpha = .70$) (Collado et a., 2013).

The NEP-C scale was adapted by the researcher for this study. Adaptations included the following: reducing items from 11 to 6; simplifying item wording; and, adjusting response categories. Item reduction and simplified wording were based on pilot feedback. Low factor loading scores were used to eliminate items (see Manoli et al., 2007). An example item is, *"People are treating the earth badly."* Response categories remained on a 5-point Likert scale; however, the neutral option was placed at the end of the response set (i.e., No Opinion) to encourage participants to choose a value-laden response (i.e., disagree or agree), since these

items can be viewed as politically sensitive (Presser & Schuman, 1980). The neutral option (i.e., No Opinion) was not eliminated because respondents can truly be ambivalent and/or not respond (Nowlis, Kahn & Dhar, 2002). The neutral option was re-coded as the middle value for statistical purposes. For this ordinal measure, scores were summed and potential scores ranged from 6 – 30; higher scores indicated higher environmental values. Environmental values (ENV) was used as a descriptive variable for this study. See Table 8 for measurement details.

**Social justice values.** Social justice values refer to a belief system that individuals have about how people should be treated to promote social justice. Social justice values were measured by the Attitudes subscale of the Social Justice Scale (SJS) developed by Torres-Harding and colleagues (Torres-Harding, Siers & Olson, 2012). Social justice was defined as a "value or belief, encompassing the idea that people should have equitable access to resources and protection of human rights" and attitudes were defined as "an acceptance of social justice ideals and related values" (Torres-Harding et al., 2012, p. 78). The SJS has eleven items and response categories are on a 7-point Likert scale that range from strongly disagree to strongly agree.

The SJS has demonstrated adequate reliability and validity. Cronbach's alpha for the Attitudes subscale was 0.95 and inter-item correlations ranged from 0.71 - .88 across two study samples, and discriminant validity was demonstrated as social justice values (i.e., attitudes SJS subscale) was significantly and inversely related to scales that measured positive endorsement of symbolic racism and neosexism (Torres-Harding et al., 2012). Studies that have used SJS have found that greater social justice values were positively associated with endorsement of harmony and equality values (Torres-Harding, Carollo, Schamberger, & Clifton-Soderstrom, 2013), and a willingness to confront white privilege (Todd, McConnel, & Suffrin, 2014).

The SJS Attitudes subscale was adapted by the researcher for this study. Adaptations included the following: reducing number of items from 11 to 7; simplifying item wording; and, adjusting response categories. Item reduction, simplified wording, and reducing the number of response categories were based on pilot feedback. Low factor loadings were used to eliminate items (see Torres-Harding et al., 2012). An example item is, *"I believe it is important to try to change big social problems, like racism, sexism, or poverty"*. Response categories were reduced to be on a 5-point Likert scale that ranged from strongly disagree (1) to strongly agree (5). The neutral option was placed at the end of the response set (i.e., No Opinion) to encourage participants to choose a value-laden response, since these items can be viewed as political and sensitive (Presser & Schuman, 1980). The neutral option was re-coded as the middle value for statistical purposes. For this ordinal measure, scores were summed and potential scores ranged from 7 – 35; higher scores indicated greater social justice values (SJV). SJV was only used as a descriptive variable. See Table 8 for measurement details.

**Perceived community garden benefits.** Community gardens can provide multiple benefits for the environment, individual gardeners, and the broader community (i.e., non-gardening residents). Based on the literature, the researcher constructed a 16-item perceived Community Garden Benefits (CG-Ben) scale that measured the extent to which gardeners' thought their community garden helped provide various benefits for different "constituents". Items were organized into four subscales: environmental benefits; personal health benefits; community food security benefits; and, community development benefits. Response categories were on a 5-point Likert scale that ranged from strongly disagree (1) to strongly agree (5). For these ordinal measures, scores were summed and potential scores ranged from 4 – 20 for each

subscale; higher scores indicated greater perceptions of respective benefit. Perceived community garden benefit subscales were used as descriptive variables.

***Environmental benefits.*** Community gardens can benefit the earth in multiple ways. Fossil fuel consumption can be reduced by gardeners growing some of their own food; biodiversity can be increased and carbon dioxide absorbed from the atmosphere simply by virtue of being a garden; and, if organic methods are used, the earth's soil can be improved (Okvat & Zautra, 2011). Perceived environmental benefits (ENVben) was measured by four items (items 1-4 of the CG-Ben scale). An example item is, *"This community garden helps me to grow my own food."* See Table 8 for measurement details.

***Personal health benefits.*** Community gardens can provide multiple health benefits to individual gardeners (Okvat & Zautra, 2011). Health was broadly defined to include physical, mental, and social health. Perceived personal health benefits (PERben) was measured by four items (items 5-8 of the CG-Ben scale). An example item is, *"This community garden helps me to eat healthier food"*. See Table 8 for measurement details.

***Community food security benefits.*** Community food security (CFS) is defined as "a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximized self-reliance and social justice" (Hamm & Bellows, 2003, p. 40). With community gardens, gardeners can improve CFS by raising awareness about food issues, donating or selling food grown locally, and teaching others how to grow their own food (Meenar & Hoover, 2012). Perceived community food security benefits (CFSben) was measured by four items (items 9-12 on the CG-Ben scale). An example item is, *"This community garden helps me to get fresh food to those in need."* See Table 8 for measurement details.

***Community development benefits.*** Community development (CD) is defined as "community members analyzing their own problems and taking action to improve economic, social, cultural, or environmental conditions" (Salvidar-Tanaka & Krasney, 2004, p. 400). Within community gardens, gardeners have learned about neighborhood issues and pooled resources to improve their neighborhood (Armstrong, 2000; Tieg et al., 2009). Perceived community development benefits (CDben) was measured by four items (items 13-16 on the CG-Ben scale). An example item is, *"This community garden helps me to learn about neighborhood issues."* See Table 8 for measurement details.

**Perceived racial differences.** Race is one example of a surface-level trait, defined as an overt demographic characteristic, usually biological, that is easily observable (Harrison et al., 2002; Liao et al., 2008). Perceived racial difference refers to an individual's perception of racial differences among group members (Harrison et al., 2002; Liao, Chuang, & Joshi, 2008) and was measured by one item (Harrison et al., 2002) adapted by the researcher. In Harrison and colleague's (2002) study, participants were asked how group members were "very similar" to "very different". Based on pilot feedback, the question and response categories were clarified to only reference differences (i.e., not similarities and differences). This adjustment was also consistent with the literature which suggests that 'similar vs. different' are not necessarily complementary response categories (Shemla et al., 2014). Response categories were adjusted accordingly.

The final question was "How much do community garden members differ in terms of their racial/ethnic backgrounds?" Response categories were on a 3-point Likert scale, "not very different" (1), "somewhat different" (2), and "very different" (3). Further, since individuals were asked to assess the group as a whole, an "I don't know" option was included to account for

gardeners, particularly new gardeners, who may not have been familiar with many other fellow gardeners. This was consistent with the literature which suggests that individuals may lack the necessary information to assess group diversity – that is, individuals have to interact with a range of group members to some degree in order to have perceptions of diversity that can be validly measured (Shemla et al., 2014). For this ordinal measure, higher scores indicated individual perceptions of greater racial differences (PRD) among gardeners in their community garden. PRD was used as a descriptive and predictive variable. "I don't know" responses were excluded from analyses except for reporting frequencies. See Table 8 for measurement details.

**Perceived deep-level similarities.** Deep-level traits are characteristics that are not easily observed, such as values, beliefs, attitudes, and worldviews (Liao et al., 2008). Perceived deep-level similarities refers to individual perceptions of shared values, beliefs, attitudes, and worldviews among group members (Harrison et al., 2002; Liao et al., 2008). Perceived deep-level similarities was measured by a 3-item scale constructed by the researcher. Gardeners were asked: How much do you think gardeners differ in terms of their…"commitment to saving the environment?", "commitment to increasing access to healthy food (for those in need)?", and "commitment to improving the neighborhood?" As with PRD, response categories were on a 3-point Likert scale that ranged from "not very different" (1), "somewhat different" (2), and "very different" (3), and an "I don't know" option was provided.

There is no "Deep-Level Similarities" scale. Researchers often create scales that measure the attitudes or beliefs pertinent to their study (see Harrison et al., 2002; Liao et al., 2008 for example). Items constructed by the researcher were based on the motivations people have for joining a community garden (Pearson & Firth, 2012), which mirror the benefits a community garden can provide to "others", such as the environment and broader community (Okvat &

Zautra, 2011). These items were combined to form a perceived deep-level similarities scale relevant for this study (Liao et al., 2008). Scores were reverse scored and then summed. For this ordinal measure, potential scores ranged from 3 – 9; higher scores indicated individual perceptions of greater deep-level similarities (DEEP) among gardeners in their community garden. DEEP was used as a descriptive and predictor variable. "I don't know" responses were excluded from analyses except for reporting frequencies. See Table 8 for measurement details.

**Socializing across race.** Two types of social interactions across race were measured: meeting others in the garden (MEET), and mixing socially outside of the garden (MIX). Each were measured by one questionnaire item constructed by the researcher. To measure "meeting", gardeners were asked, "How often do you meet people in this garden whose ethnic/racial background is different from yours?" To measure "mixing", gardeners were asked "How often do you socialize with community garden members who are of different ethnic/racial backgrounds than you outside of the garden (e.g., go out to dinner, etc.)? Response categories were on a 5-point Likert scale that ranged from never (1) to always (5). These variables were measured at the ordinal level and were used as descriptive and predictor variables. See Table 8 for measurement details.

**Perceived decision-making process.** Perceived decision-making process was measured by one questionnaire item constructed by the researcher. Gardeners were asked about how most major decisions that affect their community garden were made within their community garden. Several response categories were provided for this close-ended nominal measure (e.g., mainly by leaders acting alone, mainly by leaders with member input, by majority vote, etc.). Perceived decision-making process was used as a descriptive variable. See Table 8 for measurement details.

**Perceived democratic decision-making.** Democratic decision-making refers to a process in which each group member has a voice in decisions that affect the group (Collins & Barnes, 2014). Perceived democratic decision-making refers to an individual's perception of his or her ability to participate in group decisions. Based on empowerment theory, the ability to participate includes having a say in and influence over decisions (Collins & Barnes, 2014; Israel, Checkoway, Schulz, & Zimmerman, 1998), as well as adequate resources, such as time and information, to contribute an informed decision to the group (Collins & Barnes, 2014).

Perceived democratic decision-making was measured by six items. One item was constructed by the researcher and five items were pulled from non-standardized scales used by other researchers: a participation in decision-making scale (Collins & Barnes, 2014) and perceived control in an organization scale (Israel et al., 1998). Items pulled from other researcher scales were adapted for this study's context (i.e., did not reference employee-employer relations). Gardeners were asked how they felt about decisions made within their community garden. An example item is, *"I have a real say in how decisions are made"*. Response categories were on a 5-point Likert scale that ranged from never (1) to always (5). For this ordinal measure, scores were summed and potential scores ranged from 6 – 30; higher scores indicated greater perceived democratic decision-making (DEC) for his or her community garden. DEC was used as a descriptive and predictor variable. See Table 8 for measurement details.

**Perceived leadership opportunities.** Leadership opportunities refer to how responsibilities and tasks are distributed within an organization and include whether members can take on tasks if desired (Maton, 1998). Perceived leadership opportunities were measured by the Role Opportunities (RO) subscale of the Organizational Characteristics Scale (OCS)

developed by Maton (1998). The RO has five items and response categories are on a 5-point Likert scale that ranges from strongly disagree to strongly agree.

The RO has demonstrated adequate reliability and validity. Maton's (1998) OSC has been used in several studies, but only a few studies reported results specific to the RO subscale used in this study. These studies found that the RO had acceptable reliability (alpha = .81) (Fernando, 2011), and that increased perceptions of role opportunities were significantly and positively related to members' well-being in support groups (Maton, 1998), and greater perceptions of social support, shared values and common interests, and political efficacy in service- and advocacy-oriented community organizations (Peterson & Speer, 2000).

The RO subscale was adapted by the researcher for this study. Adaptations included the following: reducing number of items from 5 to 4; simplifying item wording; and, adjusting response categories. One item was dropped due to redundancy and wording simplified based on pilot feedback. An example item is, *"If a member wants, he or she can take on responsibility for some tasks."* Response categories were on a 4-point Likert scale that ranged from strongly disagree (1) to strongly agree (4); no neutral option was provided. Instead, "I don't know" was included as a response category in case gardeners, particularly new gardeners, did not know how tasks were distributed and/or the availability of opportunities for other gardeners to take on tasks within his or her community garden. Similar to PRD and DEEP, this was consistent with the organizational literature, which suggests that individuals may lack the necessary information to assess group characteristics (Klein & Kozlowski, 2000). That is, participants were asked to provide their individual perceptions about the group as a whole (e.g., if a member wants, he or she can take on responsibility for some task), and not their individual experience within the group (e.g., if I wanted, I could take on responsibility for some tasks).

For this ordinal measure, scores were summed and potential scores ranged from 4 – 16; higher scores indicated individual perceptions of greater leadership opportunities (TASK) for their community garden. TASK was used as a descriptive and predictor variable. "I don't know" responses were excluded from analyses except for reporting frequencies. See Table 8 for measurement details.

**Sense of community, social capital indicator.** Social capital refers to resources that individuals can potentially access from their relationships to others (Foster & Maas, 2014; Glover, 2004, 2005a; Portes & Vickstrom, 2011). There are two indicators of social capital used in this study: relationships (i.e., the social) and resources (i.e., the capital). Sense of community has been used in several studies as a social capital indicator for relationships (i.e., the social), and refers to an individual's emotional connection to community members and the community as a whole (Carpiano & Hystad, 2011; Kingsley & Townsend, 2006; Ohmer et al., 2009; Poulsen et al., 2014; Shinew et al., 2004).

In this study, an individual gardener's sense of community was measured by the 6-item Shared Emotional Connection subscale of the standardized Sense of Community Index-2 (SCI-2) developed by Chavis and colleagues (2008). As instructed by Chavis and colleagues (Chavis, Lee & Acosta, 2008), gardeners were informed that a sense of community meant that they felt like they belonged to a group, and that the "community" referred to the group of gardeners in his or her community garden. An example item is, *"I am with community members a lot and enjoy being with them".* Response categories were on a 5-point Likert scale that ranged from strongly disagree (1) to strongly agree (5). For this ordinal measure, scores were summed and potential scores ranged from 6 – 30; higher scores indicated that an individual had greater sense of community related to his or her community garden.

The SCI-2 has demonstrated adequate reliability and validity. In a survey Chavis and colleagues (2008) conducted with a broad community sample ($n$=1800), the SCI-2 had an alpha of .94 and alpha ranged between .79 to .86 for subscales, and demonstrated convergent validity as sense of community scores were significantly and positively correlated with life satisfaction, civic and political participation, and cultural and social participation scales. The standardized sense of community (SOC) scale was not adapted for this study, and was used to describe the sample and as one of the two major outcome variables. See Table 8 for measurement details.

**Resources Accessible, social capital indicator.** Another dimension of social capital is the resources (i.e., the capital) that individuals can potentially access from his or her relationships. Resources can be social support (e.g., friendships) or instrumental, such as contacts, which are used for purposive action. Instrumental resources are considered useful for an individual's material benefit, and are conducive for economic and social mobility. Only instrumental resources were measured in this study because of their potential material and economic benefit to individuals.

Instrumental resources that may be valuable for individuals can vary by sub-populations. This study used the Resource Generator scale developed by Foster and Maas (2014) for the US context, referred to as RG-US (see Van Der Gaag & Snider, 2005 for original scale). Foster and Maas (2014) developed and tested the scale with urban, low-income African-Americans, which made the RG-US scale particularly suitable for this study. The RG-US has twenty-one items that ask individuals whether they know anyone who can provide various instrumental resources. Response categories are Yes/No. The RG-US has demonstrated adequate reliability. In Foster and Maas's (2014) study ($n$=120), the scale had a Cronbach's alpha of .84. As this scale has not been used in other studies, convergent and discriminant validity could not be assessed. However,

the scale was developed with low-income African-Americans and had face and content validity (Foster & Maas, 2014).

The RG-US scale was adapted by the researcher for this study. Adaptations included the following: referencing other gardeners met in the community garden for a specific resource; reducing number of items from 21 to 17; and, simplifying response categories. The reason for item reduction and simplifying response categories were based on pilot feedback. Low factor loadings and redundancy were used to eliminate items (see Foster & Maas, 2014). Response categories were "No or Unsure" (0) and "Yes" (1). An example item is, *"Do you know anyone in this community garden who can give you good career advice?"* For this ratio measure, scores were summed and potential scores ranged from 0 – 17; higher scores indicated greater frequencies of specific resources individuals could potentially access from other gardeners he or she knew from his or her community garden. In this study, resources accessible (RES) was used to describe the sample and as the second of two primary outcome variables. See Table 8 for measurement details.

**Organizational Garden Characteristics**

Multiple general garden characteristics were measured. These variables were organized into broad categories and described in the following order: garden demographics; organizational structure; organizational function; physical features, and diversity. Organizational structure refers to management and leadership characteristics. Organizational function refers to the following characteristics: fees and waitlist; funding sources; policies or rules; events; transfer of gardening knowledge; and, communication. Physical characteristics refer to plot and enclosure types. Diversity refers to the racial demographic make-up of community gardens and their neighborhoods, in addition to whether leaders thought their community garden facilitated diverse

interactions. With the exception of a neighborhood's demographic make-up, derived from the Census, and leadership variables, derived from the gardener survey and recruitment process, all organizational community garden variables were derived from primary leader interviews. Table 8 at the end of this chapter summarizes measurement details.

**Garden demographics.** Four garden demographic variables were measured: how long the community garden had been established (years); total gardeners (number); the size of gardening space available (square footage); and, landowner type (i.e., public entity, private entity, other). To measure years established, leaders were asked what year their community garden was started. Years established was calculated by the difference between the data collection end date (August 2016) and leader responses. With the exception of landowner type (nominal level), all garden demographic variables were measured at the ratio level. Each were used to describe the gardens in the sample.

Years established and total number of gardeners were also control variables for hypotheses testing. Studies have found that time may be a salient factor for social capital (Kingsley & Townsend, 2006). Scholars have suggested that years established may be important as a time variable, in addition to garden tenure (i.e., how long a gardener had been at his or her community garden); however, the mechanism was not explained. Presumably, the longer a garden has been established, then the more likely routines and norms have been established (e.g., decision-making processes, socials provided, etc.) that help new gardeners become quickly oriented and establish relationships and access resources. Consistent with the organizational literature, total number of gardeners were included as it is likely that more people within a community garden may increase the resources potentially accessible to individuals, and perhaps

with sense of community as there would be more people to socialize and connect with (Geys & Murdoch, 2010). See Table 8 for measurement details.

**Direct management.** Based on the literature, community gardens can be directly managed and established by various types of organizations that range from informal (i.e., an individual or a group of neighbors) to formal entities, such as nonprofits (Birky & Strom, 2013; Guitart et al., 2012; McClintock, 2013). For this study, direct management referred to handling day-to-day operations, such as recruitment, planning activities, purchasing common supplies, etc. Two "direct management" variables were measured by single interview closed-ended items constructed by the researcher. Leaders were asked: "Which of the following best describes the type of organization that directly manages this community garden?" Organization could include informal (i.e., individual, group of neighbors, neighborhood associations) to formal entities (i.e., nonprofits, churches) and other. Leaders were then asked: "Did the organization identified above establish the garden?" Responses were at the nominal level: Yes (1) and No (2). Each variable was used to describe the sample. See Table 8 for measurement details.

**Indirect management.** Based on the literature, community gardens can also be indirectly managed by "umbrella" organizations, defined as an external entity that provides some degree of oversight and/or support (Milburn & Vail, 2010). For this study, umbrella organizations were defined as those that had a formal program that supports community gardens and are staffed with a coordinator or coordinators who manage several community gardens. Oversight was defined as having some degree of control over the community garden (e.g., garden rules) and support referred to website promotion, technical assistance (e.g., gardening supplies or workshops), funding assistance, and so on.

Two “umbrella” variables were measured by single interview closed-ended items constructed by the researcher. Leaders were asked: “Does an external ‘umbrella’ organization provide some degree of indirect oversight and/or support to your organization?” Response categories were at the nominal level: Yes (1) and No (2). Leaders were then asked: “Which of the following best describes the type of umbrella organization that indirectly manages this community garden?” Several response categories were provided at the nominal level (e.g., public/government entity, nonprofit, etc.). Each variable was used to describe the sample. See Table 8 for measurement details.

**Leader race.** Leader race refers to the primary leader’s race. Data was obtained from responses from the gardener survey. Gardeners were asked about their race with one questionnaire item and several response categories were provided at the nominal level (see Table 8 for full list of response categories). For this variable, race categories were collapsed into two groups: White (0) and People of Color (1). Leader race was used as a descriptive and predictor variable. See Table 8 for measurement details.

**Shared leadership (multiple leaders).** Shared leadership was measured by the presence of multiple leaders (i.e., secondary leaders) for each community garden (Parry et al., 2005). Data for this variable was obtained during the recruitment process in which the researcher asked primary leaders if there were additional people who helped directly manage the community garden. This variable was measured at the nominal level: No (0) and Yes (1), and was used as a descriptive and predictor variable. See Table 8 for measurement details.

**Fees & waitlist.** Based on the literature, community gardens can have fees and waitlists (Milburn & Vail, 2010), which some scholars have suggested may exclude low-income groups (Meenar & Hoover, 2012). Five “fees and waitlist” variables were measured by single interview

closed-ended items constructed by the researcher. Leaders were asked whether they had an annual membership fee; the cost of the fee; whether they currently had waitlist; and, if so, how many people were on the waitlist and how long did people usually wait. Presence of a membership fee and waitlist were measured at the nominal level: Yes (1) and No (2). The other items were measured at the ratio and interval levels. Each variable was used to describe the sample. See Table 8 for measurement details.

**Funding sources.** Based on the literature, community gardens can rely on various funding sources such as bake sales or large grants, which scholars have suggested might be related to "white-led" versus "minority-led" community gardens (Ghose & Pettygrove, 2014). Primary funding sources were measured by one interview closed-ended item constructed by the researcher. Leaders were asked: "Which of the following are the primary source(s) of funding that your organization relies on to operate this community garden?" Several response categories were provided at the nominal level (e.g., donations, grants, fundraisers, etc.) and leaders could select several responses. This variable was used to describe the sample. See Table 8 for measurement details.

**Policies or rules.** Community gardens can have formal rules that restrict membership (Meenar & Hoover, 2012) and enforce organic gardening only (Armstrong, 2000). Four "policies or rules" variables were measured by single interview closed-ended items constructed by the researcher. Leaders were asked: whether they had policies or rules; and if so, did they have rules that restricted membership or enforced organic gardening, and whether rules were written down, as a measure of formality (Hage & Aiken, 1967). These four variables were measured at the nominal level and were used to describe the sample. See Table 8 for measurement details.

**Events.** Community gardens can vary in whether they provide events, for whom, and whether they received external assistance (Firth et al., 2011; White, 2011). Three "events" variables were measured: events for members, events open to public, and whether external agencies helped to provide events. Events for members was measured by 2 interview closed-ended items constructed by the researcher. Leaders were asked whether they had provided socials for members, and whether they had provided workshops for their members. Both were measured at the nominal level: Yes (1) and No (2). Responses to these questions were used to construct the following nominal categories: None provided (1); Socials only (2); Workshops only (3); and, Socials & Workshops (4).

Events for the public and external assistance in providing events were each measured by single interview closed-ended items constructed by the researcher. Leaders were asked whether events provided were open to the public (i.e., non-gardening members) and if external agencies had helped to provide these events. Response categories were measured at the nominal level: Yes (1) and No (2). Event variables were used to describe the sample. However, events for members was also used as a predictor. As a predictor variable, response categories were collapsed: No events provided (0) and Yes events provided (i.e., either socials or workshops) (1). See Table 8 for measurement details.

**Transfer of gardening knowledge.** Community gardens can vary in how new gardeners are assisted in learning how to garden; usually informal mentoring has been described (Bendt, 2013), but some community gardens provide workshops (White, 2011). The "transfer of gardening knowledge" variable was measured by 1 interview closed-ended item constructed by the researcher. Leaders were asked how they thought new gardeners learned how to garden in their community garden. Several response categories were provided at the nominal level (e.g.,

hands on, informal mentoring, workshops provided, etc.). This variable was used to describe the sample. See Table 8 for measurement details.

**Communication.** Community gardens can vary in the types of communication used, and scholars have suggested that internet-based communication may exclude low-income groups from participating (Meenar & Hoover, 2012). Two communication variables (internal and external) were measured by single interview closed-ended items constructed by the researcher. Leaders were asked to select the top 3 ways they communicated internally with members and externally (i.e., recruitment). Several response categories were provided at the nominal level (e.g., website, emails, face-to-face, phone, etc.). These two variables were used to describe the sample. See Table 8 for measurement details.

**Gardening practice (plot type).** Gardening practice refers to the ways people can garden in a community garden: individually or collectively (Pudup, 2008; White, 2011). Plot types were used as an indicator to assess the degree to which gardeners garden individually versus collectively, and was measured by 1 interview closed-ended item constructed by the researcher. Leaders were asked about the plot types that were available in their community garden. Response categories were individual plots only (1), individual plots and communal areas (2), and communal plot(s) only (3). For this ordinal measure, higher scores indicated greater collective gardening being practiced by gardeners, and was used as a descriptive and predictor variable. See Table 8 for measurement details.

**Enclosure strength (enclosure type).** Enclosure strength refers to the degree to which enclosure types exclude non-gardening residents (Glover, 2005a; Meenar & Hoover, 2012), and was measured by combining leader's responses to 3 interview closed-ended items constructed by the researcher. Leaders were asked whether they had a fence; if so, did they have a gate; and, if

so, was it a locked gate. Responses were combined to create the following response categories: no fence (1); fence but no gate (2); fence & gated, no lock (3); and, fenced & locked gate (4). For this ordinal measure, higher scores indicated greater enclosure strength, and was used as a descriptive and predictive variable. See Table 8 for measurement details.

**Garden racial diversity.** Garden racial diversity refers to the racial demographic make-up of a community garden and was measured by 1 interview closed-ended item used by other researchers (Shinew et al., 2004). Leaders were asked to estimate the racial make-up of their community garden by percentages; for example, 60% White and 40% People of Color. Leaders were asked this question so the researcher could obtain an estimate for the community garden as a whole.

Based on leaders' estimates of the percent people of color for his or her community garden, the following categories were constructed:

1. "Homogenous, mainly White" (1) defined as community gardens whose percentage of people of color were less than 40%,
2. "Homogenous, mainly POC" (2) defined as community gardens whose percentage of people of color were greater than 60%, and
3. "Heterogeneous, evenly mixed" (3) defined as community gardens whose percentage of people of color were between 40% to 60%.

Categories were constructed using the median values and percentiles for three equal groups (Maly, 2000). It was necessary to create these nominal groups in order to test hypotheses, which predicted differential relationships to social capital for these three racial demographic garden networks. However, percent people of color as an interval variable was reported to describe the

sample. Garden Racial Diversity, with these nominal categories, was used as a descriptive and predictor variable.

It should be noted that the empirical range for these categories in this study were as follows: 'Mainly White' community gardens had 0% – 20% people of color, 'Mainly POC' community gardens had 70% – 100% people of color, and 'Evenly Mixed' community gardens had 50% – 60% people of color. The empirical range for these nominal categories will be used to describe results in Chapter 4 to clarify how racially diverse these community gardens were. See Table 8 for measurement details.

**Ratio of garden racial diversity to neighborhood diversity.** The ratio of garden racial diversity to neighborhood racial diversity (i.e., Racial Diversity Ratio variable) is a measure of how racially diverse a community garden is relative to the neighborhood in which it is located. This variable was calculated by dividing the percent people of color in a community garden (numerator) by the percent people of color in a garden's neighborhood (denominator). Data for community garden was obtained from leader interviews (see garden racial diversity variable). Data for the neighborhood was obtained from 2011-2015 American Community Survey (ACS) 5-year estimate.

Neighborhood can be defined at the census tract level or the block-group level. Census tracts are larger geographic units (1200 to 8000 people) compared to block-groups (600 to 3000 people) (Census, n.d.). Studies have found that census tract boundaries were larger than resident perceptions of their neighborhood (Coulton, Korbin, Chan, & Su, 2001). Further, one study found that gardeners lived within half a mile from their community garden (Meenar & Hoover, 2012). Thus, neighborhood was defined at the block-group level for this study. The researcher used the Census's Geocoding tool available online and entered a community garden's address to

identify block-group IDs for each community garden (Census, n.d.). Block-group IDs were then used to cross-reference ACS racial demographic data at the block-group level for each community garden's neighborhood.

The Racial Diversity Ratio variable was measured at the interval level. Values less than 1 indicated that there were more people of color in a community garden compared to the neighborhood. Values equal to 1 indicated that the percentage of people of color in a community garden matched the neighborhood. Values greater than 1 indicated there were more people of color in a community garden compared to the neighborhood. For example, 40% POC in CG divided by 80% POC in NE equals .5 whereas, 80% POC in CG divided by 40% POC in NE equals 2. The Racial Diversity Ratio variable and the percentage of people of color in the neighborhood were used to describe the sample. See Table 8 for measurement details.

**Garden facilitates diverse interactions.** Community gardens can facilitate diverse interactions (Firth et al., 2011; Ghose & Pettygrove, 2014; Ober-Allen et al., 2008; Tieg et al., 2009). Two types of diverse interactions were measured by single interview closed-ended items constructed by the researcher. Leaders were asked whether they thought their community garden helped facilitate interactions across race, and across other dimensions of difference (e.g., age, class, etc.). Both were measured at the nominal level: Yes (1) and No (2), and were used to describe the sample. See Table 8 for measurement details.

## Data Analyses

Quantitative and qualitative methods were used to analyze the data in this mixed-method study. Statistical analyses were performed using SPSS 24 and thematic analyses were performed with the help of Word and Excel as the organizing and coding tool. This next section describes the general procedures for analyses performed to answer each research question and test the

hypotheses, beginning with quantitative followed by qualitative analyses. Details for prescreening, statistical assumptions met, and how data were handled are provided in Chapter 4.

## Quantitative Analyses

**Question 1.** The first research question asked about the characteristics of gardeners involved in community gardens located in Southern urban food deserts (Richmond, VA), and whether gardener characteristics differed by race. Individual gardener survey data were used to answer this research question and sub-question. To create the gardener survey data set, paper survey data were first entered into Qualtrics by the researcher. Online survey data were then downloaded into SPSS. Each community garden data file was downloaded separately for coding and de-identification: garden and person IDs were entered; primary and secondary leaders were coded; online vs paper survey was coded; and identifying information was deleted (i.e., emails). Once completed, files were merged into one gardener survey data set, scales were summed, and data were pre-screened. Garden IDs and person IDs were sequential numbers (e.g., 1, 2, 3, etc.), and were related. For example, person 1 from garden 1 was labelled as "101". Further, the first person for each garden was the primary leader. For person IDs, the first digit indicated which community garden and the last 2 digits indicated the number of people for that community garden. See Table 6 for example.

Table 6

*Example of Garden ID & Person ID*

| Garden ID | Person ID | Comment |
|---|---|---|
| 1 | 101 | Gardener 1 for Garden 1 (& Primary leader) |
| 1 | 102 | Gardener 2 for Garden 1 |
| 1 | 103 | Gardener 3 for Garden 1 |
| 2 | 201 | Gardener 1 for Garden 2 (& Primary leader) |
| 2 | 202 | Gardener 2 for Garden 2 |

Pre-screening gardener survey data involved examining the data set for input errors, missing data, and scale reliability. Missing data was determined by visual inspection, frequencies, and missing values analysis (Tabachnick & Fidell, 2007). Cronbach's alpha was used as a measure of internal consistency for scales (DeVellis, 2012). According to DeVellis (2012), scales with alpha at or above .60 are acceptable. One scale had less than desirable alpha; items were dropped based on interitem and Pearson's correlations (DeVellis, 2012). Following the pre-screen, univariate statistics were reported (i.e., frequencies and means) to describe the sample.

To examine differences by race, Chi-Square ($X^2$) analyses and independent samples t-tests were performed. $X^2$ is appropriate to use when examining relationships between two categorical variables. $X^2$ assumes independence of observations, categories are mutually exclusive (i.e., a person cannot belong in multiple groups), and that the expected cell count is not below 5 (Welkowitz, Cohen & Lea, 2012). Independence of observations means that responses should not be related to or dependent on another response. In other words, $X^2$ is not appropriate when comparing responses from the same individuals (i.e., pre/post) versus different individuals, and is a study design issue. Based on this study's design, independence of observations was assumed. Categories were collapsed to meet the assumption that the excepted cell count were not less than 5, and the researcher ensured responses could not belong to more than one category. Fisher's exact tests were used when expected count less than 5 was violated and categories could not be collapsed further (Welkowitz et al., 2012).

Independent samples t-tests are appropriate to use when examining differences in group means (i.e., continuous variables) when the categorical variable is dichotomous (e.g., Race). Independent t-tests assume independence of observations, no outliers within groups, normality

within groups, and homogeneity of variance (Field, 2013). Independence of observations was assumed based on study design (i.e., no person was in both groups). Outliers are cases with extreme values, defined as values more than three standard deviations above or below (±3*sd*) the mean, and were assessed using boxplots (Abu-Bader, 2010). Univariate normality was assessed using histograms, boxplots, skewness and kurtosis statistics, and Shapiro-Wilks tests of normality (Abu-Bader, 2010). Homogeneity of variance was assessed by Levene's test; when violated, the appropriate statistics were reported. (Field, 2013).

**Question 2.** The second research question asked about the characteristics of community gardens located in Southern urban food deserts (Richmond, VA), and whether garden characteristics differed by the race of the garden leader. Organizational garden survey data were used to answer this research question. To create the garden survey data set, leaders' (primary and secondary) responses to closed-ended interview questions were entered into Word Excel. Interview transcripts were reviewed to ensure responses recorded by the researcher were accurate. Discrepancies among primary and secondary leaders were reviewed and noted. Next, primary leader responses were entered into Qualtrics with garden and person IDs assigned, and then downloaded into SPSS. Data were then pre-screened for data entry errors and missing data. Once complete, univariate statistics (i.e., frequencies and means) were used to describe the sample and answer the second research question. Differences in community garden characteristics by the primary leader's race were not examined due to small sample size ($n$=10).

**Hypotheses testing.** Social Capital hypotheses predicted relationships between select individual and organizational variables on an individual's Sense of Community and potential Resources Accessible related to their community garden. Sense of Community was an indicator of relationships formed with the community garden (i.e., the social) and Resources Accessible

was an indicator of instrumental resources embedded within those relationships (i.e., the capital). Two separate multiple sequential regression models were used to test hypotheses. Due to sample size constraints, bivariate analyses were used to examine which of the predictors had statistical significance with the outcome variables. Predictors selected for the models were based on empirical significance and theoretical importance for hypotheses testing. The following section discusses the cross-level data set used for these analyses, pre-screening and univariate descriptives, and bivariate and multivariate analyses. This section then ends with a discussion on defining statistical significance for analyses and the use of bootstrapping with inferential analyses.

***Cross-level data.*** Cross-level survey data were used to test hypotheses in a contextual analysis. To be clear, the unit of analysis for Social Capital hypotheses is the individual gardener. Unit of analysis refers to the level one makes inferences about (Klein, Dansereau, & Hall, 1994; Schnake & Dumler, 2003). However, predictors were at two levels of measurement: individual and organizational. Level of measurement refers to "the unit to which the data are directly attached" (Schnake & Dumler, 2003, p. 292).

Contextual analysis is a cross-level technique in which organizational predictors are associated or 'linked' to individual outcomes; statistical analyses are then performed using data at the individual level of measurement (James & Williams, 2000). Contextual analyses using cross-level data is appropriate to infer how variations in garden characteristics (e.g., gardening practice, enclosure strength, events for members, etc.) is related to variations among people – in this case, an individual gardener's social capital (James & Williams, 2000). Linking contextual variables to individual outcomes within a single regression model is an "old, but venerable technique" (James & Williams, 2000, p. 382). Multiple studies have used this method (Blau,

1995; Gonzales & Denisi, 2009; James, Demaree, & Hater, 1980; Marticchio, 1994; Mathieu & Kohler, 1990) and is often used when multilevel modeling (MLM) is not possible due to small sample sizes (Gonzales & Denisi, 2009).

To create the cross-level data set, organizational predictors were 'linked' to individuals by assigning a group value for each individual within his or her community garden (James & Williams, 2000). This study's cross-level data set was created in three steps. First, primary leader's race was extracted from the individual gardener survey data set and merged with the organizational garden data set. Second, the organizational garden data set was merged to the individual gardener data set. Primary leader person IDs were used to merge files appropriately. Third, the researcher 'linked' garden data to its gardeners for each community garden – that is, she copied and pasted organizational data for a specific community garden to its members. IDs were used to link data appropriately, and organizational data was labelled with "L_" (data from primary leader) as a prefix to differentiate between gardener and garden variables (e.g., Race vs. L_Race). See Table 7 below for example of linked variables in the cross-level data set.

Table 7

*Example of Linked Data for Cross-level Data Set*

| Garden | Person | CG Characteristics | | Gardener Characteristics | | | |
|---|---|---|---|---|---|---|---|
| ID | ID | Yrs. Est. | CG Diversity | Tenure | Race | SOC | RES |
| 1 | 101 | 16 | 1 | 4.92 | 0 | 28.00 | 11.00 |
| 1 | 102 | 16 | 1 | 5.08 | 1 | 24.00 | 7.00 |
| 5 | 501 | 4 | 2 | 4.17 | 0 | 23.00 | 2.00 |
| 5 | 502 | 4 | 2 | 0.33 | 1 | 20.00 | 1.00 |
| 5 | 503 | 4 | 2 | 4.25 | 0 | 19.00 | 7.00 |
| 7 | 701 | 6 | 3 | 4.17 | 1 | 30.00 | 6.00 |
| 7 | 702 | 6 | 3 | 0.33 | 0 | 12.00 | 0.00 |

***Univariate analyses.*** Once the cross-level data set was created, appropriate univariate statistics were used (i.e., frequencies and means) to describe the cross-level sample. There was no need to screen for missing, as these analyses and handling of missing were addressed in each

dataset prior to cross-linking. As a general screen for the assumptions of multiple regression, data were pre-screened for univariate outliers. Univariate outliers can be continuous and categorical. Categorical outliers are those than have a 90/10 split between categories (Tabachnick & Fidell, 2007). Continuous outliers were identified by examining z-scores that were more than ± 3*sd* from the mean. Categorical outliers were identified by frequencies.

***Bivariate analyses.*** Independent samples t-tests and one-way ANOVA were used to examine bivariate significance with categorical predictors and continuous outcome variables. Pearson's correlations were used to examine statistical significance between continuous predictors and outcome variables. T-tests were appropriate for dichotomous predictors and one-way ANOVA was appropriate for categorical variables that had 3 levels (i.e., CG Racial Diversity). The assumptions of independent samples t-tests have already been discussed and were handled in the same way for these analyses. One-way ANOVA has the same assumptions as independent samples t-tests (Field, 2013). Welch's F statistics were used when homogeneity of variance could not be assumed (Field, 2013). Pearson's correlations assume no outliers, normality, and a linear relationship between variables (Field, 2013). Outliers were examined using z-scores (i.e., ± 3*sd* from mean); normality was assessed using Shapiro-Wilks tests, skewness and kurtosis statistics, and histograms; and bivariate linearity was assessed using scatterplots (Field, 2013).

***Multivariate analyses.*** Due to sample size constraints, 11 predictors were selected for model testing. Overall, predictors selected were based on empirical significance and theoretical importance for hypotheses testing. The rationale for the selection of these 11 variables are discussed more fully in Chapter 4. Prior to running regression models, the assumptions of multiple regression were examined. Multiple regression assumes the following: independence of

observations; no univariate and multivariate outliers; univariate and multivariate normality; bivariate and multivariate linearity; no multicollinearity; and, no heteroscedasticity. Heteroscedasticity indicates that a model is unreliable as residual errors are unevenly distributed (Tabachnick & Fidell, 2007).

Independence of observations was determined using the Durbin-Watson test, which assesses whether residual errors are correlated; values between 1 – 3 indicate that residual errors are not correlated (Field, 2013). Univariate outliers were screened (again) using casewise diagnostics (i.e., more than ±3 *SD* from mean) in SPSS. Multivariate outliers were identified using Cook's D and leverage values (Field, 2010). Univariate normality was assessed using histograms, boxplots, skewness and kurtosis statistics, and Shapiro-Wilks tests of normality (Abu-Bader, 2010). Multivariate normality was determined by histograms and P-P plots (Abu-Bader, 2010). Bivariate linearity was examined using partial regression plots of standardized residuals by standardized predicted values (Abu-Bader, 2010). Multivariate linearity and heteroscedasticity were examined using scatterplots of standardized residuals by standardized predicted values (Abu-Bader, 2010). Multicollinearity was examined by correlations and Tolerance values (Field, 2013).

Once it had been determined that data met assumptions, hypotheses were tested using multiple sequential regression. In multiple sequential regression, sometimes referred to as hierarchical regression, predictor variables are entered into the model in a specific order. Those entered first get the most "credit" for variance explained. This is because predictors can share variance in explaining the outcome. For example, predictor A and B each contribute to the model (i.e., unique variance); however, they also share variance in explaining the model. If predictor A is entered in the first step, followed by predictor B in the second step, then predictor A will "get

credit" based on its own unique contribution and the shared contribution with Predictor B. Predictor B, however, will only "get credit" based on its own unique contribution (Tabachnick & Fidell, 2007).

Multiple sequential regression is appropriate when one wants to control for the effects of variables not of theoretical interest (i.e., control variables). Further, the researcher was interested in assessing how contextual (i.e., garden characteristics) differences may be related to an individual's Social Capital, over and above their own perceptions (i.e., individual gardener characteristics). Thus, predictors for each multiple sequential regression model were entered in three steps: (1) individual control variables; (2) individual gardener predictors; and, (3) organizational garden predictors. Predictors were entered simultaneously in each step (i.e., ENTER used for each block), meaning that within each block only unique variance was assessed for each predictor. In other words, predictors within blocks were on "equal ground" and did not get more or less "credit" based on order of entry (Tabachnick & Fidell, 2007).

***Statistical significance.*** Statistical significance for all analyses was defined at the $p \leq .10$ level. The researcher was more concerned with committing Type II errors than Type I errors, given that this was an exploratory study and small sample size. Type I error refers to detecting a statistically significant relationship when in fact there is none while Type II error refers to not detecting a statistically significant relationship when in fact there is one (Field, 2013). Scholars have noted that "there is nothing sacred about .05" and selecting alpha should primarily be based on practical consequences and power of tests to detect relationships, which is influenced by samples sizes (Labovitz, 1968; Skipper, Guenther, & Naas, 1967). Thus, the researcher selected a $p$ value of .10 to decrease the chances of committing Type II error with a small sample size. In other words, the researcher increased the chances of detecting relationships that may have

practical results and can inform future research. In addition, power analyses were conducted to identify the number of predictors that could be included in models given the sample size and $p \leq .10$. Power refers to the probability of a test to detect relationships assuming there is one and was set at .80 as recommended (Field, 2013).

***Bootstrapping.*** The majority of this study's analyses used inferential statistics. Inferential statistics assume a normal distribution and results are used to infer to the population. The researcher, however, is not claiming to have a sample representative of the population. In fact, she has a convenience sample that is likely unrepresentative due to self-selection bias. Bootstrapping is one method to address this issue. With bootstrapping, the sample itself is treated as the "population". Random smaller samples (i.e., bootstrap samples), typically 1000 or more, are drawn with replacement from the sample, and statistics of interest (e.g., mean, correlation coefficient, etc.) are calculated for each bootstrap sample, from which parameter estimates (e.g., standard errors, confidence intervals) are derived (Field, 2013).

The advantages to using bootstrapping are that parameter estimates are based on the sample distribution (Field, 2013). In essence, bootstrapping is a nonparametric method to "approximate the population by randomly sampling (with replacement) from the observed data to obtain new samples of the same size" (Kulesa et al., 2015, p. 3). Further, bootstrapping can help in situations where normality is violated (Field, 2013). For this study, independent samples t-tests, one-way ANOVA, Pearson's correlations, and multiple regression were bootstrapped (1000 samples). Bias corrected accelerated confidence intervals were selected, as they are more accurate parameter estimates (Field, 2013). It should be noted that results should only be inferred to other populations similar to this study's sample (i.e., convenience sample that is likely unrepresentative of all gardeners and community gardens in Southern urban food deserts).

### Qualitative Analyses

In this mixed-methods study, quantitative and qualitative data collection occurred at the same time. However, quantitative analyses were the primary analyses used to answer the study questions and test hypotheses. The role of quantitative and qualitative data in this study can be visualized like so, QUAN+qual (Padgett, 2008). In essence, qualitative data were gathered to provide deeper insight into part of question 2, which asked about the rationales or reasons leaders had for various community garden characteristics (e.g., why have a fence?, why have a membership fee?, etc.). Interviews from all leaders (primary and secondary) were used for diverse perspectives.

Qualitative data were analyzed using thematic analysis as outlined by Braun and Clarke (2006). Specifically, interview responses were first organized by question. Responses were then unitized and coded. Codes were reviewed for major patterns and anomalies to develop categories or, simply, the main reasons leaders provided for having or not having a specific garden characteristic. Broader themes were developed based on issues or patterns that cut across interview questions.

## Human Subjects Protection

IRB approval for this study was obtained on March 17, 2016 that included documentation of following components. Consent was obtained verbally or electronically from participants. To protect confidentiality and privacy, a crosswalk with identifying information and ID was created, and data sets de-identified. For the crosswalk, one file with identifying information associated with Garden and Person IDs was created and maintained separately from data files that only had Garden and Person IDs associated with each individual. Online survey data was collected using Qualtrics, a secure survey platform (Qualtrics Security Statement, 2011). Survey data, interview

audio files, transcripts, crosswalk file, and contact information were stored and secured in Google Drive only accessible to the researcher. Paper surveys and semi-structured interviews and notes were secured and only accessible to the researcher.

There were no to minimal risks associated with participating in this study. Interview and survey participants did not have to answer any question they were uncomfortable with and could stop participation in the study at any time. There were no benefits to participating in the study. As an incentive, the researcher has provided a preliminary report to leaders to share with their members. The researcher will provide a full final report and host a community forum to discuss findings with participants at a later date. Results will be reported in aggregate and anonymous.

## Measurement Summary Table

Table 8

*Summary of Measures*

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| | | **INDIVIDUAL CHARACTERISTICS** | | |
| **Demographics** | | | | |
| Age | Age | 1 = 18 or 19 years<br>2 = 20 – 29 years<br>3 = 30 – 39 years<br>4 = 40 – 49 years<br>5 = 50 – 59 years<br>6 = 60 – 69 years<br>7 = 70 + years<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |
| Gender | Sex | 1 = Female<br>2 = Male<br>3 = Other_____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| **Race** | Race | 1 = White or Caucasian<br>2 = Black or African American<br>3 = American Indian or Alaskan Native<br>4 = Asian<br>5 = Native Hawaiian or Pacific Islander<br>6 = Biracial or Multiracial<br>7 = Other _____<br><br>As a control variable, above was recoded as:<br>0 = White<br>1 = People of Color<br><br>Nominal | Researcher constructed (categories from Census) | Descriptive; **Control**<br><br>Survey |
| Ethnicity | Ethnicity | 1 = Hispanic/ Latino<br>2 = Not Hispanic/ Latino<br><br>Nominal | Researcher constructed (categories from Census) | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Education level | What is the highest degree or level of school you have completed? | 1 = Less than 9th grade<br>2 = 9th to 12th grade, no diploma<br>3 = High school graduate, GED, or alternative<br>4 = Some college, no degree<br>5 = Associate's degree<br>6 = Bachelor's degree<br>7 = Some graduate school, no degree<br>8 = Graduate or professional degree<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |
| Post-secondary Enrollment | Are you currently enrolled in post-secondary education? | 1 = No<br>2 = Yes, Technical/ Vocational<br>3 = Yes, Community College<br>4 = Yes, College or University<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |
| Post-secondary Enrollment Status | If yes, are you a…? | 1 = Full-time student<br>2 = Part-time student<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| Employment status | Employment status | 1 = Employed, full time<br>2 = Employed, part time with one job<br>3 = Employed, part time with multiple jobs<br>4 = Unemployed, looking for work<br>5 = Unemployed, not looking for work (i.e., retired)<br>6 = Other _____<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Home ownership | Do you own your home or rent? | 1 = Own<br>2 = Rent<br>3 = Other (i.e., I stay with friends/family, etc.)<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| Member of minority group | Do you consider yourself a member of a minority/oppressed group(s), however you define that for yourself? | 1 = Yes<br>2 = No<br>3 = I don't know<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| Self-identified minority group(s) | (If Yes) What minority/oppressed group or groups do you identify with? | Open text response | Researcher constructed | Descriptive<br><br>Survey |
| **Gardener-related characteristics** | | | | |
| ***Basic Traits*** | | | | |
| **Garden tenure (years)** | About when did you become a member of this community garden? | Month ____ Year ____<br><br>Open text responses were recoded to obtain length of time at garden (tenure).<br><br>Calculated as:<br>End date (Aug 2016) –<br>Begin date (Mo/Yr) =<br>Total # months/12 months (Years)<br><br>Interval measure | Researcher constructed | Descriptive; **Control**<br><br>Survey |
| **Garden role** | Have you participated in an interview with Jen (or been asked to be interviewed by Jen) about this community garden? | 1 = Yes<br>2 = No<br><br>Those interviewed were leaders.<br><br>Recoded as<br>0 = Non-leader Member<br>1 = Leader<br><br>Nominal measure | Researcher constructed | Descriptive; **Control**<br><br>Survey *(screening question)* |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Garden frequency | On average, how often do you come to the garden during a gardening season? | 1 = Not often (0-1 times a week)<br>2 = Somewhat often (2-3 times a week)<br>3 = Most days (4-5 times a week)<br>4 = Almost every day (6-7 times a week)<br>5 = Several times a day for multiple days (8+ times a week)<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |
| Garden elsewhere | Do you currently garden at home or another community garden? | 1 = Yes, I garden at home also<br>2 = Yes, I garden at another community garden<br>3 = No, I only garden here<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| Live in Neighborhood of CG | Do you live in the neighborhood where your community garden is in? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| ***Food Security, Harvest & Productivity*** | | | | |
| Food Insecurity | In the last 12 months, how often have you experienced a time where the food you bought did not last and you couldn't afford to get more? | 1 = Never<br>2 = Sometimes<br>3 = Often<br>4 = I don't know<br><br>Higher values indicated greater food insecurity; I don't know excluded<br><br>Ordinal measure | Adapted item from USDA Food Security survey | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Usually grow | What do you usually grow in your community garden? | 1 = Only plants I can eat (i.e., vegetables)<br>2 = Only plants I can't eat (i.e., flowers)<br>3 = Both plants I can & can't eat (i.e., vegetables and flowers)<br>4 = Other _____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| Harvest | What do you do with the food you harvest? (select all that apply) | 1 = Cook and eat at home<br>2 = Give some to friends & family<br>3 = Donate some to food pantries<br>4 = Sell some<br>5 = Other _____<br>6 = NA – I don't grow food<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| Garden productivity | How much do you grow? To estimate that, please choose the best answer below.<br><br>I grow enough food to cut down on my grocery costs. | 1 = Never<br>2 = Sometimes<br>3 = Often<br>4 = Always<br>5 = NA – I don't grow food<br><br>Higher values indicated greater productivity; NA responses excluded<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Help to grow more | What would help you grow more food? (select all that apply) | 1 = More gardening space<br>2 = More education/training<br>3 = More time<br>4 = More gardening supplies (i.e., compost, seeds, etc.)<br>5 = Other _____<br>6 = NA – I don't grow food<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| ***History, Skills, & Improvement*** | | | | |
| History | When did your gardening journey begin? | 1 = Before I joined this community garden (i.e., childhood)<br>2 = At this community garden<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Gardening Skills Before | How would you describe yourself as a gardener before you started gardening here?<br><br>Response category definitions:<br>EXPERT<br>I have done a lot of gardening over several years (sometimes decades). I don't normally have questions. People usually ask me for gardening advice.<br><br>ADVANCED<br>I've gardened many times (usually over several years). I'd say I've gotten the hang of growing many things. I don't normally have to ask questions or look things up.<br><br>AVERAGE<br>I've gardened several (3+) times. I'd say I've gotten the hang of growing a few things. I still ask questions or look things up.<br><br>BEGINNER<br>I've never gardened before or only a few (1-2) times. I'm not really sure what I am doing. I usually ask questions or look things up. | 1 = Beginner<br>2 = Average<br>3 = Advanced<br>4 = Expert<br><br>Higher values indicate greater gardening expertise/skills (Before)<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |
| Gardening Skills Now | How would you describe yourself as a gardener now, since you have been gardening here?<br><br>See above for response category definitions. | 1 = Beginner<br>2 = Average<br>3 = Advanced<br>4 = Expert<br><br>Higher values indicated greater gardening expertise/skills (NOW)<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Gardening Skill Improvement | Variable measured by 2 items related to gardening skills (above). | Differences in Now and Before skills were used to create following categories:<br><br>1 = Skills worsened (negative values)<br>2 = Skills stayed the same (value = 0)<br>3 = Skills improved (positive value)<br><br>Ordinal measure | Researcher constructed | Descriptive<br><br>Survey |
| **Values & Perceptions of Community Garden** | | | | |
| ***Values*** | | | | |
| Environmental Values (ENV)<br><br>*Measured by:* New Ecological Paradigm (NEP) scale for use with children | I believe that…<br>1. People are supposed to rule over nature.<br>2. Plants and animals have as much right as people to live.<br>3. People are treating nature badly.<br>4. If things don't change, we will have a big disaster in the environment soon.<br>5. People will someday know enough about nature to control it.<br>6. People are smart enough to keep from ruining the earth. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Agree<br>4 = Strongly agree<br>5 = No opinion<br><br>Items 1, 5, 6 were reverse scored; No opinion recoded as neutral option (3)<br><br>Scores were summed; higher scores indicated higher ENV<br><br>Potential range: 6 – 30<br><br>Ordinal measure | Adapted standardized scale (Manoli et al., 2007) | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Social Justice Values (SJV)<br><br>*Measured by:* Attitudes subscale of Social Justice Scale (SJS) | I believe it is important to…<br>1. Make sure all people have a chance to speak and be heard, especially those who are often treated unfairly.<br>2. Try to change big social problems, like racism, sexism, or poverty.<br>3. Help people reach their goals, personally or by supporting organizations.<br>4. Support the physical and emotional health of people.<br>5. Allow everyone to have a voice about a situation that affects their lives.<br>6. Promote fair and equal distribution of financial and other resources in our society.<br>7. Promote fair and equal decision-making power in our society. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Agree<br>4 = Strongly disagree<br>5 = No opinion<br><br>No opinion recoded as neutral option<br><br>Scores were summed; higher scores indicated higher SJV<br><br>Potential range: 7 – 35<br><br>Ordinal measure | Adapted standardized scale (Torres-Harding et al., 2014) | Descriptive<br><br>Survey |
| ***Perceived Community Garden benefits*** | | | | |
| Environmental benefit (ENVben)<br><br>*Measured by:* Environmental benefit subscale from Perceived Community Garden Benefit Scale | This community garden helps me to…<br>1. Grow my own food.<br>2. Save the environment.<br>3. Teach others about nature.<br>4. Learn about organic gardening. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Neutral<br>4 = Agree<br>5 = Strongly agree<br><br>Scores were summed; higher scores indicated greater ENVben<br><br>Potential range: 4 – 20<br><br>Ordinal measure | Researcher constructed scale and subscale | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Personal health benefit (PERben)<br><br>*Measured by:*<br>Personal health benefit subscale from Perceived Community Garden Benefit Scale | This community garden helps me to…<br>5. Eat healthier food.<br>6. Improve my physical and mental health.<br>7. Enjoy nature.<br>8. Meet others. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Neutral<br>4 = Agree<br>5 = Strongly agree<br><br>Scores were summed; higher scores indicated greater PERben<br><br>Potential range: 4 – 20<br><br>Ordinal measure | Researcher constructed scale and subscale | Descriptive<br><br>Survey |
| Community Food Security benefit (CFSben)<br><br>*Measured by:*<br>CFS benefit subscale from Perceived Community Garden Benefit Scale | This community garden helps me to…<br>9. Get fresh food to those in need.<br>10. Raise awareness about food issues.<br>11. Promote a local food economy.<br>12. Teach others how to grow their own food. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Neutral<br>4 = Agree<br>5 = Strongly agree<br><br>Scores were summed; higher scores indicated greater CFSben<br><br>Potential range: 4 – 20<br><br>Ordinal measure | Researcher constructed scale and subscale | Descriptive<br><br>Survey |
| Community Development benefit<br><br>*Measured by:*<br>CD benefit subscale from Perceived Community Garden Benefit Scale | This community garden helps me to…<br>13. Improve the neighborhood.<br>14. Learn how to work with others.<br>15. Learn about neighborhood issues.<br>16. Solve neighborhood issues with others. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Neutral<br>4 = Agree<br>5 = Strongly agree<br><br>Scores were summed; higher scores indicated greater CDben<br><br>Potential range: 4 – 20<br><br>Ordinal measure | Researcher constructed scale and subscale | Descriptive<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Perceived Differences & Similarities*** | | | | |
| **Perceived Racial Differences (PRD)** | How much do community garden members differ in terms of their…<br>1. Ethnic/racial backgrounds? | 1 = Not very different<br>2 = Somewhat different<br>3 = Very different<br>4 = I don't know<br><br>Higher scores indicated greater PRD; 4 was seen as missing<br><br>Ordinal measure | Adapted Item used by other researchers (Harrison et al., 2002) | Descriptive; Predictor<br><br>Survey |
| **Perceived Deep-level Similarities (DEEP)** | How much do community garden members differ in terms of their…<br>1. Commitment to saving the environment?<br>2. Commitment to increasing access to healthy food (for those in need)?<br>3. Commitment to improving the neighborhood? | 1 = Not very different<br>2 = Somewhat different<br>3 = Very different<br>4 = I don't know<br><br>Scores were reverse scored then summed; 4 was seen as missing.<br><br>Higher scores indicated greater DEEP<br><br>Potential range: 3 – 9<br><br>Ordinal measure | Researcher constructed | Descriptive; Predictor<br><br>Survey |
| ***Socializing Across Race*** | | | | |
| **MEET** | 1. How often do you meet people in this garden whose ethnic/racial background is different from yours? | 1 = Never<br>2 = Rarely<br>3 = Sometimes<br>4 = Very often<br>5 = Always<br><br>Ordinal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Survey |
| **MIX** | 1. How often do you socialize with community garden members who are of different ethnic/racial backgrounds than you outside of the garden (i.e., go out to dinner, etc.)? | 1 = Never<br>2 = Rarely<br>3 = Sometimes<br>4 = Very often<br>5 = Always<br><br>Ordinal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Perceived Organizational Processes*** | | | | |
| Perceived Decision-making process | 1. Based on your experience, most major decisions that affect the community garden are made… | 1 = Mainly by leader or leaders acting alone<br>2 = By the leader or leaders with input from members<br>3 = By vote (i.e., majority rule)<br>4 = By consensus (i.e., everyone agrees on the decision)<br>5 = Other<br>6 = I don't know<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Survey |
| **Perceived Democratic Decision-making (DEC)** | How do you feel about the decisions made here? I feel like…<br>1. I have a real say in how decisions are made.<br>2. I can influence decisions made.<br>3. I can speak up when I disagree with decisions made.<br>4. Leadership gives me enough information to have a say in decisions.<br>5. Leadership gives me enough time to have a say in decisions. | 1 = Never<br>2 = Rarely<br>3 = Sometimes<br>4 = Often<br>5 = Always<br><br>Scores were summed; higher scores indicated greater DEC<br><br>Potential range: 5 – 25<br><br>Ordinal measure | Adapted items used by other researchers (Collins & Barnes, 2014; Israeil et al., 1994) | Descriptive; **Predictor**<br><br>Survey |
| **Perceived Leadership Role Opportunities (TASK)**<br><br>*Measured by:* Role Opportunity subscale from Organizational Characteristics Scale | How are tasks and responsibilities managed here? I would say that…<br>1. Different members are in charge of different tasks.<br>2. A single leader is responsible for most tasks.<br>3. The talents of different people are used to get tasks done.<br>4. If a member wants, he or she can take on responsibility for some tasks. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Agree<br>4 = Strongly agree<br>5 = I don't know<br><br>Item 2 was reverse scored; 5 was seen as missing<br><br>Scores were summed; higher scores indicated greater TASK.<br><br>Potential range: 4 – 16<br><br>Ordinal measure | Adapted standardized scale (Maton, 1988) | Descriptive; **Predictor**<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Social Capital*** | | | | |
| **Sense of Community (SOC)** *(indicator of social capital)*<br><br>*Measured by:* Shared Emotional Connection subscale of Sense of Community Index 2 | What would you say about your sense of community here? I would say that…<br>1. It is very important to me to be a part of this community.<br>2. I am with other community members a lot and enjoying being with them.<br>3. I expect to be a part of this community for a long time.<br>4. Members of this community have shared important events together, such as holidays, celebrations, or disasters.<br>5. I feel hopeful about the future of this community.<br>6. Members of this community care about each other. | 1 = Strongly disagree<br>2 = Disagree<br>3 = Neutral<br>4 = Agree<br>5 = Strongly agree<br><br>Scores were summed; higher scores indicated greater SOC<br><br>Potential range: 6 – 30<br><br>Ordinal measure | Standardized scale (Chavis et al., 2008) | Descriptive; **Outcome** (DV)<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| **Resources Accessible (RES)** *(indicator of social capital)*<br><br>*Measured by:*<br>Resource Generator-US Scale | Do you know anyone in this community garden who…<br>1. Is an elected official and can help you?<br>2. Has good contacts at TV/radio/newspaper and can help you?<br>3. Can give you advice on using a personal computer?<br>4. Can give you good career advice?<br>5. Knows a lot about government regulations and can help you?<br>6. Can sometimes employ people?<br>7. Can give you good legal advice, like a lawyer?<br>8. Can give you good advice about money problems, like a money manager?<br>9. Knows how to fix a car and can help you?<br>10. Can give you a good job reference?<br>11. Can give you good health care advice, like a doctor or nurse?<br>12. Can help get rid of bulky items for you?<br>13. Can watch your home or pets while you are away?<br>14. Can lend you a small sum of money?<br>15. Can lend you a large sum of money?<br>16. Can help you find someplace to live?<br>17. Can provide a place for you to stay for a week? | 0 = No or unsure<br>1 = Yes<br><br>Scores were summed; higher scores indicated greater RES<br><br>Potential range: 0 – 17<br><br>Ratio measure | Adapted standardized scale (Foster & Maas, 2014) | Descriptive; **Outcome** (DV)<br><br>Survey |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| **ORGANIZATIONAL CHARACTERISTICS** | | | | |
| ***Garden Demographics*** | | | | |
| **Years established** | What year was this community garden established? | Year ____<br><br>Responses were recoded to obtain number of years established.<br><br>Calculated as:<br>2016 – Year est.<br><br>Interval measure | Researcher constructed | Descriptive; **Predictor**<br><br>Interview |
| **Total Gardeners** | Variable was measured by 2 items.<br><br>Leaders were asked:<br>1. How many community garden members do you have? (If you don't have an exact number, please estimate)<br>2. How many co-leaders do you have? | Responses were summed to obtain total number of gardeners, including the primary leader.<br><br>Interval measure | Researcher constructed | Descriptive; **Predictor**<br><br>Interview & Recruitment process |
| Gardening space | How much land or space is available for gardening? (please estimate) | _____acres or ____sq. ft<br><br>Responses in acres were converted to sq. ft. by the researcher<br><br>Interval measure | Researcher constructed | Descriptive<br><br>Interview |
| Landowner Type | Who owns the land for this community garden? | 1 = Public/Government (i.e., city)<br>2 = Private (i.e., donated by citizen or business)<br>3 = Other _____<br>4 = I don't know<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Structure*** | | | | |
| ***Management & Leadership*** | | | | |
| Org Type *(direct mgmt.)* | Which of the following best describes the type of organization that directly manages this community garden? | 1 = Informal (group or individual)<br>2 = Neighborhood or civic association<br>3 = Nonprofit (other than neighborhood or civic association)<br>4 = Public/Government agency (i.e., city)<br>5 = Church<br>6 = Other _____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Above Entity Est. Garden | Did the organization identified above establish the community garden? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Umbrella *(indirect mgmt.)* | Does an external 'umbrella' organization provide some degree of indirect support &/or oversight to your organization? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Umbrella type | (If Yes) Which of the following best describes the type of umbrella organization that indirectly manages this community garden? | 1 = Neighborhood or civic association<br>2 = Nonprofit (other than neighborhood or civic association)<br>3 = Public/Government agency (i.e., city)<br>4 = Church<br>5 = Other _____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| **Leader Race** | Race | 1 = White or Caucasian<br>2 = Black or African American<br>3 = American Indian or Alaskan Native<br>4 = Asian<br>5 = Native Hawaiian or Pacific Islander<br>6 = Biracial or Multiracial<br>7 = Other _____<br>Above was recoded as:<br>0 = White<br>1 = Person of color<br><br>Nominal measure | Researcher constructed (categories based on Census) | Descriptive; **Predictor**<br><br>Primary leader survey |
| **Shared Leadership** (multiple leaders) | Do you have additional leaders (i.e. co-leaders or secondary leaders) who help directly manage this community garden? | 0 = No<br>1 = Yes<br><br>Nominal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Recruitment process |
| ***Function*** | | | | |
| ***Fees & Waitlist*** | | | | |
| Membership fee | Do gardeners have to pay a membership fee or dues to join this community garden? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Fee cost (annual) | How much is the membership fee per year? | $ amount<br><br>Ratio measure | Researcher constructed | Descriptive<br><br>Interview |
| Waitlist (presence of) | Do you currently have a waitlist of people interested in joining this community garden? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Waitlist, length | (If yes) About how long do people usually wait on the waitlist? | Number of months<br><br>Interval measure | Researcher constructed | Descriptive<br><br>Interview |
| Waitlist, number of people | (If yes) About how many people do you have on the waitlist? | Number of people<br><br>Interval measure | Researcher constructed | Descriptive<br><br>Interview |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Funding Sources*** | | | | |
| Primary funding sources | Which of the following are the primary source(s) of funding that your organization relies on to operate this community garden? (select all that apply) | 1 = Membership fees<br>2 = Donations<br>3 = Fundraisers<br>4 = Grants<br>5 = Other<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| ***Policies or Rules*** | | | | |
| Presence of policies or rules | Does this community garden have policies or rules? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Rule Types | Does this community garden have rules about…: | 1 = Planting (i.e., organic, pesticide use, etc.)<br>2 = Membership restrictions<br>3 = Other _____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| Written policies | (If yes) Are these policies or rules written down? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| ***Events*** | | | | |
| **Events for members** | Variable was measured by 2 items.<br><br>Leaders were asked:<br>1. Do you provide socials for members (i.e., potlucks, BBQ, etc.)? Y/N<br>2. Do you provide workshops for members? Y/N | Responses were categorized as:<br><br>1 = None provided<br>2 = Socials only<br>3 = Workshops only<br>4 = Socials & workshops<br><br>As a predictor, above was recoded as:<br>0 = No events<br>1 = Yes events (socials or workshops)<br><br>Nominal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Interview |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Events for public | (if yes) Are events provided open to the public? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| External Agencies help provide events | Have other agencies helped provide socials or workshops for gardeners in this community garden? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| ***Transfer of Gardening Knowledge*** | | | | |
| How Novices learn to Garden | How do you think new or novice gardeners learn in this community garden? (select all that apply) | 1 = Hands on<br>2 = Informal mentoring<br>3 = Workshops provided<br>4 = Other _____ | Researcher constructed | Descriptive<br><br>Interview |
| ***Communication*** | | | | |
| Internal communication | What are the top 3 ways that your organization uses for internal communication (i.e., communication with your members)? | 1 = Websites<br>2 = Emails<br>3 = Social media<br>4 = Face-to-face<br>5 = Phone calls<br>6 = Fliers<br>7 = Other _____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| External communication | What are the top 3 ways that your organization uses for external communication (i.e., recruitment)? | 1 = Websites<br>2 = Emails<br>3 = Social media<br>4 = Face-to-face<br>5 = Phone calls<br>6 = Fliers<br>7 = Other _____<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Physical*** | | | | |
| **Gardening practice** (plot type) | What kinds of gardening plots are available in this community garden? | 1 = Individual plots only<br>2 = Mix of individual plots and communal areas<br>3 = Communal plot(s) only<br><br>Higher values indicated greater 'collective gardening'<br><br>Ordinal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Interview |
| **Enclosure Strength** (enclosure type) | Variable was measured by responses from 3 items.<br><br>Leaders were asked:<br>1. Do you have a fence? (Y/N)<br>2. Is it gated? (Y/N)<br>3. Is it locked? (Y/N) | Leaders' responses were combined to form following categories:<br><br>1 = No fence<br>2 = Fence, no gate<br>3 = Fence & gate, no lock<br>4 = Fence, gate, & locked<br><br>Higher scores indicate greater enclosure strength<br><br>Ordinal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Interview |
| Open to the Neighborhood | Is the community garden ever open to the neighborhood or other community groups? | 1 = Yes<br>2 = No<br><br>Nominal | Researcher constructed | Descriptive<br><br>Interview |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| ***Diversity*** | | | | |
| % POC in CG | Out of 100%, what percentage would you say your community garden members are… | % White _____<br>% People of color _____<br><br>Interval measure | Adapted item used by other researchers (Shinew et al., 2004) | Descriptive<br><br>Interview |
| **Garden Racial Diversity** | Variable was measured by recoding the item above (% POC in CG).<br><br>***Note.*** Actual empirical range of community gardens in this study were:<br>1 = Mainly white *(0% - 20% POC)*<br>2 = Mainly POC *(70% - 100% POC)*<br>3 = Evenly Mixed *(50% - 60% POC)* | % POC in CG was recoded as follows:<br><br>1 = Homogenous, mainly white *(> 40% POC)*<br>2 = Homogenous, mainly POC *(>60% POC)*<br>3 = Heterogeneous, evenly mixed *(40% - 60% POC)*<br><br>Categories were based on median value & percentiles for 3 even groups<br><br>Nominal measure | Researcher constructed | Descriptive; **Predictor**<br><br>Interview |
| % POC in NE | Variable was measured by data obtained from Census at block-group level<br><br>Data obtained were: total # POC and total population. | % POC in NE = $\frac{\#\ POC}{\#\ Tot\ Pop}$<br><br>Interval measure | Researcher constructed | Descriptive<br><br>Census |

| Variable | Items | Scale Development | Measure Source | Study use & Data source |
|---|---|---|---|---|
| Ratio Garden to Neighborhood Racial Diversity | Variable was measured by 2 items: % POC in CG and % POC in NE (see above) | Ratio Value = $\frac{\%\ POC\ CG}{\%\ POC\ NE}$<br><br>How to interpret ratio: Ratio values < 1 indicated that % POC CG was less than % POC NE<br><br>Ratio values = 1 indicated that % POC CG equaled % POC NE<br><br>Ratio values > 1 indicated that % POC CG was greater than % POC NE<br><br>Interval measure | Researcher constructed | Descriptive<br><br>Interview & Census |
| CG facilitates interactions across race | From your observations, do you think this community garden facilitates interactions between people from different ethnic/racial backgrounds? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |
| CG facilitates interactions across other dimension of difference | From your observations, do you think this community garden facilitates diverse interactions between people in any other way (i.e., across age, income, etc.)? | 1 = Yes<br>2 = No<br><br>Nominal measure | Researcher constructed | Descriptive<br><br>Interview |

# Chapter 4 Results

In this chapter, results are organized according to the research question asked and the hypotheses sets that were tested. As there are multiple data sets, pre-screening and meeting statistical assumptions are discussed in each section.

## Research Question 1

The first research question was, "What are the characteristics of gardeners involved in community gardens located in Southern urban food deserts (Richmond, VA?)". A sub-question was, "Are there differences among gardener characteristics by race?" Individual gardener survey data were collected from members and leaders to answer this question. Univariate statistics were used to describe the sample. Differences by race were examined using $X^2$ and bootstrapped independent samples t-tests.

### Prescreen

**Missing data.** In the individual data set, there was only one case that was missing a substantial amount of data. A visual examination of the 61 cases revealed that this one case only answered the initial survey section on gardener-related characteristics. The researcher elected to delete this one case since the individual did not provide any other relevant information necessary for subsequent analyses.

Missing values analyses indicated that there was no pattern to missing data in the remaining data set ($n$=60) and was consistent with the assumption of missing completely at

random (MCAR), according to Little MCAR's test ($X^2$= 575.96, *df* = 1196, *p*= 1.000) (Tabachnick & Fidell, 2007). No item had more than 5% missing values, a common cut-point to indicate problematic issues (Abu-Bader, 2010). At most, one item had 3 missing values (4.9%), while four items had 2 missing values (3.3%), and the remaining 16 items had one missing value (1.6%). As a final check, missing values were coded as 1 and all other values were coded as 0 and then correlated with each outcome variable, in a copy of the data set. These analyses indicated that there were no missing items significantly related to either outcome variable; "I don't know" responses were not seen as missing for these analyses.

"Select all that apply" questions were not included in the above pre-screening analyses since missing values would be over-represented. The researcher visually inspected these items and also examined the frequencies. The researcher assumed that if an individual selected at least one response item for the "select all" questions, then that person did not intentionally skip the question. Based on this criterion, the researcher determined that there was no pattern to missing values and that the assumption of MCAR remained tenable.

The researcher imputed values only for length of time gardening in three cases where the individual did not report the month. The researcher used April as the month they joined based on the fact that April was the most commonly month reported by others. This also made sense, as most people tend to join a community garden at the beginning of the spring growing season. The researcher imputed the mean garden tenure for the two individuals who did not provide month and year.

**Scale development and reliability.** Cronbach's alpha was used to examine the internal consistency of scales; Table 9 provides a summary of scale reliabilities. See Appendix F for scale interitem correlations. The 6-item Environmental Values scale had less than desirable reliability

(ENV $\alpha$ = .437). After examining interitem correlations and Pearson's bivariate correlations, two items were dropped (items 2 and 6). The resulting 4-item scale had Cronbach's $\alpha$ = .558. Dropping additional items improved the scale minimally and even though Cronbach's alpha was less than the desirable .60 alpha (DeVellis, 2012), the researcher elected to use the 4-item scale because this was an exploratory study. Further, Cronbach's alpha is a conservative estimate of reliability and is affected by the number of items; more items will produce larger alpha and less items will produce smaller alpha (DeVellis, 2012; Field, 2013). In addition, 1 item was dropped from the Resources Accessible scale because it was a constant; no one knew someone who could provide legal advice.

Table 9

*Summary of Scales' Reliability*

| | # items | *n* | α | Std α |
|---|---|---|---|---|
| *Values* | | | | |
| ENV | 4 | 60 | 0.558 | 0.575 |
| SJV | 7 | 57 | 0.908 | 0.913 |
| *Community Garden benefits* | | | | |
| ENVben | 4 | 59 | 0.682 | 0.690 |
| PERben | 4 | 59 | 0.840 | 0.842 |
| CFSben | 4 | 58 | 0.842 | 0.843 |
| CDben | 4 | 58 | 0.891 | 0.891 |
| *Differences & Similarities* | | | | |
| DEEP | 3 | 37 | 0.802 | 0.799 |
| *Organizational processes* | | | | |
| DEC | 5 | 59 | 0.955 | 0.955 |
| TASK | 4 | 47 | 0.744 | 0.748 |
| ***Social** Capital* | | | | |
| SOC | 6 | 59 | 0.852 | 0.862 |
| RES | 16 | 57 | 0.818 | 0.810 |

**Statistical assumptions**. Data were examined for bivariate statistical assumptions. Categories for nominal variables were collapsed to meet the assumptions of $X^2$ that no expected cell frequencies was less than 5 (Welkowitz et al., 2012). Race was collapsed into two categories: White and People of Color. The 3 people who reported either American

Indian/Alaskan Native or Bi/Multiracial were classified as White or People of Color based on whether they also identified as a racial minority. Responses to belonging to a minority group or groups (Yes/No) and follow-up open text responses (which group or groups) were used to assess racial minority identification. For Minority group member, "I don't know" responses were collapsed with "No" responses.

Being of Hispanic ethnicity, current enrollment in post-secondary education and student enrollment status, and "other" responses were dropped from the bivariate analyses because too few cases fell into certain categories or were not of theoretical interest. Fisher exact tests were reported in the few instances when $X^2$ assumptions were violated and categories could not be collapsed any further (Welkowitz et al., 2012). The strength of statistically significant relationships were reported using the Phi coefficient (Φ); a value of .1 is small effect size, a value of .3 is moderate effect size, and a value of .5 or greater is a large effect size (Welkowitz et al., 2012).

Independent t-tests assume independence of observations, no outliers and normality by groups, and equal variance of groups (Field, 2013). Independence of observations was assumed based on study design. Using boxplots, three extreme outliers were found and were either winsorized by replacing outlier values with the value 3*sd* below the group mean (7.14 for ENVben and 7.37 for PERben), or replaced by the closest value (4 for MEET; winsorized value was still an extreme outlier) (Field, 2013). As the characteristics of this population are unknown, the researcher assumed outliers represented the population (Field, 2013). Many of the continuous variables were not normally distributed by race as determined Shapiro-Wilk's tests of normality. When skew and kurtosis statistics were divided by their standard error (Abu-Bader, 2010), only a few had skew values greater than 2; all slightly skewed in the negative direction. Based on

histograms, the researcher determined that skewed distributions were not severe enough to warrant transformations (Field, 2013).

Further, to mitigate effects of slight deviations from normality, independent samples t-tests were performed using bootstrap sampling (1000) and bias corrected accelerated confidence intervals (Field, 2013). It should be noted that t-tests were performed with and without bootstrapping and there were no differences in what relationships were significant. This is unsurprising since independent t-tests are robust against violations of normality (Field, 2013). Only bootstrapped results were reported. Equal variance could not be assumed in some cases as determined by Levene's test and the appropriate statistics were reported (Field, 2013). Effect sizes (r) were calculated by the following formula: $r = \sqrt{(t\text{^}2/(t\text{^}2 + df))}$ (Field, 2013). A value of .1 is a small effect size, a value of .3 is a moderate effect size, and a value of .5 is a large effect size (Field, 2013). Statistical significance was determined at the $p \leq .10$ level because the researcher was more concerned with committing a Type II error than a Type I error (Field, 2013), a valid concern given the exploratory nature of this study (Labovitz, 1968; Skipper et al., 1967). Please note that the original ENVben and PERben scale scores were reported for descriptive statistics.

**Descriptive Statistics**

Demographics are summarized in Table 10. Gardener-related and other characteristics are summarized in Table 11. Tables are provided at the end of this section. See Appendix G for Scale Item Frequencies.

**Demographics.** Overall, this sample represented a wide range of demographics, particularly in age and race. Thirty-five percent (35%) were 20 to 39 years old, 30% were 40 to 59 years old, and 35% were 60 to 69 years old. Fifty-eight percent (58%) of the gardeners were

white while 65% were female. Most gardeners appeared similar in terms of education levels, employment and homeownership. Seventy-two percent (72%) had obtained a Bachelor's degree or higher, 70% were employed, and 68% owned their own home.

Forty percent (40%) of gardeners identified as belonging to a minority group or groups. All twenty-four responded to the follow-up open-text question; 17 of which indicated at least their race of "African-American" or "person of color" as belonging to a racial minority group. Other minority groups mentioned were: gender, income, sexual orientation, disability, immigrant status, and being a "single, white, working woman with no children". One person also identified genderqueer as their sex. See Table 10.

**Gardener-related & other characteristics**. Gardeners on average had been involved with their community garden for 3.02 years (*sd*=2.56, median= 3.01) ranging from less than a month to 9.08 years. Sixty-five percent (65%) of gardeners frequented their community garden two to three times a week; 70% gardened at home as well; and, 65% lived in the neighborhood of their community garden. Interestingly, 5% also gardened at another community garden. See Table 11.

***Food security, harvest & productivity.*** Eighty-five percent (85%) of the gardeners had never experienced food insecurity in the past year, while 12% indicated that they had "sometimes" or "often" experienced food insecurity in the past year. Sixty-seven percent (67%) of gardeners grew plants they could and could not eat while 32% only grew plants they could eat; 78% ate their own harvest; 75% gave some to friends or family; 25% donated some to the broader community (e.g., food pantries, gave away to strangers, etc.); and, 13% sold some of their harvest. The four who selected "other" indicated that they used their harvest for personal

use such as can and freeze, use for classes), or that their harvest had been stolen, or that they had plans for donating future surplus to the community.

Seventy-nine percent (79%) grew enough food to reduce their grocery costs to some degree. However, 12% reported that they never grew enough food to reduce costs. To grow more food, gardeners reported that they primarily needed more time (58%) and space (47%) followed by more education (33%) and supplies (33%). Twenty percent (20%) selected "other" and indicated that water, more energy, and greater community participation and volunteers were needed to grow more food. See Table 11.

***History, skills & improvement.*** Seventy-two percent (72%) of gardeners had gardened before they joined their community garden. Prior to joining their community garden, 67% of gardeners described their gardening skills as 'beginner' or 'average', while 33% described their skills as 'advanced' or 'expert'. Since joining their community garden, 46% described their gardening skills as 'beginner' or 'average', while 53% described their skills as 'advanced' or expert'. Based on their skill level before and since joining, gardening skills improved for 38% of gardeners while gardening skills stayed the same for 62% of gardeners. See Table 11.

***Values.*** The average environmental values (ENV) scale score among gardeners was 16.47 (*sd*= 2.59, median= 16.5), that ranged between 11 (min) and 20 (max). The ENV scale had a potential range of 4 – 20, suggesting that most gardeners were at the upper end of this scale and ascribed to beliefs consistent with supporting the environment. The average social justice values (SJV) scale score among gardeners was 31.05 (*sd*= 4.35, median= 33), that ranged between 19 (min) and 35 (max). The SJV scale had a potential range of 7 – 35, suggesting that most gardeners were at the upper end of this scale and ascribed to beliefs consistent with supporting social justice. See Table 11.

***Community garden benefits.*** The average environmental benefits (EVNben) score among gardeners was 16.12 (*sd*= 2.64, median= 16) on a scale that ranged between 4 (min) and 20 (max). The average personal health benefits (PERben) score among gardeners was 16.97 (*sd*= 2.85, median= 17.5), on a scale that ranged between 4 (min) and 20 (max). The average community food security benefits (CFSben) score was 13.88 (*sd*= 3.42, median= 13.5), on a scale that ranged between 4 (min) and 20 (max). The average community development (CDben) score was 15.73 (*sd*= 3.13, median= 16), on a scale that ranged between 4 (min) and 20 (max). The potential range for all of the perceived community garden benefits subscales was 4 – 20. These findings indicate that gardeners generally perceived that their community garden mainly benefitted themselves and the earth, and less so in providing benefits for community food security. See Table 11.

***Differences & similarities.*** The average perceived racial differences (PRD) score was 1.86 (*sd*= .79, median= 2), on a scale that ranged between 1 (min) and 3 (max). The potential range for PRD was 1 – 3, suggesting that most gardeners were right below the mid-point of this scale and perceived low to moderate levels of racial differences in their community garden. The average perceived deep-level similarities (DEEP) score was 6.69 (*sd*= 2.31, median= 7), on a scale that ranged between 2 (min) and 9 (max). The potential range for DEEP was 3 – 9. The minimum score for DEEP was below the potential scale score because "I don't know" was seen as missing for scale items; only two individuals had a DEEP scale score of 2. These findings suggest that most gardeners were right above the mid-point of this scale and perceived moderate levels of deep-level similarities in their community garden. See Table 11.

***Socializing across race.*** The average score for meeting others in the community garden who differed racially (MEET) was 3.12 (*sd*= .90, median = 3), on a scale that ranged between 1

(min) and 5 (max). The average score for mixing socially with other gardeners who differed racially outside of the community garden (MIX) was 2.12 (*sd*= 1.06, median = 2), on a scale that ranged between 1 (min) and 5 (max). The potential range for these items was 1 – 5. These findings indicate that gardeners met others who differed racially in their garden more frequently than they mixed socially with other gardeners who differed racially outside of their garden. See Table 11.

***Organizational processes.*** A little more than half of garden members reported that decisions were made primarily by their garden leader or leaders with input from members (55%), while 18% indicated that decisions were made solely by leader(s). Fifteen percent (15%) reported that decisions were made by vote or consensus. The average perceived democratic decision-making (DEC) score was 17.88 (*sd*= 5.67, median = 20), on a scale that ranged between 5 (min) and 25 (max). The potential range for the DEC scale was 5 – 25. The average perceived leadership role opportunities (TASK) scale score was 11.29 (*sd*= 3.07, median= 12), that ranged between 3 (min) and 16 (max). The potential range for TASK was 4 – 16. The minimum score for TASK was below the potential scale score because "I don't know" was seen as missing for scale items; only one individual had a TASK scale score of 3. These findings indicate that gardeners generally perceived high levels of democratic decision making and moderate levels of leadership opportunities in their community garden. See Table 11.

***Social capital.*** Gardeners were asked about their sense of community and whether they knew other gardeners who could provide a specific instrumental resource as indicators of social capital. The average sense of community (SOC) score was 22.93 (*sd*= 4.15, median = 23), on a scale that ranged between 12 (min) and 30 (max). The average number of instrumental resources (RES) one could obtain from other gardeners was 4.37 (*sd*= 3.50, median= 4), on a scale that

ranged between 0 (min) and 12 (max). The potential range was 6 – 30 for SOC and 0 – 17 for RES. These findings indicate that gardeners reported moderately high levels of sense of community and low amounts of resources accessible to them. See Table 11.

Table 10

*Descriptive Statistics for Gardener Demographics (n=60)*

| | n | % | | n | % |
|---|---|---|---|---|---|
| Age | | | Enrolled in post-secondary education | | |
| 20 - 29 years' old | 9 | 15.0 | No | 55 | 91.7 |
| 30 - 39 years' old | 12 | 20.0 | Yes, Technical/Vocational | 1 | 1.7 |
| 40 - 49 years' old | 7 | 11.7 | Yes, Community College | 1 | 1.7 |
| 50 - 59 years' old | 11 | 18.3 | Yes, College or University | 3 | 5.0 |
| 60 - 69 years' old | 21 | 35.0 | If yes, are you a...? | | |
| Sex | | | Full-time student | 3 | 60.0 |
| Female | 39 | 65.0 | Part-time student | 2 | 40.0 |
| Male | 20 | 33.3 | Employment status | | |
| Other | 1 | 1.7 | Employed, full time | 28 | 46.7 |
| Race | | | Employed, part time *(1 job)* | 5 | 8.3 |
| White/Caucasian | 35 | 58.3 | Employed, part time *(1+ jobs)* | 6 | 10.0 |
| Black/African American | 22 | 36.7 | Self-Employed | 3 | 5.0 |
| American Indian/Alaska Native | 1 | 1.7 | Unemployed, looking for work | 4 | 6.7 |
| Biracial/Multiracial | 2 | 3.3 | Unemployed, not looking for work | 13 | 21.7 |
| Ethnicity | | | Other | 1 | 1.7 |
| Hispanic/Latino | 2 | 3.5 | Home ownership status | | |
| NOT Hispanic/Latino | 55 | 96.5 | Own | 41 | 68.3 |
| Education Level | | | Rent | 17 | 28.3 |
| Less than 9th grade | 1 | 1.7 | Other *(i.e., I stay with family, etc.)* | 2 | 3.3 |
| 9th to 12th grade *(nd)* | 1 | 1.7 | Member of minority group | | |
| High school graduate or alt. | 2 | 3.3 | Yes | 24 | 40.0 |
| Some college *(nd)* | 10 | 16.7 | No | 34 | 56.7 |
| Associate's degree | 3 | 5.0 | I don't know | 2 | 3.3 |
| Bachelor's degree | 17 | 28.3 | | | |
| Some graduate school *(nd)* | 3 | 5.0 | | | |
| Graduate or professional degree | 23 | 38.3 | | | |

*Note: n*=60 for all except *n*=57 for Ethnicity and *n*=5 for student enrollment status in post-secondary education.*nd refers to "no degree" obtained.

Table 11 *Descriptive Statistics for Gardener-related & other Characteristics (n=60)*

| | n/m | %/sd | | n/m | %/sd |
|---|---|---|---|---|---|
| ***Basic Traits*** | | | ***History, Skills & Improvement*** | | |
| Garden tenure | 3.02 | 2.56 | Began gardening | | |
| Garden role | | | Before this garden | 43 | 71.7 |
| Member | 39 | 65.0 | At this garden | 17 | 28.3 |
| Leader | 21 | 35.0 | Gardening skills before joining | | |
| Garden frequency | | | Beginner | 15 | 25.0 |
| Not often *(0-1x /wk)* | 5 | 8.3 | Average | 25 | 41.7 |
| Somewhat often *(2-3x /wk)* | 39 | 65.0 | Advanced | 19 | 31.7 |
| Most days *(4-5x / wk)* | 9 | 15.0 | Expert | 1 | 1.7 |
| Almost every day *(6-7x / wk)* | 5 | 8.3 | Gardening skills now | | |
| Several times a day *(8+ x / wk)* | 2 | 3.3 | Beginner | 4 | 6.7 |
| Garden elsewhere *(select all)* | | | Average | 24 | 40.0 |
| Yes, at home | 42 | 70.0 | Advanced | 26 | 43.3 |
| Yes, at another garden | 3 | 5.0 | Expert | 6 | 10.0 |
| No, only here | 16 | 26.7 | Skill Improvement | | |
| Live in neighborhood of garden | | | Skills worsened | 0 | 0.0 |
| Yes | 39 | 65.0 | Skills stayed the same | 37 | 61.7 |
| No | 21 | 35.0 | Skills improved | 23 | 38.3 |
| ***Food Security, Harvest & Productivity*** | | | ***Values*** | | |
| Food Insecure *(past year)* | | | ENV | 16.47 | 2.59 |
| Never | 51 | 85.0 | SJV | 31.05 | 4.35 |
| Sometimes | 5 | 8.3 | ***Community Garden benefits*** | | |
| Often | 2 | 3.3 | ENVben | 16.12 | 2.64 |
| I don't know | 2 | 3.3 | PERben | 16.97 | 2.84 |
| Usually grow | 1 | 1.7 | CFSben | 13.88 | 3.42 |
| Only plants I can eat | 19 | 31.7 | CDben | 15.73 | 3.13 |
| Both plants I can & can't eat | 40 | 66.7 | ***Differences & Similarities*** | | |
| Other | 1 | 1.7 | PRD | 1.86 | 0.79 |
| Harvest *(select all)* | | | DEEP | 6.69 | 2.31 |
| Cook and eat at home | 47 | 78.3 | ***Socializing across race*** | | |
| Give some to friends & family | 45 | 75.0 | MEET | 3.12 | 0.90 |
| Donate some to others | 15 | 25.0 | MIX | 2.12 | 1.06 |
| Sell some | 8 | 13.3 | ***Organizational processes*** | | |
| Other | 4 | 6.7 | Decision-making process | | |
| NA - I don't grow food | 1 | 1.7 | Mainly by leader(s) alone | 11 | 18.3 |
| Grow enough to reduce grocery costs | | | By the leader(s) with input | 33 | 55.0 |
| Never | 7 | 12.1 | By vote *(i.e., majority rule)* | 2 | 3.3 |
| Sometimes | 22 | 37.9 | By consensus *(i.e., all agree)* | 7 | 11.7 |
| Often | 13 | 22.4 | Other | 3 | 5.0 |
| Always | 11 | 19.0 | I don't know | 4 | 6.7 |
| NA - I don't grow food | 5 | 8.6 | DEC | 17.88 | 5.67 |
| Grow more with… | | | TASK | 11.29 | 3.07 |
| More gardening space | 28 | 46.7 | ***Social Capital*** | | |
| More education/training | 20 | 33.3 | SOC | 22.93 | 4.15 |
| More time | 35 | 58.3 | RES | 4.37 | 3.50 |
| More supplies | 20 | 33.3 | | | |
| Other | 12 | 20.0 | | | |
| NA - I don't grow food | 2 | 3.3 | | | |

*Note.* *n*=58 for "Grow enough food to reduce grocery bills"; *n*=57 for PRD; *n*=52 for DEEP; & *n*=58 for TASK.

**Differences by Race**

Demographic differences by race are summarized in Table 12. Differences by race for gardener-related and other characteristics are summarized in Table 13 ($X^2$) and Table 14 (t-tests). Tables are provided at the end of this section.

**Differences in demographics.** There were statistically significant associations between race and the following: age; education levels; and, whether one identified as member of a minority and/or oppressed group. White gardeners (46%) were more likely to be between the ages of 20 to 39 years compared to people of color (17%) than what would be expected; Φ = .298 indicated a small effect size. White gardeners (54%) were more likely to have a graduate degree compared to people of color (12%) than what would be expected; Φ = .638 indicated a large effect size. Perhaps unsurprisingly, people of color were more likely to identify as belonging to a minority group (74%) compared to white gardeners (19%) than what would be expected; Φ = -.546 indicated a large effect size. However, not all people of color identified as a minority; 74% of people of color (n=23) identified as a minority while 26% did not or were unsure. See Table 12.

**Differences in gardener-related & other characteristics.** With respect to basic traits, there were statistically significant associations between race and the following: garden tenure, garden role, gardening elsewhere, and living in the neighborhood of the community garden. People of color had been at their community garden longer ($m$= 4.19 years) than white gardeners ($m$= 2.30 years), $p$ = .019; $r$ = .43 indicated a moderate effect size. People of color were also more likely than to be garden leaders (52%) compared to white gardeners (24%) than what was expected; Φ = .284 indicated a small effect size.

White gardeners, however, were more likely to garden elsewhere (84%) compared to people of color (57%) than what was expected; Φ = .300 indicated a moderate effect size. Given that 70% of the total sample gardened at home as well, it is likely that white gardeners were gardening at their homes. Further exploration using crosstabs suggested this as well. Of the 42 individuals who also gardened at home, 74% were white and 26% were people of color. Further, all 3 individuals who gardened at another community garden were people of color. White gardeners were also more likely to live in the neighborhood of their community garden (87%) compared to people of color (30%) than what was expected; Φ = .571 indicated a large effect size. See Table 13 for categorical variables and Table 14 for garden tenure.

***Food security, harvest & productivity.*** There were statistically significant associations between race and what gardeners did with their harvest. White gardeners were more likely than what was expected to cook and eat some of their harvest at home (97%), and to give some to their friends and family (89%) than people of color (48%, Φ =.584 indicated a large effect size; 52%, Φ = .416 indicated a moderate effect size, respectively). In contrast, people of color were more likely than what was expected to donate some of their harvest to others in the broader community (44%) and to sell some of their produce (35%) compared to white gardeners (14%, Φ = -.336 indicated a moderate effect size; 0%, Φ = -.497 indicated a moderate effect size, respectively). Overall, these findings suggest that people of color more often use their community garden to improve community food security, usually by donations, while white gardeners more often use their community garden for their own personal use. See Table 13.

***History, skills & improvement.*** There were statistically significant associations between race and gardening history and skill improvement. White gardeners were more likely to have gardened prior to joining their community garden (92%) compared to people of color (40%) than

what was expected; Φ = .569 indicated a large effect size. Unsurprisingly then, people of color were more likely to have improved their gardening skills (61%) compared to white gardeners (24%) than what was expected; Φ = .365 indicated a moderate effect size. See Table 13.

***Values & community garden benefits.*** There were statistically significant associations between race and environmental values and community food security benefits. White gardeners had higher environmental values (*m*= 17.32) than people of color (*m*= 15.09), *p*= .016; *r*= .43 indicated a moderate effect size. However, people of color had higher perceptions that their garden helped them provide a community food security benefit (*m*= 15.48, *SD*= 3.41) than white gardeners (*m*= 12.89), *p*= .010; *r*= .37 indicated a moderate effect size. This made sense as people of color were more likely to donate or sell their produce compared to white gardeners. See Table 14.

***Socializing across race.*** Finally, there were statistically significant associations between race and one type of social interaction across race. People of color reported meeting others of a difference race more frequently within their community garden (*m*= 3.39) compared to white gardeners (*m*= 2.92), *p* = .042; *r* = .26 indicated a small effect size. See Table 14.

Table 12

*$X^2$ Differences by Race for Gardener Demographics (n=60)*

| | *n* | **%** | White | | POC | | $X^2$ | *df* | *p* |
|---|---|---|---|---|---|---|---|---|---|
| | | | *n* | % | *n* | % | | | |
| Age | | | | | | | | | |
| 20 - 39 years old | 21 | 35.0 | 17 | 45.9 | 4 | 17.4 | 5.342 | 2 | **0.069** |
| 40 - 59 years old | 18 | 30.0 | 10 | 27.0 | 8 | 34.8 | | | |
| 60 - 69 years old | 21 | 35.0 | 10 | 27.0 | 11 | 47.8 | | | |
| Sex | | | | | | | | | |
| Female | 39 | 66.1 | 26 | 72.2 | 13 | 56.5 | 1.544 | 1 | 0.214 |
| Male | 20 | 33.9 | 10 | 27.8 | 10 | 43.5 | | | |
| Education Level | | | | | | | | | |
| <9$^{th}$ to some College *(nd)** | 14 | 23.3 | 1 | 2.7 | 13 | 56.5 | 24.436 | 2 | **0.000** |
| AA to Graduate *(nd)** | 23 | 38.3 | 16 | 43.2 | 7 | 30.4 | | | |
| Graduate degree | 23 | 38.3 | 20 | 54.1 | 3 | 13.0 | | | |
| Employment Status | | | | | | | | | |
| Employed | 42 | 71.2 | 29 | 78.4 | 13 | 59.1 | 2.502 | 1 | 0.114 |
| Unemployed | 17 | 28.8 | 8 | 21.6 | 9 | 40.9 | | | |
| Homeownership | | | | | | | | | |
| Own | 41 | 68.3 | 25 | 67.6 | 16 | 69.6 | 0.026 | 1 | 0.872 |
| Rent or Other | 19 | 31.7 | 12 | 32.4 | 7 | 30.4 | | | |
| Minority group member | | | | | | | | | |
| Yes | 24 | 40.0 | 7 | 18.9 | 17 | 73.9 | 17.873 | 1 | **0.000** |
| No | 36 | 60.0 | 30 | 81.1 | 6 | 26.1 | | | |

*Note.* *nd refers to "no degree obtained". *n*=59 for Employment status.

Table 13

*$X^2$ Differences by Race for Gardener-related & other Characteristics (n=60)*

| | *n* | % | White | | POC | | $X^2$ | *df* | *p* |
|---|---|---|---|---|---|---|---|---|---|
| | | | *n* | % | *n* | % | | | |
| ***Basic Traits*** | | | | | | | | | |
| Garden role | | | | | | | | | |
| Leader | 21 | 35.0 | 9 | 24.3 | 12 | 52.2 | 4.835 | 1 | **0.028** |
| Member | 39 | 65.0 | 28 | 75.7 | 11 | 47.8 | | | |
| Garden frequency | | | | | | | | | |
| 0-3 times a week | 44 | 73.3 | 28 | 75.7 | 16 | 69.6 | 0.271 | 1 | 0.603 |
| 4-8+ times a week | 16 | 26.7 | 9 | 24.3 | 7 | 30.4 | | | |
| Garden elsewhere | | | | | | | | | |
| Yes | 44 | 73.3 | 31 | 83.8 | 13 | 56.5 | 5.39 | 1 | **0.020** |
| No | 16 | 26.7 | 6 | 16.2 | 10 | 43.5 | | | |
| Live in neighborhood of garden | | | | | | | | | |
| Yes | 39 | 65.0 | 32 | 86.5 | 7 | 30.4 | 19.587 | 1 | **0.000** |
| No | 21 | 35.0 | 5 | 13.5 | 16 | 69.6 | | | |
| ***Food, Harvest & Productivity*** | | | | | | | | | |
| Food Insecure | | | | | | | | | |
| Sometimes to Often | 7 | 12.1 | 3 | 8.1 | 4 | 19.0 | 1.511[a] | 1 | 0.219 |
| Never | 51 | 87.9 | 34 | 91.9 | 17 | 81.0 | | | |
| Usually grow… | | | | | | | | | |
| Only plants I can eat | 19 | 32.2 | 14 | 37.8 | 5 | 22.7 | 1.443 | 1 | 0.230 |
| Both plants I can & can't eat | 40 | 67.8 | 23 | 62.2 | 17 | 77.3 | | | |
| Harvest | | | | | | | | | |
| Cook & eat at home | | | | | | | | | |
| Yes | 47 | 78.3 | 36 | 97.3 | 11 | 47.8 | 20.452[b] | 1 | **0.000** |
| No | 13 | 21.7 | 1 | 2.7 | 12 | 52.2 | | | |
| Give some to friends/family | | | | | | | | | |
| Yes | 45 | 75.0 | 33 | 89.2 | 12 | 52.2 | 10.364 | 1 | **0.001** |
| No | 15 | 25.0 | 4 | 10.8 | 11 | 47.8 | | | |
| Donate some to others | | | | | | | | | |
| Yes | 15 | 25.0 | 5 | 13.5 | 10 | 43.5 | 6.792 | 1 | **0.009** |
| No | 45 | 75.0 | 32 | 86.5 | 13 | 56.5 | | | |
| Sell some | | | | | | | | | |
| Yes | 8 | 13.3 | 0 | 0.0 | 8 | 34.8 | 14.849[c] | 1 | **0.000** |
| No | 52 | 86.7 | 37 | 100.0 | 15 | 65.2 | | | |
| Grow enough to reduce bills | | | | | | | | | |
| Never to sometimes | 29 | 54.7 | 19 | 52.8 | 10 | 58.8 | 0.170 | 1 | 0.680 |
| Often to always | 24 | 45.3 | 17 | 47.2 | 7 | 41.2 | | | |
| Grow more with… | | | | | | | | | |
| More gardening space | | | | | | | | | |
| Yes | 28 | 46.7 | 18 | 48.6 | 10 | 43.5 | 0.152 | 1 | 0.696 |
| No | 32 | 53.3 | 19 | 51.4 | 13 | 56.5 | | | |
| More education/training | | | | | | | | | |
| Yes | 20 | 33.3 | 15 | 40.5 | 5 | 21.7 | 2.256 | 1 | 0.133 |
| No | 40 | 66.7 | 22 | 59.5 | 18 | 78.3 | | | |
| More time | | | | | | | | | |
| Yes | 35 | 58.3 | 24 | 64.9 | 11 | 47.8 | 1.694 | 1 | 0.193 |
| No | 25 | 41.7 | 13 | 35.1 | 12 | 52.2 | | | |

| | *n* | % | White | | POC | | $X^2$ | *df* | *p* |
|---|---|---|---|---|---|---|---|---|---|
| | | | *n* | % | *n* | % | | | |
| More supplies | | | | | | | | | |
| Yes | 20 | 33.3 | 13 | 35.1 | 7 | 30.4 | 0.141 | 1 | 0.707 |
| No | 40 | 66.7 | 24 | 64.9 | 16 | 69.6 | | | |
| ***History, Skills & Improvement*** | | | | | | | | | |
| Began gardening… | | | | | | | | | |
| Before this garden | 43 | 71.7 | 34 | 91.9 | 9 | 39.1 | 19.455 | 1 | **0.000** |
| At this garden | 17 | 28.3 | 3 | 8.1 | 14 | 60.9 | | | |
| Skills before | | | | | | | | | |
| Beginner to average | 40 | 66.7 | 22 | 59.5 | 18 | 78.5 | 2.256 | 1 | 0.133 |
| Advanced to expert | 20 | 33.3 | 15 | 40.5 | 5 | 21.7 | | | |
| Skills now | | | | | | | | | |
| Beginner to average | 28 | 46.7 | 16 | 43.2 | 12 | 52.2 | 0.455 | 1 | 0.500 |
| Advanced to expert | 32 | 53.3 | 21 | 56.8 | 11 | 47.8 | | | |
| Skill Improvement | | | | | | | | | |
| Skills stayed the same | 37 | 61.7 | 28 | 75.7 | 9 | 39.1 | 8.013 | 1 | **0.005** |
| Skills improved | 23 | 38.3 | 9 | 24.3 | 14 | 60.9 | | | |
| **Organizational Processes** | | | | | | | | | |
| Decision-making structure | | | | | | | | | |
| Mainly by leader(s) alone | 11 | 20.8 | 7 | 20.6 | 4 | 21.1 | 0.381[d] | 1 | 0.826 |
| By leader(s) with input | 33 | 62.3 | 22 | 64.7 | 11 | 57.9 | | | |
| By vote or consensus | 9 | 17.0 | 5 | 14.7 | 4 | 21.1 | | | |

*Note. N* varies for Food Insecure; "Usually grow"; "Grow enough to reduce bills"; & Decision-making structure.

[a]2 cells have expected count less than 5; Fishers' exact (2-sided) $p = .241$.

[b]1 cell has expected count less than 5; Fisher's exact (2-sided) $p < .000$.

[c]2 cells have expected count less than 5; Fisher's exact (2-sided) $p < .000$.

[d]2 cells have expected count less than 5; Fisher's exact (2-sided) $p = .917$.

Table 14

*Independent T-Test Differences by Race for Gardener-related & other Characteristics (n=60)*

| | Statistics | | | | | | | Group Means | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *t* | *df* | *p* | *m diff* | *se* | BCa 95% CI | | White | | POC | |
| | | | | | | Lower | Upper | *m* | *sd* | *m* | *sd* |
| ***Basic Traits*** | | | | | | | | | | | |
| Tenure | -2.629 | 31 | **0.019** | -1.89 | 0.72 | -3.25 | -0.31 | 2.30 | 1.81 | 4.19 | 3.14 |
| ***Values*** | | | | | | | | | | | |
| ENV | 3.565 | 58 | **0.001** | 2.24 | 0.64 | 0.97 | 3.36 | 17.32 | 2.19 | 15.09 | 2.63 |
| SJV | 0.555 | 58 | 0.581 | 0.65 | 1.14 | -1.64 | 3.29 | 31.30 | 4.14 | 30.65 | 4.74 |
| ***CG benefits*** | | | | | | | | | | | |
| ENVben | -1.341 | 58 | 0.185 | -0.85 | 0.64 | -2.27 | 0.47 | 15.84 | 2.30 | 16.70 | 2.55 |
| PERben | -0.554 | 58 | 0.582 | -0.39 | 0.68 | -1.70 | 1.00 | 16.87 | 2.72 | 17.26 | 2.45 |
| CFSben | -3.045 | 58 | **0.010** | -2.59 | 0.88 | -4.21 | -0.84 | 12.89 | 3.06 | 15.48 | 3.41 |
| CDben | -1.202 | 58 | 0.188 | -1.00 | 0.75 | -2.49 | 0.59 | 15.35 | 3.41 | 16.35 | 2.59 |
| ***Diff & Sim*** | | | | | | | | | | | |
| PRD | -0.399 | 40 | 0.692 | -0.09 | 0.23 | -0.52 | 0.29 | 1.82 | 0.72 | 1.91 | 0.90 |
| DEEP | 0.629 | 33 | 0.533 | 0.44 | 0.67 | -0.96 | 1.83 | 6.87 | 1.93 | 6.43 | 2.80 |
| ***Socializing*** | | | | | | | | | | | |
| MEET | -2.085 | 58 | **0.042** | -0.47 | 0.25 | -0.98 | -0.001 | 2.92 | 0.76 | 3.39 | 0.99 |
| MIX | 0.419 | 58 | 0.677 | 0.12 | 0.26 | -0.45 | 0.63 | 2.16 | 1.09 | 2.04 | 1.02 |
| ***Org. processes*** | | | | | | | | | | | |
| DEC | 0.247 | 58 | 0.824 | 0.37 | 1.52 | -2.64 | 3.49 | 18.03 | 5.42 | 17.65 | 6.17 |
| TASK | 1.009 | 56 | 0.318 | 0.84 | 0.85 | -0.74 | 2.55 | 11.61 | 2.95 | 10.77 | 3.26 |
| ***Social Capital*** | | | | | | | | | | | |
| SOC | -0.940 | 39 | 0.353 | -1.10 | 1.13 | -3.52 | 1.17 | 22.51 | 3.75 | 23.61 | 4.75 |
| RES | -1.661 | 58 | 0.115 | -1.52 | 0.95 | -3.32 | 0.26 | 3.78 | 3.25 | 5.30 | 3.75 |

*Note.* Bootstrapped performed (1000) with bias corrected confidence intervals. *n*= 57 for PRD; *n*= 52 for DEEP; & *n*= 58 for TASK. Equal variance not assumed for Tenure, PRD, DEEP & SOC.

## Research Question 2

The second research question was, "What are the characteristics of community gardens located in Southern urban food deserts (Richmond, VA?)". Survey data were collected from primary leaders about the garden organization to answer this question. Univariate statistics of frequencies and means were used to describe the sample. The sub-question was, "What is the rationale for variations in garden characteristics?" Qualitative data from leader interviews (primary and secondary) were used to answer this sub-question.

### Prescreen

There were missing data for one primary leader's race in the organizational-level data set because this individual did not complete the gardener survey. The researcher imputed race for this primary leader based on the researcher's own observations. In addition, two community gardens had been established for less than one year; one was 7 months old and one was 11 months old. For these gardens, the researcher inputted 1 year for "Years Established". There were no other missing data in the organizational data set.

### Descriptive Statistics & Rationales

Descriptive statistics are summarized in Table 15. Qualitative data for the rationales of various community garden characteristics are provided in each section when relevant. Descriptive statistics based on primary leader responses were provided first, before rationales from all leaders were discussed. To help with clarity, "qualitative interviews with leaders" was used to indicate responses from all leaders, while "primary leaders" was used to indicate descriptive statistics when necessary. Lastly, this section ends with a discussion of the larger themes that cut across the questions and rationales provided by leaders.

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Table 15

*Descriptive Statistics for Community Garden Characteristics (n=10)*

| | *n/m* | *%/sd* | | *n/m* | *%/sd* |
|---|---|---|---|---|---|
| ***Garden demographics*** | | | ***How Novices Learn to Garden*** | | |
| Years established | 6.80 | 5.57 | Hands on learning | 10 | 100.0 |
| No. of gardeners | 9.80 | 6.53 | Informal mentoring | 9 | 90.0 |
| Size *($ft^2$)* | 1981 | 1882 | Workshops provided | 2 | 20.0 |
| Landowner | | | Referrals to external sources | 3 | 30.0 |
| Public/Government | 5 | 50.0 | Internet | 1 | 10.0 |
| Church | 3 | 30.0 | ***Communication*** | | |
| Private (for-profit) | 2 | 20.0 | Internal communication modes | | |
| ***Management*** | | | Emails | 8 | 80.0 |
| Org Type *(direct mgmt.)* | | | Social media | 4 | 40.0 |
| Informal *(group or individual)* | 6 | 60.0 | Texting | 4 | 40.0 |
| Non-profit | 2 | 20.0 | Face-to-face | 8 | 80.0 |
| Church | 2 | 20.0 | Phone | 4 | 40.0 |
| Above Entity est. CG | 10 | 100.0 | Message boards | 2 | 20.0 |
| Umbrella Org *(indirect mgmt.)* | 5 | 50.0 | External communication modes | | |
| ***Leadership*** | | | Website | 6 | 60.0 |
| Racial minority *(primary)* | 6 | 60.0 | Emails | 4 | 40.0 |
| Multiple leaders | 7 | 70.0 | Social media | 4 | 40.0 |
| ***Fees & Waitlist*** | | | Face-to-face | 7 | 70.0 |
| Membership fee | 5 | 50.0 | Fliers | 4 | 40.0 |
| Fee cost *(n=6)* | $45 | $18 | ***Physical*** | | |
| Waitlist | 0 | 100.0 | Plot Types | | |
| ***Primary Funding Sources*** | | | Individual only | 1 | 10.0 |
| Membership fees | 5 | 50.0 | Individual & communal | 4 | 40.0 |
| Donations | 8 | 80.0 | Communal only | 5 | 50.0 |
| Grants | 4 | 40.0 | Enclosure Type | | |
| Fundraisers | 1 | 10.0 | No fence | 4 | 40.0 |
| Other | 3 | 30.0 | Fence, no gate | 2 | 20.0 |
| ***Policies or Rules*** | | | Fence & gate, no lock | 2 | 20.0 |
| Presence of rules | 9 | 90.0 | Fenced, gated, & locked | 2 | 20.0 |
| Rules about… | | | Open to Neighborhood | 9 | 90.0 |
| Membership restriction *(n=9)* | 0 | 100.0 | ***Diversity*** | | |
| Organic gardening only *(n=9)* | 9 | 100.0 | % POC in CG | 48.50 | 36.21 |
| Written rules *(n=9)* | 8 | 88.9 | % POC in NE | 63.63 | 27.68 |
| ***Events*** | | | Ratio of CG to NE | 0.96 | 1.02 |
| Events for members | | | Garden Racial Diversity | | |
| None | 1 | 10.0 | Mainly white *(0% - 20% POC)* | 4 | 40.0 |
| Socials only | 6 | 60.0 | Mainly POC *(70% - 100% POC)* | 3 | 30.0 |
| Workshops only | 1 | 10.0 | Evenly mixed *(50% - 60% POC)* | 3 | 30.0 |
| Socials & workshops | 2 | 20.0 | CG facilitates interactions across… | | |
| Events open to or for public *(n=9)* | 9 | 100.0 | Race | 7 | 70.0 |
| Ext. Agencies helped provide *(n=9)* | 4 | 40.0 | Other differences *(e.g., age, etc.)* | 9 | 90.0 |

***Demographics.*** On average, community gardens had been established an average of 6.8 years (*sd*= 5.57, median = 4), ranging from 1 – 16 years. On average, community gardens had 1,981 $ft^2$ in gardening space available (*sd*= 1,882, median = 1,010) and 9.8 total gardeners (*sd*= 6.53, median = 6.5). Half of the community gardens were on land owned by public/government entities (50%), while the remaining were on land owned by churches (30%) and private entities (20%). Church sponsored community gardeners were open to the public (i.e., anyone could join) as verified by the researcher during the recruitment process.

***Management.*** Sixty percent (60%) of community gardens were directly managed by individuals or informal groups whereas the remaining 40% were managed by nonprofits (20%) or churches (20%). Half (50%) of community gardeners were under the aegis of a single umbrella organization. Additional information from the qualitative aspect of the study revealed that it was often challenging for leaders (both primary and secondary) to select which "organization" best described who directly managed their community garden. For example, some of the informal groups were tied to neighborhood associations, but leaders felt that the neighborhood associations were only fiscal conduits. A few others had nonprofit status, but had only obtained such to manage their own financial affairs.

Leaders were also asked about the benefits and challenges they received from their umbrella organization. Umbrella organizations provided indirect support and oversight; and, were defined as external entities that had a formal community garden program staffed with a coordinator or coordinators who manage several community gardens. There was only one umbrella organization in this sample (type not revealed to preserve anonymity). However, leaders discussed the nature of their relationship with landowners as well. Thus, this next section reports on the benefits and challenges across the umbrella organization and landowners.

The primary benefits mentioned by leaders from landowners and the umbrella were land and access to water. However, the umbrella organization provided additional benefits: affordable insurance; gardening supplies (e.g., wood chips, mulch, seeds, etc.); fundraising and networking opportunities; and, access to external volunteer groups that would come and help in the garden. Notably, the volunteer group most often mentioned were youth that had to complete involuntary community service and work release inmates.

Interestingly, the majority of leaders also noted that the community garden provided a benefit to their landowners and the umbrella organization as well. For example, one community garden was located on a privately owned assisted living facility (ALF). While some ALF residents were garden members, most simply came over to chat and enjoy the garden. Leaders stated that having the community garden was likely a business benefit for the landowner. Similarly, the majority of leaders noted that the umbrella profited from the arrangement as well, since they no longer had the expense of maintaining vacant lots.

> "I mean, the [umbrella] thinks…I can see their, I understand their logic. Turned it over to us, make it so it's our responsibility to keep it looking presentable. That's twice a month they don't have to run a crew out here. And when they run a crew out here, they run a crew of four guys that work and two guys that sit in the truck and smoke. And that's expensive."

A few leaders also thought that having the community garden program had an element of public relations to it, as "it looks good for the [umbrella]."

Multiple challenges were mentioned by leaders as well. Challenges with landowners were mainly around land security as a few had only a verbal agreement. Challenges with the umbrella had mostly to do with bureaucracy, the lack of organization in and communication with the umbrella garden, and what some called "micromanagement" by the umbrella organization. The lack of organization and communication referred to the "haphazard" nature of rules and resources. It was not always clear what one could and could not do, as the leaders perceived that

the regulations and policies were always changing. In some cases, leaders indicated that some community gardens were allowed to do one thing and others under the same umbrella were not (e.g., have a fence). Further, leaders never knew when resources would be available. For example, plants would be dropped off or volunteer groups would just show up. The lack of communication made it difficult for leaders to plan or even use the resources provided.

Micromanagement by the umbrella mainly had to do with issues around upkeep, which some leaders said were subject to interpretation. For example, would a compost bin qualify as upkeep or an eyesore? Many leaders discussed difficulty in mowing the lot because they did not have a lawnmower. For some, the umbrella did not approve of their aesthetic. As one leader put it, the umbrella wanted an "English garden" and even moved items without their knowledge. Further, leaders did not think it was fair to be expected to re-do their entire garden to meet someone else's idea of an ideal garden, especially if the umbrella was not going to provide assistance.

> "I'm gonna tell you, respectfully sir, I'm not gonna do it that way. We were polite, but said bite me."

Many leaders felt that the level of micromanagement was unnecessary. However, they did understand that the umbrella organization had to balance what gardeners wanted and what neighbors may or may not desire. One leader put it best, stating that

> "You can't micromanage what is going on at the garden. As long as it's safe for the community and not a nuisance to the constituency [then it's fine]".

Despite these challenges, leaders generally perceived their relationship with the umbrella organization to be beneficial. Most stated that the umbrella organization's garden program was rather new. Thus, they were "all learning together" and figuring it out as they went along. A few leaders, however, indicated a perceived lack of professionalism and interpersonal conflict with umbrella staff.

***Leadership.*** Sixty percent (60%) of community gardens had primary leaders who were racial minorities. In addition, 70% of community gardens had multiple leaders. Three community gardens were directly managed by individuals: two were "informal" community gardens and one was a nonprofit community garden.

***Fees and waitlist.*** Half (50%) of community gardens required an annual membership fee to join and the average cost was about $45 (s*d*= $18, median = $50), ranging from $25 - $70. None of the community gardens had a waitlist. Indeed, leaders (primary and secondary) consistently mentioned in the qualitative part of the study that retaining gardeners was an issue for them. Leaders described a cycle in which they would have excited new gardeners who quickly dropped off due to life changes (e.g., getting married, having children, etc.) and from realizing how "much work gardening is".

Leaders of gardens with fees explained both practical and social reasons for having a membership fee. On the practical side, annual fees were used to establish and maintain the garden (e.g., build beds, pay water bill, etc.). Often, fees were reduced once a community garden was built because the cost of maintenance (e.g., water bill) was less expensive than building the initial infrastructure (e.g., beds, purchasing common supplies, etc.). On the social side, several leaders expressed the need for gardeners to have some "skin in the game" to foster an individual sense of ownership and pride. Recruiting and retaining committed gardeners was the desired goal for having a membership fee; one leader states that "It's like, Ok, I spent that money there, I'm not just gonna' throw that money away."

However, most of these leaders were sensitive to economic access issues. Many offered sliding scales, or would give plots away for free, or gardeners could obtain a plot via "sweat equity" – that is, providing labor for communal tasks (e.g., mowing) or taking on leadership

roles. Indeed, one leader stated that it was all about the "exchange" – regardless of whether it was monetary or sweat equity – that helped gardeners value not just gardening, but feel included and a contributing member in the community garden.

> "I think that people have to see a particular interest for themselves met. There has to be some sort of exchange. If someone gives us $25 dollars, you get a plot, now you are, now you feel as if you are a part of a thing, you know? And, leaving that open is like how do you cement that relationship for someone? Like, ok, I'm just gonna come out? [] Um, one year this girl was like, 'yeah, $25 is a lot, but I'll do this and that.' And I was like, ok, you know, whatever. It all was just, like again, about the exchange. And I think that helps people to kind of, also start thinking about, 'ok, well, in what ways am I putting into' versus, you know, just taking it out."

In contrast, most of the leaders from community gardens without a membership fee indicated that they did not have one because of economic access concerns. One leader stated that they were "in the middle of a food desert" and the purpose of the garden was to get food to those in need. In addition, a few of these leaders stated that there was no need for a membership fee because they were able to support the garden with grants and fundraising. Nevertheless, a few also indicated that they noticed a lack of engagement in their community garden and wondered if having a fee would be the "buy-in that people need."

***Primary funding sources.*** Donations (80%) and membership fees (50%) were the most common primary funding sources for community gardens, followed by grants (40%) and "other" (30%). Among the other responses, three community gardens relied on a form of "labor exchange" where each garden received funds for each person that volunteered at a local agency's events (e.g., festivals, fundraisers, etc.).

According to qualitative interviews, the majority of leaders indicated that the most expensive part was establishing a community garden. Most had used one-time donations, fundraisers, and/or grants for the initial funds. Once established, community gardens relied more on donations, membership fees, and/or "labor exchange" to pay for nominal costs associated

with maintenance. During the maintenance phase, grant funding was typically used for large projects (e.g., build a greenhouse, pay for water meter). There did not appear to be a relationship between organizational type and grant funding, as leaders from community gardens managed by both informal groups and formal entities (e.g., churches, nonprofits) indicated success in obtaining grants. For the most part, leaders were able to obtain grants because of partnerships they had with external organizations that had that "grant expertise" or they themselves came from the "nonprofit" world.

***Policies or rules.*** Ninety percent (90%) of the community gardens had policies or rules, most of which were written down (89%) in some form (i.e., paper or website) and provided to new members when they joined. The one community garden without rules relied on the "Golden Rule". One community garden did not have written rules as they all gardened together; new members were oriented to the community garden's policies and practices by the leader. These gardening rules were mostly around ensuring safety (e.g., stay hydrated, wear gloves and sunscreen, etc.).

Among the 9 gardens that had policies or rules, none had any rules that restricted membership while all had rules around organic gardening. According to qualitative interviews, the majority of leaders did not see a need to restrict their membership, to neighborhood residents for example, as they wanted more people to rent empty plots or help collectively garden. Further, despite gardening rules being in place, they were not strictly enforced. For example, one leader stated that while organic gardening was encouraged, "we're not Nazis about it". It should be noted that while one community garden did not have rules per se (i.e., Golden Rule), they also practiced organic gardening.

Generally, leaders stated that they wanted to be organic because it was important to "know where your food comes from" in order to eat healthy and fresh food that did not harm the environment. For a few leaders, growing their own food organically was the ultimate form of food security.

> "Plus, when you grow your own food you know what you puttin' in. And when you get it from these big farms who are, you don't know if they're using chemicals, if their organic, and just because somebody says their organic don't necessarily mean that they are organic."

There were, however, imposed rules for community gardens under their umbrella program. Some leaders thought their umbrella's policies were "silly rules". For example, one leader indicated that membership was "technically" restricted by the umbrella to gardeners who were city residents; yet, this leader did not have the need to actively enforce this rule. Other leaders under the same umbrella did not mention this policy, suggesting that this imposed rule was an example of a "silly rule" that was ignored by leaders. One rule, however, was not viewed as "silly". A few leaders indicated that they could not sell the produce from their community garden per their umbrella's policy. The inability to sell produce meant that leaders could not teach those who were food insecure, not only how to grow, but to also make a living from growing.

***Events***. Ninety percent (90%) of community gardens had provided socials and/or workshops for members: 60% provided socials only, 10% provided workshops only, and 20% provided socials and workshops. Only 40% of community gardens had external agencies that had provided or helped provide socials/workshops for their members. All of the events provided were open to the public – meaning that non-gardening members could attend.

According to qualitative interviews, socials were the most common event provided, usually because they were simple affairs. While a few community gardens had hosted large

events (i.e., political rallies, block parties, harvest festivals) promoted widely, most leaders organized potlucks or 'food tastings' in the garden and encouraged members to bring friends. Socials were provided and open to the public for the same reasons. Leaders wanted to build a sense of community both within and outside of the garden. One leader even stated that they wanted to show non-gardening residents that they were not "a little cult" and that all were welcome. For a few leaders, however, purely social events ended because only the same core group attended. These leaders also stated that they saw more member engagement when they combined socials with workdays. One leader speculated that people "show up to do the work" rather than socialize only due to busy schedules.

According to leaders, workshops were less commonly provided mainly because leaders lacked the expertise and there was no demand from members for workshops. One leader also noted that gardening workshops would not be particularly helpful for new members. This leader had noticed that only the "gardener type" came to workshops that they had provided for a different community garden in the past.

> "So, I work with nonprofit, environmental groups. I had combined some workshops at [another community garden] that I was doing for another purpose. It was a composting workshop and a worm workshop. And so, you know, it was like, 30 people showed up. But, they were already kind of the gardener type. So, it wasn't like teaching new people to garden or to be interested in gardening."

One community garden did not provide any events for members. The leader indicated that this was because they had not considered it until recently. This leader was in the process of planning socials because they wanted to build a sense of community and make the garden a "true" community garden.

***How novices learn to garden.*** By far the most common way primary leaders thought novice gardeners learned how to garden in their community garden was through hands on

learning (100%) and informal guidance provided by other gardeners (90%). A few (10%) also thought that beginners looked things up on the internet. Only a few leaders indicated that they or others referred new gardeners to available resources (30%), either in the community or online, or by workshops provided in the garden (20%).

Again, and according to all leaders, workshops were not generally provided because leaders did not have the expertise. A few actively referred gardeners to external resources available locally or shared information via Facebook. Overall, the majority of leaders indicated that new gardeners mainly learned just by "giving it a shot" and by asking other gardeners.

***Communication.*** Leaders were also asked how they primarily communicated with their members (internal) and for recruitment (external). According to primary leaders, the most common forms of internal communication were emails (80%) and face-to-face discussions (80%) followed by phone calls (40%), texting (40%), and social media (40%). A few (20%) also used message boards placed in the garden's shed. The most common forms of external communication were websites (60%) and face-to-face or "word of mouth" recruitment (70%). Social media (40%), emails (e.g., list servs) (40%), and fliers (40%) were used to a lesser extent.

According to qualitative interviews, the majority of leaders displayed a sensitivity to access issues regarding communication, particularly in terms of recruitment. Most leaders stated that they thought going door-to-door was the best way to get others involved, particularly low-income or elderly residents who may not have internet access. Further, some leaders indicated that they had done gone door-to-door when they first established the community garden; however, this level of outreach was difficult to maintain due to lack of time. Most relied on having a sign at the garden that displayed an email or website address and "word of mouth" for recruitment. Nevertheless, one leader stated that their own efforts were inadequate to recruit

those in need; suggesting that their own privilege prevented them from having the cultural understanding to engage across race and class differences.

> "I think most [people who could] benefit from the garden probably looked at that sign and looked at the website and that didn't mean anything to them because they don't have a computer or they don't have wi-fi or they don't have all those things that educated white people take for granted and that's too bad, because we, we lack the capacity to understand how to serve a community that actually needs community gardening and to lure them in."

In contrast, a few leaders indicated that they were surprised with how many low-income, people of color they interacted with and recruited to volunteer in the community garden had internet access.

> "I mean, you'd be surprised. Everybody has a phone. A lot of people have a phone. And they say, "Well text me or email me." And when you have them sign up, they put down an email address to reach 'em as well."

***Physical.*** Half (50%) of the community gardens had communal plots only, meaning that no one person "owned" a plot, and 40% had a mixture of individual plots and communal areas. Only one community garden had individual plots only.

According to qualitative interviews, the majority of leaders from "communal only" community gardens indicated that the main reason for gardening collectively was to be inclusive of all forms of engagement and to promote community food security. For example, leaders stated that it was common for them to have neighborhood residents who occasionally helped in the garden. What was more challenging was to have consistent members because residents faced multiple life challenges.

> "We had a couple of, um, Harvest events and the people come, you know. [But], they stop returning phone calls. They tell you, they have good intentions, you know, but, it's, it's hard! You know. That, when you don't have no transportation, you got to be on the bus, the bus system sucks, you know. And, you're just running hither and yon. You know. That's the reality."

For the most part, communal gardens relied on a core team and external volunteer groups (i.e., Boy Scouts) to do the gardening. The produce was usually given away to food pantries or churches, or distributed during harvest festivals, or simply left out for anyone to take.

However, a few leaders from these 'communal only' community gardens questioned whether they were a "true" community garden when they did not have consistent gardeners from the neighborhood, particularly the low-income residents that they were trying to serve. Further, these leaders did not think their collective gardening model was sustainable as the majority of the core team were elderly and could not do the hard labor required to garden. These leaders stated that they would prefer to have individual plots because they thought it would increase a sense of ownership: gardeners would be able to "plant what they wanted, when they wanted". Similar to having membership fees, leaders thought that this sense of ownership based on individual plots would help them recruit neighborhood residents. In fact, a few of these leaders indicated that they had turned people away because they "were not that kind of community garden."

> "That lady that brought her vegetables. She came up with some vegetables that Saturday. We told her that we didn't have a garden like that. [] She said, 'they said, come work in the garden. I got my veggies, I went and bought my plants.' And she held her stuff to plant. She had twos of everything. All, everything she needed, she had. And they had to turn her away."

It should be noted that not all leaders from "communal only" community gardens questioned whether they were a "true" community garden, even when they did not have consistent participation from neighborhood residents that were primarily low-income and people of color. The majority of these leaders indicated that lack of engagement was mainly due to structural barriers this population faces. In fact, the meaning of a community garden was not questioned by these leaders. It was simply a community garden because it was available for the community; community members participated simply based on their interests and abilities.

Community gardens with a "mixture" of plot types had individual plots and communal areas. According to leaders for these community gardens, communal areas ranged from being permanently designated to temporary arrangements. For example, one community garden had planted perennials (e.g., strawberries, blueberry bushes, etc.) and herbs around the perimeter

from which any member or stranger could freely harvest while unrented plots became communal plots. According to the majority of these leaders, the main reasons for having communal areas were that they wanted to "bless the neighborhood" and to provide a way for new gardeners to "try it out" without being overwhelmed with taking care of a garden plot on their own. For the one community garden with individual plots only, the leader indicated this arrangement was due to wanting to get the "best bang for your buck"; however, people could share plots if they wanted.

With respect to enclosure type, most community gardens had a fence (60%) while 40% did not. However, 20% of those with fences did not have a gate and 20% did not have a locked gate. Two community gardens (20%) were completely enclosed: fenced, gated, and locked. Of these two, one was locked only at night and some weekends for security purposes unrelated to the community garden. The landowner, a private business, secured their premises when closed. Only one community garden required members to have a code to unlock the gate. This perhaps explains why 90% of primary leaders considered their community garden to be open and accessible to the public.

According to the qualitative interviews, the majority of leaders did not view the fence to be exclusionary. In fact, most leaders in gardens without a fence expressed a desire to have one. In general, leaders had or wanted a fence for practical, aesthetic, and psychological reasons. On the one hand, the fence protected their garden from animals and was viewed simply as "pretty". On the other hand, leaders thought that the fence was a psychological deterrent from theft and vandalism; it was just enough of an inconvenience without being a complete barrier to entry.

Indeed, the majority of leaders were quite clear that fences should be "porous" – that is, not a "barbed wire" fence because a community garden should be open to the community.

Further, one leader indicated that the more exclusionary the fence was, the more likely it would invite backlash from the excluded community.

> "I think if you're going to have a fence it has to be porous, like it has to have a couple of gates and because the idea…You're never going to keep people out. So the more that you send a message that you don't want them there…if you tell people don't come, they'll come, you know? You're not welcome here. 'Oh yeah? I'll show you how welcome I am.'"

Further, most leaders in community gardens with a fence stated that their fence was not truly a barrier; anyone could hop over or walk in. If someone were hungry, they could easily get something to eat. A few leaders indicated that they had lost members because produce was stolen. However, most leaders felt that this was just par for the course; if you were going to garden in the middle of the community, particularly in a food desert, then you had to be okay with some things "walking away."

There were a few dissenting voices from the majority view on "stealing" – that is, it was not stealing when produce was taken from a community garden. For these few leaders, they looked forward to eating what they grew and wanted to be the ones who shared it with others. Further, one leader indicated that the lack of a fence, specifically protection from stealing, was a fundamental barrier to promoting food security.

> "But, you don't have [food security] if someone can destroy the viability of it. So, [the neighborhood residents] that are needed to be here are on the high side of the block. It's very easy to get 'em to come down. For me. [But] would I really ask them to participate and take $25 dollars of their money? No. I'll just go, here's a bed that's empty, here you go. Cause I don't know if anything you grow gonna be there!"

***Decision-making process.*** Leaders were asked about their decision-making process through open-ended questions only. According to all leaders, very few community gardens had a formal decision-making body (e.g., committee with a President, Vice-president, etc.) that met regularly. Most had an informal process, in which gardeners met regularly, usually during

monthly or bi-annual workdays, and made decisions together. Often, decisions were made by consensus, but would go to a majority vote if needed.

According to all leaders, most indicated that they had started with a more formal process, or at least met more regularly, when they were establishing the garden. However, once the garden was established, there was no need to meet as frequently as decisions were "lightweight." Decisions were usually around what to grow in communal plots, what needed to be replaced, and what socials to organize. As one leader put it, "it's not rocket science" – you simply decide "what you want to do, how you're going to do it, and then do it."

According to leaders, members were able to participate in the decision-making process in all of the community gardens. However, one leader described the situation as "democracy in participation" – those who showed up to meetings or workdays had a say. Indeed, some leaders stated that despite inviting members or asking for member input, none showed up to meetings or no input was provided. In these cases, leaders just made decisions and trusted members to bring up any concerns they had.

A few leaders indicated that they did not have a decision-making process at all. Instead, one leader viewed each gardener as a "benevolent dictator" while another viewed the community garden as an "open source project". In each case, gardeners simply did what they wanted and then informed the group. For example, one gardener brought in a table and another put in a compost bin. There were some minor challenges involved with this model. For example, no one knew how to take care of the compost bin, even the gardener who installed it.

Overall, the majority of leaders stated that they had little conflict within their community garden. Although disagreements came up from time to time, most leaders perceived that as being normal when working with groups. Usually, conflicts were resolved by having a "spat", then

"cooling off", and sometimes having "a beer afterwards." However, a few leaders – notably secondary leaders – indicated having serious conflict over decisions made. Serious conflict came up in community gardens that had a formal decision making process as well as those that had no process. Further, conflict arose between leaders who were of the same race and not of the same race (i.e., primary was Black and secondary was White). These secondary leaders indicated that it was the primary leader's lack of communication and personality that was the source of their frustrations.

Of key significance, one decision that created serious conflict between primary and secondary leaders of the same race within one community garden had to do with whether the produce from communal plots should be donated or sold.

> "Cause I know, I had grew up poor. So I know how it is to be without. It's right there within reach and you can't have it. I know what it's like to not have a dinner to eat. To live off, oh Lord, to live on school lunch. A lot of times. So, when I volunteer to do this kind of stuff, I'm trying to do it for a good reason. Not just for money. You see? That's, that's why, that's how I feel about it. This whole situation. To me it's for, I'm doing it for a good cause, not for money. And it seemed to have, it turned into a money thing to me."

This conflict suggests that not all decisions are "lightweight". Indeed, the purpose of the community garden, as well as which community it serves and how can become contentious issues. Another leader indicated that balancing the desire for entrepreneurship and economic development while providing affordable food-to-food insecure residents living in a food desert was a delicate act.

***Diversity.*** Community gardens had an average of 48.50% people of color (*sd*= 36.21, median = 55.00), that ranged from 0% to 100% per garden. Surrounding neighborhoods had an average of 63.63% people of color (*sd*= 27.68, median = 72.42, that ranged from 13.96% to 98.44%. The average ratio of percent people of color in a community garden relative to its neighborhood was 0.96 (*sd*= 1.02, median = 0.68), that ranged from 0 to 3.58; meaning that

community gardens had 3% less people of color on average compared to their neighborhood's racial demographic make-up.

The minimum and maximum ratio scores ranged from 0 to 100% per garden because one community garden had no people of color despite being in a neighborhood that was 79% people of color. On the other extreme, one community garden had 3.58 times (or 358%) more people of color in the community garden because the neighborhood was only 14% people of color. This anomaly had to do with how the Census divides block groups. At the tract level, this "neighborhood" was composed of 48% people of color (ratio = 1.05). This matches how the leader described the neighborhood, stating that this particular community garden was placed right in the middle of a neighborhood segregated by the "wealthy and white on one side" and the "poor and people of color on the other side"; however, the block group delineation mostly only counted the "wealthy, white side". As a whole, the median value (0.68) indicated that community gardens had 32% less people of color compared to the neighborhood.

When looking at the racial make-up of the community garden itself, 40% were "Homogenous, mainly white (0% - 20% POC)", 30% were "Homogenous, mainly POC (70% - 100% POC)", and 30% were "Heterogeneous, evenly mixed (50% - 60% POC). Table 16 below provides a breakdown of each these categories by their neighborhood's racial make-up. Community gardens that were mainly white (0% - 20% POC) were in neighborhoods that had 56% people of color on average. Community gardens that were mainly people of color (70% - 100%) were in neighborhoods that had 83% people of color on average. In addition, community gardens that were evenly mixed (50% - 60% POC) were in neighborhoods that were 53% people of color on average. These findings suggest that community gardens that are primarily composed of people of color are located in neighborhoods that are predominantly composed of people of

color. In contrast, community gardens that were primarily composed of white gardeners and evenly mixed were both located in racially mixed neighborhoods.

Table 16

*Community Garden Racial Diversity by Percent People of Color in Neighborhood (n=10)*

| CG Racial Diversity categories | NE % POC | | | | |
|---|---|---|---|---|---|
| | m | sd | median | min | max |
| Homogenous, mainly white *(0% - 20% POC)* | 55.75 | 22.92 | 58.92 | 26.54 | 78.67 |
| Homogenous, mainly POC *(70% -100% POC)* | 82.86 | 8.87 | 79.09 | 76.49 | 92.99 |
| Heterogeneous, evenly mixed *(50% - 60% POC)* | 53.02 | 34.74 | 49.84 | 13.96 | 98.44 |

Despite the fact that community gardens had 32% less people of color compared to the neighborhood (based on the median ratio), 70% of primary leaders indicated that they thought their community garden helped facilitate interactions across race. Further, 90% thought that their community garden helped facilitate interactions across other dimensions of difference; the most common of which mentioned was intergenerational.

When asked how the community garden helped facilitate racial interactions, the majority of leaders (primary and secondary) differentiated between racial diversity *within* the garden and racial diversity *by* the garden. Racial diversity *within* the garden simply referred to the racial demographic make-up of gardeners. Racial diversity *by* the garden referred to diverse racial interactions that occurred because of the garden; that is, by neighborhood residents passing by to "chat".

When speaking about *within* the garden, most leaders from predominantly white community gardens indicated that they had hoped for the community garden to act as a "racial bridge" in the neighborhood, but that it did not often result in such despite their efforts. Black and white leaders often described incidents where they would chat with people of color walking by and invite them to join, usually to no avail. A few leaders went to great lengths to get "some people of color in" by recruiting from apartments, public housing complexes, and schools.

On the other hand, the majority of leaders from predominantly people of color community gardens indicated that they lacked racial diversity *within* the garden because there were not many white people that lived in the neighborhood. This makes sense as these community gardens were in neighborhoods that were composed of 83% people of color on average. One leader also indicated that most of the few white people in their neighborhood were involved with the community garden. Overall, these leaders focused on increasing the engagement of low-income, people of color in their neighborhood.

Indeed, for leaders in both types of community gardens (i.e., mainly white and mainly people of color), the lack of racial diversity *within* a community garden was often entangled with the lack of class or income diversity. For example, the majority of leaders noted various structural barriers that the poor and people of color face, such as working several jobs and being transitory, as well as general life circumstances all face, such as having a family. Due to their own lack of time and resources, most leaders were also constrained in their ability to hold events more frequently and in their external communication capacity to promote such events or recruit intensively (i.e., go door-to-door).

A few leaders, specifically white leaders, speculated that there were also cultural challenges using "word of mouth" recruitment. One leader thought that white gardeners approaching people of color could be perceived as unwelcoming by people of color; and thus, sustain a predominantly white community garden, despite being in a racially diverse neighborhood.

> "I mean part of it just could be part of that self-sustaining thing where the people who approach people are White. People who approach people and say, "would you like to garden with us" are White. [] And so, it doesn't feel like this is a place for Black people."

In addition, the majority of leaders in mainly white and mainly people of color community gardens also mentioned peoples' lack of interest as a reason for why their community

garden was not diverse racially and/or by income. Most white and black leaders perceived a lack of interest in gardening among African-Americans, specifically those that were of a younger generation. Notably, most black leaders thought that the lack of perceived value in growing one's own food was due to not growing up with gardening. However, a few white leaders speculated that gardening had a cultural currency only among a white, middle class with liberal values.

> "White, white liberals. There's like a, you know, 'organic's a cool thing' that's definitely been a rising tide that lifted this particular boat around the interest in gardening. And that, you know, me saying to a friend, 'Yeah, I grew that cucumber' is like, quote cool. Versus in other communities, it might be like, 'What do you mean you grew that?' So, there is a currency around it in certain educated [circles]."

In contrast, leaders within "evenly mixed" community gardens mentioned shared interests as a reason for having a racially diverse community garden. Notably, shared interests were around social justice concerns, not necessarily gardening. For example, one leader described how people across race, sexual orientation, and income levels pulled together to establish their community garden during the Occupy movement. This leader stated that "the idea of community coming together to make a tangible impact" was in the "air at the time" and the community garden was a concrete way that they could change some things.

Gentrification was also mentioned by leaders as a reason for why their community garden was racially diverse and why it was not. Most leaders stated that the "neighborhood was changing"; becoming more white as young, white professionals moved into the city, and black families left – either because elders passed away and/or families sold their homes to go to the suburbs and/or could no longer afford the property taxes. Because the area had become gentrified, leaders stated that there just were not many people of color, particularly low-income people of color, in the neighborhood anymore.

> "I'm sure they would think it was pleasant to get a bag of beans fresh out of the garden, um, but yeah, I don't think there's, I don't think there's hardly anybody on these blocks …

> for whom that would make a material difference. So, its, I mean, this area when we first started was much less gentrified, and it has become ridiculously more gentrified."

Further, the people of color remaining in the neighborhood often were elderly. Leaders indicated that they were not necessarily trying to recruit senior citizens to garden per se, as it was physically demanding.

A few leaders, however, stated that gentrification helped increase racial diversity within the garden. The reason being that many of the neighborhoods had been predominantly black; often families had lived there for generations. As one black leader put it, we were now becoming a "global society" and people of different races and ethnicities were "just showing up everywhere".

Because of these various structural and cultural issues, most leaders thought that racial interactions occurred more so *by* the community garden and not *within* the community garden. For example, multiple leaders brought up similar examples in which they would chat with people of a different race walking down the street. A few leaders viewed these interactions as substantive, in which they learned about the history of the neighborhood and black elders shared stories of growing up on farms and gardening tips. In contrast, a few leaders viewed these interactions as "superficial" in which conversations were simply "hello, how ya' doing?" Yet, these superficial interactions were perceived as valuable for generating some "degree of cohesion and familiarity" in a gentrifying neighborhood segregated by race and class. In almost all cases, leaders mentioned meeting others of a different race they "otherwise would not have met" because of the garden.

> "So, and the interesting thing about this is while...while the majority of the plot renters are White. I now know more neighbors who are not White because I am a gardener there. [] I see the woman who weeds as she walks to the market. And I'm like, 'Oh my gosh! Thank you!' And I've seen her probably a half a dozen times now. That's the woman I gave the tomato plant to. I don't know her name! But, I see her on a regular basis. And, it's usually just a hello, but, [its] an interaction. And then, she doesn't walk in front of my

> house because there's no market near my house. So, but for the garden, I wouldn't have been able to say hello and have interactions with her."

Further, a few leaders also indicated that people of color in their neighborhood were more interested in chatting about the garden and enjoying the beauty of it than in actually gardening. In some ways, it appeared as if the community garden acted as a social icebreaker that allowed racially diverse interactions to occur.

> "And it's not the way I would have thought that a community garden would have done that [facilitate racial interactions]. I would have figured that, you know, someone across the street would rent a plot or, you know, the woman who likes to weed would rent a plot, that sort of thing. But, they're not that interested in renting a plot, but they're glad that it's there. And they're happy to interact and chat and benefit from the beauty of it."

**Themes**

Four themes emerged that cut across the specific questions. All of these themes revolved around black and white cultures colliding within the context of community gardens and also captured the broader structural and social forces outside of the realm of community gardens.

**Black and white guilt and the question of displacement.** Multiple leaders brought up gentrification. For many, the community garden was physically placed at the dividing line, acting as the proverbial railroad tracks that divided rich from poor, and white from black. Many leaders thought the community garden was an amenity that was attracting a certain demographic – specifically those that belong to the white middle class – to the neighborhood. For example, one leader stated that they had heard of people moving to the area, if not because of the community garden, it was at least an "added bonus". A few leaders, black and white, feared the obvious, and perceived inevitable, displacement of poor people and people of color.

A few black and white leaders struggled over the role their community garden might play in displacing the community they were trying to attract and serve. Some white leaders expressed a form of white guilt in representing the "new White people moving into the neighborhood". One

leader even felt that their white presence might inspire fear among people of color in the neighborhood.

> "If I try to walk south... it's just like...it's not a good idea because I feel like I make so many people feel uncomfortable by my presence in the neighborhood. It's an all-black neighborhood. I'm like, white girl cruising through. I just felt like I was going someplace where it was like, 'Oh shit, like, the next wave is coming.' You know?"

Despite such concerns, leaders were unsure what could be done about the issue, or whether the community garden was "to blame" or more of a symptom, since the "gentrification machine" was already occurring in these neighborhoods.

> "I'm not sure what that means. You know? Because, um, the neighborhood was already kind of like predominantly White, or, on that side. Um, so, I don't know if that means that, you know, the garden may contribute to gentrification, in a sense. And I worry about that. Like, if the garden is raising property values then that means that a certain demographic is gonna be [displaced] at some point, yeah. So. That's kind of dangerous. [But] The gentrification machine was working before."

**Black desire for visibility in a white movement.** Overwhelming, black and white leaders perceived that growing one's own food was mainly valued by a liberal, white, middle class. Further, both black and white leaders also thought that there was a generational and geographic difference among African-Americans with respect to growing. Several black leaders shared that they had grown up with gardening because they had lived in the "country". Often, their family grew food simply because they had to if they wanted to eat. These leaders thought that people of color, especially those that grew up in the city, simply did not know how to garden as well as how much money they could save if they grew some of their own food. For most black and white leaders education was the answer to promoting a "value" of gardening.

A few black leaders, however, disagreed with this majority view. One black leader stated that African-Americans have always been growing food in their backyards, "they just don't advertise it to people." Further, a few black leaders stated that while they had a racially diverse community garden, the people of color there were not from the neighborhood. These leaders

indicated that black gardeners travelled specifically to support black-led efforts to gain visibility within a white movement.

> "White gardeners live in the neighborhood, and the black gardeners do not. [] Well, the thing, the thing that I was pushing and advocating is that this is one of the few gardens that's been, that's being operated by Black folk. So. Try to help support it to sustain it, to replicate it. (be visible) Yeah."

In addition, white leaders from mainly white community gardens often expressed a desire to increase black visibility, but felt that their own privilege 'colored' their ability to understand and reach across cultural divides. Many wondered what they could do to be more accessible and inviting for people of color.

> "Like, if we actually want a community garden that looks like the community that we live in, we're not doing that right. And so, what needs to change in order for that to reflect what the community actually is? [] I mean, I would be interested in seeing a diverse community garden and finding out what they did. But, um, I don't know. Is it all just…middle income white people?"

Further, a few white leaders also questioned the lack of interest and knowledge about gardening among people of color, stating that a "bunch of people grew up on farms" in the South.

**(White) food security and (white) entrepreneurship.** A few black leaders indicated that community gardens could be more racially diverse if they were connected to entrepreneurship and economic development, which would also address food insecurity among those who experienced it. However, their umbrella organization's policies restricted them from selling produce from their community gardens. Some leaders thought that this policy prohibited people from even conceptualizing the connection between community gardens and employment. However, a few thought that this restriction was by design.

> "People who are homeless and all that stuff, I'm working with them to create these spaces. But, it's very scary because I kind of feel like I have to work in a stealth mode cause if somebody finds out, like, they'll come and then try to sabotage the fact that people they want to be homeless are not gonna have to be homeless. Because, that guy that was living on the street, he's growing food and selling it to you. So, he's making some money. But that's not the model that's respected or supported or encouraged at all."

One black leader also noted that local white-led organizations were able to be successful in promoting and profiting from urban agriculture, yet black-led efforts were not.

> You have everyone else moving into the city, they create these big urban farms and these big things. [] So, what you see is all of your bigger organizations that are well funded, getting all the grants and all the other things to do everything and they want have a top down approach. And so, even [black-led urban agriculture organization] had no success in being able to be its own thing without [white-led urban agriculture organization] trying to tell them to just bring it under them. And that's kind of just disrespectful on so many layers and levels."

Without connecting community gardening efforts to jobs or opportunities to earn money (e.g., selling produce at farmers' markets or local restaurants), this black leader saw "food desert" grant funding that supported community gardens and other "big projects" like urban farms simply as tools for gentrification and the displacement of people of color.

> "Food deserts, everybody at this point I think should know, are just a way of getting funding for infrastructure for gentrification. It has nothing to do with helping the people historically who have not had food. Those people aren't even gonna be there. So, how sick is that? So, how about you help me move you out. Under the name of food deserts. That's really what they're telling people."

**Slavery: past & present.** The historical trauma of slavery came up in a few interviews, specifically with black leaders. Leaders mentioned that they would hear comments about not being a "slave" anymore from people of color. Leaders indicated that sensitivity to this issue was necessary because you never "knew where people were coming from" and how the idea of farming would affect them emotionally. Most of these leaders stated that it was a matter of "educating them" to view gardening as self-empowering because you could provide food for yourself and your family; a conversation that some thought might be better handled between those with the same skin color. While not necessarily disputing that these conversations might be better handled among people of color, one black leader stated that there were no short cuts around this issue and it simply had to be discussed.

> "You just gotta have a repeat conversation. You know? There ain't no magic mirror. Ain't no elixir. You got to work it out! You got to work that out!"

In addition, many leaders, black and white, mentioned having youth, specifically kids from the Department of Juvenile Justice (DJJ), who provided labor in the garden for required service hours. This occurred in most community gardens across the sample, regardless of whether they were under the umbrella organization or not. Notably, "slavery" comments sometimes came from DJJ youth who often did menial tasks such as weeding and physically demanding labor that elderly gardeners could not. One black leader expressed discomfort using these youth this way.

> "We had the young teenagers from the Juvenile Justice, yesterday. [DJJ supervisor] said, 'everybody's got a garden. And everybody's called.' [] We had bought us some dirt. And we had to get it moved to where we needed it. Well, I couldn't...we couldn't do it. So, they moved wheelbarrows of dirt. [] And like I said, and I told the gentleman, 'Now, I want to be honest with you. I'm surprised that we're working these children because this dirt is wet. And it's heavy. And me personally, I think we should have just told you all to go back home today. Because it's wet dirt. And I wouldn't want my children moving wet dirt because they're young, now. But, this will hurt their bodies when they get older' ... He said, 'They'll move it.'"

Whenever the use of DJJ youth came up during interviews, black and white leaders were quick to state how they tried to provide some sort of reward, such as harvesting and eating some of the produce, or buying them breakfast. Leaders firmly stated that although they were "troubled youth" they were "still human beings" who deserved dignity and respect. However, one issue with 'rewards' was that DJJ youth were in the garden on a temporary basis and not of their own choosing. There is nothing to harvest unless these youth are there at the right time of the year. A few community gardens were able to provide an experience in which youth learned something beyond weeding and perhaps gained a skill.

> "So, we had about, like 4 or 5 people that's kind of like, with us, and then we had, you know, about 4 or 5 of the DJJ kids. And, I remember one of the kids. It was his last day and he was like, 'You know, I've been doing mulch for the last two days in a row. I wanna do something else.' And, we had something else for him to do. We had, like a

> greenhouse. And it was like, ok, go work with [CG member]. [And], he got, you know, to be heard and for us to react. [] So, you know, I think that that was rewarding because after that he was very positive about that experience. [] And it was nice to be able to show that we cared."

## Social Capital Hypotheses Testing

Informed by Social Capital Theory, hypotheses were formulated about relationships between individual and organizational characteristics, and two indicators for individual gardeners' social capital – Sense of Community, defined as relationships formed or the 'social' of social capital, and Resources Accessible, defined as potential resources accessible from relationships or the 'capital' of social capital. Multiple sequential regression was performed to test hypotheses, and each model was run separately. Prior to running regression models, bivariate analyses, independent samples t-tests, one-way ANOVA, and Pearson's correlations, were conducted. Because of sample size constraints, bivariate significance and theory were used to select which predictors to include in models. Analyses were performed using bootstrap sampling. Statistical significance was determined at the $p \leq .10$ level because the researcher was more concerned with committing a Type II error than a Type I error (Field, 2013), a valid concern given the exploratory nature of this study (Labovitz, 1968; Skipper et al., 1967).

### Prescreen

For these analyses, cross-level data were used meaning that organizational characteristics for each community garden was linked to respective gardeners. Data were prescreened for missing data in the analyses conducted and handled for the individual and organizational datasets. It should be noted that the outlier value that was transformed in the individual data set for MEET was converted back to its original value of 5.

Data were then screened for univariate outliers, as a general screen for multiple regression statistical assumptions. There were no univariate outliers among continuous variables

as determined by no standardized z scores that were ± 3*sd* from the mean (Abu-Bader, 2010). Dichotomous univariate outliers are defined as those that have a 90/10 split between categories (Tabachnick & Fidell, 2007. Tabachnick and Fidell (2007) suggest eliminating variables with such uneven splits "because the correlation coefficients between these variables and others are truncated and because the scores for the cases in the small category are more influential than those in the category with numerous cases" (p. 73). The Events for Members dichotomous variable had an extreme uneven split (92/8) and was dropped from the multivariate analyses.

**Descriptive Statistics**

Descriptive statistics for the cross-level sample are summarized in Table 17. The frequencies for individual characteristics are the same as in Tables 10 and 11. Note that the frequencies and means for organizational characteristics in the cross-level sample differ from those reported in garden characteristics in Table 15 because the garden characteristics are now a calculation based on the number of individual gardeners who participated in the study. For example, in the cross-level sample, gardeners were from community gardens that had been established longer (*m*= 7.97 vs. *m*= 6.80) and had more total gardeners (*m*= 13.80 vs *m*= 9.80) than that reported in the community garden sample characteristics in Table 17.

After consulting with a statistician, it was determined that weighted regression was not necessary. That is, as is, each predictor variable at the individual gardener level counted equally in its potential relationship with an individual's Sense of Community and Resources Accessible. Contextual analyses simply take into account the context of the community garden characteristics for each gardener with respect to their individual Social Capital. Individual gardeners from large or small community gardens may have high or low perceived Sense of

Community and Resources Accessible, particularly since one may have strong emotional connections with only a few individual or access to multiple resources from a few individuals.

Table 17

*Descriptive Statistics for Cross-level Sample (n=60)*

| | *n/m* | *%/sd* | | *n/m* | *%/sd* |
|---|---|---|---|---|---|
| **Individual** | | | **Organizational** | | |
| *Demographics* | | | *Demographics* | | |
| Race | | | Years established | 7.97 | 5.73 |
| White | 37 | 61.7 | No. of gardeners | 13.80 | 7.56 |
| People of Color | 23 | 38.3 | *Diversity* | | |
| Garden role | | | Garden Racial Diversity | | |
| Member | 39 | 65.0 | Mainly white *(0% - 20% POC)* | 35 | 58.3 |
| Leader | 21 | 35.0 | Mainly POC *(70% - 100% POC)* | 15 | 25.0 |
| Garden tenure | 3.02 | 2.56 | Evenly mixed *(50% - 60% POC)* | 10 | 16.7 |
| *Differences & Similarities* | | | *Leadership* | | |
| PRD | 1.86 | 0.79 | Primary leader's race | | |
| DEEP | 6.69 | 2.31 | White | 35 | 58.3 |
| *Socializing across race* | | | Person of Color | 25 | 41.7 |
| MEET | 3.12 | 0.90 | Multiple Leaders | | |
| MIX | 2.12 | 1.06 | No | 13 | 21.7 |
| *Organizational processes* | | | Yes | 47 | 78.3 |
| DEC | 17.88 | 5.67 | *General characteristics* | | |
| TASK | 11.29 | 3.07 | Gardening practice *(collective)* | 2.27 | 0.61 |
| *Social Capital* | | | Enclosure strength | 1.98 | 1.05 |
| SOC | 22.93 | 4.15 | Events for members | | |
| RES | 4.37 | 3.50 | No | 5 | 8.3 |
| | | | Yes | 55 | 91.7 |

*Note.* $n$=57 for PRD, $n$=52 for DEEP & $n$=58 for TASK.

## Bivariate Analyses

Predictors were examined for bivariate significance; however, empirical significance and theory determined which predictor variables were entered into regression models. Independent t-tests, one-way ANOVA, and Pearson's correlations were used to assess significant bivariate relationships and bootstrapped.

**Statistical assumptions.** Prior to running bivariate analyses, relevant assumptions were checked. Independent t-tests and one-way ANOVA assume independence of observations, no outliers and normality by groups, and equal variance of groups (Field, 2013). Independence of

observations was assumed based on study design. There were no extreme outliers as determined by visual examination of box plots. Predictors were normal for Sense of Community, and none were normal for Resources Accessible as determined by Shapiro-Wilks tests. When skew and kurtosis statistics were divided by their standard error (Abu-Bader, 2010), only Race and Leader's Race had skew values greater than 2; both slightly skewed in the positive direction (see Table 18). Based on histograms, the researcher determined that skewed distributions were not severe enough to warrant transformations (Field, 2013). Further, independent t-tests and one-way ANOVA are fairly robust to violations of normality (Field, 2013).

Table 18

*Skewness & Kurtosis Statistics for Categorical Predictor Groups by Social Capital*

| | Sense of Community | | Resources Accessible | |
|---|---|---|---|---|
| | skew/*se* | kurt/*se* | skew/*se* | kurt/*se* |
| Race | | | | |
| White | -1.77 | 1.40 | **2.19** | 0.40 |
| POC | -0.50 | -0.90 | 0.04 | 1.75 |
| Role | | | | |
| Leader | -1.55 | 0.54 | -0.11 | -1.45 |
| Member | 0.10 | -0.42 | 1.67 | -0.63 |
| Leader Race | | | | |
| White | -0.42 | 0.54 | **2.08** | 0.40 |
| POC | -0.90 | -0.45 | 0.30 | -1.81 |
| Multiple Leaders | | | | |
| Yes | -0.87 | 0.05 | 1.90 | -0.62 |
| No | -0.86 | 0.75 | 0.01 | -1.59 |
| CG Racial Diversity | | | | |
| Mainly white | -0.86 | 0.45 | 1.97 | 0.10 |
| Mainly POC | -0.54 | 0.04 | -0.10 | -1.75 |
| Evenly mixed | 0.08 | -0.21 | 0.40 | -1.10 |

Pearson's correlations assume normality and linearity (Field, 2013). None of the continuous predictors were normal according to Shapiro-Wilks' tests. When divided by their standard error, three predictors had skew values above 2; democratic decision-making (DEC) and leadership opportunities (TASK) had slight negative skews, and Enclosure strength had a slight positive skew. Three predictors had kurtosis values above 2: perceived racial differences

(PRD), Years a garden had been established, and total gardeners had "fat" tails (see Table 19). Bivariate scatterplots indicated that many continuous predictors had linear relationships with respect to both outcome variables, and a few, mainly one-item measures at the ordinal level, had weak to no linear relationships with outcome variables. Transformations were performed; however, none performed substantially better than non-transformed variables. Thus, analyses were performed with non-transformed variables for ease of interpretation.

Table 19

*Univariate Statistics for Continuous Predictors & Social Capital*

| | *n* | range | min | max | *m* | *sd* | variance | skew/*se* | kurt/*se* |
|---|---|---|---|---|---|---|---|---|---|
| *Individual* | | | | | | | | | |
| Tenure | 60 | 9.08 | 0.00 | 9.08 | 3.02 | 2.56 | 6.55 | 1.83 | -1.22 |
| PRD | 57 | 2.00 | 1.00 | 3.00 | 1.86 | 0.79 | 0.62 | 0.82 | **-2.15** |
| DEEP | 52 | 7.00 | 2.00 | 9.00 | 6.69 | 2.31 | 5.32 | -1.93 | -1.38 |
| MEET | 60 | 4.00 | 1.00 | 5.00 | 3.12 | 0.90 | 0.82 | 0.62 | 0.60 |
| MIX | 60 | 4.00 | 1.00 | 5.00 | 2.12 | 1.06 | 1.12 | 1.80 | -0.88 |
| DEC | 60 | 20.00 | 5.00 | 25.00 | 17.88 | 5.67 | 32.17 | **-2.43** | -0.78 |
| TASK | 58 | 13.00 | 3.00 | 16.00 | 11.29 | 3.07 | 9.44 | **-2.77** | 0.42 |
| SOC | 60 | 18.00 | 12.00 | 30.00 | 22.93 | 4.15 | 17.25 | -1.09 | 0.07 |
| RES | 60 | 12.00 | 0.00 | 12.00 | 4.37 | 3.50 | 12.24 | 1.63 | -1.42 |
| *Organizational* | | | | | | | | | |
| YRS Est | 60 | 15.00 | 1.00 | 16.00 | 7.97 | 5.73 | 32.88 | 1.55 | **-2.35** |
| Total Gardeners | 60 | 18.00 | 5.00 | 23.00 | 13.80 | 7.56 | 57.11 | 0.11 | **-2.97** |
| Gardening practice | 60 | 2.00 | 1.00 | 3.00 | 2.27 | 0.61 | 0.37 | -0.64 | -0.85 |
| Enclosure strength | 60 | 3.00 | 1.00 | 4.00 | 1.98 | 1.05 | 1.10 | **2.47** | -1.02 |

Bivariate analyses were performed using bootstrap sampling (1000) and bias corrected accelerated confidence intervals (Field, 2013). Analyses were performed with and without bootstrapping and there were no differences in what was significant; thus, only bootstrapped results were reported. For t-tests and one-way ANOVA, equal variance could not be assumed in some cases as determined by Levene's test and the appropriate statistics were reported (i.e., Welch's *F* for one-way ANOVA) (Field, 2013). Further, the one-way ANOVA tests were not significant and post-hoc analyses were not pursued. For Pearson's correlations, listwise deletion was used because bootstrapping automatically excludes cases without complete data (i.e., *n*= 52).

As regression models do the same, it made sense to examine which predictors with complete data had significant bivariate correlations with the outcome variables. Effect sizes (r) for significant t-tests were reported and calculated by the following formula: $r = \sqrt{(t\text{^}2/(t\text{^}2 + df))}$; Pearson's correlations are already a measure of effect size (Field, 2013). A value of .1 is small effect size, a value of .3 is moderate effect size, and a value of .5 is large effect size (Field, 2013).

**Bivariate results.** Results from independent t-tests and one-way ANOVA are summarized in Table 20. None of the categorical predictors had significant relationships with Sense of Community, and only garden role had a significant relationship with Resources Accessible. Leaders had a greater number of resources accessible to them (*m*= 5.95) compared to members (*m*= 3.51), BCa 95%CI [-4.46, -.29], *p* = .027; *r* = .40 indicated a moderate effect size.

Table 20

*Independent t-tests & ANOVA differences in Social Capital by Categorical Predictors*

| | Group 1 | | Group 2 | | Group 3 | | *t/F* | *df* | *p* |
|---|---|---|---|---|---|---|---|---|---|
| | *m* | *sd* | *m* | *sd* | *m* | *sd* | | | |
| **Sense of Community** | | | | | | | | | |
| Race | *White* | | *POC* | | | | | | |
| | 22.51 | 3.75 | 23.61 | 4.75 | | | -0.940 | 39 | 0.389 |
| Role | *Member* | | *Leader* | | | | | | |
| | 22.85 | 3.85 | 23.10 | 4.76 | | | -0.220 | 58 | 0.844 |
| Leader Race | *White* | | *POC* | | | | | | |
| | 22.94 | 3.55 | 22.92 | 4.96 | | | 0.020 | 41 | 0.984 |
| Multiple Leaders | No | | Yes | | | | | | |
| | 23.46 | 4.27 | 21.79 | 4.15 | | | 0.515 | 58 | 0.609 |
| CG Racial Diversity | *Mainly white* | | *Mainly POC* | | *Evenly mixed* | | | | |
| | 23.31 | 3.61 | 22.87 | 4.44 | 21.70 | 5.56 | 0.582 | 2, 57 | 0.562 |
| **Resources Accessible** | | | | | | | | | |
| Race | *White* | | *POC* | | | | | | |
| | 3.78 | 3.25 | 5.30 | 3.75 | | | -1.661 | 58 | 0.121 |
| Role | *Member* | | *Leader* | | | | | | |
| | 3.51 | 2.93 | 5.95 | 3.97 | | | -2.477 | 32 | **0.027** |
| Leader Race | *White* | | *POC* | | | | | | |
| | 4.00 | 3.21 | 4.88 | 3.88 | | | -0.930 | 46 | 0.346 |
| Multiple Leaders | *No* | | *Yes* | | | | | | |
| | 5.08 | 3.80 | 4.17 | 3.43 | | | 0.825 | 58 | 0.433 |
| CG Racial Diversity | *Mainly white* | | *Mainly POC* | | *Evenly mixed* | | | | |
| | 4.14 | 3.31 | 5.40 | 4.14 | 3.60 | 3.10 | 0.793 | 2, 22 | 0.465 |

*Note.* T-tests and one way ANOVA performed using bootstrapped sampling (1000) and bias corrected confidence intervals. For SOC, equal variance not assumed for Race & Leader Race. For RES, equal variance not assumed for Role, Leader Race & CG Racial Diversity.

With respect to Sense of Community, garden tenure had a weak positive correlation with SOC, $r$ = .247, BCa 95%CI [-.01, .44], $p$ = .077 such that gardeners who were gardening for longer periods of time reported greater Sense of Community. For socializing across race, both types of interactions, meeting others within the garden (MEET) and mixing socially outside of the garden (MIX) had weak positive correlations with SOC; $r$ = .251, BCa 95%CI [.02, .48], $p$ = .073; $r$ = .271, BCa 95%CI [.02, .49], $p$ = .052, respectively. These results indicated that those who socialized across race more frequently for both type of interactions reported greater Sense of Community. For perceived organizational processes, both democratic decision-making (DEC) and leadership opportunities (TASK) had moderate to small positive correlations with SOC; $r$ = .328, BCa 95%CI [.10, .55], $p$ = .017; $r$ = .232, BCa 95%CI [-.06, .51], $p$ = .099, respectively. These results indicated that gardeners who had greater perceptions of democratic decision-making and leadership opportunities reported greater Sense of Community.

With respect to Resources Accessible, garden tenure had a moderate positive correlation with RES; $r$ = .464, BCa 95%CI [.17, .71], $p$ = .001, such that gardeners who were gardening for longer periods of time reported greater number of Resources Accessible. For perceived differences and similarities, perceived racial differences (PRD) had a weak negative correlation; $r$ = -.266, BCa 95%CI [-.51, -.01], $p$ = .002, while perceived deep-level similarities (DEEP) had a moderate positive correlation with RES; $r$ = .390, BCa 95%CI [.14, .59], $p$ = .004. These results indicated that gardeners who perceived greater racial differences among their fellow gardeners reported less Resources Accessible while gardeners who perceived greater deep-level similarities with fellow gardeners reported greater Resources Accessible.

For socializing across race, only mixing socially outside the garden (MIX) had a moderate positive correlation with RES, $r$ = .317, BCa 95%CI [.05, .63], $p$ = .022, such that

gardeners who mixed socially with other gardeners of a different race outside of the garden reported greater Resources Accessible. For perceived organizational processes, democratic decision-making (DEC) had a weak positive correlation with RES; $r$ = .245, BCa 95%CI [-.02, .51], $p$ = .08, such that gardeners who perceived greater democratic decision-making reported greater Resources Accessible. Leadership opportunities (TASK), however, approached statistical significance, $r$ = .228, BCa 95%CI [-.07, .48], $p$ = .104, suggesting that gardeners who perceived greater leadership opportunities reported greater Resources Accessible.

It should be noted that none of the organizational characteristics were related to SOC or RES.

Table 21

*Pearson's Correlations for Continuous Predictors & Social Capital (n=52)*

| | | **Social Capital** | | Predictor Variables | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **SOC** | **RES** | Tenure | PRD | DEEP | MEET | MIX | DEC | TASK | YRS Est | Tot Gar | PLOT | FENCE |
| **SOC** | | 1 | | | | | | | | | | | | |
| | Sig. | | | | | | | | | | | | | |
| **RES** | | **.299*** | 1 | | | | | | | | | | | |
| | Sig. | 0.032 | | | | | | | | | | | | |
| Tenure | | **0.247** | **.464**** | 1 | | | | | | | | | | |
| | Sig. | 0.077 | 0.001 | | | | | | | | | | | |
| PRD | | -0.179 | **-0.266** | **0.236** | 1 | | | | | | | | | |
| | Sig. | 0.204 | 0.057 | 0.092 | | | | | | | | | | |
| DEEP | | 0.216 | **.390**** | 0.166 | **-0.240** | 1 | | | | | | | | |
| | Sig. | 0.125 | 0.004 | 0.240 | 0.086 | | | | | | | | | |
| MEET | | **0.251** | -0.110 | **0.271** | **.552**** | -0.076 | 1 | | | | | | | |
| | Sig. | 0.073 | 0.438 | 0.052 | 0.000 | 0.592 | | | | | | | | |
| MIX | | **0.271** | **.317*** | 0.112 | **.309*** | 0.027 | **0.253** | 1 | | | | | | |
| | Sig. | 0.052 | 0.022 | 0.429 | 0.026 | 0.849 | 0.071 | | | | | | | |
| DEC | | **.328*** | **0.245** | 0.016 | 0.025 | **0.241** | 0.117 | 0.204 | 1 | | | | | |
| | Sig. | 0.017 | 0.080 | 0.912 | 0.861 | 0.085 | 0.407 | 0.146 | | | | | | |
| TASK | | **0.232** | 0.228 | 0.073 | -0.107 | **.390**** | -0.067 | -0.063 | **.451**** | 1 | | | | |
| | Sig. | 0.099 | 0.104 | 0.606 | 0.451 | 0.004 | 0.636 | 0.658 | 0.001 | | | | | |
| YRS Est | | 0.159 | -0.071 | 0.140 | 0.106 | 0.028 | 0.115 | -0.118 | 0.015 | **-0.235** | 1 | | | |
| | Sig. | 0.260 | 0.619 | 0.323 | 0.456 | 0.843 | 0.418 | 0.404 | 0.919 | 0.094 | | | | |
| Tot Gar | | 0.088 | 0.002 | **-0.265** | **-.402**** | 0.153 | **-.368**** | -0.185 | **.337*** | **.510**** | 0.025 | 1 | | |
| | Sig. | 0.535 | 0.989 | 0.057 | 0.003 | 0.279 | 0.007 | 0.189 | 0.015 | 0.000 | 0.862 | | | |
| PLOT | | -0.171 | 0.201 | **.286*** | 0.034 | 0.166 | 0.033 | 0.075 | **-.277*** | 0.065 | **-.578**** | **-.406**** | 1 | |
| | Sig. | 0.227 | 0.153 | 0.04 | 0.813 | 0.240 | 0.814 | 0.599 | 0.047 | 0.646 | 0.000 | 0.003 | | |
| FENCE | | -0.165 | -0.189 | **-.441**** | 0.116 | -0.211 | 0.106 | 0.086 | -0.010 | **-.338*** | -0.215 | **-.345*** | **-0.245** | 1 |
| | Sig. | 0.243 | 0.181 | 0.001 | 0.414 | 0.133 | 0.456 | 0.546 | 0.942 | 0.014 | 0.126 | 0.012 | 0.080 | |

*Note.* Bolded are sig. at $p \leq .10$. *$p \leq .05$ ** $p \leq .01$. PLOT refers to Gardening practice. FENCE refers to Enclosure strength. Bootstrapped (1000) with bias corrected 95% confidence intervals.

**Selecting Predictors for Regression Models**

Due to sample size constraints, not all of the predictors and controls were included in the models. According to Tabachnick and Fidell (2007), when there are too many cases the multiple correlation coefficient (R) will depart significantly from zero. Thus, 11 predictors and controls were selected based on bivariate significance and theoretical importance for hypothesis testing. (see Table 22; CG Racial Diversity was dummy coded into 2 variables). Using GPower (Faul, Erdfeld, Buchner & Lang, 2009), the appropriate sample size for 11 predictors is 50, assuming a large effect size (.35), $\alpha = .10$, and, power = .80; the final sample size was 52.

Predictors selected were: (1) individual demographic controls, (2) individual gardener characteristics, and (3) a community garden's racial diversity. Race was a critical variable to examine, given that this study was exploring the relationships between race and racial diversity on one's social capital. Thus, it was important to include all race-related variables to examine how race – that is, one's own race, one's perception of racial differences, and a garden's racial diversity – may be related to Sense of Community and Resources Accessible in a multivariate context. In addition, individual demographics and characteristics were retained because the researcher assumed they would be more salient for an individual's Social Capital than organizational characteristics.

Other than a community garden's racial diversity, none of the organizational characteristics were included in the models.

Table 22

*Summary of Predictors & Rationale for inclusion in Social Capital Regression Models*

| Sense of Community | | Resources Accessible | |
|---|---|---|---|
| Predictors | Rationale for Inclusion | Predictors | Rationale for Inclusion |
| Race | Theoretical | Race | Theoretical |
| Role | Theoretical | Role | Empirical |
| Tenure | Empirical | Tenure | Empirical |
| PRD | Theoretical | PRD | Empirical |
| DEEP | Theoretical | DEEP | Empirical |
| MEET | Empirical | MEET | Theoretical |
| MIX | Empirical | MIX | Empirical |
| DEC | Empirical | DEC | Empirical |
| TASK | Empirical | TASK | Theoretical |
| CG Racial Diversity | Theoretical | CG Racial Diversity | Theoretical |

## Multiple Sequential Regression Models

**Statistical assumptions.** Prior to running the regression models, relevant assumptions were checked. Independence of observations (i.e. residuals were not correlated) were met as assessed by Durbin-Watson statistics being between acceptable values of 1 and 3 (1.644 for SOC and 1.843 for RES; critical values at .05 level were 1.091 (lower) and 2.085 (upper) according to Durbin-Watson table) (Field, 2013). Bivariate and multivariate linearity, and homoscedasticity were present as determined by visual inspections of partial regression plots and a scatterplot of standardized residuals by standardized predicted values. There was no evidence of multicollinearity, as determined by no Tolerance values were less than .20. No Cook's D values were greater than 1 and no leverage values were greater than their acceptable cut-point, .69; (3[($k$+1)/N]), indicating that the assumption of no multivariate outliers was met (Field, 2013). The assumption of multivariate normality was met, as assessed by histograms and P-P plots of standardized residual errors for each model (see Figures 2 – 5 after respective models). However, both regression models exhibited mild heteroscedasticity.

Variables for each step were entered simultaneously (i.e., method used was ENTER for each block). Regression models were performed with bootstrap sampling (1000) and bias corrected accelerated confidence intervals. It should be noted that analyses were performed with and without bootstrapping and there were no substantial differences in what was significant. Thus, only bootstrapped results were reported.

Lastly, and based on hypotheses, CG Racial Diversity was dummy coded differently for each model. That is, the researcher had hypothesized that groups that were racially similar (homogenous) would have higher Sense of Community than groups that were racially mixed (heterogeneous). According to the literature, homogenous groups are more likely to have higher Sense of Community compared to heterogeneous groups. It does not matter if groups are mainly white or mainly people of color in terms defining "homogeneity" based on race. In order to test this assumption, "Heterogeneous, evenly mixed" was the referent for the two homogenous groups – "mainly white" and "mainly POC" community gardens in the Sense of Community regression model.

Alternatively, the researcher had hypothesized that for Resources Accessible, community gardens that were mainly white would have the most resources accessible to members compared to community gardens that were evenly mixed and those that were mainly people of color. This hypothesis was based on Social Capital Theory and historical and structural systems of oppression, which assume that oppressed groups have less access to resources. In order to test this assumption, "Homogenous, mainly white" was the referent for "mainly POC" and "evenly mixed" community gardens for the Resources Accessible regression model.

**Sense of community results.** Three sets of predictors were regressed sequentially on Sense of Community: demographics (model 1), individual characteristics (model 2), and organizational characteristics (model 3). Model results are summarized in Table 23 at the end of this section. Model 1 was not significant ($p$ = .316). Model 2 was significant ($p$ = .004) and explained 29% of the variance. Model 3 was significant ($p$ = .006) and explained 29.3% of the variance; however, the addition of a garden's racial diversity did not significantly explain more variance; $\Delta R^2$ = .03, $p$ = .352.

Table 25 at the end of this chapter provides a summary table of hypotheses supported, not supported, and not tested for Sense of Community and Resources Accessible models. There were no substantial differences in results for predictors in the models; thus, the following statistics reported in-text are for model 3 unless stated otherwise.

Among the demographic controls, race had a non-significant relationship to Sense of Community; thus the researcher's hypothesis was supported ($b$= 1.87, BCa 95%CI [-2.14, 5.85], $p$ = .265). Garden role had a non-significant relationship to Sense of Community; thus, the researcher's hypothesis that leaders would have higher levels of SOC compared to non-leader members was not supported ($b$= -.18, BCa 95%CI [-3.13, 2.62], $p$ = .881). Garden tenure had a positive significant relationship with Sense of Community in model 2 ($b$= .33, BCa 95%CI [-.12, .71], $p$ = .093); however, it was not significant in model 1 ($b$= .32, BCa 95%CI [-.12, .75], $p$ = .165) or model 3 ($b$= .34, BCa 95% CI [-.12, .76], $p$ = .128). Zero was included in the confidence intervals across all models, which indicated that the relationship between garden tenure and Sense of Community can be negative and positive. Model 2 also indicated that for unit increase in garden tenure (3.84 months; .32 years * 12 months), an individual's Sense of Community increased by .33; an effect size that does not appear to have much practical significance. Further,

garden tenure was also not significant in any of the non-bootstrapped models. Thus, in contrast to hypotheses the researcher concluded that garden tenure was not significantly related to Sense of Community.

Among individual characteristic predictors, PRD, MEET, and MIX were significantly related to Sense of Community which was predicted by the hypotheses, while DEEP, DEC, and TASK were not, which was not predicted by the hypotheses.

With respect to differences and similarities, perceived racial differences (PRD) had a negative relationship with Sense of Community supporting the researcher's hypothesis. For every unit increase in the PRD scale, one's Sense of Community scale score decreased by 2.50 (BCa 95%CI [-5.22, -.05], $p$ =.037). Given that the average SOC score in this sample was 22.93 ($SD$= 4.15) that ranged from 12 – 30, a scale increase of 2.50 suggests that PRD had a small to moderate effect size. In contrast, perceived deep-level similarities (DEEP) had a negative non-significant relationship with Sense of Community; thus, the researcher's hypothesis that DEEP would have a positive significant relationship with SOC was not supported ($b$= -.06, BCa 95%CI [-.67, .60], $p$ = .790).

With respect to socializing across race, meeting others of a different race in the garden (MEET) had a positive significant relationship with Sense of Community supporting the researcher's hypothesis. For every unit increase in the MEET scale, one's Sense of Community scale score increased by 1.73, suggesting that MEET had a low to moderate effect size (BCa 95%CI [.51, 3.23], $p$ = .019). Similarly, mixing socially with others of a different race outside the garden (MIX) had a positive significant relationship with Sense of Community supporting the researcher's hypothesis. For every unit increase in the MIX scale, one's Sense of Community

scale score increased by 1.00, suggesting that MIX also had a small effect size (BCa 95%CI [.13, 2.12], $p$ = .058).

With respect to organizational processes, perceived democratic decision-making (DEC) had a non-significant relationship with Sense of Community; thus, the researcher's hypothesis that DEC would have a positive significant relationship was not supported ($b$= .08, BCa 95%CI [-.13, .27], $p$ = .495). Similarly, leadership opportunities (TASK) had a non-significant relationship with one's Sense of Community; thus, the researcher's hypothesis that TASK would have a positive significant relationship with SOC was not supported ($b$= .20, BCa 95%CI [-.23, .73], $p$ = .375).

For the organizational predictors, there were no differences between community gardens that were "homogenous, mainly white" compared to the referent "heterogeneous, evenly mixed" for Sense of Community ($b$= 1.43, BCa 95%CI [-3.54, 9.84], $p$ = .541). In addition, there were no differences between community gardens that were "homogenous, mainly people of color" compared to the referent "heterogeneous, evenly mixed" for Sense of Community ($b$= -1.00, BCa 95%CI [-5.67, 5.75], $p$ = .625). Thus, the researcher's hypotheses that individuals in homogenous community gardens (i.e., either mainly white or mainly POC) would have a higher Sense of Community compared to individuals in heterogeneous community gardens was not supported.

In terms of relative importance, there was not a substantial difference in standardized coefficients ($B$) for each significant predictor in the models. Based on Model 3, perceived racial differences ($B$ = -.53) was the strongest predictor for Sense of Community, followed by meeting others of a different race ($B$ = .39) and mixing socially with others of a different race ($B$ = .29). However, MEET had a stronger relationship than MIX to Sense of Community; thus, the

researcher's hypothesis was not supported. That is, the researcher had hypothesized that MIX would have a stronger relationship with SOC than MEET.

Table 23

*Predictors regressed on Sense of Community (n=52)*

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | *b* | *B* | *p* | *b* | *B* | *p* | *b* | *B* | *p* |
| *Demographics* | | | | | | | | | |
| Race *(1=POC)* | 0.32 | 0.04 | 0.797 | 0.29 | 0.04 | 0.805 | 1.87 | 0.25 | 0.265 |
| Role *(1=Lead)* | 0.65 | 0.08 | 0.572 | -0.28 | -0.04 | 0.812 | -0.18 | -0.02 | 0.881 |
| Tenure | 0.32 | 0.22 | 0.165 | 0.33 | 0.22 | **0.093** | 0.34 | 0.23 | 0.128 |
| *Individual* | | | | | | | | | |
| PRD | | | | -2.46 | -0.53 | **0.005** | -2.50 | -0.54 | **0.037** |
| DEEP | | | | -0.03 | -0.02 | 0.874 | -0.06 | -0.04 | 0.790 |
| MEET | | | | 1.66 | 0.39 | **0.019** | 1.73 | 0.41 | **0.036** |
| MIX | | | | 1.00 | 0.29 | **0.038** | 1.00 | 0.29 | **0.058** |
| DEC | | | | 0.13 | 0.18 | 0.270 | 0.08 | 0.11 | 0.495 |
| TASK | | | | 0.18 | 0.14 | 0.484 | 0.20 | 0.16 | 0.375 |
| *Organizational* | | | | | | | | | |
| CG Racial Diversity | | | | | | | | | |
| Mainly white *(0% - 20% POC)* | | | | | | | 1.43 | 0.19 | 0.541 |
| Mainly POC *(70% - 100% POC)* | | | | | | | -1.00 | -0.12 | 0.624 |
| Constant | 22.19 | | 0.001 | 15.56 | | 0.002 | 14.99 | | 0.008 |
| F *(df)* | 1.210 | (3, 48) | | 3.316 | (9, 42) | | 2.917 | (11, 40) | |
| $R^2$ *(adj $R^2$)* | 0.070 | (.012) | | 0.415 | (.290) | | 0.445 | (.293) | |
| Sig. | 0.316 | | | **0.004** | | | **0.006** | | |
| $\Delta R^2$ *(Sig. $\Delta F^2$)* | | | | 0.345 | **(.002)** | | 0.030 | (.352) | |

*Note.* "Heterogeneous, evenly mixed *(50% - 60% POC)*" is referent for CG Racial Diversity. Regression was performed with bootstrapped sampling (1000) and bias corrected confidence intervals.

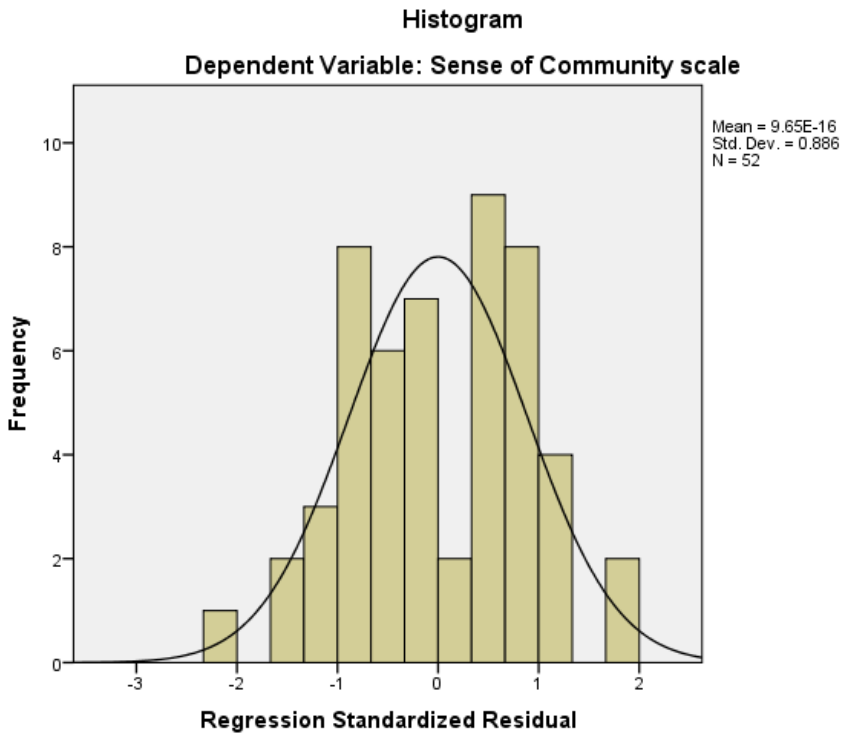


*Figure 2*. Histogram of Standardized Residuals for SOC Regression Model

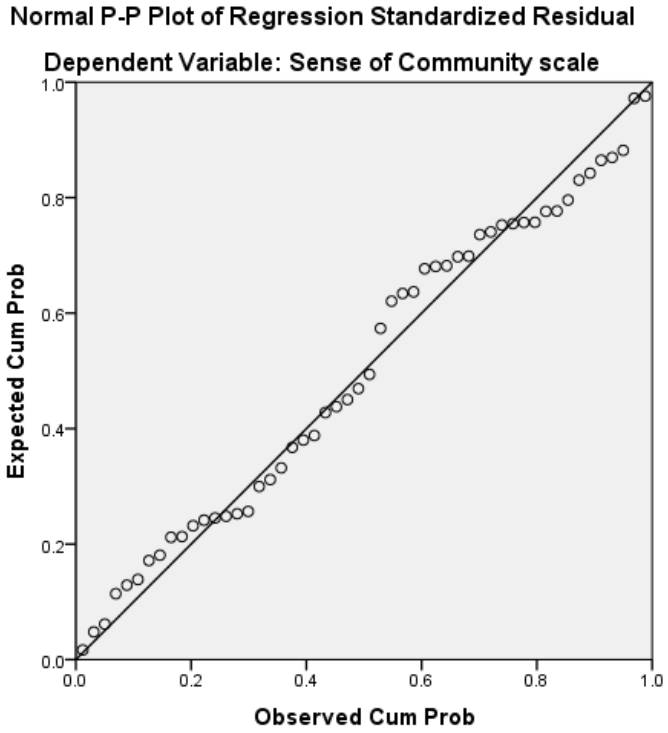


*Figure 3.* P-P Plot of Standardized Residuals for SOC Regression Model

**Resources accessible results.** Three sets of predictors were regressed sequentially on Resources Accessible: demographics (model 1), individual characteristics (model 2), and organizational characteristics (model 3). Model results are summarized in Table 24 at the end of this section. Model 1 was significant ($p < .000$) and explained 26% of the variance. Model 2 was significant ($p < .000$) and explained 58% of the variance; thus, the addition of individual characteristic predictors significantly increased variance explained by 32%. Model 3 was significant ($p < .000$) and explained 56% of the variance; however, the addition of organizational characteristics did not significantly explain more variance. In fact, it decreased variance explained by a non-significant 2%.

Table 25 at the end of this chapter provides a summary table of hypotheses supported, not supported, and not tested for Sense of Community and Resources Accessible models. There were no substantial differences in results for predictors in the models; thus, the following statistics reported in-text are for model 3.

Among demographic controls, race was not significantly related to Resources Accessible in any of the models; thus, the researcher's hypothesis that white gardeners would have more RES compared to people of color was not supported ($b$= .51, BCa 95%CI [-1.97, 3.58], $p$ = .706). Garden role had a positive significant relationship to Resources Accessible in all the models, thus supporting the researcher's hypothesis. Garden leaders had 1.76 more resources available to them compared to members not in a leadership role ($b$= 1.76, BCa 95%CI [-.31, 3.74], $p$ = .074). Given that the average number of resources accessible in this sample was 4.37 ($sd$ = 3.50) that ranged between 0 – 12, a difference of 1.78 suggests that garden role had a large effect size. Garden tenure also had a positive significant relationship to Resources Accessible in all of the models, thus supporting the researcher's hypothesis. For every unit increase in garden

tenure (7.44 months; .62 years * 12 months), one's Resources Accessible scale score increased by .62, suggesting that garden tenure had a low effect size (BCa 95%CI [.25, 1.02], $p$ = .004).

Among individual characteristic predictors, PRD and MIX were significantly related to Resources Accessible which was predicted by hypotheses, while DEEP, MEET, DEC, and TASK were not, which was not predicted by hypotheses.

Perceived racial differences (PRD) had a negative significant relationship with Resources Accessible; however, the researcher's hypothesis that PRD would have a *positive* significant relationship with RES was not supported. Further, for every unit increase in the PRD scale, one's Resources Accessible scale score decreased by 1.68, suggesting that PRD had a large effect size (BCa 95%CI [-2.94, -.48], $p$ =.004). Perceived deep-level similarities (DEEP) had a positive non-significant relationship with Resources Accessible; thus, the researcher's hypothesis that DEEP would have a positive significant relationship with RES was not supported ($b$= .23, BCa 95%CI [-.05, .51], $p$ = .175).

Meeting others of a different race within the garden (MEET) had a non-significant relationship with Resources Accessible; thus, the researcher's hypothesis that MEET would have a positive significant relationship with RES was not supported ($b$= -.70, BCa 95%CI [-1.56, -.04], $p$ = .175). Mixing socially (MIX) with others of a different race outside the garden had a positive relationship with Resources Accessible supporting the researcher's hypothesis. For every unit increase in the MIX scale, one's Resources Accessible scale score increased by 1.19, suggesting that MIX had a moderate effect size (BCa 95%CI [.50, 1.94], $p$ = .006). In addition, the researcher had hypothesized that MIX would have a stronger relationship with RES compared to MEET. To some degree, this hypothesis was partially supported by the fact that MIX was significant while MEET was not.

With respect to organizational processes, perceived democratic decision-making (DEC) had a non-significant relationship with Resources Accessible; thus, the researcher's hypothesis that DEC would have a positive significant relationship with RES was not supported (*b*= .07, BCa 95%CI [-.11, .26], *p* = .385). Perceived leadership opportunities (TASK) had a non-significant relationship with Resources Accessible; thus, the researcher's hypothesis that TASK would have a positive significant relationship with RES was not supported (*b*= .03, BCa 95%CI [-.22, .29], *p* = .806).

For the organizational predictors, there were no differences between community gardens that were "heterogeneous, evenly mixed" compared to the referent "homogenous, mainly white" for Resources Accessible (*b*= .33, BCa 95%CI [-2.45, 2.47], *p* = .779). In addition, there were no differences between community gardens that were "homogenous, mainly people of color" compared to the referent "homogenous, mainly white" for Resources Accessible (*b*= .28, BCa 95%CI [-2.36, 3.23], *p* = .840). Thus, the researcher's hypothesis that individuals in "evenly mixed" or "mainly POC" community gardens would have a less resources accessible compared to individuals in "mainly white" was not supported. Further, there were no differences in relative strength between "evenly mixed" and "mainly POC" community gardens compared to "mainly white" community gardens (*B*=.04 for both); thus, the researcher's hypothesis that those in "evenly mixed" community gardens would have access to more RES than those in "mainly POC" community gardens was not supported.

In terms of relative importance, there was not a substantial difference in standardized coefficients (*B*) for each significant predictor in the models. Based on Model 3, garden tenure (*B* = .45) was the strongest predictor for Resources Accessible, followed by perceived racial

differences (*B*= -.39), mixing socially with others of a different race (*B* = .37), and garden role (*B* = .24).

Table 24

*Predictors regressed on Resources Accessible (n=52)*

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | *b* | *B* | *p* | *b* | *B* | *p* | *b* | *B* | *p* |
| *Demographics* | | | | | | | | | |
| Race *(1=POC)* | -0.06 | -0.01 | 0.958 | 0.74 | 0.11 | 0.391 | 0.51 | 0.07 | 0.706 |
| Role *(1=Lead)* | 2.26 | 0.31 | **0.055** | 1.77 | 0.25 | **0.063** | 1.76 | 0.24 | **0.074** |
| Tenure | 0.55 | 0.40 | **0.012** | 0.61 | 0.44 | **0.004** | 0.62 | 0.45 | **0.004** |
| *Individual* | | | | | | | | | |
| PRD | | | | -1.65 | -0.38 | **0.002** | -1.68 | -0.39 | **0.004** |
| DEEP | | | | 0.23 | 0.15 | 0.146 | 0.23 | 0.16 | 0.175 |
| MEET | | | | -0.70 | -0.18 | 0.109 | -0.70 | -0.18 | 0.144 |
| MIX | | | | 1.20 | 0.38 | **0.005** | 1.19 | 0.37 | **0.006** |
| DEC | | | | 0.06 | 0.10 | 0.368 | 0.07 | 0.10 | 0.385 |
| TASK | | | | 0.03 | 0.03 | 0.788 | 0.03 | 0.03 | 0.806 |
| *Organizational* | | | | | | | | | |
| CG Racial Diversity | | | | | | | | | |
| Evenly mixed *(50% - 60% POC)* | | | | | | | 0.33 | 0.04 | 0.779 |
| Mainly POC *(70% - 100% POC)* | | | | | | | 0.28 | 0.04 | 0.840 |
| Constant | 2.33 | | 0.001 | 1.68 | | 0.389 | 1.60 | | 0.454 |
| F *(df)* | 7.100 | (3, 48) | | 8.827 | (9, 42) | | 6.896 | (11, 40) | |
| $R^2$ *(adj $R^2$)* | 0.307 | (.264) | | 0.654 | (.580) | | 0.655 | (.560) | |
| Sig. | **0.000** | | | **0.000** | | | **0.000** | | |
| $\Delta R^2$ *(Sig. $\Delta F^2$)* | | | | 0.347 | **(.000)** | | 0.001 | (.968) | |

*Note.* "Homogenous, mainly white *(0% - 20% POC)*" is referent for CG Racial Diversity. Regression was performed with bootstrapped sampling (1000) and bias corrected confidence intervals.

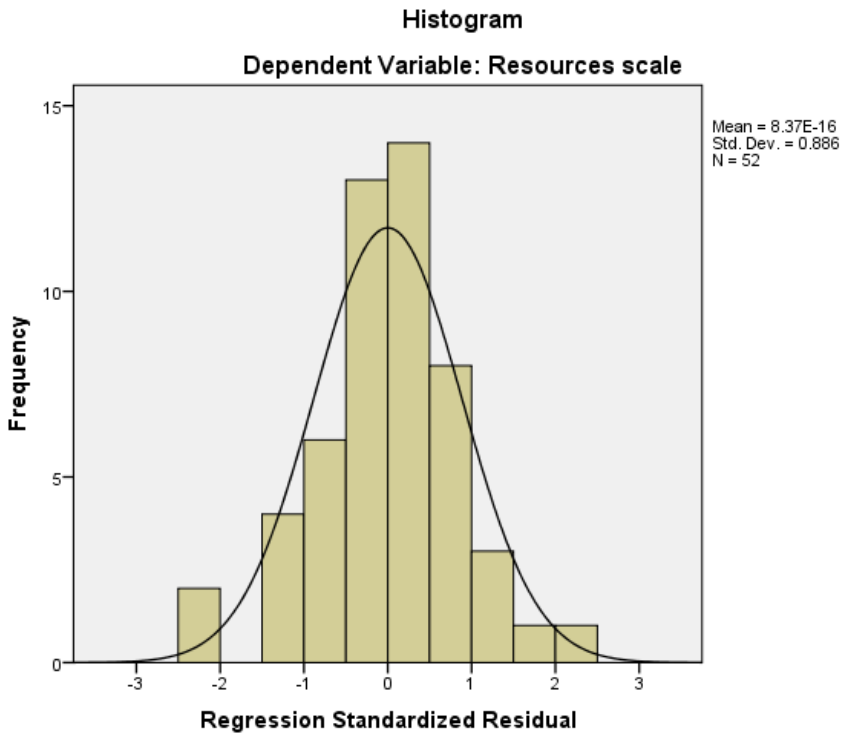


*Figure 4.* Histogram of Standardized Residuals for RES Regression Model

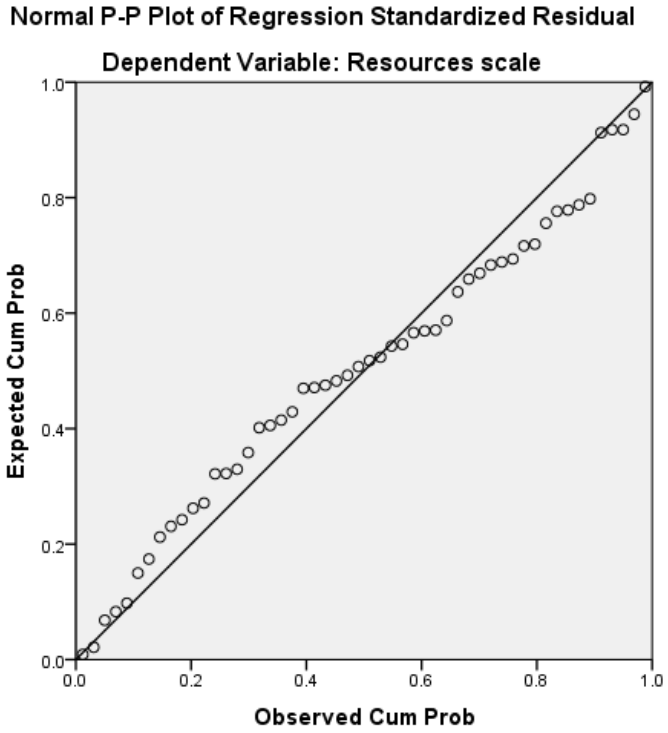


*Figure 5.* P-P Plot of Standardized Residuals for RES Regression Model

Table 25

*Summary of Social Capital Hypotheses Supported, Not Supported & Not Tested*

| | Sense of Community | | | Resources Accessible | | |
|---|---|---|---|---|---|---|
| | Hypothesized | Result | Hypothesis | Hypothesized | Result | Hypothesis |
| **Individual** | | | | | | |
| *Controls* | | | | | | |
| Race *(1 = POC)* | No relationship | ns | **Supported** | Negative | ns | Not supported |
| Role *(1 = Leader)* | Positive | ns | Not supported | Positive | sig | **Supported** |
| Tenure | Positive | ns | Not supported | Positive | sig | **Supported** |
| *Predictors* | | | | | | |
| Differences & Similarities | | | | | | |
| PRD | Negative | sig | **Supported** | Positive | sig; neg | Not supported |
| DEEP | Positive | ns | Not supported | Positive | ns | Not supported |
| Socializing across race[a] | | | | | | |
| MEET | Positive | sig | **Supported** | Positive | ns | Not supported |
| MIX | Positive | sig | **Supported** | Positive | sig | **Supported** |
| | MIX > MEET | < | Not supported | MIX > MEET | | **Partial support** |
| Org. processes | | | | | | |
| DEC | Positive | ns | Not supported | Positive | ns | Not supported |
| TASK | Positive | ns | Not supported | Positive | ns | Not supported |
| **Organizational** | | | | | | |
| *Controls* | | | | | | |
| Yrs Est. | Positive | | Not Tested | Positive | | Not Tested |
| Total Gardeners | Positive | | Not Tested | Positive | | Not Tested |
| *Predictors* | | | | | | |
| Racial Diversity[b] | | | | | | |
| Mainly white | Positive | ns | Not supported | Positive | ns | Not supported |
| Mainly people of color | Positive | ns | Not supported | Negative | ns | Not supported |
| Evenly mixed | Negative | ns | Not supported | Positive | ns | Not supported |
| Leadership | | | | | | |
| Leader's Race | None | | Not Tested | None | | Not Tested |
| Shared leadership | Positive | | Not Tested | Positive | | Not Tested |
| General characteristics | | | | | | |
| Gardening practice | Positive | | Not Tested | Positive | | Not Tested |
| Enclosure type | Negative | | Not Tested | Negative | | Not Tested |
| Events for Members | Positive | | Not Tested | Positive | | Not Tested |

*Note.* [a] MIX will have a stronger relationship with both social capital indicators compared to MEET (MIX > MEET).
[b] "Homogeneous, mainly white" community gardens will have a stronger relationship with Resources Accessible compared to "Heterogeneous, evenly mixed" community gardens.

# Chapter 5. Discussion

By reconnecting people, place and nature, the development of a local alternative food system promises to address a host of issues, not the least of which are increasing community food security, rejuvenating democracy, and advancing social justice (Levkoe, 2006). Community gardens in particular have been promoted as interventions that can simultaneously enhance community food security, broadly promote community wellbeing, while addressing environmental concerns (Draper & Freedman, 2010; Okvat & Zautra, 2011). However, an oft unexamined assumption within the community garden literature is that community gardens automatically benefit everyone, even when located in low-income neighborhoods (Ghose & Pettygrove, 2014; Meenar & Hoover, 2012; Reynolds, 2014).

This study explored race and racial diversity within community gardens and the capacity of community gardens to generate social capital and promote social justice in Southern urban food deserts, specifically Richmond, VA. This study begins to address the overarching gap in the literature since no studies have explored community gardens in the Southern region of the US.

Despite study limitations, which will be discussed below, these findings extend the literature on community gardens in several ways, the most important of which has to do with racial issues. This chapter is organized as follows. Findings that highlight racial issues in relation to the two descriptive research questions will be discussed first, followed by a discussion regarding a community garden's capacity to generate social capital for its gardeners. This chapter

then ends with a discussion about this study's methodological limitations, practice and research implications, and conclusion.

## Question 1: Gardener Characteristics

It has not always been clear who gardens in community gardens located in low-income neighborhoods, such as food deserts. Food deserts are areas with a high percentage of low-income residents who most likely experience food insecurity due to poverty and additional challenges posed by living in a food desert (Patel, 2012; USDA, 2009; Walker et al., 2011). The assumption has been that community gardens improve community food security for poor communities and communities of color. Thus, the first research question asked about the characteristics of gardeners in Southern urban food deserts and whether there were racial differences among gardeners.

### Racial Diversity among Gardeners

In this study, community gardeners were demographically diverse with respect to age and race; however, the majority were female, which is consistent with previous studies (Ghose & Pettygrove, 2014; Firth et al., 2011; Kingsley & Townsend, 2006; Ober-Allen, 2008; Ohmer et al., 2009; Poulsen et al., 2014; Tieg et al., 2009). Also consistent with other studies (Ohmer et al., 2009), more than half of gardeners had attained a Bachelor's education or above, were employed full-time or retired, and owned their own homes, characteristics often associated with middle-class socioeconomic status. White gardeners were also more likely to be younger than people of color, which corroborates findings from Meenar and Hoover's (2012) study. Overall, results indicate that gardeners in these Southern urban food desert community gardens were demographically similar to community gardeners studied in other regions.

While the majority of gardeners in this study likely belong to the middle-class, they are not all white. These findings diverge, to some degree, from previous research. Participants in community gardens and other forms of urban agriculture have been reported as representing a predominantly white, middle-class movement (Alkon & McCullen, 2010; Guthman, 2008a,b; Slocum, 2008). The few studies that have focused on community gardeners in low-income neighborhoods have also indicated a high prevalence of the 'white, middle-class' involved who desire a sustainable lifestyle (Firth et al., 2011; Kingsley & Townsend, 2006; Meenar & Hoover, 2012). Reynolds (2014) has suggested that the presence of people of color in these initiatives has been obscured by the media and, somewhat ironically, research on white privilege in urban agriculture. These findings add credence to this argument in that people of color, mostly from a presumed middle-class, are involved in community gardens.

Notably, very few gardeners in this sample had experienced food insecurity, which is consistent with previous studies that have noted the lack of low-income groups participating in community gardens (Loopstra & Taruska, 2013; Macias, 2008; Meenar & Hoover, 2012). Consistent with prior studies (Algert et al. 2014; Armstrong, 2000; Hanna & Oh, 2000; Wakefield et al., 2007), gardeners were fairly productive in this sample; the majority reported that they "sometimes" to "always" grew enough during a growing season to reduce their grocery costs. The lack of engaging those who were food insecure in a food desert is concerning, especially since findings also suggest the majority of gardeners grew enough food to decrease food costs, and one might assume at least supplement meals.

**Key Racial Differences among Gardeners**

There were multiple differences by race among gardeners. This next section highlights key racial differences that question assumptions that community gardens can directly improve

food security, reports on 'who' tends to indirectly promote community food security, raises questions on the role of one's values in relation to their community garden, and demonstrates that proximity to one's community garden based on where one lives should not be assumed.

**Community garden benefits.** Consistent with the literature, gardeners generally perceived that their community garden provided multiple benefits (Holland, 2004; Drake & Lawson, 2015; Waliczek et al., 1996; see also Draper & Freedman, 2010 and Okvat & Zautra, 2011 for literature reviews). However, people of color had higher perceptions that their community garden helped them improve community food security compared to white gardeners. This is likely the case because people of color used their harvest differently; more donated and sold their produce than white gardeners. In contrast, white gardeners were more likely to use their harvest for personal use: more cooked and ate it at home, and shared it with friends and family compared to people of color. Prior studies have found that people of color were more likely to state that it was important for their community garden to provide benefits to the wider community, such as provide food for those in need and improve the neighborhood, compared to white gardeners (Shinew et al., 2004; Waliczek et al., 1996). The desire to improve community food security may also explain why the few people that also gardened at another community garden were all people of color. Such findings suggest an element of 'civic-mindedness' in people of color who participated in this study.

**Values.** This study was the first to quantitatively examine values among gardeners, although many qualitative studies have suggested that white gardeners tend to be involved out of 'green' concerns (Firth et al., 2011; Kingsley & Townsend, 2006). In this study, white gardeners had higher environmental values compared to people of color, which is congruent with some studies that have examined differences by race in environmental attitudes among the general

public (Johnson, Gaither & Bragg, 2004). However, other studies that have used several different measures for environmental concerns, such as prioritizing public spending on environmental issues, have found no differences by race among the general public (Jones, 1998). Given that this study's environmental values measure had low internal reliability, the researcher cautions interpretation of this result and encourages future research to clarify environmental values expressed by people of color and the implications for their participation in community gardens. Nevertheless, such findings suggest an element of 'environmental stewardship' that was higher among white gardeners than people of color who participated in this study and is consistent with the community garden literature (Firth et al., 2011; Kingsley & Townsend, 2006).

In contrast to the differences in reported environmental values, both racial groups reported high levels of social justice values. It is hard to understand, however, how these social justice values are expressed by white gardeners in this sample, as white gardeners were less likely to use the harvest from their community garden to enhance community food security compared to people of color. Recent scholarship has indicated that once aware of their own privilege, liberal white middle-class gardeners would focus on increasing social justice, such as engaging in policy development and advocacy work to raise awareness about the structural roots (i.e., racism, classism, etc.) for various food-related issues (Reynolds, 2014). Future studies may want to explore whether gardeners view their participation in community gardens as an expression of their social justice values and if these views differ by race.

**Proximity to the garden.** Lastly, more than half of gardeners lived in the neighborhood of their community garden. However, people of color were less likely to live in the neighborhood of their community garden compared to white gardeners. These findings corroborate previous studies that have indicated that gardeners do not always live near their community garden

(Pudup, 2008); indeed, 35% did not live in the neighborhood of their community garden in this sample. These findings also contradict previous research that indicated white gardeners were less likely to live in the neighborhood of their community garden compared to people of color (Armstrong, 2000; Meenar & Hoover, 2012). Perhaps people of color were more likely to travel to a community garden not in their neighborhood to promote community food security. Or, as one black leader in this study suggested, people of color travel to community gardens not in their neighborhood specifically to support other black-led efforts. Future research may want to further explore why and how people make decisions to garden in neighborhoods other than their own.

**Gardener Characteristics Summary**

In sum, the majority of gardeners who participate in community gardens located in Southern urban food deserts appeared to belong to the middle-class. The high prevalence of middle-class gardeners in these community gardens is similar to studies in other regions of the US (Ohmer et al., 2009); however, the gardeners in this study were not all white. People of color, of which the majority were African-Americans, were well represented in this largely "middle-class" sample.

Community gardens can improve community food security in two different ways: indirectly and directly. This study found that gardeners, mostly people of color, were more likely to indirectly improve community food security by donating their produce more so than white gardeners. The fact that people of color used their harvest differently than white gardeners likely explains why they perceived that their community garden helped them improve community food security more so than white gardeners, a finding that is consistent with previous studies (Shinew et al., 2004; Waliczek et al., 1996). However, this study found that very few gardeners in these food deserts were food insecure, which is consistent with previous research (Loopstra &

Taruska, 2013; Macias, 2008; Meenar & Hoover, 2012). These findings raises questions around the assumption that community gardens directly improve food security.

## Question 2: Community Garden Characteristics

It has not always been clear who the 'community' is in community gardens and which community or communities benefit from either the process or the product of community gardening. Given concerns about 'white privilege' – specifically the high prevalence of a white middle-class – in community gardens in low-income neighborhoods (Meenar & Hoover, 2012; Ghose & Pettygrove, 2014), it was important to clarify how racially diverse these community gardens were relative to the neighborhood. The literature has also suggested that certain characteristics of community gardens, such as having a fence (Glover, 2005a; Meenar & Hoover, 2012) or the lack of racial minorities in leadership roles (Ghose & Pettygrove, 2014; White, 2011; see also Kato, 2013 and Sherriff, 2009 for other AFIs) may act as barriers to poor communities, who are often members of communities of color in urban areas. Thus, the second research question asked community garden leaders about the characteristics of their community garden in these Southern urban food deserts. Leaders were also asked why they thought the gardens were or were not racially diverse.

### Racial Diversity within Gardens

While gardeners were racially diverse *across* the sample, this did not mean that each community garden was racially diverse. The majority of community gardens in this sample were racially segregated. Most of the community gardens were composed of mainly white gardeners or mainly people of color. Since the majority of people of color in this sample were African-American, these community gardens will be referred to as 'mainly Black community gardens' and 'mainly White community gardens' for simplicity.

Consistent with prior research, mainly White community gardens were in racially mixed neighborhoods, while mainly Black community gardens were in predominantly black neighborhoods (Shinew et al., 2004). These findings also diverge from what Shinew and colleagues (2004) found in their study in St. Louis, MO. That is, this study also found racially mixed (Evenly mixed) community gardens in racially mixed neighborhoods. There were no mainly White community gardens in predominantly white neighborhoods because none of the urban food desert neighborhoods in this sample were predominantly white.

In essence, there were two 'communities' in these community gardens: the 'environmentally conscious' white middle-class, and the 'civically minded' black middle-class. White-middle class community gardens were in racially mixed neighborhoods undergoing gentrification according to leaders. Based on the study's gardener survey, this white community of gardeners appeared to focus more on environmental stewardship than community food security, which is consistent with previous research (Firth et al., 2011). Several white leaders indicated that non-participating residents commented on the beauty of the garden. Thus, non-participating residents may have benefited from these community gardens based on the enjoyment of its beauty and the fact that it was green space, which prior research has found can improve mental health and cognitive functioning (Kuo et al., 2001, Kuo, 2001; Kuo et al., 2004; Laumann et al., 2003; Ulrich et al., 1991, Van den Berg, 2003). However, the community that benefited the most from these predominately white gardens were likely the white middle-class gardeners themselves, despite the fact that the gardens were located in a low-income and racially mixed neighborhood.

In contrast, civically minded black middle-class community gardens were in predominantly black neighborhoods, not undergoing gentrification according to leaders. Based

on the gardener survey, this community of gardeners appeared to focus more on community food security than environmental stewardship, which is also consistent with previous research (Firth et al., 2011). It is unknown whether non-participating residents were the 'community' that benefitted from harvest donated to food pantries, church ministries, and strangers. However, it appears as if both the community of black middle-class gardeners and the broader community, particularly those likely to be food insecure, benefited from these predominately black-middle class community gardens beyond aesthetic enjoyment.

**Barriers to Participation**

The literature has indicated that certain community garden characteristics may be barriers to low-income groups, specifically membership fees, fencing, and electronic outreach communication methods (Meenar & Hoover, 2012; Glover, 2005a). Scholars have also stressed the importance of providing events for members and the public as ways to increase engagement (Bendt et al., 2013; Glover, 2005a; Firth et al., 2011; Kingsley & Townsend, 2006; Milburn & Vail, 2010). In this sample, these characteristics were not prominent barriers. Across all gardens, regardless of racial composition, only half had membership fees, which were negotiable for many if income was an issue; more than half had no fence or were fenced, but not gated; and, the majority used multiple methods for outreach and hosted events.

Some scholars have also suggested that people of color in leadership roles may be more likely to organize a community garden differently than white leaders based on their knowledge of community needs and culturally appropriate customs, such as gardening collectively and employing shared leadership models (Ghose & Pettygrove, 2014; Kato, 2013; Sherriff, 2009; White, 2011). In this sample, most community gardens had racial minorities as a primary leader and had multiple leaders. Overall, all leaders in this sample, regardless of race, appeared to be

quite sensitive to access issues and worked to the best of their abilities to increase the participation of those they were trying to serve. In sum, the qualitative data did not point to any differences in community garden characteristics by leader race or by a garden's demographic make-up.

**Reasons for Being or Not Being Race (& class) Diverse**

Regardless of a garden's racial composition, black and white leaders struggled to engage people of color from the neighborhood who they perceived as low-income. Leaders' perceptions of why they were or were not diverse thus refers to low-income people of color, mostly low-income African-Americans.

**Gentrification.** Gentrification was a key reason leaders stated for why their community garden was or was not race and/or class diverse. It is quite possible that *changing* neighborhood demographics may largely explain why there were mainly White and Evenly Mixed community gardens in racially mixed neighborhoods. According to leaders, these community gardens were in neighborhoods that used to be predominantly black. These neighborhoods were undergoing gentrification, suggesting that Evenly Mixed community gardens might become White community gardens in the future. The association of community gardens and rising property values has been documented in the literature (Been &Voicu, 2006; Crossney & Shellenberger, 2012). Thus, some leaders' fears around the potential displacement of the poor and people of color appear are suggested by the study findings.

**Structural barriers & life circumstances.** Consistent with prior research (Macias, 2008; Meenar & Hoover, 2012), black and white leaders generally thought that their gardens were not as race and/or class diverse as they wanted them to be because of structural barriers poor communities and communities of color often face, such as such as working several jobs and

being transitory, and general life circumstances that constrain one's time, such as having a family. Leaders' perceived barriers were also consistent with the few studies that have asked non-participating low-income people of color about their perceptions of community gardens (Loopstra & Taruska, 2013).

**Lack of interest & knowledge.** Black and white leaders also thought that there was a lack of interest in and value of gardening among people of color, particularly low-income African-Americans. Notably, white leaders emphasized that gardening had a cultural status among a liberal white middle-class as an explanation for the lack of interest. That is, gardening was the "cool" thing to do for white folks but not for black folks. This finding is congruent with other studies that found that white participants believed that the lack of racial diversity in farmers' markets and community-supported agriculture (CSA) was due to a lack of valuing local and organically grown produce among low-income groups (Alkon & McCullen, 2010) and that purchasing said produce was a matter of personal choice (Guthman, 2008b). In contrast, white leaders in this study did not denigrate people of color for not participating in community gardens; they simply noted that gardening might hold a different cultural value for communities of color.

However, black leaders emphasized the lack of knowledge about gardening and what it could provide, particularly in economic savings, as an explanation for the lack of interest among low-income, African-Americans. Black leaders also thought that the lack of gardening knowledge differed by generations and by one's childhood experience with gardening. The lack of gardening knowledge among non-participating low-income African-Americans is consistent with other research (Haynes-Maslow, Auvergne, Mark, Ammerman & Weiner, 2015) and congruent with this study's survey which found that people of color were less likely to have a

history of gardening prior to joining their community garden. Future research should explore the "lack of interest" from the perspective of non-participating low-income African-Americans.

**Disincentives to Participation**

Black leaders noted three additional issues that they perceived deterred low-income African-Americans from participating in community gardens.

**Historical trauma.** Black leaders reported that comments about "not being a slave anymore" came up from time to time when interacting with other African-Americans in or about the community garden. This finding suggests that there may be a stigma around gardening within the black community that is rooted in the history of slavery. There is very little empirical research in the literature around this issue in community gardens although some scholars have noted that the association with slavery in other urban agriculture activities might require greater sensitivity in outreach efforts (Guthman, 2008a,b). In only one study has a black activist and leader in urban agriculture in Detroit, MI reported that "a large number of African American families in Detroit had moved only a few generations ago from the South where they engaged in sharecropping"; thus, urban agriculture was viewed by some in this community as "regressive" (Thibert, 2012, p. 354). Future research should explore perceptions of gardening and farming among African-Americans to examine the prevalence of this view and inform culturally sensitive engagement practices specific to this population.

**Obstacles to entrepreneurship.** Community gardens that were under an umbrella organization were prohibited from selling produce in this study. Black leaders from these community gardens perceived regulations that prohibited the selling of produce as a barrier to promoting entrepreneurship around community gardens. In their view, the ability to sell produce would increase race and class diversity within their garden because it would increase

employment opportunities for those who experience poverty and food insecurity. This finding extends the literature, which has indicated that the lack of reliable grant funding for various micro-enterprises has been a key barrier to the development of a local food economy that is 'green, profitable, and fair' (Kaufman & Balkey, 2000; Vitello & Wolf-Powers, 2014). It is unknown at this time why this regulation was put into place by the umbrella organization as this was outside the scope of this study. It would be worthwhile for future research to explore why selling produce is prohibited in some community gardens and how common this regulation is.

**Inability to secure property.** The literature has indicated that having a fence is exclusionary and that may explain the lack of involvement of low-income groups despite being in socioeconomically diverse neighborhoods (Glover et al., 2005a; Meenar & Hoover, 2012). However, one black leader argued the opposite view, stating that a fence was necessary and important for the participation of those who are food insecure. In a very literal sense, a fence provides a measure of food security in that it helps prevent theft from either humans or animals. A recent study of non-gardening low-income African-Americans in North Carolina corroborates this claim as well (Haynes-Maslow et al., 2015). Participants reported that they thought a community garden would be a convenient and affordable way to obtain healthy, fresh food; however, they were concerned about having food when it came time to harvest because of fear of crime, theft, and vandalism.

In prior research, some community garden leaders and non-leader members have interpreted the fence as exclusionary and indicative of "outsiders" running a garden (Glover, 2005a; Meenar & Hoover, 2012. However, one black leaders in this study viewed gardening without a fence as a foolhardy endeavor; why invest one's time and labor if one cannot secure their property? This finding also suggests that ideas around what is exclusive and inclusive may

be tinged with middle-class assumptions. It is one thing to shrug off produce being stolen when one is not relying on one's garden for food and another when one is. Future research should explore why non-participating low-income residents were not involved beyond the issue of fencing.

**Community Garden Characteristics Summary**

In sum, and consistent with previous research (Shinew et al., 2004), the majority of community gardens were racially segregated, despite the fact that gardeners were racially diverse across the sample. Gentrification, and the lack thereof, appeared to play a large role in explaining these varied outcomes. Mainly White and Evenly Mixed community gardens were in gentrifying neighborhoods that had been predominantly black, while Black community gardens were in predominantly black neighborhoods not *currently* undergoing gentrification. Community gardens have been associated with rising property values (Been & Voicu, 2006; Crossney & Shellenberger, 2012), suggesting that Evenly Mixed community gardens might become White community gardens in the future, and perhaps Black community gardens might become Evenly Mixed as well. Some leaders' fears around the potential displacement of the poor and people of color appear are suggested by the study findings.

Regardless of a garden's racial composition, black and white leaders struggled to engage low-income people of color from the neighborhood, despite being quite sensitive to access issues. Leaders cited structural barriers, general life circumstances, lack of interest, and the lack of gardening knowledge to explain the lack of participation, which accords with the few studies that have asked low-income groups why they do not participate in community gardens (Haynes-Maslow et al., 2015; Loopstra & Taruska, 2013).

However, a few black leaders reported that the historical trauma around slavery, the lack of entrepreneurial opportunities, and the inability to secure one's property (harvest) were additional disincentives for low-income African-Americans to participate in community gardens. Without addressing these issues, it is difficult to see how community gardens can promote "a just food system at the local level" rather than "just a local food system" (Agyeman & Simon, 2012, p. 89). Indeed, the lack of participation of low-income groups suggests that community gardens, at the most, benefit poor communities of color largely through charitable efforts mainly provided by the civically-minded black middle-class, and at the least, provide greenery and beauty largely through the efforts of both the environmentally conscious white middle-class and civically-minded black middle-class.

## Social Capital

It was hypothesized that community gardens could promote social justice through the development of social capital. Social capital refers to resources embedded in, and derived from social relationships. Community gardens have the potential to generate social capital that benefit individual garden members, the gardening group, and neighborhood residents (see Glover et al., 2005a for example). Social capital, however, needs to be equitably accessible to all garden members (Glover, 2004) and be beneficial to neighborhood residents to realize its social justice goals (Firth et al., 2011).

Given that a community network and resources are necessary before community gardeners can generate long-term benefits, such as advocating for policy change and engaging in other social justice initiatives, this study's hypotheses examined individual gardeners' access to social capital by virtue of belonging to a community garden. Recall that there are two indicators of social capital used in this study. One's Sense of Community was an indicator of the

relationships with fellow gardeners – the 'social' of social capital, while Resources Accessible was an indicator of the 'capital' one could potentially access from these relationships.

**Sense of Community**

The following results are discussed in order of how they were entered sequentially in the Sense of Community regression model.

**Individual demographics, step 1.** None of the demographics predicted one's sense of community as operationalized in this study. As expected, there were no differences in sense of community between white gardeners and people of color, which is similar to other studies (Shinew et al., 2004). However, contrary to expectations, being a leader and being at one's community garden for longer periods of time did not increase gardeners' sense of community. Glover and colleagues (2005a) had found that leaders socialized with fellow gardeners more often compared to non-leader members, which had suggested that leaders might develop more relationships and thus, have a higher sense of community than non-leader members. Kingsley and Townsend's (2006) qualitative study had suggested that being at a community garden for longer periods of time was necessary to develop relationships. Gardening is a voluntary activity and prior research has found that a "desire for a personal sense of connectedness" is a key motivating factor for joining (Glover et al., 2005a; Kingsley & Townsend, 2006). It is possible then that gardeners may be predisposed toward a sense of community simply by joining a community garden, regardless of how long they had been at their community garden or their role as a leader or non-leader member.

**Individual gardener characteristics, step 2.** Perceptions of racial differences and both types of social interactions across race – meeting and mixing – were significant predictors for sense of community. As expected, the more one perceived there to be racial differences among

fellow gardeners the more one's sense of community decreased, which is congruent with previous research in the relational demography literature (Portes & Vickstrom, 2011; Shemla et al, 2014; Stolle et al., 1998). Also as expected, the more gardeners met others of a different race within their garden and the more they mixed socially with fellow gardeners of a different race outside of the garden (e.g., went out to dinner, etc.), the greater their sense of community. These findings are congruent with qualitative studies that have indicated community gardens fostered a sense of community and trust within diverse groups (Firth et al., 2011; Kingsley & Townsend, 2006, 2009; Poulsen et al., 2014; Tieg et al., 2009; Wakefield et al., 2007). Further, meeting others of a different race in the garden was more salient for gardeners' sense of community than mixing socially outside of the garden, such as going out to dinner, which was contrary to expectations. This may suggest that causal interactions are all that are necessary to develop a sense of community.

Contrary to expectations, the remaining individual gardener characteristics were not significant predictors for one's sense of community. Greater perceptions of shared deep-level attitudes and values with fellow gardeners did not increase gardeners' sense of community, which contradicts findings from the relational demography literature (Elfenbein & O'Reilly, 2007; Harrison et al., 1998, 2002). Similarly, greater perceptions of democratic decision-making processes and leadership opportunities within their community garden did not increase gardeners' sense of community, which contradicts findings from qualitative studies (Glover, 2004; Holland, 2004; Kingsley & Townsend, 2006; Milburn & Vail, 2010; Tieg et al., 2006).

This study was the first to quantitatively examine these relationships. It would be premature to state that shared similarities, democratic decision-making, and leadership opportunities are not important for increasing one's sense of community. There are several

methodological explanations for these contrary findings. For example, the sample may have been too small to detect these relationships, particularly if they are weak. This could also be an issue with the sample itself. For example, the majority of gardeners in this sample had high perceptions that the decision-making process in their garden was democratic. Thus, the lack of variation in perceived democratic decision-making might explain why greater perceptions of democratic decision-making was not associated with an increase in resources accessible. It is notable that the bivariate results indicated that the more one perceived racial differences among fellow gardeners, the less one perceived deep-level similarities with fellow gardeners, which is congruent with relational demography studies (Elfenbein & O'Reilly, 2007; Harrison et al., 1998, 2002). Future studies may want to continue to explore these relationships, as methodological issues, discussed more below, may have been the reason for these contrary findings.

**Community garden racial diversity, step 3.** The racial make-up of a community garden was not a predictor for one's sense of community. In other words, it did not matter whether one was in a mainly White, Evenly Mixed, or mainly Black community garden. Gardeners had high or low levels of sense of community in all of these gardens, regardless of their own race. These results contradict Social Capital Theory predictions that greater racial diversity will have an adverse or negative relationship with one's sense of community. However, these results align with relational demography studies that have found that *perceived* racial differences was more important to one's sense of community than *objective* racial differences (Harrison et al., 2002), operationalized in this study as a garden's racial make-up as reported by leaders. Seen in this light, the *objective* racial make-up of one's garden, regardless of type, did not explain additional variation in sense of community once one's *perception* of racial differences was controlled for.

In sum, perceived racial differences and social interactions across race – meeting and mixing – were the only significant predictors for one's sense of community. Greater perceptions of racial differences decreased one's sense of community; however, both types of social interactions across race increased one's sense of community. Further, casual meetings with fellow gardeners of a different race within the garden appear to be more important than mixing socially with fellow gardeners of a different race outside of the garden for increasing one's sense of community. Notably, one's race, role, how long they have been at their community garden, and a garden's racial make-up were not significantly related to one's sense of community. Overall, these findings suggest that community gardens can foster a sense of community among gardeners, regardless of whether they are white or a person of color, a leader or a non-leader member, and how long they have been at their community garden. Further, whether one was in a White, Evenly Mixed, or Black community garden did not matter for one's sense of community.

**Resources Accessible**

The following results are discussed in order of how they were entered sequentially in the Resources Accessible regression model.

**Individual demographics, step 1.** Race was not a significant predictor for resources one could potentially access from fellow gardeners. Being in a leadership role and length of time was associated with greater number resources accessible, which is congruent with the literature (Glover et al., 2005b; Kingsley & Townsend, 2006) and which makes sense conceptually.

**Individual gardener characteristics, step 2**. Greater perceptions of racial differences and mixing socially with fellow gardeners of a different race outside of the garden were the only significant predictors for potential resources accessible. As expected, perceived racial differences had a significant relationship with resources accessible; however, the nature of this relationship

was in the *opposite* direction of what was expected. The more one perceived there to be greater racial differences among gardeners, then the fewer number of resources were perceived to be potentially accessible, regardless of one' race.

Social Capital Theory predicts that greater racial differences would be associated with an *increase* in resources accessible, particularly if one is a racial minority (Foley & Edwards, 1997; Hawe & Shiell, 2000; Lin, 2000). This assumption is based on (a) historical and structural systems of oppression by which the majority of resources have accrued to the dominant group – in this case, white people, and (b) the Principle of Homophily, which suggests that individuals tend to form relationships based on shared demographics, histories, and cultures (Lin, 2000). Given that the majority of the sample appears to belong to the middle-class, regardless of race, it may be the case that resources were perceived as being equitably accessible despite one's race.

As expected, mixing socially with other gardeners of a different race outside of the garden had a positive relationship with resources accessible; however, meeting others of a different race within the garden did not. One possible explanation for this is that mixing socially with someone outside of the garden (go out to dinner, etc.) might be indicative of a deeper or more intimate relationship than casual encounters in the garden. It makes sense that it might be more difficult to ask for an instrumental resource, such as being lent even a small amount of money, from someone one considers a gardening acquaintance rather than a friend. Previous research has indicated that community gardens can foster deep friendships among gardeners and that they have accessed resources from fellow gardeners (Glover et al., 2005a).

This study did not distinguish between resources that were accessible from one considered a friend versus an acquaintance. Future research might want to further explore the different types of social interactions across race on the number of resources potentially

accessible to gardeners using this distinction. It is hard to explain, however, why mixing socially across race was not related greater perceptions of shared similarities, which one might assume would be an indicator of friendships. This could be indicative of measurement issues. Future research could use focus groups to provide deeper insight into what additional deep-level attitudes might be among gardeners and how gardeners socialize inside and outside of the garden.

None of the remaining individual gardener characteristics were significant predictors for resources accessible. Contrary to expectations, greater perceptions of shared deep-level similarities was not related to an increase in the perceived number of potential resources one could potentially access. According to relational demography studies, greater perceptions of shared deep-level attitudes and values should foster relationships that cross racial divides (Elfenbein & O'Reilly, 2007; Harrison et al., 1998, 2002), and Social Capital Theory predicts that greater diversity within groups should increase resources one has accessible, particularly if one belongs to an oppressed group (Foley & Edwards, 1997; Hawe & Shiell, 2000; Lin, 2000). However, these findings are congruent with Kingsley and Townsend's (2006) qualitative study specific to community gardens that found that few instrumental resources were exchanged even in a predominantly white community garden where gardeners perceived themselves to share the same "green values".

Perceptions of democratic decision-making and leadership opportunities were not significantly related to resources accessible, which contradicts findings from qualitative studies (Glover, 2004; Glover et al., 2005a; Holland, 2004; Kingsley & Townsend, 2006; Milburn & Vail, 2010; Tieg et al., 2006). Again, this study was the first to quantitatively examine these relationships, and it would be premature to state that democratic decision-making and leadership

opportunities are not important for increasing one's resources accessible. As with the Sense of Community model, there are several methodological explanations for these contrary findings. For example, the sample may have been too small to detect these relationships, particularly if they are weak. This could also be an issue with the sample itself. For example, the majority of gardeners in this sample had high perceptions that the decision-making process in their garden was democratic. Thus, the lack of variation in perceived democratic decision-making might explain why greater perceptions of democratic decision-making was not associated with an increase in resources accessible.

**Community garden racial diversity, step 3.** The racial make-up of a community garden was not a predictor for one's potential resources accessible. In other words, it did not matter whether one was in a predominately White, Evenly Mixed, or predominately Black community garden. Gardeners had high or low levels of potential resources they could access from fellow gardeners in all of these gardens, regardless of their own race. These findings contradict what Social Capital Theory would predict, in that members in a White community garden should have access to more resources compared to those in Evenly Mixed and Black community gardens. Similar to before with respect to race, it may be the case that resources were perceived as being equitably accessible despite one's race and racial make-up of the community garden, given that the majority of the sample appeared to belong to the middle-class.

In sum, garden role, garden tenure, perceived racial differences, and mixing socially with others of a different race outside of the garden were significant predictors for resources accessible. Similar to Sense of Community, greater perceptions of racial differences decreased one's resources accessible. However, being in a leadership role, longer garden tenure length, and mixing socially with others of a different race outside of the garden increased one's resources

accessible. These findings suggest that it takes longer and more effort by a gardener – they have to take on a leadership role – to access a greater number of potential resources. Further, the fact that "mixing" was significant for resources accessible while "meeting" was not suggests that it might be more important to development friendships to potentially access resources, rather than casual acquaintances. Notably, neither race nor a garden's racial make-up were associated with an increase in the number of resources one could access from fellow gardeners likely because this was largely a middle-class sample.

**Social Capital, Community Gardens & Social Justice**

Overall, these findings suggest that community gardens, at least in this sample, have limited potential to promote social justice by providing a space and place for oppressed groups to (a) develop relationships and (b) access resources through social capital. On the one hand, and in terms of developing relationships, community gardens appear to be an excellent vehicle for fostering a sense of community among individuals, regardless of their race, garden role, garden tenure, and the racial make-up of their garden. And while greater perceptions of racial differences had a negative impact on one's sense of community, socializing across race – both meeting and mixing – had a positive impact.

Notably, the majority of the sample had high levels of sense of community; yet, very few of the predictors had a relationship with one's sense of community. Future studies may want to include socializing, regardless of whether it occurred across race, to see if this has more predictive value for one's sense of community. Additional variables one might want to include are trust in fellow gardeners and perceived shared norms, based on Social Capital Theory. The researcher had treated these concepts as being almost synonymous with sense of community. For example, how do you have a sense of community if you do not trust others?

On the other hand, and in terms of accessing resources, the picture of community gardens promoting social justice is not quite so optimistic. It took longer and more effort by a gardener – they had to be in a leadership role – to potentially access resources. Perhaps the greatest value of community gardens with respect to resources is that it provides a space and place for social interactions. Mixing socially with gardeners of a different race outside of the garden increased the number of potential resources one could access, regardless of one's race or racial make-up of their garden.

Nevertheless, gardeners were only able to identify four instrumental resources they could potentially access from fellow gardeners on average, suggesting that individuals in community gardens in this sample have limited potential to increase access to resources even in a largely middle-class sample. It is unknown whether this was the case because there were few resources in a community garden's network, or, fewer gardeners had developed deep enough relationships to identify who had what resource and felt comfortable asking them for help. This could also be a function of the measure itself such that not all resources potentially accessible to gardens may have been listed.

While the quantity of the average number of resources (4) does not seem very high, they may be valuable to individuals based on their own goals and purposes. Future research may want to explore these issues further. In particular, they may want to add additional resources to the measure based on interviews and/or focus groups feedback. Developers of the Resources Accessible measure used in this study note that no one scale can capture all the instrumental resources potentially accessible and valuable for various groups, and indicated that it would be appropriate to add and/or remove items based on the context (Foster & Maas, 2014).

Still, when seen in the context of the whole study, very few gardeners appeared to be low-income. Without increasing the participation of low-income groups, resources that are considered valuable for economic and social mobility are only exchanged among members of middle-class groups. Future research may want to consider including income and other socioeconomic status measures and conduct a rigorous class analysis, perhaps using other neo-marxist theories and theoretical frameworks as well (see Harvey, 2005 for example).

Social Capital Theory, however, was a useful theoretical framework to focus attention on the *value* of relationships. Further, while there are some methodological issues with how relationships and resources were operationalized in this study, which will be discussed below, it was useful to separate one's race, a garden's racial diversity, as well as one's perceived racial differences and shared deep-level similarities from relationships and resources potential available to one from those relationships. In other words, it was useful not to employ the bonding and bridging distinctions typically used in the social capital literature. Recall that bonding social capital refers to resources in relationships between individuals who are similar or "homogenous" while bridging social capital refers to resources in relationships between individuals who are not similar or "heterogeneous" (Lin, 2000; Putnam, 2000; Wakefield & Poland, 2005). Often, 'homogenous' and 'heterogeneous' are defined by demographics, and scholars have argued that bridging social capital (e.g., ties that cross race, etc.) is more valuable for members of oppressed and minority groups (Foley & Edwards, 1997; Hawe & Shiell, 2000; Lin, 2000).

Using the bonding and bridging distinctions in this way precludes analyses from examining how race, as well as shared interests, may be related to relationships formed. Further, race or racial diversity as a proxy indicator for valuable resources assumes that communities of color do not have resources of value, which was an erroneous assumption based on this study's

results. It was important to measure the actual resources potential available in relationships to gain some knowledge of "how much capital an individual or groups actually has at its disposal" as Glover (2005a) argues. In short, this study found that race and racial diversity was not related to gardeners' sense of community or resources accessible. Thus, race and racial diversity should not be used as a proxy to indicate what resources are available to one. Future studies should include income to gain some knowledge of how much capital is potentially available for members of poor communities, regardless of race, in community gardens. Perhaps perceptions of shared interest would be salient for developing relationships and gaining resources that cross class-boundaries.

## Practice Implications

This study identified three specific cultural and structural issues about community gardens in urban desserts that center on gentrification, entrepreneurship for low-income groups, and historical trauma that environmental social workers can apply their practice skills in order to promote justice within the context of community gardens. Specifically, social workers can raise awareness and open dialogue about gentrification concerns especially since these concerns occur in low-income areas where vulnerable populations are clustered; critically evaluate economic development rhetoric and build partnerships and programming to increase entrepreneurship opportunities; and, help build culturally appropriate workshops and outreach materials with African-Americans that are sensitive to potential stigma rooted in the history of slavery. Conversations around any or all of these issues, in particular with historical trauma, could also open dialogue about larger issues related to race and class that go beyond a community garden.

All of these issues are complex, however, gentrification warrants additional discussion due to how community gardens and gentrification has been presented as a 'David and Goliath'

battle in the literature. The literature has documented several high profile case studies of community organizing that successfully mobilized citizens to protest when the city was planning to destroy community gardens for redevelopment (Barraclough, 2009; Shepard, 2013; Schmelzkop, 1995, 2002; Staehli et al., 2002). Community organizing and social movements often require a clear 'villain' in a simple 'story' to mobilize citizens (see Taylor, 2000 for review of social movement framing). However, there may not always be a clear 'villain' (the city) and the gentrification 'story' may not have a simple and clear headline, such as 'Community gardens that feed hungry and homeless destroyed by corporate greed. Residents fear losing their homes'. Social workers should be aware that gentrification takes time, often years (Marcuse, 2016). It may not be immediately noticeable and displacement can be silent.

It seems more likely that social workers will have to contend with how to mobilize gardeners when the ill effects of gentrification are not immediately apparent, or even perceived as 'ill' effects. Furthermore, how does one mobilize gardeners when some of them may be the 'villain'? Several leaders in this study expressed 'white guilt' in being "one of those gentrifiers". Guilt over being a gentrifier has been documented in other studies, indicating that this phenomenon is not new or specific to being a community gardener (see Marcuse, 2016 for review). Marcuse (2016) notes that 'gentrifiers are people too' who often have limited options of where they can live as well. "They are, like those they displace, the victims of powerful economic forces that are operating through the market" (Marcuse, 2016, p. 1266). Normalizing this issue may be a point of entry for social workers to initiate dialogue, raise awareness and greater understanding of structural forces that contribute to gentrification and displacement, and build solidarity across communities to advocate for more and/or better affordable housing policies and programs.

The voice of low-income groups has been missing the literature. Social workers often directly work with vulnerable groups in various human services agencies and organizations, such as public housing and social services, and can facilitate discussions with low-income residents about community gardens. First, and foremost, do they even want a community garden, and if so, what would be helpful to increase their participation? Social workers should be mindful of gentrification concerns, economic development desires, and sensitive to historical trauma when facilitating those conversations.

Social work education field placements and service-learning courses can also help address capacity issues mentioned by leaders while providing experiential learning opportunities to develop practice skills. For example, students can learn how to engage with community in culturally appropriate ways by providing door-to-door outreach and conduct research through assessments that gather non-participating residents' perceptions. Such activities would answer social work scholars' call for more environmental content incorporated in the curriculum to meet rising demand from students (Shaw, 2013) and some case examples are already documented in the literature (see Gray et al., 2013; see also Rinkel & Powers, 2017 for recent environmental social work educational tool).

## Research Limitations & Implications

### Methodological Limitations

There were several methodological limitations to this study that future research should address. First, this study was limited by its small and convenience sample. Because of the small sample size, the researcher was unable to test all social capital hypotheses or assess whether there were differences in community garden characteristics by the primary leader's race. A larger sample size of gardeners and community gardens would be helpful to address these issues. A

larger sample size may be possible if one includes all community gardens, not just those in food deserts. Future research may want to consider this approach and include food desert status as a variable. It might be interesting to know if there are differences between gardeners and/or community gardens in food deserts and not in food deserts.

It would also be ideal if future research could employ random sampling techniques to obtain a representative sample, as this study had a convenience sample that is not representative of the population of interest due to selection bias. A larger and representative sample may only be possible in areas that have multiple umbrella organizations that support community gardens and have a listing that one can use. Some studies have used this approach, and notably, they are in larger cities (see Armstrong, 2000 for example). If one were able to obtain a larger and ideally probability sample, the researcher would recommend using multi-level modelling to assess for variations between community gardens and among gardeners.

Also because of the small sample size, this study was unable to quantitatively explore which community garden characteristics were related to a garden's racial make-up at the organizational level. Future research should consider addressing this issue as it would be useful to advance understanding around what organizers can do to promote race and class diversity within their garden, especially if located within a low-income and racially diverse neighborhood. One could answer this question quantitatively based on characteristics already suggested in the literature and used in this study.

However, given that it may be difficult to obtain a larger sample, qualitative approaches may be a useful alternative, perhaps even preferable. The researcher obtained valuable insight from leader interviews that challenged the benefit of some of these recommended community garden features, such as the fence. It would also be valuable to obtain perceptions from non-

participating residents as their voice has been missing in the literature. Future qualitative research might want to consider a cross-comparative case study and obtain leader, non-leader members, and non-participating low-income resident views about community gardens that are mainly White, mainly Black or People of Color, and Evenly Mixed.

Second, many of the standardized measures used were adapted; previous psychometric properties around reliability and validity no longer apply. Given that the research aims were to broadly describe gardeners, measures were shortened for survey length rather than dropping variables from the study. For future research that focus on specific questions raised by this study's results, the researcher recommends using full standardized scales when applicable and appropriate for this population. If future researchers choose to adapt standardized scales, the researcher advises conducting focus groups with community gardeners to guide measurement adaptations, especially with the environmental values scale as it had low internal consistency in this study.

The Perceived Community Garden Benefits' subscales needs to be highlighted for future scale development. The environmental, personal health, community food security, and community development benefit subscales were based on the literature, which has documented the many different benefits community gardens can provide and to whom. The researcher used items developed by other researchers whenever possible, and subscale items were grouped based on a conceptual understanding of the literature. While subscales exhibited moderate to high internal consistency, it would be useful to generate additional scale items using focus groups and/or interviews with community gardeners and develop empirically based subscales using factor analyses techniques; additional studies can then validate the scale (DeVellis, 2012; Tabachnick & Fidell, 2007). The same could be said for all the researcher-developed scales such

as the perceived deep-level similarities and measures of socializing across race. Standardized scales with sound psychometric properties would be invaluable for future research in this area, particularly when examining differences by race or other characteristics.

Third, this was a correlational study. As such, this study cannot address issues of causality. For example, one should not assume that socializing across race – meeting or mixing – caused one to have a higher sense of community. It may be the case that because one has a high sense of community, they were more likely to socialize across race. In addition, one may have a high sense of community simply because they joined a community garden. Future research may want to consider longitudinal studies, or barring that, include a measure that captures gardeners' desire for "personal connectedness" or sense of community as a reason for joining. That is, did one have a high sense of community because of the people in the community garden or simply because they joined a community garden?

Fourth, the researcher would recommend that future studies require active membership. In hindsight, this criterion seems obvious. However, the researcher had not considered the possibility of a community garden with no members. Based on recruiting and speaking with leaders, membership is fluid and dynamic based on gardening cycles. It is difficult to say when would be the best time to conduct a study like this one. Ideally, one captures the spring and summer growing season, which is the most active time according to leaders and the researcher's prior knowledge. Some leaders, however, had difficulty stating how many members they had as they were waiting to hear if previous gardeners were going to renew their plots and were in process of recruiting additional gardeners for the upcoming season.

Fifth, and lastly, there may be measurement and conceptual issues that may explain why sense of community had a weak, albeit significant, relationship with resources accessible. One,

the weak relationship between the two could be indicative of a measurement issue with the Resources Accessible scale. As previously discussed, there may have been more instrumental resources available to gardeners from fellow gardeners that were not listed on this scale. Two, this could be a conceptualization issue. It may be the case that one's Sense of Community, defined as having a strong emotional connection to fellow gardeners *and* the community garden as a whole, was not a good indicator of the relationships that one formed within their community garden. In this study, it is unknown how many fellow gardeners individuals knew, and whether resources accessible were from few or many relationships. Not to mention how many gardeners felt a strong sense of community simply because they had joined a community garden, regardless of meeting others or the quality of those relationships. Future research may want to explore a community garden's capacity to generate relationships and potential resources accessible in those relationships using social network analyses to tease out the number of relationships and their quality (i.e., strong or weak ties, or friends vs. acquaintances) rather than one's Sense of Community as a measure of relationships.

**Additional Questions Raised**

In addition to addressing methodological limitations, there were two other questions raised in this study that have not already been discussed. The first question raised was, "What is a community garden?" More specifically, to what degree must one have the 'individual' in order to have a 'community' for it to be a community garden? For example, some leaders questioned whether they were a "true" community garden, particularly those that were operating under a collective model of gardening. These leaders perceived that they had difficulty recruiting members because they did not offer individual plots. Without which, these leaders also thought that they lost members because members lacked an individual sense of ownership and pride in

growing something on their own, and over which they had total control: they could decide what to grow, when to grow it, and what to do with the harvest.

This perceived need for an individual sense of ownership might be connected to one leader's insight that it was necessary to "cement the exchange" with potential recruits or new gardeners in order for them to feel as if they belonged to the 'community' in the community garden. This leader argued that it was necessary to have a membership fee or in-kind contribution in order to "cement the exchange". This leader also speculated that having this exchange empowered the individual to view themselves as a contributing member of the community garden, rather than someone who only takes something out.

The reason this issue is interesting is because some parts of the (more radical) literature denigrates neoliberal subjectivities – meaning that we, those of us in the US at least, have been indoctrinated to only care for the individual and not the collective (Allen & Guthman, 2006; Alkon & Mares, 2012; Guthman, 2008c). Common examples of "neoliberal subjectivities" in this context are individual plots while collective gardening is upheld as an example of the community coming together in a way that allows each to contribute according to their abilities and take according to their need (Pudup, 2008; Sherriff, 2009; White, 2011; see also McClintock, 2013 for discussion on radical and neoliberal dualities in urban agriculture). Findings from this study's leaders suggest that there are pros and cons to different configurations of community gardens. Future research might want to explore the perceived benefits and challenges to developing a sense of community and individual ownership from gardeners across community garden types: individual gardening only, mixed, and collective gardening only.

Second, the development of human capital and skills has been emphasized in the literature as the primary way community gardens can promote economic development (Jones,

2012; Macias, 2008), particularly when youth were involved (Ghose & Pettygrove, 2014). This study does not refute those claims; however, it does raise the question on the use of involuntary labor, such as DJJ youth, on a temporary basis. The majority of black and white leaders indicated that these youth had been involved in their community gardens, usually to help with menial and labor intensive tasks. Most leaders were quick to note how they tried to provide rewards to these youth. However, without some system or program in place where they could benefit from gardening in terms of learning employable skills, it is difficult not to view the use of DJJ youth as a form of, or reminiscent of slavery. Future studies should explore the prevalence of involuntary labor (youth and adults) in this context, and also assess if there are any perceived benefits from those who provide involuntary labor and their recommendations for improvement.

## Conclusion

This study explored race and racial diversity within community gardens and the extent to which community gardens promote social justice through social capital. This exploration was prompted by critiques about the lack of attention to social justice from food justice and food sovereignty scholarship (see McClintock, 2013 for review); a critical lens that had not been applied to the assumption that community gardens inherently and automatically benefit poor communities and communities of color. Based on gaps in the community garden literature and critiques raised from the food movement literature, particularly around white privilege, this study focused on race and racial diversity when describing gardener and community garden characteristics specifically located in Southern urban food deserts. That is – who is the community in these community gardens and which community or communities benefit? Furthermore, what characteristics about these gardeners and gardens are related to social capital? An emphasis was placed on the number of potential resources an individual could access that are

valuable for social and economic mobility as a way community gardens could promote social justice, beyond food security benefits.

To return to Schlosberg (2004), there are three criteria for social justice: distribution, recognition, and participation. Recall that these dimensions are interconnected in the following ways: (a) which 'maldistribution(s)' is or are recognized affects who participates in and benefits from AFI efforts and (b) who participates in AFI efforts affects which 'maldistribution(s)' is or are recognized (Schlosberg, 2004). This study's results indicated that, while racially diverse, the middle class largely participated in these community gardens. Despite such racial diversity among gardeners, community gardens were for the most part racially segregated. In general, the civically-minded Black middle-class increased community food security largely through donations of their harvest while the White middle-class did not. One could argue that because people of color had a greater understanding or 'recognition' of historical and structural systems of oppression, they were more likely to attend to food insecurity or 'maldistributions' in this context.

Nevertheless, black and white leaders struggled to increase the participation of low-income groups, without which, food security benefits were largely 'distributed' or delivered through a charity model and the few social capital resources that could potentially be exchanged were between middle-class gardeners. Food justice and food sovereignty scholars have argued that privilege can reproduce inequities within AFI efforts and thus, have placed a stronger emphasis on political action, democratic decision-making, and leadership roles for oppressed groups as ways to, if not eradicate, at least lessen the possibility of reproducing such inequities (Allen, 2014; DuPuis & Goodman, 2005). This study's results do not cast doubt on these claims. However, the majority of gardeners perceived there to be high levels of democratic decision-

making, people of color were more likely to be in leadership roles than white gardeners, and the majority of community gardens had primary leaders who were racial minorities.

The lack of participation of low-income people of color in these community gardens appears to be based more so on cultural and structural issues – gentrification, historical trauma, low-income groups working multiple jobs – that constrain community gardeners' efforts rather than their efforts alone, thus pointing to the need for greater political advocacy. Based on the insight of a few black leaders, it may be the case that democratic decision-making and people of color in leadership roles is more necessary at higher levels, such as with an umbrella's regulations and policies that prohibit selling produce, than decisions that are made within a community garden.

In sum, community gardens do not automatically benefit everyone equitably, even when located in low-income neighborhoods. They have also been associated with harm in the form of gentrification and displacement and the use of involuntary youth labor. Social workers have been called upon to help advance human rights and justice – social, economic, and environmental. The key role for social work scholars and practitioners engaged in community gardens as a form of environmental social work is to pay critical attention to, and hold others accountable for, the values of justice and equity in order to fully promote the Three E's of sustainable development and a sustainable world that benefits everyone, everywhere, for all time.

This work cannot be done alone; multi-disciplinary efforts are required (Ramsay & Boddy, 2017). Beyond academia and professional disciplines, collaboration across multiple social groups – those with and without middle-class privilege and across race – are necessary for what Agyeman (2005) calls 'movement fusion' to build a social movement that has the resources, skills, and intimate knowledge of food-related problems to advocate for humanely and

sustainably produced food as a human right. Social workers have the skills to act as boundary crossers to help create interdisciplinary and cross-community collaborations, as well as the community organizing skills when advocacy and protest may be necessary (Ramsay & Boddy, 2017).

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Appendix A. Community Garden Literature Review Summary Matrix

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **PHYSICAL BENEFITS: NUTRITION & FOOD SECURITY** | | | | | | |
| Lautenschlager & Smith (2007) | To explore how CGs influence attitudes, beliefs & values about nutrition, food & cooking among youth | Qualitative; focus groups; comparison b/t gardening intervention youth and non-involved youth | Minneapolis/St. Paul; inner city kids; N=40, 56% female, 15% White | | Demographics; home gardening activity | Gardening youth were more willing to eat nutritious foods, try unfamiliar foods and had stronger appreciation for diverse cultures than non-gardening youth. |
| Alaimo et al. (2008) | To determine association b/t CG participation & FV intake among urban adults | Quantitative; survey | Flint, MI; N=766 adults (n=116 CG participation); 51% female, 27% White, 10% no health insurance | F&V intake | Demographics | CG participation households consumed 1.4x more FV/day that those who did not & were 3.5x more likely to consume FV at least 5x daily |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Corrigan (2011) | To determine the extent to which CGs contribute to food security | Qualitative; interviews & field observations | Baltimore, MD; 5 gardeners interviewed; 4 black elderly gardeners & and 1 older female, race unknown; no income indicators provided | | **Note**: CG was located in food desert & gardeners donated food to community | Gardeners motived by: childhood, desire for fresh food that was healthier, & relaxing to garden. Gardeners donated surplus to orgs. of their choice, no rule to do so. Gardeners get almost all produce from their gardens. |
| Evers & Hodgson (2011) | Community gardens impact on food security. Direct FS defined as providing space to grow food & indirect FS by educating on how to grow food. | Mixed-methods; structured interviews & survey | Australia; 28 gardeners & 7 coordinators that represented 6 CGs located in neighborhoods with varying levels of neighborhood poverty. | Various re: food security | **Note:** Did not obtain economic status of gardeners; could not assess whether most vulnerable benefited from CGs. | Direct FS limited; primary barriers to gardening were time, space, availability of plots, & productivity of garden. Indirect FS limited; most had gardening experience already and lack of educational workshops to serve novices. |
| Litt et al. (2011) | To assess CG participation on fruit & vegetable consumption | Quantitative (MLM); survey | Denver, CO; 436 residents & 58 block groups; 68% female, 57% White, 56% college degree & 40% received public assistance. | F&V scale (6-items) | Gardener status, demographics, social involvement and NE attachment | CGs consumed more F&V (5.7xday) than home gardeners (4.6xday) & non-gardeners (3.9xday). |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Loopstra & Tarasuk (2013) | To assess how low-income community members view CGs as means to address food insecurity | Qualitative; interviews | Toronto; 371 low-income families. Approx., 75% of sample was food insecure. | | | Of 371, only 12 (3.2%) were/had been involved in CGs. Families did not community garden because not accessible (66.3%), mainly because did not know about (28.4%) or was not a good fit (38.7%), mainly because they lacked time (23.4%). |
| Algert et al. (2014) | To assess output of community gardens and associated cost savings | Quantitative | San Jose, CA; 10 gardeners (subset representative of n=83 gardeners). Subset demographics: Mean age = 60; 30% completed high school & 25% college; ave. monthly income =$4900. | Gardeners weighed produce and recorded in log. | Gardeners varied in gardening experience (less than 5, 6-10, & 11 or more years). | On average (4 month period), gardeners produced 0.75lb/sq ft, which is more productive than conventional (0.60 lbs/ sq ft) and very close to biointensive farming (0.83 - 0.95 lbs/ sq ft). Gardeners saved on average $1.53/lb, approximately $435 per plot in a growing season. Crops grown were: tomatoes, squash, green beans, peppers, onions, eggplants, & cucumbers. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **MENTAL HEALTH BENEFITS** | | | | | | |
| Mundel & Chapman (2010) | To explore a community kitchen garden as example of decolonizing health (i.e., holistic health promotion) | Qualitative (PAR); interviews and observations | Canada; Interviews with 5 leaders & 5 participants of Aboriginal project. No demographics provided. Unclear whether leaders belong to Aboriginal group as participants. | | | Participants perceived garden and kitchen to promote physical, mental, & spiritual health. Gardeners reported that decolonizing on micro-scale because reduced dependency (i.e., colonization). |
| Hale et al. (2011) | To explore multi-level CG benefits as relational process. | Qualitative; interviews & focus groups | Denver, CO; N=67 gardeners from 28 gardens. Demographics: 67% female; 78% White; ave. age = 47. No mention of economic indicators. | | | Hands on processes enabled gardeners to 'reconnect' to nature and learn different sense of time (cyclical); ability to create beauty provided sense of pride and ability to share with others; emotional connection to what they grew (i.e., tastes better); spiritual for gardeners and way to preserve cultural traditions. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **ECONOMIC & HUMAN CAPITAL BENEFITS** | | | | | | |
| Kaufman & Bailkey (2000) | To explore barriers to UA as entrepreneurial effort. | Qualitative: Case Studies & Interviews | Nationwide: N=120 informants that represent 70 entrepreneurial AFIs & detailed case studies of Boston, Chicago, & Philadelphia. | | | A variety of for-profit and CBO/nonprofit groups involved in entrepreneurial UA activities. CBOs & nonprofits served low-income groups, but had difficulty maintaining programs due to lack of business skills among Cos and consistent funding to subsidize activities. |
| Vitiello & Wolf-Powers (2014) | To identify most effective use of UA to make impact for community economic development | Qualitative: Case Studies (6) (N=23 interviews with bureaucrats & UA leaders, includes support staff & community gardeners) | Camden & Trenton, NJ; Chicago, IL; Detroit, MI; Milwaukee, WI; Philadelphia, PA | | | Several examples of workforce integration & development (i.e., youth stipends, prisoners, etc.). One program had 250 graduates (prisoners) & 70% had full-time employment & 95% did not return to prison. Authors suggest CGs better for social enterprise &CD. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **SOCIAL BENEFITS** | | | | | | |
| Shinew et al. (2004) | To explore how CGs influence interracial interaction. | Mixed Method; interview with open & closed questions | St. Louis, MO; N=180 CG gardeners (n=58 Black, n=128 White). 71% were female, 67% completed college, & 61% had incomes above $35,000. | Low interracial contact vs High interracial contact groups & Black vs. White.<br><br>Contact defined by perceived racial %; not actual interactions across race | Racial composition of NE, trust, sense of community, motivation, & socializing in CG | Gardeners differed in education & income (Blacks lower). No differences by race on all measures except Black gardeners were more motivated to provide food to others. Difference b/t contact groups did not differ on trust or SOC. Black CGers more likely motivated to provide food for others. No difference by race or low/high contact groups in thinking that CGs are good for bringing together groups that differ racially. |
| Glover et al. (2005a) | To explore resource mobilization via social processes in CG | Qualitative; interviews | St. Louis, MO; n=7 CG garden leaders. No demographics described | | | Primary motivation by gardeners was to socialize; able to access resources to implement & maintain CG via strong & weak ties |
| Tieg et al. (2009) | To explore CG as way to strengthen neighborhoods and collective efficacy | Qualitative | Denver, CO; interviews & focus groups (N=67 gardeners & 29 CG sites). NE demographics of CGs not described. | Social processes | Demographics: 64% female & 78% white; ave. age =47. No economic/ education data collected. | Evidence that CG provides place for gardeners to develop trust, reciprocal relationships, identify community problems (civic engagement), & build community. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Alaimo et al. (2010) | Participation in community gardens and/or neighborhood association meetings are positively associated with perceptions of social capital. | Quantitative; telephone survey | Residents in Flint, MI (N=1,916; n=271 in CG, n=129 in NE meeting, n=292 in both, n=1224 did not participate in any). Ave. poverty rate for NE =26% (approx.). Overall ind. Demographics not provided. | Social capital | Individual-level demographics & census-level= Neighborhood crime, Physical environment disorder (PED) | CG and NE association involvement were associated with higher levels of perceived SC than those not involved in any way. NE alone was associated with more SC constructs than CG alone. CG + NE associated with most SC constructs. |
| Comstock et al. (2010) | To explore how individual and CG affect neighborhood attachment | Quantitative (HLM); survey | Denver, CO; 41 block groups, 410 residents, 41 gardeners. Demographics: 54% White, 53% college, 69% home owners, & 45 ave. age | NE attachment (6-item scale) | Ind-level: demographics, collective efficacy. NE-level: aggregate demographics, crime rates | Any gardening was sig. for (+) NE compared to no gardening activity, as was years (-) and collective efficacy (+). EF = .18 |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **CIVIC BENEFITS: CIVIC ENGAGEMENT & ECOLOGICAL CITIZENSHIP** | | | | | | |
| Glover (2003) | To explore how gardeners portrayed their efforts in initiating a CG | Qualitative; interviews | Mid-size city, Mid-western US (n=14). No demographics provided. | | | Illustrates typical CG story: Residents were tired of high crime, etc. and residents got together to 'reclaim their space' via a CG. Viewed by participants as empowering, less conflict oriented than night patrols and a symbol of pride. Crime decreased (according to participants) and CG still continued 9 years later. |
| Buckingham (2005) | To explore the 'feminization' or empowerment of women in allotments (British version of CG). | Qualitative; interviews, documents | London; interviews with 7 women who were allotment representatives (interface between allotment holders & local authorities) | | | Allotment was originally primarily male activity (women can only grow flowers, not food). Finding was more women now involved; driven by concern over food quality & climate change, more often involved children. Higher educated women more often organic gardening & compost compared to low-income women. Low-income more driven to garden due to poverty. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Glover et al. (2005b) | To explore whether CG leaders had higher democratic values than CG participants. | Quantitative; telephone survey | Community gardeners in St. Louis, MO. (N=191, n=91 leaders, n=100 non-leaders). 71% female, 67% White, 70% had $35,000 annual or higher | Democratic Values (Citizen Profile scale – political subscale) | Leadership status (self-identify), Intensity of participation, demographics | Leaders had stronger democratic values than non-leaders. Only time in garden was sig. associated with democratic values; only 3.1% of variance explained. |
| Parry et al. (2005) | To examine the influence of community gardens on the reproduction & resistance of gender roles and relations. | Qualitative (Feminist); In-depth interviews w/ 7 leaders (self-identified), focus group (3) w/ supporting NGO, & field site observations (4) & brief interviews with gardeners (6) | St. Louis, MI; N=23. 19 female & 7 African American. (Discrepancy of total gardeners in sample). No economic/ education data collected. | Leadership roles, social processes, empowerment | | Women more often initiated CGs; were more comfortable describing as co-leadership (team oriented, cooperative) & hence, were more flexible in divvying tasks. Tasks divvied by: ability, knowledge, & interests. Women empowered by success in CG transferred to other life areas (i.e., applied for school grant, going for a new degree). |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Ohmer et al. (2009) | To explore community garden program on participants' conservation values & beliefs, sense of community, & volunteerism | Mixed methods; interviews & survey | Western Pennsylvania. Interviews: 27 gardeners, 10 partners, & 7 funders. Survey: 56% (n=258) gardeners, 44% partners, & 33% local agencies & city officials | Motivation, Conservation ethic, sense of community, community impact of garden, level of involvement, & volunteer ethic | Demographics only for gardeners in survey: 91% white, 66% employed, 55% college degree, & 49% earned over $35,001 | Motivations: beautify NE, give back, & support green spaces. Participants valued green spaces and conservation efforts. Participants felt CGs contributed to sense of community (socializing) and benefited wider community (more attractive). Volunteering in CG sig. associated with volunteering in other activities |
| Travaline & Hunold (2010) | To explore how UA fosters ecological citizenship (defined here as public participation & learning about food system) | Qualitative; interviews & site visits | Philadelphia; 7 UA projects ranging from urban farms, educational centers, high school garden, & NGOs that supports CGs. No mention of # of interview for each UA project, their role or demographics. | | | Participation - majority of UA orgs run by middle-class, white & female. Only some valued & incorporated community members in decision-making (for-profit less so). |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| White (2011) | To explore how Blacks utilize CG as resistance to food insecurity & transformation of city. | Qualitative; Case study of D-Town Farm (interviews, documents, observation) | Detroit, MI; interviewed 10 most active volunteer farmers. All Black (5 male, 5 female) & range of occupations (professional to unemployed). 4 were founding members. | | | Participants view success due to CG doubles as community center; partnerships with local agencies to provides resources, activities, workshops; hosts social activities (festivals), employs youth, reframed historical legacy of slavery, & provision of food for local residents. Author & participants argue how CG facilitates agency & empowerment. |
| Bendt et al., (2013) | To explore the processes of experiential learning in community gardens on ecological, social, & political knowledge. | Qualitative; case studies of 4 CGs that includes interviews and observations | Berlin, Germany; 4 CGs, 33 interviews (31 w/ gardeners and 2 w/ city officials). All 4 CGs were publically accessible (no gates/locks) and located in lower middle class NEs. Demographics varied depending on CG. | | | Main findings were that the more CGs were open to various publics (i.e., social events, etc.) the less ecological learning occurred. However, these CGs were able to engage a wide diversity of participants, suggesting a trade-off between learning deeply by a few and engaging a wide variety of people. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **COMMUNITY-LEVEL BENEFITS & CONSEQUENCES** | | | | | | |
| Schmelzkopf (1995) | To describe how CGs can lead to conflict over appropriate land use (i.e., use value vs. exchange value). | Case study | New York, NY | | | CGs were developed by residents as way to fight urban blight, which city initially supported. Once land was valuable, city took land to sell for redevelopment. Framed as need for affordable housing, but little were earmarked as such. Majority of CGs destroyed and lots left vacant. Residents protested. |
| Schmelzkopf (2002) | To describe how CGs can lead to conflict over appropriate land use (i.e., use value vs. exchange value). | Case study | New York, NY | | | Describes in more detail conflict between gardeners & Giuliani over land use (i.e., how threat led to CO by various CG gardeners) |
| Staeheli et al. (2002) | To describe how CGs can lead to conflict over appropriate land use (i.e., City's rights vs. rights to the city). Application of Levebre theory. | Case study | New York, NY | | | Describes NY CG conflict. Notes that CGs were 'decentralized' until conflict & then banded together (CO). |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Been & Voicu (2006) | To explore impact of CGs on NE property values | Quantitative (regression models): data from census & observations of CG appearance by students. | Bronx, NY (n= 86 CGs rated) | Sale prices of buildings w/in 1000 ft of CG to other properties in NE (census tract) before & after CG | Income levels in NE (census tract); quality of CG | CGs improved residential property values. Impact is greater for houses closer to CG. Greatest impact on values for low-income areas. |
| Barraclough (2009) | To explore how land use policies regarding CG reproduce racism and poverty | Case study | South Central Farm in Los Angeles, CA | | | Demonstrates that closure of South Central Farm for development was due to 'color-blind' land use policies in favor of middle-class homeowners |
| Crossney & Shellenberger (2012) | To assess CG's influence on NE characteristics | Quantitative (longitudinal) | Philadelphia; 48 tracts had CGs & use of 2000 & 2010 Census | | Demographics @ tract level | Tracts with CGs had increased college graduates & housing values and decreased in poverty and vacant housing |
| Eizenburg (2012) | To explore different NGO management of CGs (i.e., public-private land trusts). | Qualitative; case study | 2 NGOs in NY that support CGs | | | NGO models differ in how land was secured: as land-trust vs. bought and secured by donor/corporate sponsor. Land-trust better at maintaining community voice, but more responsibility was burdensome. Donor model did not incorporate community voice. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| **MULTIPLE BENEFITS** | | | | | | |
| Waliczek et al. (1996) | To describe CG influence on quality of life | Quantitative; survey | Nationwide survey (1108 survey sent to 46 garden coordinators). 361 gardener responses for 36 CG sites. In sample: 58% (201) White, 12 % (43) Black, 18% (64) Hispanic, & 15% (53) Asian. | Multiple based on quality of life and Maslow's hierarchy of needs. | Demographics of gardeners & size of cities CGs are located in. | By race, Blacks and Hispanics ranked CGs higher for physiological needs (working w/ nature), safety, social needs (provide food for others), self-esteem (pride in creation), & self-actualization needs (teaching their children to grow) compared to Whites & Asians. Few differences by gender; women ranked beauty & saving money more imp. than men. |
| Armstrong (2000) | To describe CG characteristics and individual gardeners and relationship to community development. | Mixed Method; telephone interview/survey | New York; 20 garden coordinators (managed 63 CGs in total). 46% located in low-income areas, 38% high, 16% unknown. No other demographics provided. | | | Gardens differed b/t urban/rural. Urban more often fenced & organic gardening rules. CGs in low-income areas were 4x more likely to address NE issues. Gardeners that were not local residents closely tied to each other, but CG was not beneficial to local community. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Hanna & Oh (2000) | To explore how CGs can increase overall community wellbeing among communities living in urban poverty | Mixed methods; surveys, interviews and site visits | West Philadelphia; N=45 (56% Black, 75% female, 31% b/t ages 25-50). No economic/ education data collected. | | | Gardening was a low cost activity, majority grew food, & majority spent 10 hours or less per week on their garden. Majority of gardeners were older and had prior gardening experience from their childhoods in South. |
| Saldivar-Tanaka & Krasny (2004) | To explore how Latinos view the primary purpose of their CGs & benefits & to explore how supporting CG agencies view the primary purpose of CGs. | Case Study (Qualitative); interviews, observation, & document reviews | New York, NY (CGs in primarily Latino neighborhoods); interviewed 32 gardeners (20 CGs) & interviewed 11 staff of supporting agencies (NGO, City). 90% of CGers were Puerto Rican, majority male & seniors most active gardeners. No economic/ education data collected. | Purpose: (1) community development (i.e., urban blight), (2) open space (be in nature), & (3) civic ag. (grow food) | Demographics, planting practices, activities, facilities, garden history, & issues facing the CG. | Most have 3 types who participate: gardeners, garden members, & garden friends. Most Latinos view CG for social activities, same as agencies. Major issues were: tenure & lack of resources. CGs acted as sites for community organizing to obtain resources for gardens. In general, gardeners viewed CGs as places to create spaces that fit their culture & social needs. |
| Wakefield et al. (2007) | To explore CG impact on health | Qualitative (CBPR); interviews & focus groups | South-East Toronto, Canada; 68 gardeners from 15 sites. | | Area described as having high poverty rates and high ethnic diversity. No demographics provided. | Gardeners reported better access to food & reduced grocery costs, better mental health by being in nature, sense of empowerment (see something work out) and community attachment through sharing. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Allen et al. (2008) | To explore how community gardens influence youth positive development | Qualitative (CBPR); Case studies of 2 sites | Flint, MI; interviews (12 youth) & 16 adults for 2 sites. Sites had formal youth programming. | | | Youth described multiple benefits: pride in NE, learning responsibility, multi-generational interaction, eating more vegetables because they grew it; and gaining new friends and handling conflict. |
| Kingsley et al. (2009) | To assess CGs contribution to health & wellbeing | Qualitative; semi-structure interviews | Australia; 10 community gardeners (from Dig-in). 7 female, all white. 6 were on CG committee (i.e., leaders). | | **Note**: Overall 55 CGers described as mainly white, middle class & female. Membership required to access CG. | Gardeners motivated by desire to socialize and reconnect with food & nature. Perceived to contribute to wellbeing (holistic sense). Barrier to gardening was driving to location. |
| Milbourne (2012) | To explore every day socio-environmental (in)justices through community gardens | Qualitative | UK; Interviews with 10 national orgs, 22 coordinators, 35 gardeners (from 3 sites) in low-income areas. No other demographics described. | | | Community gardens provided local places/spaces that enabled gardeners to exert local control and create places that fit community needs (similar to 1970s US garden movement). |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Poulsen et al. (2014) | To assess perceived benefits of gardening from community gardeners | Qualitative; interviews & focus groups | Baltimore, MD; N=28 gardeners (13 CGs); broad range of ages; 19 female, 23 White, 5 Black. No other demographics provide. | | | Similar to others, gardeners reported multiple perceived benefits, esp. meeting others they never would have otherwise. Benefits are interconnected & across levels. |
| **GARDENERS & COMMUNITY GARDENS: CHARACTERISTICS THAT MAY INFLUENCE HOW BENEFITS ARE DISTRIBUTED AND WHO BENEFITS** | | | | | | |
| Irvine et al. (1999) | To illustrate how CGs can be a LA21 initiative through its implementation and potential outcomes. | Case Study | Toronto, Canada; CG has 40 plots and is located in diverse NE b/t social service agencies (who have own plots) | | | No results re: outcomes. Authors speak to how three E's were attended to in CG development (processes) and recommends CG as a LA21 initiative. |
| Ferris et al. (2001) | To explore various CGs and implications for sustainability (LA21) | Qualitative: methods not stated, but assume team spoke to various CG organizations & site visits | San Francisco Bay area | | | Developed typology of CGs: leisure gardens, school gardens, entrepreneurial gardens, crime diversion/work training gardens, therapy gardens, and neighborhood gardens |
| Twiss et al. (2003) | Reports on Lessons Learned from California Healthy Cities & Communities (initiative promotes CGs) | Mixed Methods; survey & interviews of grantees | California | | | Good example of NGO & public agencies involvement to develop CGs for vulnerable populations to increase food access. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Glover (2004) | To explore social capital processes in CG | Qualitative; interviews | Mid-size city, Mid-western US (n=14); 2 racial minorities, core leaders were White & homeowners. Participants mixed b/t homeowners & renters. | | | Illustrates how bottom-up/grass-roots CG can still be exclusive. Homeowners (more often white) were more involved & had more decision power in CG. Diverse NE, but not many racial/ethnic minorities involved. |
| Holland (2004) | To explore how CGs can act as a model for sustainability (LA21) initiatives. | Mixed Methods; interviews & survey | UK; N=96 for surveys (18 were for farms, rest from CG. RR is 38%. Assuming that CG response was for 1 CG.) & 13 interviews (3 for urban farms). No demographics provided. | | | Primary & current purposes of CG were for education, community development, & leisure. Diverse users & public access. Two leadership models; paternalistic individual vs. consensus. Essentially, CGs are diverse and benefits are interconnected, like sustainability concept. |
| Kingsley & Townsend (2006) | To explore community garden's impact on social connectedness | Qualitative | Australia (Interviews with 10 gardeners with 'Dig-in' CG). 7 female, all white. 6 were on CG committee (i.e., leaders). | | **Note**: Overall 55 CGers described as mainly white, middle class & female. Membership required to access CG. | Evidence that design and management influenced social networks: places to sit, roles, rules & social activities for gardeners |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Macias (2008) | To assess AFI's contributions to: food equity, social integration, & natural human capital | Case Studies; (Qualitative) Interviews & observation | Burlington, VT; 12 interviews with 4 CSAs, 4 organic farmers, & 4 CG site coordinators. No demographics provided. | | **Note**: CG site coordinators could be garden leaders. Unclear. | CGs were cheaper for poor. However, inaccess due to: time, 'commuter' garden, & history. Poor used to fish there & now a CG that they felt excluded from. CGs: moderate for food equity (see above); high for social integration & high for natural human capital (gardening knowledge). |
| Milburn & Vail (2010) | To explore key factors that support long-term success of community gardens | Qualitative; interviews | 4 CG coordinators that organized/ managed CGs active for 10 years or more from WI, VT, NC, & OR. Represents a range of nonprofit & public entities. | | **Note**: interviews were with people from NGO or public agency that provided support and/or managed community gardens. Not specific to 1 CG. | Key factors for successful CGs: (1) secure land tenure, (2) sustained interest (i.e., engage community in development), (3) community development (i.e., fulfil community needs, resident desires & skills), & (4) design of CG (i.e., physical design reflects social and garden needs) |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Firth et al. (2011) | To examine the nature of community in community gardens and explore how type of community affects how benefits are generated and distributed. | Qualitative; Comparative Case Study | 2 community gardens in UK. No demographics provided | | Location, Who initiated, Who manages, Purpose of garden, Type of users, Types of activities, & Funding | Both types associated with 3 forms of SC. However, place-based benefited local community whereas interest-based only benefited gardening group. Top-down associated with green values of organizing nonprofit & participant values. Interest-based associated with top-down while place-based associated with bottom-up. |
| Turner et al., (2011) | To explore why individuals are motivated to become involved and stay involved in CGs & how that relates to ecological citizenship (i.e., changing values/behaviors for sustainable living) | Qualitative (ethnography); participant observations, interviews | Australia; 20 CG participants from 7 CGs. No demographics provided | Motivations for involvement | | Gardeners were primarily motivated so they can have control over what they eat (opposed to Big Agro) & gardening was therapeutic. Drive for community was not motivating force. Author argues that participants gained sense of belonging & place via nature. Sustainability is learned by connecting mind & body. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Pearson & Firth (2012) | To explore the diversity of community garden types | Mixed Methods; survey & interviews | East Midlands, UK; surveyed 18 CGers and interviewed 2 NGO staff (coordinators) who supported CGs in area. | | No demographics for CG respondents provided. | CGs varied in size, approx. 50% employed staff, ave. volunteers per garden were 15, majority used by/for children & homeless, grew food, & hosted community activities. |
| Meenar & Hoover (2012) | To explore CGs from a food justice perspective | Mixed Methods; GIS, online survey, semi-structured interviews, field visits | Philadelphia; survey (n=46 from garden coordinators that manage 81 CGs), interviews (n=20 w/ representatives of CGs, urban farms, & NGOs) & 35 field visits to gardens, food cupboards & community events. | Multiple | | Most CGs started by un- or underemployed & creative hipster class (mostly White) who want to grow own food. CGs located in diverse NE; Whites mostly active in CG activities (47% White) that do not match city demographics (41% White). 67% do not require fees for membership. Most use internet/email so poor communities lack 'informational access'. Many donate food to local orgs although 54% informal donations. Most CGs have wait lists, time is barrier. Some perceived as White, top-down movement; fencing as issue of exclusion. |

| Author (year) | Research Focus | Method | Sample | DV(s) | IV(s) | Main Results |
|---|---|---|---|---|---|---|
| Cohen & Reynolds (2014) | To explore resources needed for UA to meet SD and social justice goals of AFIs. | Qualitative; Case study: documents & interviews | New York, NY: N=31 (n=16 gardeners, n=5 NGO staff, n=4 funders, & n=6 public agencies) | | **Note**: Gardeners selected to reflect various locations, leadership demographics & garden type. Stats. Not provided. | Gardeners report similar goals & resources from past studies. Gardeners report disparities in accessing resources along racial/class lines; concern that UA is being 'white-led'. |
| Reynolds (2014) | To evaluate urban agriculture project from critical race perspective | Qualitative; Interviews w/ various stakeholders | New York, NY; N= 31 key informants - n=16 (gardeners & farmers), n=5 staff from support NGO, n=4 funders, n=6 city officials. | | **Note**: Gardeners selected to reflect various locations, leadership demographics & garden type. Stats. Not provided. | White, higher income gardeners more able to access resources (land, grants, etc.). Some gardeners (both Whites & Blacks) perceive UA as being white-led. |
| Ghose & Pettygrove (2014) | To explore impact of community gardens on 'citizenship practice' (i.e., how community gardens challenge and reinforce neoliberalism). Same vein as Guthman. | Qualitative; interviews w/ residents, garden organizers, & nonprofit & city representatives | Milwaukee, WI; 6 CGs in inner-city NE w/ high poverty. 2 CGs had White garden leaders and participants primarily Black. 2 CGs Black leaders & participants. 1 CG mostly White. No mention of other CGs. | | | To large degree, those involved did not challenge city policies because disciplined by insecure land tenure. City views CGs as temporaL and ideal for permanent entrepreneurial activities (i.e., redevelopment). Also relevant re: Reynolds (2014) & race/class disparities in access to resources. |

Appendix B. Recruitment Materials

## Identifying Relevant Community Gardens

*Subject heading:* Requesting Information about Community Gardens in Richmond

Dear (Name),

I am contacting you because you are: (a) listed as the contact person for your association on Richmond City's website or (b) the (staff title) of (relevant organization name). My name is Jen and I am a PhD student at VCU. I am currently working on my dissertation research study, which is about describing community gardens and their garden members here in Richmond.

I am creating a list of existing community gardens from various sources so I can contact gardeners and ask them if they would like to participate in my study.

(a) Sometimes neighborhood/civic associations will start a community garden. **Will you please let me know if your association has a community garden?**

(b) I saw online that your organization helps people interested in community gardens and that you have sponsored some (listed on your website). **Will you please let me know of community gardens (other than the ones you sponsor) that I could add to my list?**

The information I am asking for is:

- Community Garden Name (if there is one)
- Community Garden Address
- Community Garden Contact (name, phone and/or email)

Please provide me with a contact's name, phone and/or email ONLY if that individual agrees to have this information shared. If you are not sure whether or not the contact would want information about his/her garden shared, please forward this email to that person so he/she can contact me.

If you have any questions or concerns, call me at 850-368-2426 (cell) or email me at jettnerjf@vcu.edu.

Thank you so much for your help,

Jen

## Garden Contact Recruitment Email and Phone Script Template

**Recruitment Email** *(if applicable)*

*Subject heading*: Research about Your community garden

Dear (Name),

I got your name from (a) online sources or (b) (relevant organization name). My name is Jen and I am a PhD student at VCU doing my dissertation study. My study is about describing community gardens and their members here in Richmond. I am especially interested in community gardens located in food deserts.

For my study, I'd like to:

- Interview & survey a community garden 'leader' (someone who helps manage the community garden), and
- Survey community garden members

I would love to schedule a time to chat with you for about 15 to 20 minutes on the phone and see if you **might be** interested in participating.

Please let me know when would be a good time to call you. Or, you can call me at 850-368-2426 (cell).

Thank you,

Jen

## Phone Script Template

*[Note: Introductory comments may vary based on whether researcher was able to send recruitment email.]*

Hello (Name),

Thank you so much for your time. Just as a refresher, my name is Jen and I am working on my dissertation about community gardens here in Richmond, especially those in food desserts. I'd like to interview and survey garden leaders and survey garden members to find out more about how the gardens function and how the garden members participate in and benefit from garden activities.

I am calling to see if you might be interested in participating in this study. This call can take about 15 to 30 minutes to complete. Would now be a good time for you?

*[If Yes, go to Step 1]*
*[If No, ask for a convenient time to call back.]*

**Step 1: Verify 3 Inclusion Criteria**

Before I go into all the study details with you, I want to first check and see if your community garden fits my study. I'm interested in community gardens that are in Richmond city, that are in a food desert, and that are publicly accessible. I believe that your community garden is in Richmond and a food desert based on the address I have on record for you.

[Confirm physical location of the garden. If correct, then should be in Richmond City limits and in a food desert. If address is incorrect, then get correct address and verify Richmond City and food desert status.]

What I'm not sure about is whether your community garden is publicly accessible. By 'publicly accessible,' I mean a community garden that is typically open to the general public. So, these community gardens can be 'open to the public' in different ways. For example:

- Anyone can join, as long as there is room, or
- They are often in neighborhoods or parks, so non-members can walk by or even enter the garden.

The idea is that these 'publicly accessible' community gardens are places where gardeners and non-gardeners **could** meet. Community gardens that are only open to a specific group (i.e., students, patients, prisoners) are not accessible to the public. For example, community gardens located in schools, hospitals or prisons are NOT public access gardens.

Based on that definition, would you consider your community garden to be 'publicly accessible'?
*[If Yes, go to Step 2]*
*[If No, go to Step 4]*

**Step 2: Identify Garden Leader**

Okay, so your community garden does fit my study. Now, what I am trying to do is figure out who would be the appropriate person to interview as the "garden leader" for this community garden.

By garden leader, I mean someone who is both:

- Involved in directly managing some aspect about the community garden (i.e., waitlist, recruitment, paying bills, etc.), and
- Is able to answer questions about the overall community garden such as the number of members and date it was established.

Based on that definition, would you consider yourself to be the appropriate garden leader?

*[If Yes, go to Step 3]*
*[If No, ask if they can suggest an alternative garden leader and provide their contact, if appropriate. Ask he/she to provide researcher's contact information to alternative. Follow-up with alternative garden leader to recruit via email and/or phone.]*

**Step 3. Recruit Garden Leader into the Study**

*[Proceed to recruit leader by reviewing Leader Consent form. Once recruitment is complete, go to Step 4.]*

**Step 4. Snowball with Garden Contact**

Thank you for taking the time to talk with me. Do you know of other community gardens in Richmond? I could really use your help in figuring out if I am missing anyone. I only need the name of the community garden, its address, and the contact person.

*[Make sure that garden contacts provide phone and/or email ONLY if that individual agrees to have this information shared. If garden contacts are not sure whether the garden contact would want information about his/her garden shared, ask he/she to provide researcher's contact information instead.]*

## Garden Member Recruitment Email

*Subject heading*: Opportunity to participate in a Community Garden study

[Personal greeting from Garden leader],

[Please see below / You will receive an email] about an opportunity to participate in a study about community gardens. **This study is completely voluntary**. No one in the garden or in the community will know whether or not you participate in the study. I am simply passing this information along to you.

**Community Garden Study Information**

Dear Community Gardener,

I hope this email finds you well. My name is Jennifer and I am a PhD student at VCU asking for your participation in a study about community gardens. I am currently working on my dissertation research. My study is about describing community gardens and their members here in Richmond. I am especially interested in community gardens located in food deserts.

The survey:

- Should take **10-15 minutes** to complete,
- Is **confidential** – no one is asked to provide their private information (i.e., names, etc.), and
- Is **voluntary** – no one will know whether you took the survey or not.

Please click on the link below to take the survey.

Click here to take the survey.

Please see the study flyer for more information (attached). *[Note: Member consent form is study flyer]* If you have any questions, please contact me at jettnerjf@vcu.edu or 850-368-2426 (cell).

If you do not want to receive emails about this study in the future, please let me or your garden leader know.

Thank you,

Jen

## Garden Member Recruitment Announcement (electronic)

Opportunity to Participate in a Community Garden Study!

Jennifer Jettner, a PhD student, will be at our (insert event). She is working on her dissertation research to learn more about community gardens here in Richmond. **Most importantly, she wants to hear from you!** She will talk with you about her study and answer any questions you might have. If interested, she will have surveys on hand for you to fill out.

## Survey Recruitment Flyer

**Calling all Community Gardeners…**

**What Do You Think about Your Community Garden?**

**What is this about?**

- Opportunity to participate in a Community Garden Study

**Who are you?**

- My name is Jen and I am PhD student at VCU. I am currently working on my dissertation research.
- In my study, I want to learn about community gardens here in Richmond, especially those in food deserts.

**What do I do in this study?**

It's easy. Simply fill out a survey

- Survey takes **10-15 minutes** to complete
- Is **confidential** – no one is asked to provide their private information (i.e., names, etc.), and
- Is **voluntary** – no one will know whether you took the survey or not.

**Who can participate?**

Community garden members who are:

- 18 years or older, &
- Can read English

**What happens afterwards?**

Once the study is finished…

- An overall report will be sent out &
- Overall results will be shared in person during an event.

The report and event details will be given to each community garden leader or steward to share with their members.

**Your Next Steps…**

| **Sounds Interesting… How do I get started?** | **Maybe. I have some questions. Who can answer them?** | **Thanks, but no thanks.** |
|---|---|---|
| • Ask Jen to go over the study details<br>• Let Jen know you want to participate (verbal consent)<br>• Fill out survey | • Jen can<br>• If Jen is busy with another person, please read the consent form for details | • Ok. Thanks for reading about my study! |

Appendix C. Consent Forms

## Leader Consent Form

**Title:** Community Garden Study
**VCU IRB Number:** HM20007007

**Study Purpose**
The purpose of this study is to learn about community gardens and their members in Richmond City. This study is focused on community gardens that are:

1. Located in Richmond City,
2. Located in food deserts, and
3. Are potentially open to the general public (i.e., located in a neighborhood or park).

You are being asked to participate in this study because you have been identified as a garden leader for a community garden that meets the 3 criteria listed above.

Garden Leaders must be 18 years or older and able to speak English to participate in this study.

**Study Description and Your Involvement**
If you decide to participate in this research study, you will be asked to give your verbal and/or electronic consent after you have had all your questions answered and understand what will happen to you.

In this study, Garden Leaders will be asked to:

1. Participate in an interview (about 1 hour),
2. Complete a survey (about 10-15 minutes), and
3. Help the researcher distribute the survey to their community garden members.

**Interviews**
Interviews should take about 1 hour. During the interview, I will ask you questions about the community garden that covers several topics, such as:

Basic characteristics

- Year established, size, # of garden members, etc.
- Land ownership
- Plot types

Organizational characteristics

- Who & how the community garden is managed
- Funding sources
- Activities provided
- Ways for communicating with members and recruitment

The researcher will take notes during the interview and tape record if permission is provided. The date, time, and location for the interview will be agreed upon by the participant and researcher.

**Surveys**

Surveys should take about 10-15 minutes to complete. The survey asks questions about the gardener that covers several topics, such as:

Yourself

- Gardening history & experience
- Values
- Age, race, gender, etc.

Your thoughts about the community garden

- Purpose
- How decisions are made
- People you have met through the garden

Participants are asked to complete the survey on their own. Participants can choose to have the researcher send them an online survey or paper survey. The researcher will email the link for online surveys. The researcher will mail paper surveys and provide self-addressed, stamped envelopes for participants to return paper surveys. Online or paper surveys will be sent to a participant after the interview has been completed.

**Getting Surveys to Garden Members**

Garden Leaders are also asked to help the researcher get the survey to their community garden members. Leaders will be able to select which options work best for surveying their members (see Table 1).

Leaders may select an online survey, a paper survey, or both as the best way for getting the survey to their members. The leader's responsibility in helping changes based on which option or options are selected.

Table 1. Options for Getting Survey to Community Garden Members

| Survey Type | Garden Leader Responsibilities | Researcher Provides to Leader |
|---|---|---|
| Online survey | *Option 1*<br>• Provide member emails to researcher<br>• Send study email announcement once | Study email announcement |
| | *Option 2*<br>• Send email with survey link to their members<br>• Send follow-up email with survey link twice | Standard email with survey link |
| Paper survey handed out by Researcher during community garden events (i.e., workday session). | *Option 1*<br>• Identify dates/times for events<br>• Announcement to members (*optional*)<br>• Introduce researcher to members @ event (or have someone else introduce if cannot attend) | A standard announcement 'blurb' to include in regular communications with members |
| Paper survey handed out by Garden Leader | *Option 2*<br>• Handout survey packets to members<br>• Collect surveys and give to Jen *(optional)* | Survey Packets that include:<br>• Survey<br>• Member Consent Form<br>• Self-addressed, stamped envelopes<br>• Recruitment flyer |

**Risks and Discomforts**

There are very few risks to participating in this study.

One risk has to do with your identity. To reduce that risk of identification – no names will be connected to your data and data from individual surveys will not be reported. Your contact information will be stored separately from your survey data.

One other risk has to do with the possibility of you feeling some mild distress. Some topics in the interview or questions on the survey may be uncomfortable for some respondents. You do not have to talk about any subjects you do not want to talk about. You can end the interview and the survey at any time.

**Compensation**

There is no compensation (i.e., payment, gift card, etc.) for those who participate in this study.

**Benefits to You and Others**

You may not get any direct benefit from this study, but, the information we learn from people in this study may help us understand who participates in community gardens located in food deserts and how these gardens function. This information may also help identify common challenges and successes that can be shared to help people improve how accessible these gardens are and to increase who benefits from them.

To increase the likelihood that you and others benefit from this study, the researcher will provide a report of the overall results to garden leaders. In addition, the researcher will share these results in person during an event. Details on this event will be provided to garden leaders once the study is complete.

Garden leaders will be asked to share the overall report and the event details with their members.

> **Please note:** Your current role in the community garden will not be impacted by this study. Garden leaders and/or members will not know if you participate or not in this study. And if you participate, garden leaders and/or members will not know your individual responses.
>
> The overall report that leaders receive at the end of this study will be a summary of **all the gardeners in Richmond** who participated, not just the gardeners who participated from this community garden.

**Costs**

There are no costs for participating in this study other than the time you will spend in the interview, filling out the survey, and helping the researcher survey your community garden members.

**Confidentiality**

Data is being collected only for research purposes.

Your data (interview and survey information) will be identified by ID numbers, not names. Your data will be stored in a locked research area and stored separately from your personal identifying information. All personal identifying information (i.e., name, email, and/or phone) will be kept in a password protected file. This password protected file will be deleted after the study is complete.

Interviews will be typed up by the researcher using notes and audio recordings (if permission is granted). Interview notes will be kept secured in a locked file cabinet. If permission is granted, interviews will be audio taped, but no names will be recorded. Audio recordings will be stored in a password protected file. After information from notes and/or audio recordings is typed up, interview notes and audio recordings will be destroyed/ deleted.

Typed interviews and online survey information will be kept secured in a password protected file. Paper surveys will be kept secured in a locked file cabinet. Typed interviews and surveys (online and paper) data will be kept indefinitely. Remember, only ID numbers will be connected to this data – not names. Access to all data will be limited to study personnel and VCU research staff as appropriate.

We will not tell anyone the answers you give us; however, information from the study as a whole and the consent form signed by you may be looked at or copied for research or legal purposes by Virginia Commonwealth University.

**Voluntary Participation and Withdrawal**
You do not have to participate in this study. If you choose to participate, you may stop at any time without penalty. You may also choose not to answer particular questions that are asked in the study.

You may withdraw your interview and/or survey information once you complete the study. Please contact Jennifer Jettner to do this. You will not, however, be able to withdraw your interview and/or survey information once the study is complete (i.e., data has been analyzed by the researcher).

Your participation in this study may be stopped at any time by the researcher without your consent. The reasons might include you have not followed study instructions or administrative reasons require your withdrawal.

**Alternatives**
You may choose not to participate in this research as an alternative.

**Questions**
If you have any questions, complaints, or concerns about your participation in this research, contact:

**Jennifer Jettner, PhD student and Researcher**
**Email: jettnerjf@vcu.edu**
**Phone: (850) 368-2426 (cell)**
**Dr. Mary Secret, Dissertation Chair**
**Email: msecret@vcu.edu**
**Phone: (804) 828-2379 (office)**

The study staff named above is the best person(s) to call for questions about your participation in this study.
If you have questions about your rights as a participant in this or any other research, you may contact:

Office of Research
Virginia Commonwealth University
800 East Leigh Street, Suite 3000
P.O. Box 980568
Richmond, VA 23298
Telephone: (804) 827-2157

Contact this number to ask general questions, to obtain information or offer input, and to express concern or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk to someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/irb/volunteers.htm

**Verbal Consent for Interview**

Do you have any questions about the information I have provided?

If Yes, follow-up on questions/concerns.

Is this research something you would be interested in participating in?

If Yes, verify that participant is 18+ and can read English, then proceed to setting up time for interview.

If No, thank them for their time.

**Verbal Consent for Survey** (if applicable)

If you are interested in participating, but have questions about this study, please contact Jennifer Jettner.

If you are interested in participating and do not have any questions, please complete the survey in the envelope if you can answer YES to all three items below:

- ☐ I am 18 years old or older
- ☐ I can speak English
- ☐ I consent to participate in this study

Once you complete the survey, please give it or mail it back to Jennifer Jettner in the envelope provided OR place the survey in the envelope and give it to your community garden leader (if applicable). **Be sure to SEAL the envelope with the STICKER provided.**

If you are not interested in participating, do not complete the survey. Place the blank survey in the envelope and give it or mail it to Jennifer Jettner OR place the blank survey in the envelope and give it to your community garden leader (if applicable). **Be sure to SEAL the envelope with the STICKER provided.**

Thank you!

Please keep a blank copy of this form for your records.

## Member Consent Form

**Title:** Community Garden Study
**VCU IRB Number:** HM20007007

**Study Purpose**
The purpose of this study is to learn about community gardens and their members in Richmond City. This study is focused on community gardens that are:

1. Located in Richmond City,
2. Located in food deserts, and
3. Are potentially open to the general public (i.e., located in a neighborhood or park).

You are being asked to participate in this study because you are a member of a community garden that meets the 3 criteria listed above.

Garden Members must be 18 years or older and able to speak English to participate in this study.

**Study Description and Your Involvement**
If you decide to participate in this research study, you will be asked to give your verbal/electronic consent to participate after you have had all your questions answered and understand what will happen to you.

In this study, Garden Members will be asked to complete a survey that takes about 10-15 minutes. The survey asks questions about the gardener that covers several topics, such as:

Yourself

- Gardening history & experience
- Values
- Age, race, gender, etc.

Your thoughts about the community garden

- Purpose
- How decisions are made
- People you have met through the garden

**Risks and Discomforts**
There are very few risks to participating in this study.

One risk has to do with your identity. To reduce the risk of identification – no names will be connected to your data and data from individual surveys will not be reported. If provided, your contact information will be stored separately from your survey data.

One other risk has to do with the possibility of you feeling some mild distress. Some topics in the interview or questions on the survey may be uncomfortable for some respondents. You do not have to

talk about any subjects you do not want to talk about. You can end the interview and the survey at any time.

**Compensation**
There is no compensation (i.e., payment, gift card, etc.) for those who participate in this study.

**Benefits to You and Others**
You may not get any direct benefit from this study, but, the information we learn from people in this study may help us understand who participates in community gardens located in food deserts and how these gardens function. This information may also help identify common challenges and successes that can be shared to help people improve how accessible these gardens are and to increase who benefits from them.

To increase the likelihood that you and others benefit from this study, the researcher will provide a report of the overall results to garden leaders. In addition, the researcher will share these results in person during an event. Details on this event will be provided to garden leaders once the study is complete.

Garden leaders will be asked to share the overall report and the event details with their members.

> **Please note:** Your current role in the community garden will not be impacted by this study. Garden leaders and/or members will not know if you participate or not in this study. And if you participate, garden leaders and/or members will not know your individual responses.
>
> The overall report that leaders receive at the end of this study will be a summary of **all the gardeners in Richmond** who participated, not just the gardeners who participated from this community garden.

**Costs**
There are no costs for participating in this study other than the time you will spend in filling out the survey.

**Confidentiality**
Data is being collected only for research purposes.

Your data (survey information) will be identified by ID numbers, not names. Your data will be stored in a locked research area and stored separately from your community garden and personal identifying information. All community garden identifying information (i.e., name and address) will be kept in a password protected file. This password protected file will be deleted after the study is complete. The survey will not ask you for any personal identifying information.

Online survey information will be kept secured in a password protected file. Paper surveys will be kept secured in a locked file cabinet. Surveys (online and paper) data will be kept indefinitely. Remember,

only ID numbers will be connected to this data – not names. Access to all data will be limited to study personnel and VCU research staff as appropriate.

We will not tell anyone the answers you give us; however, information from the study as a whole and the consent form signed by you may be looked at or copied for research or legal purposes by Virginia Commonwealth University.

**Voluntary Participation and Withdrawal**
You do not have to participate in this study. If you choose to participate, you may stop at any time without penalty. You may also choose not to answer particular questions that are asked in the study.

You will not be able to withdraw your interview or survey information once you complete the study.

Your participation in this study may be stopped at any time by the researcher without your consent. The reasons might include you have not followed study instructions or administrative reasons require your withdrawal.

**Alternatives**
You may choose not to participate in this research as an alternative.

**Questions**
If you have any questions, complaints, or concerns about your participation in this research, contact:

**Jennifer Jettner, PhD student and Researcher**
**Email: jettnerjf@vcu.edu**
**Phone: (850) 368-2426 (cell)**

**Dr. Mary Secret, Dissertation Chair**
**Email: msecret@vcu.edu**
**Phone: (804) 828-2379 (office)**

The study staff named above is the best person(s) to call for questions about your participation in this study.

If you have questions about your rights as a participant in this or any other research, you may contact:

Office of Research
Virginia Commonwealth University
800 East Leigh Street, Suite 3000
P.O. Box 980568
Richmond, VA 23298
Telephone: (804) 827-2157

Contact this number to ask general questions, to obtain information or offer input, and to express concern or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk to someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/irb/volunteers.htm

**Verbal Consent**

If you are interested in participating, but have questions about this study, please contact Jennifer Jettner.

If you are interested in participating and do not have any questions, please complete the survey in the envelope if you can answer YES to all three items below:

- ☐ I am 18 years old or older
- ☐ I can speak English
- ☐ I consent to participate in this study

Once you complete the survey, please **give it** or **mail it** back to Jennifer Jettner in the envelope provided OR place the survey in the envelope and give it to your community garden leader (if applicable). **Be sure to SEAL the envelope with the STICKER provided.**

If you are not interested in participating, do not complete the survey. Place the blank survey in the envelope and **give it** or **mail it** to Jennifer Jettner OR place the blank survey in the envelope and give it to your community garden leader (if applicable). **Be sure to SEAL the envelope with the STICKER provided.**

Thank you!

Please keep a blank copy of this form for your records.

Appendix D. Semi-Structured Interview

**Basic Characteristics**

What year was this community garden established? (If you don't know the exact year, please estimate) _____

How many community garden members do you have? (If you don't have exact number, please estimate) _____

How do you identify/define a community garden member?

Are there restrictions for who can join this community garden? For example, only neighborhood residents?

☐Yes
☐No
☐I don't know

Can you tell me a little more about …?

a. What/Why those restrictions
b. Why no restrictions

Who owns the land for this community garden?

☐Public/Government entity (i.e., city/county land, school property, etc.)
☐Private entity (i.e., donated by private citizen, business, etc.)
☐Other _____
☐Don't know

What kinds of gardening plots are available in this community garden?

☐Individual plots only

☐One communal/shared plot

☐Mix of individual plots and communal/shared plots

☐Other _____

Can you tell me a little more about why that plot arrangement? How was that chosen?

How much land or space is available for gardening? (Please estimate)

_____ acres OR _____ sq. $ft^2$

Do gardeners have to pay a membership fee or dues to join this community garden?

☐Yes

☐No

(If Yes) How much is the membership fee per year? _____

Can you tell me a little more about why or why not you have a membership fee?

Do you currently have a waitlist for people interested in joining this community garden?

☐Yes

☐No

☐I don't know

(If Yes) About how long do people wait on the waitlist? _____ years _____ months

(If Yes) About how many people do you have on the waitlist? _____

What are some reasons why people may be on a waitlist to join this community garden?

Does your community garden have a fence?

☐Yes

☐No

(If Yes) Is the gate ever locked?

☐Yes

☐No

(If Yes) How do members access the garden?

(If Yes) Is the garden ever open to neighborhood residents or other community groups?

☐Yes

☐No

☐I don't know

(If Yes) How does that process work? How is the garden open to the community?

Can you tell me a little more about why or why not?

a. Purpose of fence?
b. Purpose of locking?

**Organizational Characteristics**

Quite simply, how community gardens are organized and managed seems to be getting more complex.

More formal organizations (i.e., schools, nonprofits, churches, etc.) are involved in starting and **directly managing** community gardens (i.e., recruitment, purchasing supplies, paying bills, etc.). Direct management refers to handling day-to-day operations (i.e., recruitment, planning activities, purchasing common supplies, etc.).

Also, some community gardens are **indirectly managed** by a larger 'umbrella' organization. These larger organizations have coordinators that provide some oversight and/or support to various community gardens.

Oversight means that the 'umbrella' organization has some control or say over this community garden (i.e., garden rules, etc.). 'Support' can be as simple as advertising this community garden

on the umbrella organization's website or more involved like helping you with funding, providing workshops, and so on.

Which of the following best describes the type of 'organization' that **directly** manages this community garden?

☐Informal group
☐Neighborhood or civic association
☐Nonprofit organization (other than neighborhood or civic association)
☐Public/Government agency (i.e., city department, school, etc.)
☐Church
☐Other _____

Did the organization identified above establish the community garden?

☐Yes
☐No
☐I don't know

Can you tell me a little more about how this community garden got started?

Does an external 'umbrella' organization provide some degree of indirect oversight and/or support to your organization?

☐Yes
☐No
☐I don't know

(If Yes) Can you tell me a little more about what that looks like?

(If Yes) Which of the following best describes the type of 'umbrella' organization(s) associated with this community garden?

☐Neighborhood or civic association
☐Nonprofit organization (other than neighborhood or civic association)
☐Public/Government agency (i.e., city department, school, etc.)
☐Church
☐Other _____

What might be some of the benefits from having an umbrella organization providing you with indirect oversight and/or support?

What might be some of the challenges?

Which of the following is the primary source of funding that your organization relies on to operate this community garden? (Select all that apply.)

☐Membership fees/dues
☐Donations
☐Fundraisers
☐Grants
☐Other _____

Can you tell me a little about how decisions are made in this community garden?

a. Process (i.e., votes?)
b. Structure (i.e., committee group?)

Does this community garden have policies or rules about…? (Select all that apply)

☐ Planting (i.e., organic, pesticide use, etc.)
☐ Membership
☐ Other _____

(If selected) Can you give me some examples of the policies or rules you have and why.

(If selected) How do garden members learn about these policies or rules?

(If selected) Are these policies or rules written down?

☐Yes
☐No
☐I don't know

Does your organization provide activities in the community garden for **garden members** to socialize (i.e., potlucks, BBQs, etc.)?

☐Yes

☐No

☐I don't know

Can you tell me a little about why or why not?

(If Yes) Can you give me some examples of these activities and why they are provided?

Does your organization provide activities in the community garden for the **general public** to socialize (i.e., potlucks, BBQs, etc.)?

☐Yes

☐No

☐I don't know

Can you tell me a little about why or why not?

(If Yes) Can you give me some examples of these activities and why they are provided?

Does your organization provide gardening workshops or other educational workshops (i.e., cooking demonstration, how to compost, etc.)?

☐Yes

☐No

☐I don't know

Can you tell me a little about why or why not?

Do **other agencies** help provide social activities and/or educational workshops for gardeners in this community garden?

☐Yes

☐No

☐I don't know

Can you tell me a little about why or why not?

If not, how do you think new or novice gardeners learn to garden in this community garden?

Please select the **top 3** ways that your organization uses for **internal** communication (i.e., communication with community garden members.).

| | |
|---|---|
| ☐Website | ☐Phone calls |
| ☐Emails | ☐Face-to-face |
| ☐Social media (i.e., Facebook, twitter) | ☐Other |
| ☐Fliers | ☐Other |

Please select the **top 3** ways that your organization uses for **external** communication (communication with those who are not currently garden members) i.e., recruit more gardeners, etc.).

| | |
|---|---|
| ☐Website | ☐Phone calls |
| ☐Emails | ☐Face-to-face |
| ☐Social media (i.e., Facebook, twitter) | ☐Other |
| ☐Fliers | ☐Other |

Lastly, this next set of questions has to do with diversity. Diversity is an important topic, but it can be sensitive. Please let me know if you prefer not to answer these questions.

Research has found that community gardens can be places where diverse groups interact. Although people can differ in many ways, the focus of this study is understanding whether community gardens facilitate the interaction of people from diverse ethnic/racial backgrounds.

To do that, I need to know about the racial composition of your community garden members. As a best guess estimate, and a crude one…

1. Out of 100%, what percentage of your community garden members would you say are…
   - ☐ Asian _____%
   - ☐ Hispanic/Latino/Mexican _____%
   - ☐ African American _____%
   - ☐ White _____%
   - ☐ I don't know _____%

2. Out of 100%, what percentage of this neighborhood's residents would you say are…
   - ☐ Asian _____%
   - ☐ Hispanic/Latino/Mexican _____%
   - ☐ African American _____%
   - ☐ White _____%
   - ☐ I don't know _____%

From your observations, do you think this community garden facilitates interactions between people from different ethnic/racial backgrounds?

☐Yes
☐No
☐I don't know

Can you tell me a little about why or why not?

(If Yes) Can you give me some examples?

Now, do think this community garden facilitates diverse interactions between people in any other way (i.e., across age, income, etc.?

☐Yes
☐No
☐I don't know

Can you tell me a little about why or why not?

(If Yes) Can you give me some examples?

At the end of the day, why a community garden?

How did you get involved?

What have been the key challenges for managing a community garden?

Knowing what you know now, what advice would you give to others starting and/or newly managing a community garden?

Is there anything else you'd like to share about your community garden?

**Thank you!**

Follow-up discussion about:

- Surveying garden members
- List of community gardens
- Other contacts?

Appendix E. Final Survey

**Community Garden Survey**

**Thank you** for taking this survey. The survey should take about **10 – 15** minutes. The information you share will help us learn about community gardens here in Richmond.

Once the study is finished …

- An overall report will be sent out &
- Results from the overall report will be shared in person during an event.

The overall report will be a summary of **all the gardeners in Richmond** who participated, not just the gardeners who participated from this community garden. The report and event details will be given to each garden leader to share with their members.

**Before We Begin …**

All the questions in this survey refer to the community garden listed below.

Do you garden at _____ community garden? ***Check only ONE***

- ☐ Yes
- ☐ No, I garden at _____
- ☐ No, I'm not a community gardener

This survey will be sent out several times through email or during community gardening events. Please let me know that you have NOT taken this survey before.

Have you already taken this survey? ***Check only ONE***

- ☐ Yes
- ☐ No

**If Yes**

You only need to complete this survey once.
Please give this survey back to Jen BEFORE YOU COMPLETE IT AGAIN.

**If No**

Have you participated in an interview with Jen (or been asked to be interviewed by Jen) about this community garden? ***Check only ONE***

- ☐ Yes
- ☐ No

**Now onto the Survey …**

# About you – the Gardener

## Gardening History & Experience

About when did you become a member of this community garden?

Month _____ Year _____

On average, how often do you come to the community garden during a gardening season? ***Check only ONE***

- ☐ Not often (0-1 times a week)
- ☐ Somewhat often (2-3 times a week)
- ☐ Most days (4-5 times a week)
- ☐ Almost every day (6-7 times a week)
- ☐ Several times a day for multiple days (8+ times a week)

What do you usually grow in your community garden? ***Check only ONE***

- ☐ ONLY Plants I can eat (i.e., vegetables)
- ☐ ONLY Plants I can't eat (i.e., flowers)
- ☐ BOTH Plants I can and can't eat (i.e., vegetables and flowers)
- ☐ Other _____

What do you do with the food you harvest? ***Select ALL that apply***

- ☐ Cook and eat at home
- ☐ Give some to friends & family
- ☐ Donate some to food pantries
- ☐ Sell some
- ☐ Other_____
- ☐ NA – I don't grow food

How much do you grow? To estimate that, please choose the best answer below. ***Check only ONE***

I grow enough food to cut down on my grocery bills.

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Always
- ☐ NA – I don't grow food

What would help you grow more food? ***Select ALL that apply***

- ☐ More Gardening Space
- ☐ More Education/Training
- ☐ More Time
- ☐ More Gardening Supplies (i.e., compost, seeds, etc.
- ☐ Other _____
- ☐ NA – I don't grow food

Do you **currently** garden **at home** or another community garden? ***Select ALL that apply***

- ☐ Yes, I garden at home also
- ☐ Yes, I garden at another community garden
- ☐ No, I only garden here

**When** did your gardening journey **begin**? ***Check only ONE***

- ☐ Before I joined this community garden (i.e., childhood)
- ☐ At this community garden

**EXPERT**
I have done a lot of gardening over several years (sometimes decades). I don't normally have questions. People usually ask me for gardening advice.

**ADVANCED**
I've gardened many times (usually over several years). I'd say I've gotten the hang of growing many things. I don't normally have to ask questions or look things up.

**AVERAGE**
I've gardened several (3+) times. I'd say I've gotten the hang of growing a few things. I still ask questions or look things up.

**BEGINNER**
I've never gardened before or only a few (1-2) times. I'm not really sure what I am doing. I usually ask questions or look things up.

## Use the definitions in the box to help you answer these questions

How would you describe yourself as a gardener...

**Before** you started gardening here?
***Check only ONE***

- ☐ Expert
- ☐ Advanced
- ☐ Average
- ☐ Beginner

**Now**, since you have been gardening here …
***Check only ONE***

- ☐ Expert
- ☐ Advanced
- ☐ Average
- ☐ Beginner

# About You & Your Community Garden

**Community Garden Purpose**

Community gardens can help people in many ways.

How much do you disagree or agree with the sentences below?
***Check only ONE for each sentence below***

| **This community garden helps *me* to…** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 1. Grow my own food. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Save the environment. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Teach others about nature. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Learn about organic gardening. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Eat healthier food. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Improve my physical and mental health. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7. Enjoy nature. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. Meet others. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. Get fresh food to those in need. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. Raise awareness about food issues. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. Promote a local food economy. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. Teach others how to grow their own food. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. Improve the neighborhood. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14. Learn how to work with others. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15. Learn about neighborhood issues. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16. Solve neighborhood issues with others. | ☐ | ☐ | ☐ | ☐ | ☐ |

**Community Garden Organization**

Community gardens can be managed in many ways.

There may be **one** leader or **a team** of leaders who help in the day-to-day operations, like paying the water bill, assigning garden plots, or recruiting new garden members.

**Sometimes** decisions are made by the whole group and **sometimes** they are made by a leader or leaders.

Based on your experience, most major decisions that affect the community garden are made:
***Check only ONE***

- ☐ Mainly by the leader or leaders acting alone
- ☐ By the leader or leaders with input from members
- ☐ By vote (i.e., majority rule)
- ☐ By consensus (i.e., everyone agrees on the decision)
- ☐ Other _____
- ☐ I don't know

So, how do ***you*** feel about the decisions that are made here?
***Check only ONE for each sentence below***

| **I feel like…** | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|
| 1. I have a real say in how decisions are made. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. I can influence decisions made. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. I can speak up when I disagree with decisions made. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Leadership gives me enough *information* to have a say in decisions. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Leadership gives me enough *time* to have a say in decisions. | ☐ | ☐ | ☐ | ☐ | ☐ |

**Sometimes** tasks are the responsibility of a leader or leaders, and **sometimes** tasks are assigned to interested members.

How are tasks and responsibilities managed here? ***Check only ONE for each sentence below***

| **I would say that …** | Strongly Disagree | Disagree | Agree | Strongly Agree | I don't know |
|---|---|---|---|---|---|
| 1. Different members are in charge of different tasks. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. A single leader is responsible for most tasks. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. The talents of different people are used to get tasks done. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. If a member wants, he or she can take on responsibility for some tasks. | ☐ | ☐ | ☐ | ☐ | ☐ |

**Sense of Community**

Community gardens can be places that help people meet and develop a sense of community. A sense of community means that you feel like you belong to a group.

For this next set of questions, the **"community"** means the group of gardeners in **this community garden**.

What would you say about your sense of community here? ***Check only ONE for each sentence below***

| **I would say that …** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 1. It is very important to me to be a part of this community. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. I am with other community members a lot and enjoy being with them. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. I expect to be a part of this community for a long time. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Members of this community have shared important events together, such as holidays, celebrations, or disasters. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. I feel hopeful about the future of this community. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Members of this community care about each other. | ☐ | ☐ | ☐ | ☐ | ☐ |

**People Met in the Community Garden**

Community gardens can also be places to meet different kinds of people.

The next set of questions asks about the people **you have met** through **this community garden.**

***Check Yes or No for each question below.***

| **Do you know anyone in this community garden who…** | **Yes** | **No or Unsure** |
|---|---|---|
| 1. Is an elected official and can help you? | ☐ | ☐ |
| 2. Has good contacts at TV/radio/newspaper and can help you? | ☐ | ☐ |
| 3. Can give you advice on using a personal computer? | ☐ | ☐ |
| 4. Can give you good career advice? | ☐ | ☐ |
| 5. Knows a lot about government regulations and can help you? | ☐ | ☐ |
| 6. Can sometimes employ people? | ☐ | ☐ |
| 7. Can give you good legal advice, like a lawyer? | ☐ | ☐ |
| 8. Can give you good advice about money problems, like a money manager? | ☐ | ☐ |
| 9. Knows how to fix a car and can help you? | ☐ | ☐ |
| 10. Can give you a good job reference? | ☐ | ☐ |
| 11. Can give you good health care advice, like a doctor or nurse? | ☐ | ☐ |
| 12. Can help get rid of bulky items for you? | ☐ | ☐ |
| 13. Can watch your home or pets while you are away? | ☐ | ☐ |
| 14. Can lend you a small sum of money? | ☐ | ☐ |
| 15. Can lend you a large sum of money? | ☐ | ☐ |
| 16. Can help you find someplace to live? | ☐ | ☐ |
| 17. Can provide a place for you to stay for a week? | ☐ | ☐ |

**Diversity in the Community Garden**

The next set of questions are about how garden members in this community garden differ in terms of background and attitudes.

Remember, people can be different in a lot of ways.
These questions are only about a **few** differences.

**Check only ONE for each sentence below.**

| **How much do community garden members differ in terms of their…** | Not Very different | Somewhat different | Very different | I don't know |
|---|---|---|---|---|
| 1. Ethnic/racial backgrounds? | ☐ | ☐ | ☐ | ☐ |
| 2. Commitment to saving the environment? | ☐ | ☐ | ☐ | ☐ |
| 3. Commitment to increasing access to healthy food (for those in need)? | ☐ | ☐ | ☐ | ☐ |
| 4. Commitment to improving the neighborhood? | ☐ | ☐ | ☐ | ☐ |

How often do you meet people **in this garden** whose ethnic/racial backgrounds is different from yours? ***Check only ONE***

☐ Never ☐ Rarely ☐ Sometimes ☐ Very Often ☐ Always

How often do you socialize with community garden members who are of different ethnic/racial backgrounds than you **outside of the garden** (i.e., go out to dinner, etc.)? ***Check only ONE***

☐ Never ☐ Rarely ☐ Sometimes ☐ Very Often ☐ Always

# Now – A little about YOU (*Nearly there!)*

**Beliefs on how the Earth should be treated**

For each belief, please select how much you disagree or agree. ***Check only ONE for each sentence below***

| **I believe that…** | Strongly Disagree | Disagree | Agree | Strongly Agree | No Opinion |
|---|---|---|---|---|---|
| 1. People are supposed to rule over nature. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Plants and animals have as much right as people to live. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. People are treating nature badly. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. If things don't change, we will have a big disaster in the environment soon. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. People will someday know enough about nature to control it. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. People are smart enough to keep from ruining the earth. | ☐ | ☐ | ☐ | ☐ | ☐ |

**Beliefs on how People should be treated**

For each belief, please select how much you disagree or agree. ***Check only ONE for each sentence below***

| **I believe it is important to …** | Strongly Disagree | Disagree | Agree | Strongly Agree | No Opinion |
|---|---|---|---|---|---|
| 1. Make sure all people have a chance to speak and be heard, especially those who are often treated unfairly. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Try to change big social problems, like racism, sexism, or poverty. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Help people reach their goals, personally or by supporting organizations. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Support the physical and emotional health of people. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Allow everyone to have a voice about a situation that affects their lives. | ☐ | ☐ | ☐ | ☒ | ☐ |
| 6. Promote fair and equal distribution of financial and other resources in our society. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7. Promote fair and equal decision-making power in our society. | ☐ | ☐ | ☐ | ☐ | ☐ |

# Last Section!

Age ***Check only ONE***

- ☐ 18 or 19 years old
- ☐ 20 – 29 years old
- ☐ 30 – 39 years old
- ☐ 40 – 49 years old
- ☐ 50 – 59 years old
- ☐ 60 – 69 years old
- ☐ 70 years old or above

Sex ***Check only ONE***

☐ Female ☐ Male ☐ Other _____

Race ***Check only ONE***

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Biracial or Multiracial
- ☐ Other _____

Ethnicity ***Check only ONE***

☐ Hispanic/Latino ☐ NOT Hispanic/Latino

What is the highest degree or level of school you have completed? ***Check only ONE***

- ☐ Less than 9th grade
- ☐ 9th to 12th grade, no diploma
- ☐ High school graduate, GED or alternative
- ☐ Some college, no degree
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Some graduate school, no degree
- ☐ Graduate or professional degree

Are you currently enrolled in post-secondary education? ***Check only ONE***

☐ No ☐ Yes, Technical/Vocational ☐ Yes, Community College ☐ Yes, College or University

If yes, are you a …? ***Check only ONE***

☐ FULL-time student ☐ PART-time student

Employment Status ***Check only ONE***

- ☐ Employed, full time
- ☐ Employed, part time with one job
- ☐ Employed, part time with multiple jobs
- ☐ Unemployed, looking for work
- ☐ Unemployed, not looking for work (i.e., retired)
- ☐ Other _____

In the last 12 months, how often have you experienced a time where the food you bought did not last and you couldn't afford to get more? ***Check only ONE***

☐ Never ☐ Sometimes ☐ Often ☐ I don't know

Do you own your home or rent? ***Check only ONE***

☐ Own ☐ Rent ☐ Other (i.e., I stay with friends/family)

Do you live in the neighborhood where your community garden is in? ***Check only ONE***

☐ Yes ☐ No

Do you consider yourself a member of a minority/oppressed group(s), however you define that for yourself? ***Check only ONE***

☐ Yes ☐ No ☐ I don't know

If Yes, what minority/oppressed group or groups do you identify with?

_____

Lastly, is there anything else you would like to add about your community garden?

_____

_____

_____

_____

_____

_____

## Thank you for completing this survey!

Please put your survey in the envelope and give it or mail to Jen.

Appendix F. Scale Interitem Correlations

## Values

*Table 26*

*Environmental Values Scale Interitem Correlations*

| | | 1 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | People are supposed to rule over nature | 1 | | | |
| 3 | People are treating nature badly | 0.099 | 1 | | |
| 4 | If things don't change, we will have a big disaster in the environment soon | 0.027 | 0.617 | 1 | |
| 5 | People will someday know enough about nature to control it | 0.415 | 0.321 | 0.037 | 1 |

*Note.* Item 5 was reverse scored. Items #2 & 6 were dropped.

*Table 27*

*Social Justice Values Scale Interitem Correlations*

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | Make sure all people have a chance to speak and be heard, especially those who are often treated unfairly. | 1 | | | | | | |
| 2 | Try to change big social problems, like racism, sexism, or poverty. | 0.862 | 1 | | | | | |
| 3 | Help people reach their goals, personally or by supporting organizations. | 0.722 | 0.591 | 1 | | | | |
| 4 | Support the physical and emotional health of people. | 0.646 | 0.641 | 0.797 | 1 | | | |
| 5 | Allow everyone to have a voice about a situation that affects their lives. | 0.892 | 0.93 | 0.625 | 0.688 | 1 | | |
| 6 | Promote fair and equal distribution of financial and other resources in our society. | 0.314 | 0.468 | 0.44 | 0.417 | 0.487 | 1 | |
| 7 | Promote fair and equal decision-making power in our society. | 0.355 | 0.523 | 0.432 | 0.471 | 0.481 | 0.837 | 1 |

**Perceived Community Garden Benefits**

Table 28

*Environmental benefits subscale Interitem Correlations*

| | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1 | Grow my own food. | 1 | | | |
| 2 | Save the environment. | 0.288 | 1 | | |
| 3 | Teach others about nature. | 0.208 | 0.413 | 1 | |
| 4 | Learn about organic gardening. | 0.417 | 0.447 | 0.372 | 1 |

Table 29

*Personal Health benefits subscale Interitem Correlations*

| | | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|
| 5 | Eat healthier food. | 1 | | | |
| 6 | Improve my physical and mental health. | 0.677 | 1 | | |
| 7 | Enjoy nature. | 0.608 | 0.705 | 1 | |
| 8 | Meet others. | 0.487 | 0.435 | 0.515 | 1 |

Table 30

*Community Food Security benefits subscale Interitem Correlations*

| | | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|
| 9 | Get fresh food to those in need. | 1 | | | |
| 10 | Raise awareness about food issues. | 0.545 | 1 | | |
| 11 | Promote a local food economy. | 0.577 | 0.548 | 1 | |
| 12 | Teach others how to grow their own food. | 0.582 | 0.581 | 0.606 | 1 |

Table 31

*Community Development benefits subscale Interitem Correlations*

| | | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|
| 13 | Improve the neighborhood. | 1 | | | |
| 14 | Learn how to work with others. | 0.622 | 1 | | |
| 15 | Learn about neighborhood issues. | 0.671 | 0.656 | 1 | |
| 16 | Solve neighborhood issues with others. | 0.603 | 0.682 | 0.799 | 1 |

## Perceived Deep-level Similarities

Table 32

*Perceived Deep-level Similarities Scale Interitem Correlations*

| | | 1 | 2 | 3 |
|---|---|---|---|---|
| 1 | Commitment to saving the environment? | 1 | | |
| 2 | Commitment to increasing access to healthy food (for those in need)? | 0.744 | 1 | |
| 3 | Commitment to improving the neighborhood? | 0.372 | 0.595 | 1 |

## Perceived Organizational Processes

Table 33

*Democratic Decision-making Scale Interitem Correlations*

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | I have a real say in how decisions are made. | 1 | | | | |
| 2 | I can influence decisions made. | 0.911 | 1 | | | |
| 3 | I can speak up when I disagree with decisions made. | 0.801 | 0.781 | 1 | | |
| 4 | Leadership gives me enough information to have a say in decisions. | 0.812 | 0.796 | 0.782 | 1 | |
| 5 | Leadership gives me enough time to have a say in decisions. | 0.781 | 0.786 | 0.713 | 0.941 | 1 |

Table 34

*Leadership Role Opportunities Scale Interitem Correlations*

| | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1 | Different members are in charge of different tasks. | 1 | | | |
| 2 | A single leader is responsible for most tasks. | 0.439 | 1 | | |
| 3 | The talents of different people are used to get tasks done. | 0.521 | 0.421 | 1 | |
| 4 | If a member wants, he or she can take on responsibility for some tasks. | 0.591 | 0.215 | 0.365 | 1 |

*Note*. Item 4 was reverse scored

## Social Capital

Table 35

*Sense of Community Scale Interitem Correlations*

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1 | It is very important for me to be a part of this community. | 1 | | | | | |
| 2 | I am with other community members a lot and enjoy being with them. | 0.466 | 1 | | | | |
| 3 | I expect to be a part of this community for a long time. | 0.603 | 0.55 | 1 | | | |
| 4 | Members of this community have shared important events together, such as holidays, celebrations, or disasters. | 0.464 | 0.414 | 0.505 | 1 | | |
| 5 | I feel hopeful about the future of this community. | 0.643 | 0.425 | 0.588 | 0.558 | 1 | |
| 6 | Members of this community care about each other. | 0.446 | 0.488 | 0.528 | 0.382 | 0.576 | 1 |

Table 36

*Resources Accessible Scale Interitem Correlations*

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Is an elected official and can help you? | 1 | | | | | | | | | | | | | | | |
| 2 | Has good contacts at TV/radio/newspaper and can help you? | 0.085 | 1 | | | | | | | | | | | | | | |
| 3 | Can give you advice on using a personal computer? | -0.094 | 0.245 | 1 | | | | | | | | | | | | | |
| 4 | Can give you good career advice? | -0.179 | 0.221 | 0.347 | 1 | | | | | | | | | | | | |
| 5 | Knows a lot about government regulations and can help you? | 0.079 | 0.521 | 0.336 | 0.556 | 1 | | | | | | | | | | | |
| 6 | Can sometimes employ people? | 0.004 | 0.188 | 0.255 | 0.029 | 0.029 | 1 | | | | | | | | | | |
| 7 | Can give you good advice about money, like a money manager? | 0.128 | 0.085 | 0.209 | 0.143 | 0.182 | 0.239 | 1 | | | | | | | | | |
| 8 | Knows how to fix a car and can help you? | 0.004 | 0.278 | 0.255 | 0.288 | 0.361 | 0.148 | 0.239 | 1 | | | | | | | | |
| 9 | Can give you a good job reference? | 0.095 | 0.227 | 0.446 | 0.51 | 0.376 | 0.301 | 0.406 | 0.301 | 1 | | | | | | | |
| 10 | Can give you good health care advice, like a doctor or nurse? | 0.039 | 0.156 | 0.439 | 0.365 | 0.189 | 0.205 | 0.411 | 0.305 | 0.386 | 1 | | | | | | |
| 11 | Can help you dispose of (get rid of) bulky items for you? | 0.079 | 0.043 | 0.265 | 0.405 | 0.125 | 0.278 | -0.023 | 0.112 | 0.376 | 0.277 | 1 | | | | | |
| 12 | Can watch your home or pets while you are away? | -0.204 | 0.089 | 0.268 | 0.463 | 0.187 | -0.013 | -0.099 | 0.156 | 0.142 | 0.23 | 0.41 | 1 | | | | |
| 13 | Can lend you a small sum or money? | 0.004 | 0.188 | 0.255 | 0.548 | 0.278 | 0.148 | 0.121 | 0.243 | 0.469 | 0.305 | 0.278 | 0.24 | 1 | | | |
| 14 | Can lend you a large sum of money? | -0.054 | -0.083 | 0.136 | 0.189 | -0.11 | 0.234 | -0.054 | -0.076 | 0.169 | 0.259 | 0.162 | 0.175 | 0.234 | 1 | | |
| 15 | Can help you find someplace to live? | 0.021 | 0.405 | 0.302 | 0.148 | 0.32 | 0.37 | 0.262 | 0.273 | 0.256 | 0.232 | 0.15 | 0.278 | 0.467 | 0.246 | 1 | |
| 16 | Can provide a place for you to stay for a week? | -0.186 | 0.122 | 0.285 | 0.359 | 0.185 | -0.049 | -0.054 | 0.165 | 0.203 | 0.328 | 0.279 | 0.508 | 0.487 | 0.29 | 0.409 | 1 |

Appendix G. Scale Item Frequencies

## Values

Table 37

*Environmental Values Scale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| If things don't change, we will have a big disaster in the environment soon | 61 | 3.3 | 1.7 | 5.0 | 38.3 | 51.7 |
| People are treating nature badly | 60 | 1.7 | 5.0 | 1.7 | 48.3 | 43.3 |
| People are supposed to rule over nature | 60 | 38.3 | 45.0 | 3.3 | 6.7 | 6.7 |
| People will someday know enough about nature to control it | 60 | 25.0 | 50.0 | 13.3 | 8.3 | 3.3 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

Table 38

*Social Justice Values Scale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| Try to change big social problems, like racism, sexism, or poverty. | 60 | 1.7 | 0.0 | 1.7 | 31.7 | 65.0 |
| Make sure all people have a chance to speak and be heard, especially those who are often treated unfairly. | 60 | 1.7 | 1.7 | 1.7 | 33.3 | 61.7 |
| Allow everyone to have a voice about a situation that affects their lives. | 58 | 1.7 | 0.0 | 1.7 | 35.0 | 58.3 |
| Help people reach their goals, personally or by supporting organizations. | 60 | 0.0 | 1.7 | 3.3 | 38.3 | 56.7 |
| Support the physical and emotional health of people. | 60 | 1.7 | 0.0 | 1.7 | 43.3 | 53.3 |
| Promote fair and equal distribution of financial and other resources in our society. | 59 | 0.0 | 6.7 | 6.7 | 33.3 | 51.7 |
| Promote fair and equal decision-making power in our society. | 59 | 0.0 | 3.3 | 3.3 | 40.0 | 51.7 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

**Perceived Community Garden Benefits**

Table 39

*Environmental benefits subscale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| Grow my own food | 60 | 3.3 | 1.7 | 11.7 | 35.0 | 46.7 |
| Save the environment | 60 | 1.7 | 3.3 | 21.7 | 40.0 | 33.3 |
| Learn about organic gardening | 60 | 1.7 | 1.7 | 10.0 | 56.7 | 30.0 |
| Teach others about nature | 60 | 3.3 | 3.3 | 21.7 | 48.3 | 23.3 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

Table 40

*Personal Health benefits subscale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| Enjoy nature | 59 | 1.7 | 0.0 | 5.0 | 35.0 | 56.7 |
| Improve my physical and mental health | 60 | 1.7 | 3.3 | 15.0 | 33.3 | 46.7 |
| Eat healthier food | 60 | 3.3 | 1.7 | 5.0 | 46.7 | 43.3 |
| Meet others | 60 | 1.7 | 1.7 | 13.3 | 50.0 | 33.3 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

Table 41

*Community Food Security benefits subscale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| Teach others how to grow their own food | 60 | 1.7 | 11.7 | 23.3 | 41.7 | 21.7 |
| Get fresh food to those in need | 59 | 3.3 | 18.3 | 36.7 | 23.3 | 16.7 |
| Raise awareness about food issues | 59 | 3.3 | 13.3 | 23.3 | 40.0 | 18.3 |
| Promote a local food economy | 60 | 5.0 | 16.7 | 28.3 | 33.3 | 16.7 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

Table 42

*Community Development benefits subscale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| Improve the neighborhood | 60 | 1.7 | 0.0 | 8.3 | 43.3 | 46.7 |
| Learn how to work with others | 59 | 1.7 | 3.3 | 18.3 | 45.0 | 30.0 |
| Learn about neighborhood issues | 60 | 1.7 | 3.3 | 26.7 | 38.3 | 30.0 |
| Solve neighborhood issues with others | 59 | 3.3 | 6.7 | 33.3 | 36.7 | 18.3 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

## Perceived Differences & Similarities

Table 43

*Perceived Racial Differences Item Frequencies*

| | *n* | Not very different | Somewhat different | Very different | I don't know |
|---|---|---|---|---|---|
| | | % | % | % | % |
| Ethnic/racial backgrounds? | 60 | 36.7 | 35.0 | 23.3 | 5.0 |

Table 44

*Perceived Deep-level Similarities Scale Item Frequencies*

| Item | *n* | Not very different | Somewhat different | Very different | I don't know |
|---|---|---|---|---|---|
| | | % | % | % | % |
| Commitment to saving the environment? | 58 | 38.3 | 31.7 | 1.7 | 25.0 |
| Commitment to increasing access to healthy food (for those in need)? | 60 | 45.0 | 20.0 | 5.0 | 30.0 |
| Commitment to improving the neighborhood? | 60 | 61.7 | 15.0 | 5.0 | 18.3 |

*Note.* Not very=1, Somewhat=2, Very=3. Items reverse scored for DEEP scale. I don't know was seen as missing for scales.

## Socializing Across Race

Table 45

*Socializing Across Race Item Frequencies*

| | *n* | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| Meet people in this community garden whose ethnic/racial background is different form yours? | 60 | 3.3 | 16.7 | 53.3 | 20.0 | 6.7 |
| Mix socially with community garden members who are of a different ethnic/racial background than you outside of the garden (i.e., go out to dinner, etc.)? | 60 | 36.7 | 26.7 | 26.7 | 8.3 | 1.7 |

## Perceived Organizational Processes

Table 46

*Democratic Decision-making Scale Item Frequencies*

| | *n* | Never % | Rarely % | Sometimes % | Often % | Always % |
|---|---|---|---|---|---|---|
| I can speak up when I disagree with decisions made. | 60 | 6.7 | 8.3 | 11.7 | 31.7 | 41.7 |
| Leadership gives me enough information to have a say in decisions. | 60 | 8.3 | 11.7 | 16.7 | 35.0 | 28.3 |
| Leadership gives me enough time to have a say in decisions. | 60 | 8.3 | 13.3 | 18.3 | 33.3 | 26.7 |
| I have a real say in how decisions are made. | 59 | 10.0 | 13.3 | 20.0 | 36.7 | 18.3 |
| I can influence decisions that are made. | 60 | 11.7 | 13.3 | 15.0 | 43.3 | 16.7 |

Table 47

*Leadership Role Opportunities Scale Item Frequencies*

| | *n* | SD % | D % | A % | SA % | IDK % |
|---|---|---|---|---|---|---|
| If a member wants, he or she can take on responsibility for some tasks. | 60 | 0.0 | 6.7 | 40.0 | 48.3 | 5.0 |
| Different members are in charge of different tasks. | 60 | 3.3 | 13.3 | 41.7 | 26.7 | 15.0 |
| The talents of different people are used to get tasks done. | 60 | 0.0 | 10.0 | 51.7 | 25.0 | 13.3 |
| A single leader is responsible for most tasks. | 60 | 6.7 | 48.3 | 23.3 | 10.0 | 11.7 |

*Note.* SD = Strongly disagree, D = Disagree, A = Agree, SA = Strongly agree, IDK = I don't know

## Social Capital

Table 48

*Sense of Community Scale Item Frequencies*

| | *n* | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | | % | % | % | % | % |
| It is very important for me to be a part of this community. | 60 | 0.0 | 1.7 | 16.7 | 50.0 | 31.7 |
| I expect to be a part of this community for a long time. | 60 | 1.7 | 8.3 | 20.0 | 40.0 | 30.0 |
| I feel hopeful about the future of this community. | 60 | 0.0 | 5.0 | 15.0 | 51.7 | 28.3 |
| Members of this community care about each other. | 60 | 0.0 | 3.3 | 20.0 | 48.3 | 28.3 |
| Members of this community have shared important events together, such as holidays, celebrations, or disasters. | 60 | 1.7 | 26.7 | 23.3 | 28.3 | 20.0 |
| I am with other community members a lot and enjoy being with them. | 59 | 3.3 | 10.0 | 28.3 | 41.7 | 15.0 |

*Note.* SD = Strongly disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

Table 49

*Resources Accessible Scale Item Frequencies*

| | *n* | No | Yes |
|---|---|---|---|
| | | % | % |
| Can give you advice on using a personal computer? | 60 | 50.0 | 50.0 |
| Knows a lot about government regulations and can help you? | 60 | 56.7 | 43.3 |
| Can help you dispose of (get rid of) bulky items for you? | 60 | 60.0 | 40.0 |
| Can give you a good job reference? | 59 | 61.7 | 36.7 |
| Can watch your home or pets while you are away? | 60 | 63.3 | 36.7 |
| Can give you good career advice? | 59 | 65.0 | 33.3 |
| Has good contacts at TV/radio/newspaper and can help you? | 59 | 68.3 | 30.0 |
| Can sometimes employ people? | 60 | 75.0 | 25.0 |
| Knows how to fix a car and can help you? | 60 | 76.7 | 23.3 |
| Can lend you a small sum or money? | 60 | 76.7 | 23.3 |
| Can help you find someplace to live? | 60 | 76.7 | 23.3 |
| Can give you good health care advice, like a doctor or nurse? | 60 | 78.3 | 21.7 |
| Can provide a place for you to stay for a week? | 60 | 80.0 | 20.0 |
| Can give you good advice about money, like a money manager? | 60 | 85.0 | 15.0 |
| Is an elected official and can help you? | 60 | 86.7 | 13.3 |
| Can lend you a large sum of money? | 60 | 98.3 | 1.7 |
| Can give you good legal advice, like a lawyer? | 60 | 100.0 | 0.0 |