

MIXED-METHODS INVESTIGATIONS OF COMMUNITY ENGAGEMENT IN
URBAN ENVIRONMENTAL STEWARDSHIP

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Cities across the US are expanding their green infrastructure (e.g. trees, parks, gardens) at a time when the majority of Americans live in urban and urbanizing areas. Given that many people will only experience nature in cities, urban greening initiatives are critical for increasing public access to the health and ecosystem services provided by natural resources. However, local government often lacks public resources for adequately maintaining urban green spaces due to changes in urban environmental governance and the delivery of public services. Thus, public involvement in urban environmental stewardship plays an important role in natural resource management in cities. The four chapters of this dissertation examine strategies for the engagement of residents and volunteers in urban environmental stewardship. Chapter 1 describes the design, implementation and evaluation of an outreach program consisting of mailed postcards to remind residents to water street trees in Ithaca, NY. A difference-in-difference analysis of soil moisture data collected at each tree found significant differences in soil moisture between the treatment and control group and found that postcards may be an effective intervention strategy. Chapter 2 presents the ecological model of street tree watering which identifies factors at intrapersonal, interpersonal, organizational, community and public policy levels of analysis that may affect residents' street tree watering behavior. The analysis of survey data found significant differences in factors in the ecological model of street watering between

residents who watered and those who did not water. Chapter 3 entailed a narrative inquiry of the community engagement strategies employed by a small nonprofit organization working to build community capacity in low-income communities in Washington, DC. Narratives from staff members highlight the nature of community engagement practices as culturally situated in the form of community expression, celebration and conversation. In Chapter 4, a national survey of urban environmental nonprofit organizations reveals that volunteer contributions and volunteer management practices enhance the ability of organizations to carry out their mission in light of acute and chronic stressors (e.g. natural disasters, financial crises). Together, the four chapters in my dissertation contribute breadth and depth of understanding on the organizational and community context of community engagement and volunteer management practices in urban environmental activities.

BIOGRAPHICAL SKETCH

Christine Moskell grew up in Newburyport, Massachusetts. Christine attended Hobart and William Smith Colleges in Geneva, NY and holds a B.A. in Environmental Studies. After college, Christine worked as a natural resources community educator for Cornell University Cooperative Extension in Syracuse, New York. In this position, she worked with youth and adult volunteers on aquatic invasive species removals and green infrastructure projects throughout Onondaga County. In Fall 2009, Christine began graduate school at Cornell University and received an M.S. in Natural Resources in Spring 2012. Christine received her Ph.D. degree in Natural Resources in 2016 from Cornell University. In her first year following graduate school, Christine will be starting a position as a lecturer teaching a course on environmental science, activism and art at Colgate University.

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TABLE OF CONTENTS

INTRODUCTION	1
CHAPTER 1: ENGAGING RESIDENTS IN STREET TREE STEWARDSHIP: RESULTS OF A TREE WATERING OUTREACH INTERVENTION	16
Abstract	16
Introduction.....	17
Methods.....	23
Results	33
Discussion	45
Conclusion.....	50
Acknowledgements	51
Literature Cited.....	51
CHAPTER 2: THE ECOLOGICAL MODEL OF STREET TREE WATERING: A CONCEPTUAL FRAMEWORK FOR RESEARCH AND COMMUNITY ENGAGEMENT IN URBAN FOREST STEWARDSHIP	58
Abstract	58
Introduction.....	59
Methods.....	73
Results	81
Discussion	87
Conclusion.....	96
Appendix 2.1: Survey Materials.....	97
Appendix 2.2: Measurement Development	100
Literature Cited.....	106
CHAPTER 3: COMMUNITY EXPRESSION, CELEBRATION AND CONVERSATION: INSIGHTS FOR COMMUNITY ENGAGEMENT IN URBAN GREENING FROM THE GREEN SCHEME IN WASHINGTON, DC	115
Abstract	115
Introduction.....	116
The Current Study	127
Meeting the Green Scheme	128
Research Questions.....	130
Methodology.....	130

Findings.....	145
Discussion.....	179
Conclusion.....	190
Appendix 3.1: Interview Questions.....	191
Appendix 3.2 Practitioner Profiles.....	195
Literature Cited.....	247
CHAPTER 4: THE CONTRIBUTIONS OF VOLUNTEERS AND VOLUNTEER MANAGEMENT PRACTICES TOWARD THE ORGANIZATIONAL RESILIENCE OF URBAN ENVIRONMENTAL NON-PROFIT ORGANIZATIONS.....	258
Abstract.....	258
Introduction.....	259
Methods.....	274
Results.....	290
Discussion.....	299
Conclusion.....	304
Appendix 4.1: Survey Disposition Codes.....	305
Appendix 4.2: Survey Instrument.....	306
Literature Cited.....	320
CONCLUSION.....	328

INTRODUCTION

The presence of natural resources can enhance the sustainability and livability of urban areas. Urban natural resources, such as street trees and community gardens, are especially important for human and environmental health in light of urbanization (Lovell and Taylor 2013). Urban environmental stewardship (UES) is broadly defined as the management, conservation and monitoring of urban natural resources and green spaces (Svendsen et al. 2016). Many groups are involved in UES, including government agencies, nonprofit organizations and other community groups (Svendsen and Campbell 2008). Hence, community engagement in UES is often facilitated by organizations that provide opportunities for residents and volunteers to participate in UES activities, such as tree planting or community gardening (Romolini et al. 2012). There are large networks of UES groups in many cities across the US (Svendsen et al. 2016).

UES groups face a number of community engagement challenges, including negative views that people sometimes harbor toward green spaces (Kronenberg 2015), an inability to recruit volunteers (Moskell et al. 2010), and difficulty engaging residents in low-income communities where urban green spaces may not be a priority (Locke and Grove 2016). Very few studies in the UES literature have examined strategies to overcome these obstacles for community engagement or approaches for community engagement more broadly. The objectives of this dissertation are to 1) design, implement and evaluate strategies to promote UES 2) identify the factors that encourage residents to participate in UES, 3) explore the nature of the challenges

associated with community engagement practices for UES and how they can be overcome and 4) examine the ways volunteer management practices and volunteers enhance the resilience of urban environmental nonprofit organizations. My research results will inform practical knowledge about the design of community engagement strategies. The following sections provide an overview of UES, an overview of the concept of community engagement in UES in the context of this dissertation, and an overview of each of the dissertation chapters.

Urban Environmental Stewardship

Research on UES has examined stewardship as practiced by individuals and organizations. First, individual stewards are motivated by values, ethics and community concerns, which lead to both individual and collective UES activities (Romolini et al. 2012). At the organizational scale, UES groups are characterized by their efforts to manage urban ecosystems, such as street trees, community gardens, waterways, parks and green roofs. These activities have been described as civic ecology (Krasny and Tidball 2015) and civic stewardship (Fisher et al. 2012) and are rooted in civic environmentalism. Civic environmentalism entails collaboration, a place-based focus on environmental and community enhancement and involves direct public engagement in the restoration of places (Sirianni and Friedland 2001). Many of these groups focus on the broader social needs of local communities beyond urban environmental management (Romolini et al. 2012; Fisher et al. 2012). For example, many UES groups focus broader quality of life issues such as public health and community development,

and use stewardship and management activities to pursue these causes (Fisher et al. 2012).

UES is associated with a wide range of beneficial outcomes at multiple scales. For example, UES improves the health and well-being of individuals through hands-on exposure to natural resources, which has been shown to increase cognitive functioning and reduce stress (see Wells and Rollings 2012). At the community level, collective UES activities can strengthen relationships and empower groups to remediate urban blight and decay (see Krasny and Tidball 2015). Urban ecosystems benefit from UES through the expansion of trees, parks and other green spaces that improve air and water quality, provide habitat for wildlife and reduce greenhouse gas emissions (Andersson et al. 2014). Recent UES research has focused on monitoring and measuring the individual, community and environmental outcomes of UES (Silva and Krasny 2016; Krasny et al. 2014), as well as examining the social networks of UES groups in cities across the US and their implications for the governance of socio-ecological systems (see Connolly et al. 2015; Svendsen et al. 2016).

Cases of UES activities from across the world have been extensively described in the literature (e.g. Svendsen 2013; Krasny and Tidball 201; Metcalf et al. 2016). While these cases make clear that UES groups are engaging residents and volunteers, the strategies that organizations use to design and offer opportunities for community involvement in UES have not been explored in depth. The work in this area has mainly focused on better understanding volunteer motivations in order to tailor volunteer recruitment and management strategies to fulfill the functions UES volunteerism serves

for individuals (Moskell et al. 2010; Asah and Blahna 2012; Asah et al. 2014; Krasny et al. 2014). More recently, UES practitioners were interviewed about the types of skills that are important for engaging others in stewardship (Krasny et al. 2015). They reported skills such as advocacy, the articulation of a large vision, the mobilization of others, building relationships and collaborations and volunteer management (Krasny et al. 2015). However, little is known about how these skills manifest in UES organizations' approaches for engaging communities in stewardship.

Research is needed that examines the process of community engagement in UES, specifically how groups recruit participants (Wolf et al. 2013), how these groups operate in low-income communities that may not realize the value of trees and other urban natural resources (Locke and Grove 2016), how to engage residents in UES in the absence of nonprofit organizations (see Watkins et al. 2016), and what encourages residents to steward urban natural resources beyond positive attitudes and motivations (Moskell and Allred 2013). The following section provide a definition of community engagement in UES.

Definition of Community Engagement in Urban Environmental Stewardship

My dissertation draws on the ecological perspective of health promotion in order to conceptualize UES activities as shaped by individual, social and environmental factors (McLaren and Hawe 2005). In this case, the environment refers to any space outside the person through which they must navigate (Lewin 1951). UES activities occur in behavior settings, which Barker (1968) defines as the social and physical situations in which behavior occurs. According to behavior setting theory, the social and physical

aspects of behavior settings are synomorphic and coincide to generate “forces” that shape people’s behavior within the setting. Behavior settings are also regulated by factors at the macro-policy and socio-cultural levels, which dictate what events can take place within the settings and how they occur (Barker 1968). Sidewalks, for example, represent the behavior settings for the stewardship of urban trees. Social forces present in those settings may include the cultural values that shape residents’ preferences for street trees (Fraser and Kenney 2000), as well as city policies related to the maintenance of the tree (Loukaitou-Sideris and Ehrenfeucht 2009). A physical attribute of the setting that may shape residents’ stewardship behaviors of that tree would be nearby access to water. If there is no access to water, the behavior setting may not support residents’ ability to water trees. Barker’s (1968) behavior setting theory has not been applied to UES, but it is relevant for highlighting the ways in which UES activities are shaped by complex social and environmental “forces.”

I view community engagement as both a process and an outcome (Palmer-Wackerly et al. 2014). The involvement of residents and volunteers in UES activities can produce health, community and environmental outcomes as previously reviewed. Community engagement as a process entails building relationships with community members in order to modify behavior settings in a way that facilitates residents and volunteers taking part in UES activities. Behavior settings have social, community, built, organizational, and public policy attributes that may interact with, and possibly mediate or moderate, the relationship between individual-level characteristics (e.g. attitudes, beliefs) and UES activities. Conceptualizing community engagement as the modification

of settings encompasses a view of community engagement strategies as interventions. In psychology, interventions are planned strategies to change or promote behavior, whereas anthropologists tend to view interventions as community development initiatives (Schensul and Trickett 2009).

Collaboration between researchers and community members can produce strategies about how to alter behavior settings in a way that reflects the local culture, which encompasses the belief systems, values, norms, traditions and their associated practices, rituals and behavior, and other qualities of community life (Trickett 2009; Minkler 2010). It is important that community engagement interventions include components, programs and activities that are culturally relevant so that the intervention will resonate with community members and ultimately, become situated within the community context (Trickett and Beehler 2013). Strategies to alter behavior settings to promote participation in UES could entail making physical changes to a setting (e.g. installing an accessible source of water to easily transport to plants), or building relationships between people or organizations to mobilize social and human capital (Stokols et al. 2003; 2013). Collaboration may also point to sources of community capacity (e.g. social networks, physical resources, knowledge, skills) that that can be drawn upon to carry out the intervention (Trickett and Beehler 2013). Enhanced community capacity (e.g. formation of new knowledge, skills and relationships) as a result of community involvement in the design and implementation of an intervention is another outcome of community engagement (Palmer-Wackerly 2014).

I argue that conceptualizing community engagement in UES as collaborative, culturally relevant interventions designed to enhance community capacity is relevant for understanding and addressing the factors that shape residents' and volunteers' participation in UES. Like health behaviors, UES activities are multi-faceted in that they occur within complex social systems and involve transactions between humans and natural resources (the natural environment) amidst urban socio-ecological systems. My dissertation draws on ecological perspective of health promotion in different ways across the four chapters. The following section gives a short overview of each chapter, including its grounding in academic literature, methods used and contributions made.

Overview of Dissertation Chapters

Chapter 1

This study involved the design, implementation and evaluation of a tree watering outreach program (i.e. an intervention) to encourage residents to water newly planted street trees in Ithaca, NY. The program involved informational strategies to prompt residents to water street trees. A quasi-experimental design involving a treatment and control group was used to assess the impact of the program on residents' street tree watering behavior. The program was evaluated using residents' self-reported watering behavior in a written mail survey, as well as biophysical soil moisture data collected at residents' trees. This chapter is in-press at *Arboriculture & Urban Forestry* (Moskell et al. In Press).

Chapter 2

This chapter builds on the ecological model of urban forest stewardship that I developed as part of my M.S. research (Moskell and Allred 2013). The ecological model of urban forest stewardship applied the ecological perspective of behavior from human development and public health (Sallis and Owen 2015) to identify the “ecology” of social, built-environmental, organizational and policy factors that may interact with individual-level factors (e.g. beliefs, attitudes) to jointly influence stewardship activities. For this dissertation chapter, I present an updated and streamlined version of the ecological model of urban forest stewardship called “the ecological model of street tree watering.” This chapter addresses the lack of research in the urban forestry literature on what encourages residents to water street trees. The ecological model of street tree watering identifies factors from previous literature at interpersonal, intrapersonal, organizational, community and public policies levels of analysis that may shape residents’ watering behavior. Additional data from the survey is presented that points to the relationship between the factors in the ecological model of street tree watering and residents’ tree watering behavior.

Chapter 3

Chapter 3 presents qualitative research examining the community engagement strategies of the Green Scheme, a small environmental nonprofit organization working to engage low-income communities in tree planting and community gardening to address food and environmental justice issues. I employ narrative inquiry to produce “practitioner profiles” (Forester and Peters 2005) of each staff member based on a

series of in-person interviews I conducted with each of them. The practitioner profiles are then analyzed through the lens of the design principles of community interventions from public health (Trickett and Beehler 2013), specifically the ways that the Green Scheme's community engagement practices are culturally situated and designed to build community capacity for tree planting and community gardening. The Green Scheme's practitioner profiles represent "windows" into the Green Scheme's practices of community engagement that provide us with key insights into strategies for community engagement, as well as the nature of the challenges associated with engaging residents in urban greening in low-income communities.

Chapter 4

This chapter investigates the role of volunteer contributions to urban environmental nonprofit organizations and how that and the organizations' volunteer management practices influence organizational resilience. Organizational resilience is defined as the organizational ability to adapt and respond to acute and chronic stressors, such as natural disasters and economic downturns. While previous studies in urban environmental stewardship have described the organizational characteristics of these groups, little is known about these organizations' volunteer management practices. Data come from a national survey of urban environmental nonprofit organizations. Furthermore, little is known about the contributions that volunteers make to these organizations beyond time and labor. Organizational resilience is used in this study as the means through which to examine volunteer contributions toward the organization's ability to carry out its mission. This chapter draws on theory from

volunteer and human resource management that views volunteers as engaged in bi-directional and reciprocal relationships with others within an organizational environment.

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CHAPTER 1: ENGAGING RESIDENTS IN STREET TREE STEWARDSHIP: RESULTS OF A TREE WATERING OUTREACH INTERVENTION

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Abstract

Street trees provide numerous environmental, community and health benefits, but municipal urban forestry programs often lack the public resources to adequately maintain trees, particularly in the time immediately following planting. Watering trees in the first 3 years after planting is critical for tree survival. A quasi-experimental design was used to test whether an outreach intervention impacted residents' street tree watering behavior and whether their watering behavior enhanced soil moisture, an important outcome for tree growth. Residents at mailing addresses for trees in the treatment group received educational materials about watering, while the control group received no educational materials. Soil moisture data was collected weekly at every tree throughout the growing season (May-September 2012) and used as a proxy for residents' watering behavior. Results indicate that the postcards had a positive impact on residents' watering behavior, but that the impact diminished over time. While the impact of the postcards on soil moisture was not statistically significant, the evaluation

of the outreach intervention has practical significance for future educational efforts to engage residents in street tree watering.

Key Words: urban trees, soil moisture, community engagement, stewardship

Introduction

Street trees can enhance the livability and sustainability of cities by providing a number of environmental, health and community benefits, but the provision of these benefits is dependent upon street tree survival (Roman et al. 2014). Research shows that the first three years after a street tree is planted is a critical period for tree establishment and growth, yet it is also a time of stress for young trees (Trowbridge and Bassuk 2004). When trees are harvested at the nursery, approximately 90% of their fine nutrient and water absorbing roots may be damaged or removed (Whitlow and Bassuk 1988). After replanting, street trees can experience transplant shock, which is the reduction in water and nutrient uptake due to their damaged root systems. Transplant shock can inhibit tree growth and establishment, which is one reason why street tree mortality is very high in the first 1-3 years post-planting (Trowbridge and Bassuk 2004; Roman and Scatena 2011). Trees that do survive often need 2-3 years to recover from transplant shock and to resume normal growth (Trowbridge and Bassuk 2004).

Watering street trees in the first 1-3 years after they are planted can help them recover from transplant shock (Whitlow and Bassuk 1988). It is recommended that newly planted trees get 15-20 gallons of water per week (Johnson et al. 2010). However, municipal urban forest managers may not be able to adequately water newly planted trees on a weekly basis due to a lack of public resources for post-planting tree

maintenance (Pataki et al. 2011; Pincetl 2013). People's efforts to water street trees are especially important, given the high levels of water stress that trees experience in urban environments, which may not be remediated by natural rainfall (Whitlow et al. 1992; Ferrini and Fini 2011; Vico et al. 2014), especially in periods of drought and higher temperatures (Dale and Frank 2014). Practitioners of large-scale urban tree planting initiatives in cities across the US have cited the inability to adequately water newly planted street trees as a major challenge to the success of these initiatives (Young 2011). For this reason, many cities and tree planting initiatives rely on residents, nonprofit organizations and community groups to help maintain newly planted street trees (Young 2011; Young and McPherson 2013; Pincetl 2013).

The involvement of residents and volunteers in watering and otherwise stewarding street trees is beneficial for a number of reasons. First, community involvement may help to address the lack of government resources for tree watering. Surveys of public officials involved in municipal urban forest management have noted lack of funding as a significant challenge (Grado et al. 2006; Driscoll et al. 2014). Thus, relying on the community to help water street trees may be many cities' most feasible economic and logistical option for ensuring trees are adequately watered. Second, community participation in urban forest management may result in the empowerment of residents. Individual-level empowerment is defined as belief that one can make a positive difference, an understanding of the socio-political context and taking action to address issues of concern to them (Zimmerman 2006). Empowerment has often been mentioned as a possible outcome of residents and volunteers' participation in

community tree planting events (Sklar and Ames 1985; Sommer et al. 1994; Summit and Sommer 1998; Austin 2002; Elmendorf 2008). For example, tree-planting projects may enhance residents' sense of pride in their community and their feeling of self-efficacy related to improving their neighborhood communities (Dwyer et al. 1992; Bloniarz and Ryan 1996). Involving residents in the stewardship of street trees may also produce similar feelings of community pride and efficacy toward neighborhood improvement (Mincey and Vogt 2014). Lastly, community involvement in urban forest management may enhance the sustainability of urban forests (Clark et al. 1997; Kenney et al. 2011).

Recent studies suggest that residents' involvement in stewarding street trees may enhance tree growth and survival. A study in New York City found that signs of stewardship in the built environment surrounding street trees (e.g. planted flowers or mulch in the planting bed, evidence of weeding, and stewardship related signage close to the tree) were significantly associated with higher survival rates (Lu et al. 2010). Another New York City study found that street trees that were stewarded by local volunteers trained in tree watering, tree pit care and tree health assessment had a significantly higher survival rate over 5 years than did trees that were not monitored by volunteers (Boyce 2010). Examining the relationship between community-tree planting groups and tree survival in New Haven, Connecticut, Jack-Scott and colleagues (2013) found that tree survival was significantly associated with group experience (measured by years) and with an alignment of tree plantings with group mission (e.g. park trees planted by "friends of parks" groups) (Jack-Scott et al. 2013).

More recently, Mincey and Vogt (2014) investigated the relationship between tree survival and the street tree watering strategies employed by groups of neighbors in Indianapolis, IN. Using self-reported measures of watering behavior, Mincey and Vogt (2014) conducted semi-structured interviews to examine the presence or absence of collective watering strategies in each neighborhood. Collective watering strategies included signed agreements between neighbors, neighbors monitoring each other and giving verbal reminders to encourage each other to water newly-planted street trees. Street trees watered through collective watering strategies had higher survival rates than street trees watered by individual residents in the absence of agreements or reminders between neighbors. Collective watering strategies may have increased the sense of accountability between neighbors, which may have motivated residents to water their street trees more consistently, thereby enhancing the health of the trees (Mincey and Vogt 2014).

The recent studies on the impact of volunteer involvement in street tree stewardship on tree health and survival are limited. With the exception of Lu and colleagues (2010), these studies examined programs coordinated by a local non-profit organization rather than with residents who were not participants in such programs. While non-profit organizations play an important role in coordinating street tree stewardship efforts in the community (see *Cities and the Environment* (Volume 6)), these organizations may not be present or active in every community where cities plant street trees, and those that are present may not have the capacity to coordinate residents' street tree watering on a regular basis across an entire city. Furthermore,

many cities require residents and private property owners to maintain street trees planted in public rights of way adjacent to their property (Loukaitou-Sideris and Ehrenfeucht 2009). However, many residents may not recognize themselves as responsible for caring for street trees planted. For example, a study conducted in New York City found that many residents believed the government was responsible for managing street trees on public property, rather than civil society organizations and community volunteers (Moskell and Allred 2013). Despite partnerships with nonprofit organizations that work to raise community awareness about the importance of street tree maintenance, community engagement in urban forest management remains a significant challenge for municipal urban tree planting initiatives across the US (Young 2011; Pincetl et al. 2013; Campbell 2015).

Research is needed that examines the involvement of residents in street tree stewardship outside of formal volunteer programs hosted by nonprofit organizations, as many residents may not have access to or a willingness to participate in such programs. Furthermore, research is needed that examines and evaluates strategies that city agencies can use, independent of local nonprofit organizations, to recruit residents to water street trees. For example, city agencies can use informational strategies to enhance residents' awareness of the importance of watering newly planted street trees. Informational strategies have been included in interventions increase knowledge of an environmental problem so as to promote pro-environmental behavior to address that problem (Steg and Viek 2009). An example of an informational strategy is prompting or the use of reminders about when to complete a pro-environmental behavior (Lehman

and Geller 2004). Prompts that are noticeable, self-explanatory and presented in close proximity to where the behavior occurs may be most effective for encouraging behavior change (McKenzie-Mohr 2011). Prompts with strong visual cues that indicate the specific action to be completed and that appear when the action needs to be completed may be most effective at prompting a certain behavior (see Tetlow et al. 2014 for a review). Prompting has been an effective informational strategy in interventions to promote pro-environmental behaviors, such as energy conservation (see Steg and Viek 2009 for a review). Prompts can be relatively low-cost (Lehman and Geller 2004), which make them an attractive option for cities to use to encourage residents to water newly planted street trees.

The Current Study

The goal of this study was to evaluate the impact of an outreach intervention that used weekly postcard reminders to encourage residents to water newly planted street trees. To our knowledge, no studies have examined tree-watering behavior at the individual tree level using both self-reported watering behavior and soil moisture measurements. This study uses both social and biophysical measures to identify evidence of watering by residents and whether watering occurred as a result of the outreach intervention. The purpose of taking soil moisture measurements was to “ground truth” or validate residents’ self-reported watering behavior survey responses with an objective measure. Another contribution of this study is the use of a quasi-experimental design, which allowed us to isolate the effect of the outreach intervention (i.e. receiving a postcard reminder) on residents’ watering behavior and soil moisture,

while controlling for other variables that may affect soil moisture (e.g. soil compaction).

Research questions and hypotheses (H) for this study are as follows:

1. What is the effect of an outreach intervention on residents' watering behavior and soil moisture, controlling for soil compaction and watering by the city?
 - a. H1: Residents in the treatment group will water trees more frequently than residents in the control group, as indicated by self-report
 - b. H2: Trees in the treatment group will have higher average weekly soil moisture than trees planted at addresses in the control group
 - c. H3: Average weekly soil moisture will be greater between treatment and control groups in the weeks a postcard was mailed to residents
2. Does self-reported watering behavior align with measures of soil moisture?
 - a. H4: Trees that were reported to be watered more frequently will have a higher average weekly soil moisture than trees that were reported as watered less frequently by residents
3. To what degree is direct communication with residents via postcards an effective strategy for ensuring newly planted street trees get watered?

Methods

Study Site

This study took place within a 17-week period between May and September 2012 in Ithaca, NY, a small city in the Finger Lakes Region of New York State. Ithaca's urban forest management goals and street tree watering challenges are similar to those found in other small cities across the United States. Despite the presence of a number

of citizen's groups involved in urban forest planning and advocacy in Ithaca, these groups do not take an active role in watering the street trees planted on public property throughout the city. In light of the Ithaca Parks and Forestry Division's goal to fill 100% of the available planting sites by 2015, watering newly planted street trees is an important concern in the city (Denig 2014). To facilitate watering, the Parks and Forestry Division installed a plastic irrigation bag (TreeGator, Spectrum Products, Inc., Raleigh, NC) to the trunk of each newly planted tree in the early May 2012. The irrigation bags hold ~15 gallons of water, which permeates into the ground around the tree trunk by way of small holes at the bottom of the bag. Staff from the Department of Public Works are responsible for filling up the bags with water. Time constraints and additional commitments make it difficult for staff to adequately water each tree weekly. Thus, the Division relies upon residents to help water the street trees using the irrigation bags. However, the City has not previously had the resources for mass communication materials to inform residents that their help is needed to water trees (City of Ithaca 2012; 2014). The outreach intervention developed as part of the study (to be discussed below) was designed to address this communication need.

Study Sample

This study includes both a biophysical sample and a social sample. The biophysical sample included all street trees (N = 81) planted between Fall 2011 (53.1%; n = 43) and Spring 2012 (46.9%; n = 38) by the City of Ithaca's Parks and Forestry Division. Three species of trees were planted: Amur Maackia (*Maackia amurensis* Rupr. and Maxim) (30.9%, n = 25), Swamp White Oak (*Quercus bicolor* Wild) (35.7%, n = 29),

and Glenleven Linden (*Tilia cordata* Mill 'Glenleven') (33.3%, n = 27). The city made all decisions about tree planting, such as species selection and planting locations. Before each tree was planted, each address received a letter from the City notifying them about the upcoming planting. After the tree was planted, the City left a door hanger at each residence informing them about the benefits trees provides. The social sample included the mailing addresses (including apartments and commercial offices) (N = 114) that were listed at the address where each tree was planted.

Study Design

Using a nonequivalent control group design (specifically a posttest only control group design) (Campbell and Stanley 1963; Kerlinger et al. 2000), the mailing addresses (N = 114) associated with the building directly adjacent to each tree were assigned into treatment and control groups. Tree species was the matching variable for assigning trees so that the treatment and control groups would have relatively equal numbers of each species (Shadish et al. 2002). It was later determined how many individual apartment or business units were listed at each address using a county tax assessment database. Most of the street trees were planted in front of a single-family home (n = 52) and thus were associated with 1 mailing address each. However, some trees (n = 20) were planted in front of a multi-family home, which explains why the total number of mailing addresses (N = 114) was greater than the number of street trees planted (N = 81). Trees were assigned to treatment or control at the building level. For example, if a tree was assigned to the treatment group, the mailing addresses for all of

the individual apartment units listed at the adjacent building were each assigned to the treatment group.

The Outreach Intervention

The treatment group (N = 66 mailing addresses; N = 47 trees) received an outreach intervention that consisted of postcard reminders to water the tree (8 total) that were mailed bi-weekly over a 17-week period. The postcards included a picture of a tree with an irrigation bag (TreeGator, Spectrum Products, Inc., Raleigh, NC) and instructed residents to fill the bag attached to their tree with water once per week. The control group (N = 48 mailing addresses; N = 34 trees) did not receive the outreach intervention.

Social Data Collection

Residents' self-reported watering behavior was measured in two different surveys. First, the treatment group received surveys at the end of June, July and August. Questionnaires asked how often they had watered their tree in the past month; the residents could fill in the exact number of times they had watered. The treatment group was not notified about these questionnaires ahead of their delivery. The control group did not receive these monthly questionnaires to avoid the suggestion that the control group's watering behavior was being monitored.

Second, mailing addresses in both the treatment and control groups (N = 114) received a written survey at the end of the 2011-2012 growing season in November 2012. The survey asked residents about their watering behavior and it also included a question directed to the treatment group to evaluate whether the postcards distributed

as part of the outreach intervention were helpful for learning how, and being reminded, to water the tree. The back page of the survey included a space in which respondents' could write comments with additional information they wanted to share. Both the monthly surveys and the final survey were distributed using a modified version of the drop-off pick up method. One week prior to the delivery of a survey, all addresses in the treatment and control groups received a postcard notifying them of the upcoming survey. Surveys were dropped off the following week at mailboxes with return postage and a cover letter with instructions for mailing back the survey (Broussard Allred and Ross-Davis 2011; Vaske 2008).

Biophysical Data Collection

Two biophysical variables were measured at each tree. First, soil moisture measurements were taken at each tree using a Theta Probe Soil Moisture Sensor (Delta-T Devices Ltd, Cambridge, UK) on the same day every week in 15 weeks within a 17-week period between May and September 2012. Theta probes measure the dielectric constant of soil to estimate the volumetric soil water content (m^3m^{-3}). Pure water is measured at $1.0 \text{ m}^3 \text{ m}^{-3}$ and dry soil corresponds to a measurement of $0.0 \text{ m}^3\text{m}^{-3}$ (Miller and Gaskin 1996). Each week at each tree, the average of three theta probe readings were recorded. Second, soil compaction (a proxy for site conditions) was measured using a penetrometer (Dickey John Soil Compaction Tester, Minneapolis, Minnesota, USA) in mid-September 2012 at each tree. At each tree, the average of three penetrometer readings was recorded. The unit of measurement for the penetrometer (inches) is interpreted as the inches of depth before reaching 300 pounds

per square inch resistance. Because each tree was planted on public property, residents were not informed that soil moisture and soil compaction near their tree was being measured. Soil moisture measurements represent an objective measure of residents' watering behavior.

Average weekly pan-evaporation data for Ithaca, NY/Tompkins County was collected from the Northeast Regional Climate Center at Cornell University. Pan-evaporation integrates temperature and precipitation, thereby providing a measure of the time of trees' greatest need for water when there is more evaporation pressure on both the soil and plant leaves. The four weeks during the summer that the City's Department of Public Works' watering truck watered trees throughout the city was also recorded. The Department of Public Works was not notified of which street trees in this study were assigned to the treatment and control groups. In each of those four weeks, the city watered trees in only some neighborhoods. However, one limitation of this data was that individual tree watering data, such how much water was applied to each tree, was unavailable. It was assumed that the city watered all of the trees in each neighborhood, but it's likely the watering truck may have missed some trees. Limitations associated with this data are presented in the discussion section.

Data Analysis

Data analysis procedures are organized below by the 3 research questions.

Research Question 1: Outreach Intervention and Self-Reported Watering Behavior

In order to determine the effect of the outreach intervention on residents watering behavior (and subsequently on soil moisture), watering behavior was analyzed in two

ways. First, descriptive frequencies were conducted to determine how many respondents to the monthly surveys (distributed to the treatment group) had watered their trees. The mean number of times that respondents had watered was also calculated from the monthly survey results. Second, descriptive frequencies were calculated to determine how many respondents to the final survey (distributed to both the treatment and control groups) had watered their trees. Chi-square tests were conducted to determine if the differences in self-reported watering (from the final survey) between the treatment and control groups were significant. Fisher's Exact Test results are reported in instances in which there were cell counts <5 . Only final survey respondents who lived at their address over summer 2012 were included in this second analysis.

To measure the impact of the outreach intervention on soil moisture, an independent samples t-test was conducted to identify significant differences in average soil moisture levels for the treatment and control groups. Means for both groups for 15 out of 17 weeks in which soil moisture was collected are reported (the data collection team was on vacation for 2 weeks out of the 17 weeks, hence soil moisture is only reported for 15 weeks).

To control for confounding variables we did not measure, a "difference-in-difference" regression analysis was conducted, which is an analytical tool used in social science research and program evaluation to measure the differences in two groups before and after a treatment. One strength of this analysis is that it accounts for underlying variation between treatment and control groups (Lechner 2010). Difference-

in-difference analysis has been used in forestry to evaluate programs that pay producers of ecosystem services in developing countries (Pattanayak et al. 2010; Honey-Rosés et al. 2011; Arriagada et al. 2012). Difference-in-difference analysis has also been conducted in studies relevant to urban forestry that measured the interaction between household location decisions and urban green space (Stone et al. 2015) and that examined the impact of vacant lot greening programs on crime and human health (Branas et al. 2011).

In this study, the goal of the difference-in-difference regression analysis is to compare the difference in soil moisture between the treatment and control group in the week before a postcard was mailed to the difference in soil moisture between the treatment and control group in the week a postcard was mailed. The difference between these two differences can be interpreted as the impact of the postcard “treatment” on soil moisture. The difference-in-difference analysis was implemented using seven different multiple linear regression models, one each for postcards 2 through 8.

For the purposes of explaining the regression model below, week X represents the week prior to a postcard mailing and week Y represents the week a postcard was received. Five independent variables were entered into the regression model to predict the dependent variable, soil moisture in week Y. First, a dummy variable was created coded as *week* (0 = week X, 1 = week Y), which represents the difference in soil moisture between week Y and X for the control group. Second, a *postcard received* a dummy variable (0 = no postcard received, 1 = postcard received) which represents the difference in soil moisture between the treatment and control groups in week X. Third, a

dummy variable *postcard-week* which indicates all of the trees planted at a residence that received a postcard in week Y, the week the postcard was mailed (0 = no postcard received in week Y, 1 = postcard received in week Y). The “*postcard-week*” variable represents the impact of the postcard, which can be understood with the following formula:

$$\text{Postcard impact } (\beta_{\text{postcard-week}}) = (\textit{Treatment soil moisture in week X} - \textit{Control soil moisture in week X}) - (\textit{Treatment soil moisture in week Y} - \textit{Control soil moisture in week Y})$$

The fifth variable *soil compaction* (continuous) represents the penetrometer measurements at each tree. A sixth independent dummy variable *city watering* (0 = not watered, 1 = watered) was added in the model for postcards 4 – 8 to capture the four weeks (7, 9, 10, 12) in which the city watered some of the trees. A *city watering* score of 1 indicates that the tree was located in a neighborhood where the city watered that week. The reader will be guided in how to interpret the beta coefficients for the regressions to determine the impact of the postcards in the results section. It was impossible to control for additional biophysical factors (average weekly temperature, precipitation and evaporative demand) that may also affect soil moisture, as the data collected for these variables were constant across all of the trees. However, the difference-in-difference analysis accounts for any pre-existing differences in these variables between treatment and control groups. The implications of this limitation for this study will be addressed in the discussion section.

Research Question 2: Self-Reported Watering Behavior and Soil Moisture

To determine which trees were watered and at what frequency, a dummy variable for watering score was computed based on watering behavior as self-reported on the final survey. It was only possible to compute water scores for the trees at addresses that completed the final survey and answered the question about watering behavior. Trees were coded as 0 = never watered, 1 = watered a few times over the summer, 2 = every other week, and 3 = at least once per week. For trees planted outside of apartment buildings, there were no instances of more than one apartment at the same address reporting that they watered the tree. Pearson's correlation coefficients were calculated to determine the relationship between the watering score and soil moisture in each of the 15 weeks. Pearson's correlation coefficients were also calculated to determine the relationship between self-reported watering and soil moisture in the first and second halves of the summer. A one-way analysis of variance (ANOVA) was calculated for each of 15 weeks to identify significant differences in average weekly soil moisture between trees with different watering scores. Multiple comparisons were calculated using Bonferroni post-hoc tests.

Research Question 3: Evaluation of the Outreach Intervention

To evaluate the effectiveness of the outreach intervention, descriptive frequencies were calculated to identify how many final survey respondents believed the postcards were helpful in learning about how to water the tree and in reminding them to water their tree. Cross-tabulations and chi-square analyses were conducted to examine how many treatment group respondents who had watered had found the postcards to

be helpful reminders. Comments provided by final survey respondents on the back page of the questionnaire that related to watering, the postcards or the project in general are also reported and used to evaluate the outreach intervention. Analyses for this research question only include final survey respondents who resided at their address in summer 2012.

Results

First, descriptive statistics related to the characteristics of the trees, the monthly and final survey response rates and the socio-demographics of survey respondents are presented. Subsequent results are presented and organized by research question.

Descriptive Statistics

Descriptive statistics for the site type and species of the street trees are found in Table 1.1.

Table 1.1: Distribution of trees across site types and distributions of tree species for the treatment and control groups. Cross-tabulations for the control and treatment groups present row percentages of total N.

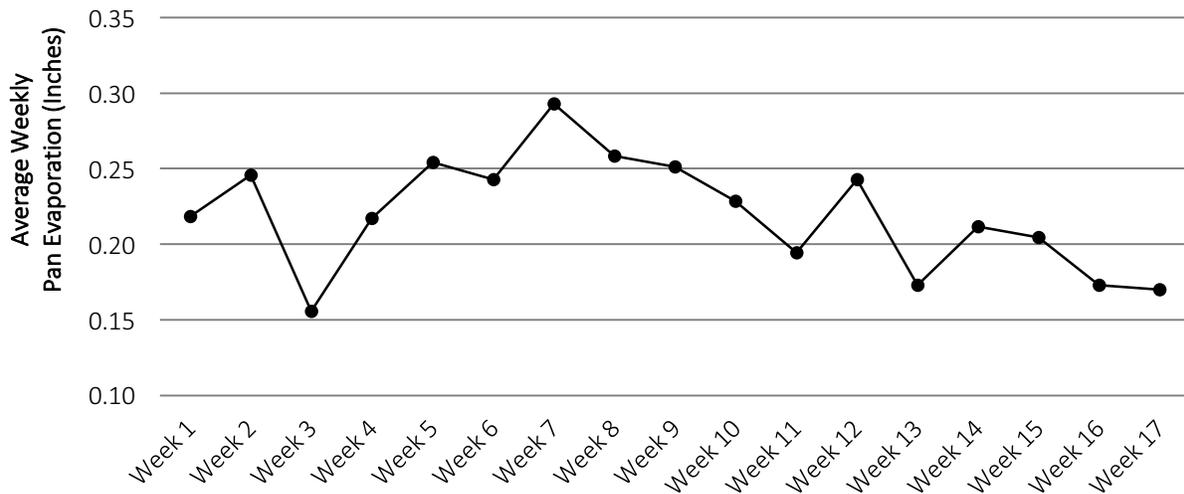
	Total % (N)	Control % (n)	Treatment % (n)	χ^2	p-value
Site Type				2.48 ^a	0.31
Single family home	64.2% (52)	38.5% (20)	61.5% (32)		
Multi-family home	24.7% (20)	40.0% (8)	60.0% (12)		
Commercial	11.1% (9)	66.7% (6)	33.3% (3)		
Species				2.08 ^a	0.36
Swamp white oak (<i>Quercus bicolor</i>)	35.8% (29)	41.4% (12)	58.6% (17)		
Glenleven Linden (<i>Tilia cordata</i> 'Glenleven')	33.3% (27)	51.9% (14)	48.1% (13)		
Amur Maackia (<i>Maackia amurensis</i>)	30.9% (25)	32.0% (8)	68.0% (17)		

^aFisher's Exact Test due to cell counts <5

The majority of trees were planted at single-family homes (64.2%). A Fisher's Exact Test found no significant difference in the distribution of trees across site types between the control and treatment groups ($p = 0.31$) or in the distribution of tree species between the control and treatment groups ($p = 0.36$). The city watered the street trees in 4 different weeks. More than half of all trees were watered in week 7 (75.3%, $n = 61$), week 9 (50.6%, $n = 41$) and week 12 (93.8%, $n = 76$), but only a few trees were watered in week 10 (7.4%, $n = 6$). The percentage of treatment group trees that were watered in each of those weeks were 54.1% in week 7, 56.1% in week 9, 83.3% in week 10 and 55.3% in week 12. Chi-square analyses and Fisher's Exact Tests revealed no significant difference in city watering between the treatment and control group.

Mean soil compaction for the 81 trees was 10.004 inches (standard deviation = 3.865). There was no significant difference in soil compaction between the treatment group (9.34 inches) and the control group (10.48 inches) ($t = -1.315$, $df = 79$, $p = 0.192$). For the 17-week time period in which this study took place, the daily average precipitation was 0.07 inches (standard deviation: 0.17), the average daily temperature was 68.6 degrees Fahrenheit (standard deviation: 6.8), and the average daily pan evaporation rate was 0.22 inches (standard deviation 0.06). Average weekly pan evaporation rates for the study period are presented in Figure 1.1.

Figure 1.1: Average weekly pan evaporation for Ithaca, NY/Tompkins County (May 23 – September 12, 2012). Data provided by the Northeast Regional Climate Center.



Survey Response Rates

The response rate for the monthly watering survey (distributed to the treatment group only) was highest in June (21.5%, $n = 14$), but decreased in July (18.5%; $n = 12$) and August (15.4%, $n = 10$). The response rate for the final survey was 39.5% ($n = 45$).

A Fisher's Exact Test found no significant differences in the final survey response rate between the treatment and control group ($p = 0.52$).

While a formal survey non-response follow-up was not conducted, non-response bias was checked by comparing survey response rate by building type. A Fisher's Exact Test revealed differences in survey response and building type ($p = 0.085$). The majority of respondents resided at single-family homes (60%, $n = 27$) whereas the majority of non-respondents (57.1%, $n = 36$) and refusals (66.7%, $n = 4$) resided at apartment buildings.

Socio-demographics of Final Survey Respondents

The majority of respondents to the final survey were homeowners (76.3%, $n = 29$), aged 55+ (51.4%, $n = 19$), non-Hispanic/Latino (97.1%, $n = 34$), Caucasian (85.7%, $n = 30$), and have an earned income of greater than \$50,000 (68.8%, $n = 22$). There were no significant differences in homeownership ($\chi^2 = 0.474$, $p = 0.491$), ethnicity ($\chi^2 = 1.328$, $p = 0.249$), race ($\chi^2 = 0.628$, $p = 0.428$) or income ($\chi^2 = 0.121$, $p = 0.728$) between final survey respondents in the treatment and control groups. A Fisher's exact test showed no significant age differences between final survey respondents in the treatment and control groups ($p = 0.35$).

Research Question 1: Outreach Intervention and Self-Reported Watering Behavior

The majority of respondents to the monthly surveys (treatment group only) reported watering their trees in June (78.6%, $n = 11$), July (72.7%, $n = 8$) and August (60%, $n = 6$). On average, respondents watered 3.82 times in June, 4.56 times in July and 4.17 times in August. After removing four respondents (9.5%) who reported they

had not lived at their address during summer 2012, the majority of final survey respondents (35.3%, n = 12) reported watering their tree once per week, 11.8% (n = 4), reported watering bi-weekly, 20.6% (n = 11) reported watering a few times over the summer and 32.4% (n = 34) reported never watering (Table 1.2). While the majority of respondents who had watered once per week were in the treatment group (83.3%, n = 10), a Fisher’s Exact Test found no significant differences in self-reported watering between the treatment and control groups (p = 0.816).

Table 1.2: Self-reported watering behavior from the final survey for the control and treatment group

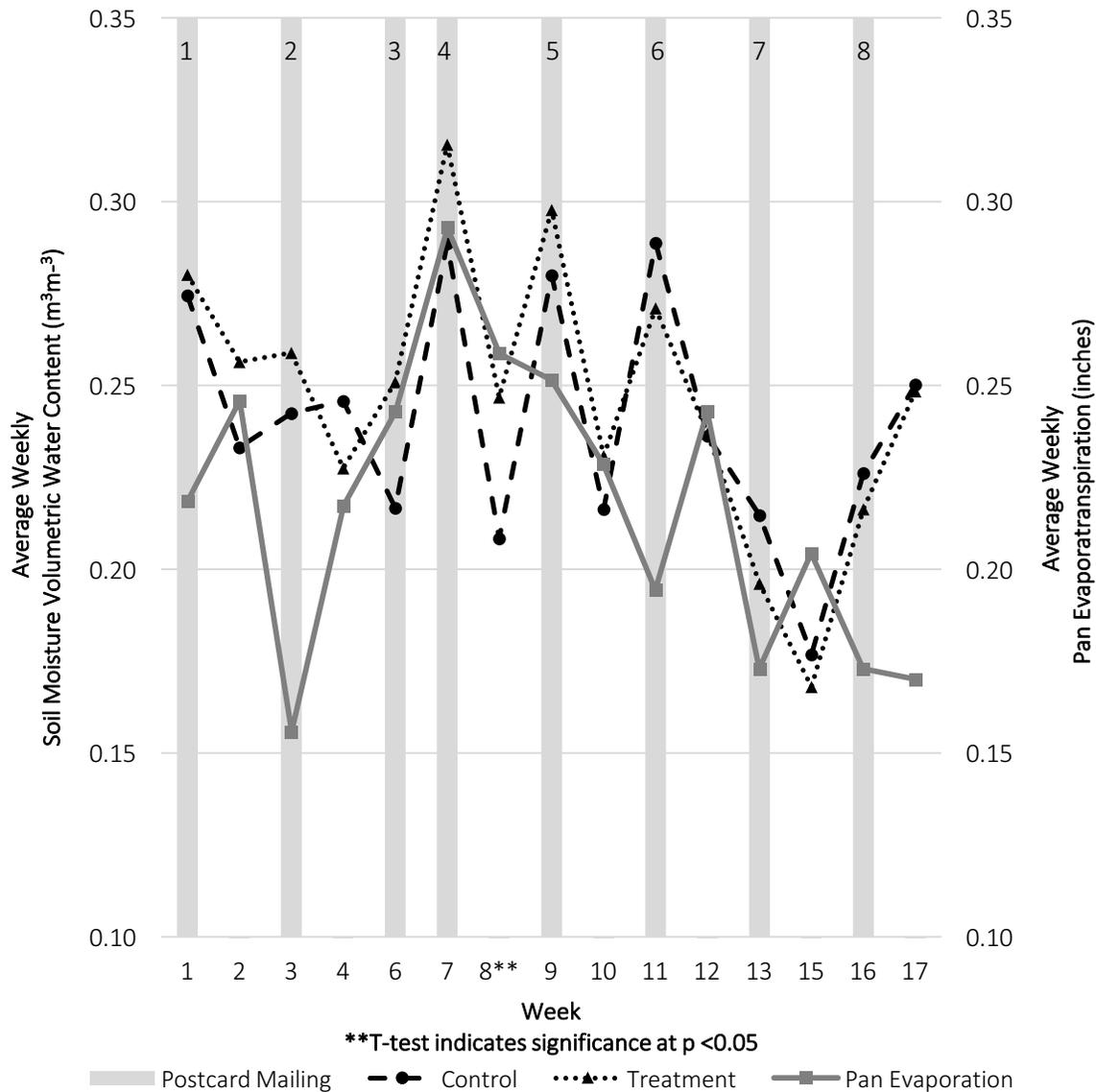
	Control		Treatment	
	%	(n)	%	(n)
Once per week	16.7%	(2)	83.3%	(10)
Every other week	25.0%	(1)	75.0%	(3)
A few times over the summer	28.6%	(2)	71.4%	(5)
Never	36.4%	(4)	63.6%	(7)

Fisher’s Exact Test = 1.419, p = 0.816

A statistically significant difference in average weekly soil moisture was observed between the control and treatment groups in week 8 (t = -2.087, df = 77, p = 0.04), with the treatment group having higher soil moisture than the control group. This same trend was found in week 2 (t = -1.912, df = 76, p = 0.06), week 6 (t = -1.807, df = 78, p = 0.08), but the differences between the groups were not statistically significant (Figure 1.2). The differences observed in week 6 and week 8 fell within a period of high pan-evaporation, which corresponds to the time when trees had their greatest watering

need. There were no significant differences in soil moisture between the two groups in weeks one, four, five and seven.

Figure 1.2: Average weekly soil moisture for trees in the treatment and control groups. The gray columns correspond to the weeks in which a postcard was mailed to the treatment group. Average weekly pan evaporation rates for Ithaca, NY/Tompkins County are also depicted.



After controlling for soil compaction and watering by the city, only two out of seven postcards had a statistically significant impact on soil moisture (Table 1.3).

Table 3: Beta coefficients (p-values in parentheses) for multiple linear regression models predicting the impact of each postcard mailing on average weekly soil moisture, controlling for soil compaction and city watering. All regression models include the week prior the postcard mailing and the week in which the postcard was mailed.

Regression Model	1	2	3	4	5	6	7
Postcard	2	3	4 ^a	5	6	7	8
Weeks	2, 3 ^m	4, 6 ^m	4, 7 ^{m,w}	8, 9 ^{m,w}	10 ^w , 11 ^m	12 ^w , 13 ^m	15, 16 ^m
1. Constant	0.21 (0.00) ***	0.23 (0.00) ***	0.23 (0.00) ***	0.16 (0.00) ***	0.20 (0.00) ***	0.25 (0.00) ***	0.16 (0.00) ***
2. Week	0.01 (0.51)	-0.03 (0.10)	0.04 (0.01) ***	0.07 (0.00) ***	0.07 (0.00) ***	-0.02 (0.27)	0.05 (0.01) ***
3. Postcard received	0.02 (0.14)	-0.02 (0.21)	-0.02 (0.24)	0.03 (0.11)	0.01 (0.47)	0.00 (0.92)	-0.01 (0.50)
4. Postcard-week	-0.01 (0.70)	0.05 (0.02) **	0.05 (0.04) **	-0.02 (0.46)	-0.03 (0.22)	-0.02 (0.45)	0.00 (0.96)
5. Soil compaction	0.003 (0.03) **	0.002 (0.18)	0.001 (0.42)	0.005 (0.01) ***	0.002 (0.27)	0.000 (0.83)	0.002 (0.18)
6. City Watering	--	--	0.01 (0.53)	0.01 (0.44)	-0.02 (0.46)	-0.02 (0.44)	--
N	158	161	162	157	162	162	162
R	0.24	0.22	0.48	0.41	0.34	0.23	0.34
R²	0.06	0.05	0.23	0.17	0.12	0.05	0.12
Adj. R²	0.03	0.02	0.21	0.14	0.09	0.02	0.09
F	2.24	1.88	9.41	6.02	4.08	1.72	5.12
p-value	0.07 *	0.12	0.00 ***	0.00 ***	0.00 ***	0.13	0.00 ***

*** p < 0.01, ** p < 0.05

^a This regression model included week 7 (when the postcard was mailed) and week 4, the last previous week in which a postcard had not been mailed.

^m indicates the week the postcard was mailed and the *week* dummy variable that was entered into the regression model

^w indicates the week in which some of the trees were watered by the city

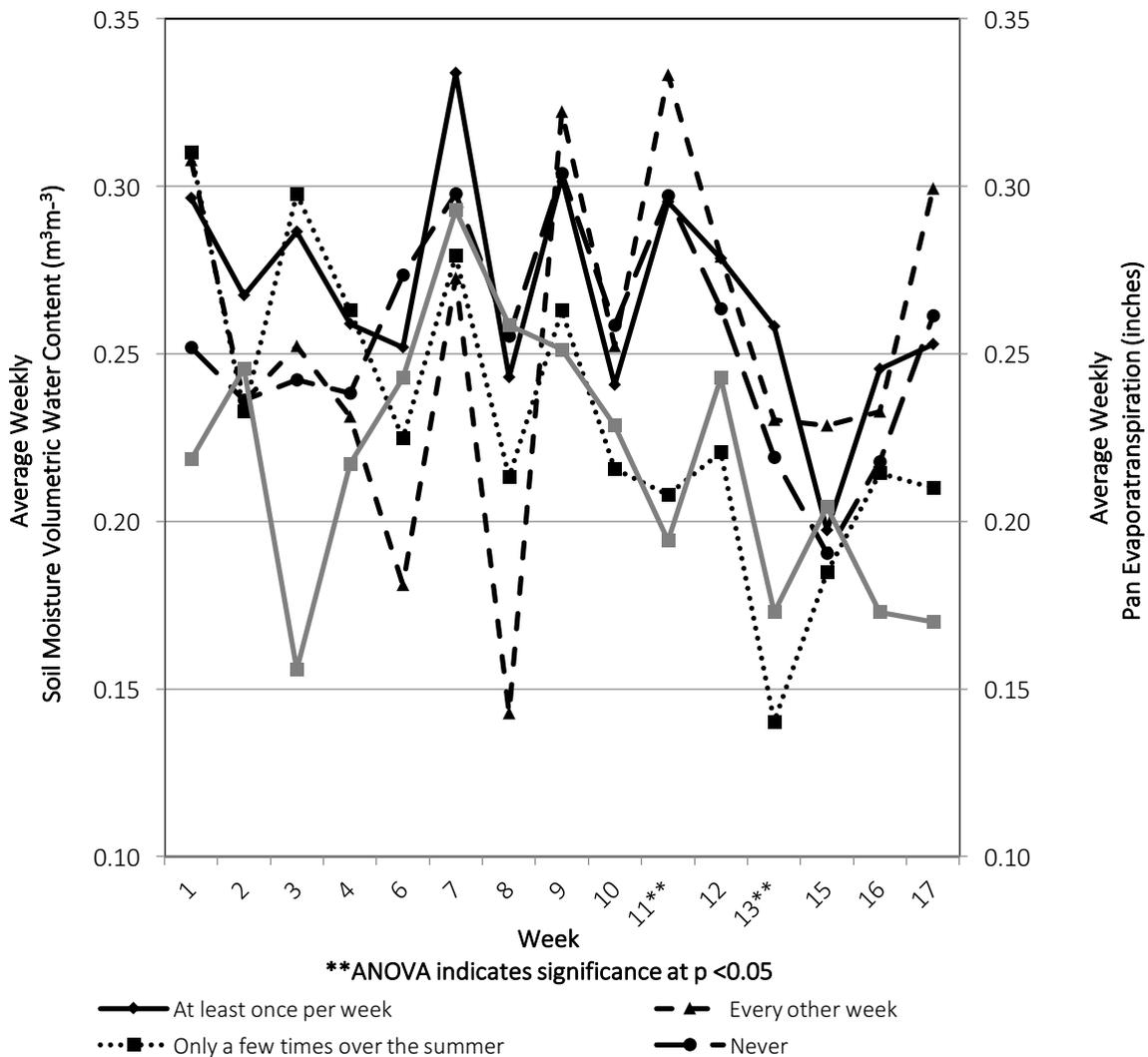
Regression model 2 indicated that postcard 3 had a significant impact on soil moisture in week 6 ($\beta_{\text{postcard-week}} = 0.05$ $p = 0.02$), but note that the model's predictive power was weak ($\text{Adj. } R^2 = 0.02$, $F = 1.88$). The impact of postcard 3 (the coefficient for ($\beta_{\text{postcard-week}}$) can be interpreted by looking at Figure 2. In week 4, the treatment group had lower soil moisture ($0.23 \text{ m}^3\text{m}^{-3}$) than the control group ($0.25 \text{ m}^3\text{m}^{-3}$) ($\beta_{\text{postcard received}} = -0.02$, $p = 0.21$). The control group's soil moisture decreased from week 4 ($0.25 \text{ m}^3\text{m}^{-3}$) to week 6 ($0.22 \text{ m}^3\text{m}^{-3}$) ($\beta_{\text{week}} = -0.03$). However, the treatment group's soil moisture increased from week 4 ($0.23 \text{ m}^3\text{m}^{-3}$) to week 6 ($0.25 \text{ m}^3\text{m}^{-3}$) when they received the postcard. Thus, there was a greater difference in soil moisture between the treatment and control group in week 6 ($0.03 \text{ m}^3\text{m}^{-3}$) than in week 4 ($-0.02 \text{ m}^3\text{m}^{-3}$), hence it can be concluded that postcard 3 had a significant impact on soil moisture in week 6 ($\beta_{\text{postcard-week}} = 0.05$ $p = 0.02$). Regression model 3 showed that postcard 4 also had a significant impact on soil moisture in week 7 ($\beta_{\text{postcard-week}} = 0.05$ $p = 0.04$); this model had the strongest predictive power of any of the regression models ($\text{Adj. } R^2 = 0.21$, $F = 9.84$). In summary, five out of seven postcards had no statistically significant impact on soil moisture, with postcards 2, 5, 6 and 7 having a negative impact on soil moisture ($\beta_{\text{postcard-week}}$ ranging from -0.05 to -0.01) and postcard 8 having no impact. However, postcards 3 and 4 were mailed during the period of trees' greatest watering need, as indicated by high pan-evaporation rates at that time.

Research Question 2: Self-Reported Watering Behavior and Soil Moisture

Watering scores were computed for 37 trees (45.7%), based on the number of final survey respondents who answered the question about watering behavior ($n = 37$, N

= 44). The majority of trees (35.0%, n = 13) were scored as never watered, 10.8% (n = 4) were watered biweekly, 18.9% (n = 7) were watered a few times during the summer and 35.1% (n = 13) were never watered. Trees that were watered weekly had the highest soil moisture in four out of 15 weeks (weeks 2, 7, 13 and 16), while trees that were watered biweekly had the highest soil moisture in 5 out of 15 weeks (9, 11, 12, 15 and 17) (Figure 1.3).

Figure 1.3: Average weekly soil moisture by watering score as self-reported in the final survey. Average weekly pan evaporation rates for the Ithaca, NY/Tompkins County are also depicted.



However, ANOVAs revealed that there were only significant differences in soil moisture between the 4 groups of trees in week 11 ($F(3, 33) = 4.075, p = 0.01$) and week 13 ($F(3, 33) = 2.827, p = 0.05$). In week 11, trees that had been watered weekly ($0.3 \text{ m}^3\text{m}^{-3}$) and biweekly ($0.33 \text{ m}^3\text{m}^{-3}$) both had significantly higher soil moisture than trees that had been watered only a few times over the summer ($0.21 \text{ m}^3\text{m}^{-3}; p = < 0.05$). Trees that had been watered only a few times over the summer had significantly higher soil moisture than trees that had never been watered ($0.30 \text{ m}^3\text{m}^{-3}$) $p = 0.04$). In week 13, trees that had been watered weekly ($0.26 \text{ m}^3\text{m}^{-3}$) had significant higher soil moisture than trees that had been watered only a few times over the summer ($0.14 \text{ m}^3\text{m}^{-3}; p = 0.04$). These differences did not correspond to the period of trees' greatest watering need as evidenced by the pan-evaporation data.

There was a positive significant correlation between watering score and soil moisture in week 2 ($r = 0.36, p = 0.03$). However, there was no statistically significant correlation between watering score and soil moisture in all other weeks. Watering score was not correlated with soil moisture in the first half of the summer ($r = 0.25, p = 0.12$) or in the second half of the summer ($r = 0.06, p = 0.7$)

Research Question 3: Evaluation of the Outreach Intervention

There were $n = 45$ respondents to the final survey ($N = 114, 39.5\%$ response rate). Among the 20 respondents who remembered receiving postcards over the summer, the majority (75%, $n = 15$) believed the postcards were helpful to them in learning about how to water the new trees. A majority (64.7%, $n = 11$) also believed the postcards were helpful reminders for watering. Respondents who had watered and not

watered significantly differed in their memory of receiving postcards (Fisher's exact test = 5.87, $p = 0.03$). The majority of respondents who watered their tree (76.2%, $n = 16$) did remember receiving a postcard, while the majority the majority of respondents who never watered their tree (66.7%, $n = 8$) reported never receiving a postcard. Of respondents who had watered and remembered receiving a postcard, the majority (80%, $n = 15$) believed the postcards were helpful in learning how to water their tree and 76.9% ($n = 10$) believed the postcards were helpful watering reminders. There were also some respondents who didn't remember seeing the postcards (23.8%, $n = 5$), but who still watered their tree.

Thirty respondents (24.6%) wrote a comment on the back of the survey and 9 of these respondents (30%) addressed watering, the postcards or the project in general in their comments. Four comments addressed watering, with all but one coming from residents in the treatment group. The first person reported that she was unable to water because she did not have a large bucket with which to carry water to the tree. They thought that this project should have provided a large bucket to residents. A second person reported that she and her husband watered their tree when they watered their flowerbeds because even though they are elderly, they "still try to keep [their] home looking nice for the neighborhood." The third person that commented about watering reported that they had often forgotten to water the tree, but that they had always intended to water it. The only person to comment about watering in the control group reported that they had seen their tree being watered by the city, but started watering the tree themselves when their friend informed the commenter that they were involved in

this study. It was assumed that their friend was in the treatment group, but it's important to note that the treatment group was never informed that they were part of a research study. Study limitations associated with this respondents' comment are acknowledged in the discussion section.

One respondent in the treatment group reported that there were way too many postcards about the tree and that they "found it extremely annoying." Finally, two respondents (both from the treatment group) expressed gratitude for the project in general. One respondent specifically thanked the project team, while the second respondent thanked "whoever took care of the tree."

Discussion

These findings suggest that the outreach intervention may have had a very small impact on residents' watering behavior. While differences in self-reported watering between the treatment and control group were not statistically significant (therefore not supporting Hypothesis 1), differences in average weekly soil moisture were found between the two groups (supporting Hypothesis 2). After controlling for other variables that may impact soil moisture, the multiple linear regressions showed that postcards 3 and 4 had the greatest impact on soil moisture, which partially supported Hypothesis 3. These postcards were mailed when trees had their greatest watering need, as evidenced by a period of high pan-evaporation rates between weeks 6 and 10. Thus, the fact that these postcards had the most impact on soil moisture during this time period likely also had the greatest impact on the health of the trees. However, the regression models for postcards 3 and 4 only predicted between 2-21% of the variance

in soil moisture, meaning the exact impact of the postcards on soil moisture cannot be determined with confidence. A larger sample size of trees would have enhanced the predictive power of the regression analyses. Lastly, we found that there were significant differences in soil moisture between trees that were reported as watered more frequently in only 2 out of the 15 weeks, thereby partially supporting Hypothesis 4. There was no statistically significant correlation between self-reported watering score and soil moisture. Additional research is needed to determine whether self-reported watering aligns with soil moisture. Future research should measure watering behavior on a weekly basis to determine if it is indicative of weekly soil moisture levels.

The results suggest that it took some time for the postcard mailings to be effective for encouraging watering behavior because an impact of the postcard was not observed until week 6. It is likely that it may have taken residents some time to read the postcards and to realize that they were responsible for watering their tree. Figure 2 shows that there were greater differences in soil moisture between the treatment and control group in the first half of the summer, with the treatment group having higher soil moisture levels than the control group until week 11. This trend suggests that the impact of the postcard may have diminished over time, as there were no significant soil moisture differences between the two groups in the later part of the summer. During that later time period, the control group had higher soil moisture than the treatment group. The final survey respondent who wrote to us that the postcards were “annoying” further suggests that the postcards became less effective over time, perhaps because the postcards became repetitive. Although the statistical results suggest the outreach

intervention did not impact watering behavior, the monthly survey results suggest that at least some residents in the treatment group had been watering their trees at the weekly frequency as recommended by the outreach intervention.

This study aimed to use soil moisture data as a way to “ground truth” residents’ self-reported watering behavior from written social surveys. However, there were only 2 weeks in which more frequently watered trees (weekly or biweekly) had significantly higher soil moisture levels than less frequently watered trees. This result is not surprising, given that self-reported watering was not significantly correlated with weekly soil moisture (except in week 2), or with soil moisture in the first and second halves of the summer. Future research is needed to determine whether people’s self-reported watering behavior can be validated with soil moisture data. Our study could be improved by having weekly measurements of self-reported watering behavior rather than the one retrospective measurement of watering behavior that was included on the final survey. “Ground-truthing” or validating residents’ self-reported watering behavior would also require controlling for other biophysical factors that may impact soil moisture at each, such as weekly precipitation.

This study has practical significance for the design of future outreach interventions to encourage residents to water street trees. The strategy of mailing postcards may be most effective if they are delivered immediately prior to when trees’ watering need is expected to be greatest. This would allow residents time to see and read the postcards before the trees are in most need of being watered. Based on the evaluation of the outreach intervention from the final survey, the use of postcards were

effective in helping many residents learn how to water the tree, even though it may have taken them some time to read the materials sent. However, it is not clear that the postcards influenced watering behavior. One comment from the final survey suggested that the postcard did not turn their intention to water into actual watering behavior. One barrier faced by residents in the study may have been the lack of access to water, as was mentioned in one final survey comment. The outreach intervention was unable to address this issue, making the message on the postcards to water the tree ineffective for people who did not have an easy way to water the tree. Future outreach interventions should consider providing buckets or hoses to residents who do not have a way to carry water to their tree.

Another final survey comment suggested an additional way the outreach intervention could be improved. One respondent reported that the project raised their awareness that the city needed residents help to water street trees. However, their comment mentioned it was their friend who informed them of the project, rather than solely the postcards. This suggests that the outreach intervention “treatment” may have spilled over into the control group. The potential spillover may have biased some residents to water their trees as a result of them knowing they were being studied. It is important to note that residents in both the treatment and control groups were never informed that the research team was taking soil moisture measurements at each tree. However, it is possible that the treatment group may have deduced from the monthly watering surveys that their watering behavior was being monitored. Thus, the monthly

surveys could have biased the treatment group, which may have weakened the internal validity of the study.

While spill-over of a treatment is undesirable from a research design perspective, it is a positive outcome from an education and outreach perspective because it may have led to more people becoming aware of the city's tree watering needs. Perhaps the efficacy of the outreach intervention could have been improved if it also included a social component. Recent research has suggested that formal written agreements and monitoring between neighbors may be an effective way to encourage residents to water street trees (Mincey and Vogt 2014). Encouraging neighbors to personally remind each other to water street trees may be more effective than the relatively impersonal postcard reminders distributed in the outreach intervention.

Study Limitations

This study faced four limitations. The first limitation was the small samples of 81 trees and 114 mailing addresses. Limited survey response rates also prevented an accurate report of watering behavior at all trees. These small samples prohibited us from conducting more advanced analyses of soil moisture and watering behavior, as low statistical power prevented us from adding additional biophysical variables that may impact soil moisture to the regression model. The second limitation was that the county-wide measures of precipitation, temperature and pan evaporation, which meant these measures were equal across all of the trees in the study. The lack of variation in this biophysical data prevented us from entering this data as additional independent variables in the regression models; these variables would have been considered

constants and dropped from the models. Future research should collect precipitation, temperature and pan evaporation data at each tree when weekly soil moisture measurements are collected. A third limitation was that the city watering data did not reflect whether each individual tree was watered, or with how much water. Individual tree watering data, including the quantities of water applied to each tree every week, would provide a more accurate account of other sources of water that may impact soil moisture levels at each tree. The fourth limitation was that some members of the treatment group may have known they were being studied due to the monthly surveys asking them about their watering behavior. These surveys may have biased them to water their trees more than they would have otherwise. Future research can reduce the effect of testing on internal validity by also administering the monthly surveys to the control group so that all participants in the study experienced the same “tests” of watering behavior.

Conclusion

This study suggests that postcard reminders mailed weekly may be an effective way for municipal urban forestry programs to remind residents to water street trees using irrigation bags. However, it may take a few weeks for the postcards to have a significant impact, and that impact may diminish over time if the postcards become repetitive or if residents become irritated by the number of mailings. Managers and practitioners interested in replicating the outreach intervention featured in this study should expand the intervention to ensure that residents have a source of water near the trees that need to be watered, such as by providing hoses or buckets. Ensuring that

residents have a way to water newly planted street trees may enhance the effectiveness of postcard reminders to water. Future outreach interventions can also include a social component to encourage residents to remind each other to water their trees.

Researchers interested in isolating the impact of an outreach intervention on street tree watering behavior should conduct the study with a larger sample of trees and mailing addresses in order to have the statistical power necessary to determine the impact of the outreach intervention on participants' behavior.

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CHAPTER 2: THE ECOLOGICAL MODEL OF STREET TREE WATERING: A CONCEPTUAL FRAMEWORK FOR RESEARCH AND COMMUNITY ENGAGEMENT IN URBAN FOREST STEWARDSHIP

Abstract

Due to growing evidence of the health, social and environmental benefits of urban forests, many cities across the US have launched large-scale tree planting initiatives. The maintenance of these newly-planted trees, especially adequate watering, has been cited as a major challenge for the success of tree planting initiatives. In light of limited public funding for the maintenance of trees, cities often rely on residents to help water street trees. However, the settings in which trees are planted may pose barriers (social and physical) to residents' engagement in tree watering. Furthermore, very little research has explored what enables residents to water street trees beyond individual-level factors, such as attitudes toward trees or volunteer motivations. I argue that both research and community engagement in urban forestry need to consider how the social and physical features of the settings where street trees are planted may support or discourage residents to water trees. This paper introduces the ecological model of street tree watering, which was informed by ecological models of behavior from the fields of human development and public health. Ecological models of behavior represent a conceptual framework for understanding how individuals shape and are shaped by their interactions with people, organizations and institutions and available physical resources, as well as by the social norms, culture and public policies that may govern those relationships. The current study first reviews literature in human development, public health and urban forestry that provides the foundation for the ecological model of

street tree watering. Next, data from a pilot study is presented to demonstrate the utility of using the ecological model of street tree watering to explore the factors beyond the individual that may encourage or discourage residents to water street trees. This article concludes with recommendations for future research and community engagement strategies based on the ecological model of street tree watering.

Keywords: street tree watering, ecological model of behavior, urban environmental stewardship

Introduction

Cities across the U.S. have been planting millions of trees in recent years to remediate the environmental and health consequences of urbanization (McPherson and Young 2013). Trees planted along city streets and sidewalks (i.e. “street trees”) provide numerous environmental and health benefits, such as improved air quality and reduced asthma rates (see Wolf and Robbins 2015). However, newly planted street trees face a number of stressors in the urban environment that may prevent their healthy growth and survival. Watering trees in the initial years following planting is especially crucial for street tree survival, and for ensuring that the benefits provided by trees are maximized and sustained. However, many cities lack the staffing and funding to adequately water newly planted trees and thus, rely on residents to help water the trees (e.g. Pincetl 2013). In light of the importance of community involvement in urban forest management (Kenney et al. 2011), many municipal tree planting initiatives have called for residents and volunteers to help care for newly planted street trees (Pincetl 2010; Pincetl 2013; Campbell 2015).

Despite recognition of the importance of community involvement in urban forest management (Kenney et al. 2011), especially in large-scale urban tree planting initiatives, (Pincetl 2010; Pincetl 2013) there is surprisingly little research that has examined the factors that may encourage or discourage residents to care for street trees. Some studies on urban forest stewardship have examined the social and community outcomes of stewardship, such as empowerment (Westphal 2003), collective efficacy between neighbors (Mincey and Vogt 2014) and sense of community (Ryan 2015). Others have examined the relationship between urban forest stewardship and biophysical outcomes for the trees, such as tree survival and growth (Sklar and Ames 1985; Boyce 2010; Lu et al. 2010; Jack-Scott et al. 2013; Mincey and Vogt 2014; Vogt et al. 2015; Roman et al. 2015). However, only three studies specifically examined street tree watering as independent variables. In two of those studies, a collective watering strategy in which groups of residents watered trees together was positively related to tree survival (Mincey and Vogt 2014; Vogt et al. 2015). In a third study, Roman et al. (2015) examined the tree watering practices (frequency of watering, source of water, watering training for volunteers) of two nonprofit organizations in a case study of tree planting projects that achieved high tree survival rates (Roman et al. 2015).

The current study builds on previous research on street tree watering and urban forest stewardship by examining the factors that encourage residents to water street trees. I present an ecological model of street tree watering that depicts factors at intrapersonal, interpersonal, organizational, community and public policy levels that may

encourage or discourage residents to water street trees. The ecological model of street tree watering is based on the ecological perspective from human development and public health, a conceptual framework that has been used to understand the social and environmental determinants of various health behaviors and outcomes (e.g. physical activity) (e.g. Sallis and Owen 2015). The objective of this study was to apply the ecological model of street tree watering to a pilot study that examined the intrapersonal, interpersonal, organizational, community and public policy factors that may shape residents' street tree watering behavior. Recommendations for future research and the implications for community engagement in urban forest stewardship are also discussed.

Social and Environmental Factors that Promote Urban Forest Stewardship

Just as the biophysical and social (human) environment is important for determining tree growth and survival (Roman et al. 2014), the environment surrounding street trees may also shape people's stewardship behaviors. Street trees are part of urban forests, which are recognized as socio-ecological systems that have complex political, cultural, social and physical (built-environmental) features. Vogt and colleagues (2015) describe four categories of variables in urban forest socio-ecological systems that may influence urban forest health. These categories are: 1) the characteristics of the trees (e.g. size when planted), 2) the biophysical environment (e.g. soil conditions), 3) the community (e.g. the socio-economic characteristics of the people, community stewardship groups and volunteers) and 4) the institutions (e.g. rules, norms and shared strategies) that dictate which actors carry out basic urban forest management tasks such as planting, pruning, watering and mulching. While research has demonstrated the

ways urban forest stewardship (and urban environmental stewardship more broadly) positively impacts individuals, communities, natural settings and socio-ecological systems (see Krasny and Tidball 2015 for a review), we know little about how the physical environment, the community and institutional dimensions of urban forest socio-ecological systems shape people's stewardship behaviors, such as watering street trees.

Many social science studies in urban forestry have examined attitudes toward trees or toward characteristics of trees (see Jones et al. 2013 for a review) or urban forestry volunteers' motivations (see Moskell et al. 2010 for a review). Such studies are based on the assumption that individual level social psychological variables (e.g. attitudes) will predict the likelihood that residents will be supportive of, and participate in, urban forest management activities. However, the emphasis on individual-level variables overlooks the ways that the political, cultural, social and physical (built-environmental) dimensions of urban forest socio-ecological systems may shape street tree watering or other stewardship activities. The few studies that have examined the effect of street tree watering on tree survival point to features of urban forest socio-ecological systems that can encourage residents to water street trees. Mincey and Vogt (2014) examined the watering plans submitted by groups of residents in 25 neighborhoods in Indianapolis, IN to a nonprofit organization that provided trees to groups of residents to plant. The authors conducted qualitative interviews with residents and found that the "collective watering strategies" developed by residents entailed signed watering agreements between neighbors, neighbors monitoring each other's

watering behavior and verbally reminding their neighbors to water their trees. This study suggests that the social environment, specifically social norms for watering trees, can support residents' willingness to water trees. However, it is important to remember that the biophysical environment can also affect tree survival despite adequate watering. Vogt et al. (2015) further examined the data from Mincey and Vogt (2015) and found that trees planted in the spring and watered collectively had the greatest odds of survival compared to trees planted in the fall and individually watered. The authors expected to find that trees planted in the fall and watered collectively would have had the greatest survival rates because the trees did not immediately face a warm summer season. They speculated that tree planted in the spring and watered collectively had the greatest survival rates because it was easier for residents following a collective watering strategy to start watering immediately after planting. This study suggests that implementing a watering strategy soon after planting activities may be most effective for ensuring that residents carry out watering (Vogt et al. 2015).

Other ways that the social and physical environment surrounding trees can support residents' ability to water is through the provision of knowledge and physical resources required to properly water trees. Roman et al. (2015) conducted a case study of the features of two tree planting programs that achieved unusually high survival rates relative to tree survival rates in other cities. The two programs in the study included the nonprofit organization Canopy in East Palo Alto, CA (survival rate: 96% after 5.92 years) and the nonprofit University City Green in two neighborhoods in Philadelphia, PA (survival rate: 91% at 6.25 years in Kingsessing and 73% at 6.58 years in Powelton).

The authors found that the training of volunteers and residents in the practice of watering trees, the installation of tree irrigation bags on newly planted street trees and the proximity of a source of water (e.g. fire hydrants) near the trees so that residents could water by hand were important factors (among other types of tree stewardship) that likely contributed to high tree survival rates. The ecological model of behavior from human development and public health can help us to further consider how social and physical dimensions of urban forest socio-ecological systems may shape stewardship activities.

The Ecological Model of Behavior

The ecological model of behavior (EMB) is a conceptual framework originating in the work of Urie Bronfenbrenner (1977; 1979) and adapted for use in public health and the behavioral sciences to understand the interacting factors at various levels of influence that can affect behavior (Sallis and Owen 2015). The ecological perspective of behavior recognizes the interaction between individual and environmental determinants of behavior. In this context, the “environment” means any space outside the person through which a person must navigate (McLaren and Hawe 2005). Ecological models of behavior have progressed from a focus on how people’s perceptions of the environment surrounding them shape their behavior (Lewin 1951) to the ways the social and physical attributes of the settings where behavior occurs (i.e. the behavior settings) directly affects behavior (Barker 1968). The EMB as it’s known today in which an individual is situated within multiple levels of analysis or “influence” emerged from Bronfenbrenner’s (1977; 1979) ecological systems theory, which helped to reveal the ways that

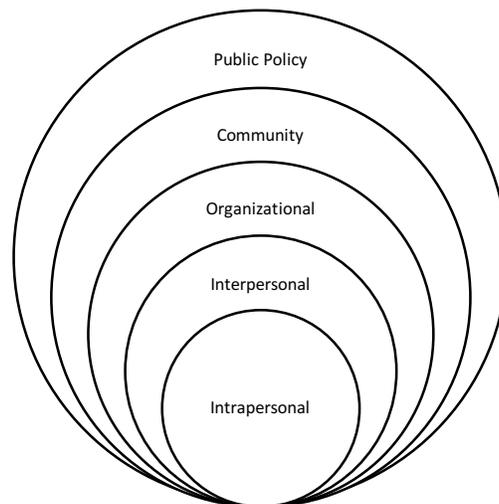
environments can have direct and indirect effects on an individual person.

Bronfenbrenner viewed the individual as nested within multiple environments or systems that influence their development: 1) the microsystem includes a person's immediate settings (e.g. home, work, school); 2) the mesosystem includes interactions between micro systems (e.g. the influence of the home on the child's school environment); 3) the exo-system includes indirect interactions between microsystems (e.g. the influence of the parent's work environment on life in the home); 4) the macro-system encompasses the larger society and culture (e.g. the influence of media).

Ecological systems theory accounts for the ways that environments that are proximal to the individual (e.g. home) and distal (e.g. society) can interact to shape behavior (Bronfenbrenner 1979).

More recently, ecological models have been applied to specific behaviors (e.g. physical activity) to depict how behavior is shaped by individual, environmental and policy determinants (Sallis and Owen 2015). Like Bronfenbrenner's (1977; 1979) ecological systems theory, the EMB depicts the individual as situated within multiple "levels of influence," represented in the model a series of concentric circles (Figure 2.1).

Figure 2.1: The ecological model of behavior (McLeroy et al. 1988; 2003). The individual (intrapersonal level) is nested within interpersonal, organizational, community and public policy levels of influence on their behavior and outcomes.



The intrapersonal level includes individual-level characteristics such as knowledge, attitudes, behavior and encompasses the individual's formal and informal social network and support systems (family, friends, peers). The organizational level includes organizations and social institutions, including their organizational characteristics (e.g. formal and informal rules and regulations for operation). The community level includes two dimensions: 1) the relationships among organizations, institutions and informal networks within defined boundaries (McLeroy et al. 1988) and 2) the attributes of the physical built environment of the community (McLeroy et al. 2003). Finally, local, state and national policies comprise the public policy level. The goal of ecological models is to convey the complex contextual influences on behavior.

Ecological models also help to inform the design of interventions to promote health behavior and behavior change. Interventions informed by the EMB, often referred

to as “multilevel interventions,” may be most effective at promoting behavior change because they simultaneously introduce changes to settings at multiple levels of influence in order to support people’s engagement in healthy behavior (Sallis and Owen 2015). Targeting more than one level in an intervention is important because it is thought to exert a greater influence on behavior (by addressing multiple social and environmental determinants) than by just addressing one level. There is debate about how many levels an intervention needs to target in order to be considered “multilevel,” but interventions have ranged from two or more levels (Nastasi and Hitchcock 2009) to three levels (one individual-level and two levels beyond the individual; Taplin et al. 2012). Multilevel interventions aim to create “health promotive” environments (Stokols 1992) by altering the features of multiple levels of influence in a manner that would synergistically result in changes to settings in ways that would promote positive behavior change and outcomes. The premise of multilevel interventions is that changing the social and environmental context in which behavior occurs is more likely to support behavior change than interventions aimed at individuals alone (Sallis and Owen 2015). Within public health, there is an increasing recognition that the EMB is better suited for understanding health behaviors and outcomes than linear models that aim to predict behavior from individual level variables (e.g. educational attainment, attitudes). Behavior-change interventions informed by the EMB are currently being used to address many different public health issues, such as cancer prevention and the promotion of physical activity to reduce obesity (Buchan et al. 2012; Trickett and Beehler 2013; Schölmerich et al. 2015).

The EMB was recently applied to urban forest stewardship. Moskell and Allred (2013a) developed an ecological model of urban forest stewardship adapted from Sallis et al.'s (2006) ecological model of physical activity. Moskell and Allred (2013a) identified behavior settings in four domains (occupational, parks, home, neighborhoods) as well as the macro-policy and natural environmental factors that may influence stewardship behavior. The current paper updates Moskell and Allred's (2013a) model with a focus on a specific urban forest stewardship behavior: street tree watering.

The Ecological Model of Street Tree Watering

This paper presents the ecological model of street tree watering, which updates the ecological model of urban forest stewardship (Moskell and Allred 2013a) in two major ways. The first update was streamlining the framework of the model to follow the framework of McLeroy et al.'s (1988; 2003) ecological model of health promotion so that model mirrors the same levels of analysis included in ecological models of behavior for other health behaviors and outcomes. Second, the model focuses on just one behavior—street tree watering—which is consistent with the trend in ecological models to be designed for a specific behavior. The original ecological model of urban forest stewardship focused on multiple behaviors, including basic tree care, planting trees, political support for and participation in planning for urban forest programs. Focusing on just one behavior in ecological models has the advantage of later informing behavior-specific interventions tailored to the unique social and environmental determinants of that behavior (Sallis and Owen 2015). Below (Table 2.1) is the updated ecological

model of street tree watering, showing factors at each ecological level as they apply to stewardship.

Table 2.1: The Ecological Model of Street Tree Watering

Ecological Level of Influence	Influencing Factors	Description	Citations
Intrapersonal	Knowledge of and attitudes toward trees	Positive views toward trees may translate to support of UF programs	Lohr et al. 2004; Zhang et al. 2011; Jones et al. 2013
	Knowledge of tree maintenance	Knowledge of how to care for trees is necessary	Rae et al. 2010; Pincetl 2013
	Volunteer motivations related to the environment	Desire to work in nature and to improve community	Austin 2002; Moskell et al. 2010
Interpersonal	Volunteer motivations related to relationships	Urban forestry volunteers indicated social relationships as a motivation for participating in tree planting programs	Moskell et al. 2010
	Social norms	Visible signs of stewardship may serve as indirect social pressure to care for trees	Lu et al. 2010
	Watering agreements between neighbors*	Neighbors with signed agreements to water trees were sanctioned by their neighbors to water	Mincey and Vogt 2014; Vogt et al. 2015
Organizational	Organizational characteristics of nonprofits	The messages an organization uses to recruit volunteers may shape whether people decide to volunteer; characteristics may also impact the retention of volunteers	Moskell et al. 2010
	Planting decisions by nonprofits (where, how)	Nonprofit organizations may only plant trees in certain neighborhoods, thus specific neighborhoods would have trees in need to care	Watkins et al. 2015
		Resident involvement in nonprofit's tree planting process	Sklar and Ames 1985, Boyce 2010, Jack-Scott et al. 2013
	Programs that provide training and support in stewardship	The type and design of programs hosted by nonprofit organizations can facilitate residents taking care of trees	Boyce 2010; Jack-Scott et al. 2013; Mincey and Vogt 2014; Roman et al. 2015

Community Dimension 1: Relationships between organizations, institutions	Social networks of stewardship groups	Strong social networks have brokers who facilitate more opportunities to become involved in stewardship	Andersson et al. 2014; Connolly et al. 2013
Community Dimension 2: Physical built environment	Physical access to water	Ground-level access to water and watering resources (hoses, buckets, tree irrigation bags, fire hydrants) with support from nonprofit organizations facilitates tree watering.	Young 2011; Young and McPherson 2013; Roman et al. 2015
	Visible signs of stewardship	Visual evidence of stewardship (e.g. the presence of mulch, signage (e.g. “curb your dog!”), seating, the absence of litter from the planting bed, on or near the tree) may signal to neighbors that they should also care for their trees	Lu et al. 2010
Public Policy	Public involvement in city tree planting processes	Residents may not feel a sense of ownership over trees they didn’t plant and may be unwilling to steward them because they did not feel included in the process	Sommer et al. 1994; Rae et al. 2010; Moskell and Allred 2013b
* Indicates that watering trees was a dependent variable in the study. All other studies included represent factors that may influence stewardship.			

The factors included in the ecological model of watering street trees are interrelated in many ways. At the intrapersonal level, people’s attitudes toward trees, their knowledge of tree maintenance and their physical ability to actively steward trees may influence their willingness and ability to steward street trees (Rae et al. 2010; Moskell and Allred 2013b; Pincetl 2013). The organizational level encompasses the activities of urban forestry nonprofit organizations. At the community level street tree stewardship practices occur within planting beds built into sidewalks or in tree lawns (sometimes known as public rights of way), which is the space between the street and the sidewalk (Loukaitou-Sideris and Ehrenfeucht 2009). A built environment that supports residents’ ability to easily and safely carry out these actions, such as a ground level source of water near the tree, may increase the likelihood that residents engage in

stewardship (see for example Young 2011). At the interpersonal level, residents may be encouraged or nudged to participate in street tree stewardship due to the relationships they have with their family, friends and peers. These could include direct social pressures, such as reminders from neighbors, (Mincey and Vogt 2014) or due to indirect social pressures, like visual evidence that their neighbors are stewarding their trees and neighborhood social norms related to landscaping (Lu et al. 2010).

The interpersonal level overlaps with the institutional level as groups of people often engage in street tree stewardship together through programs hosted by nonprofit organizations or community groups. Many environmental stewardship volunteers have reported that the desire for social interactions was a motivation for volunteering in formal stewardship programs (see Moskell et al. 2010 and Wolf et al. 2013 for reviews). Aspects of the organizational context of nonprofits or community groups may influence people's willingness to begin and sustain their involvement with these organizations, such as the messages the organization uses to recruit volunteers and how well volunteers are integrated into the organizational culture (see Snyder and Omoto 2008). The organizational level overlaps with the public policy level in that many nonprofit organizations are part of public-private partnerships with government agencies. These partnerships are increasingly employed in urban forestry due to societal shifts in governance such that civil society is increasingly responsible for the delivery of public services, including urban natural resource management (Pincetl 2010; Moskell and Allred 2013b). These governance arrangements may influence the nature of the involvement of nonprofits in street tree stewardship (and thus the engagement of its

volunteers) in that certain neighborhoods may have a higher need for stewardship (Conway et al. 2011; Pincetl et al. 2013; Perkins et al. 2011).

The public policy level manifests itself in the street trees planted by city initiatives. The characteristics of street trees (e.g. species, planting locations) are representative of the city's tree planting policies (Loukaitou-Sideris and Ehrenfeucht 2009). Residents' experiences with and views toward these policies (which may reflect larger governance trends) may have implications for their willingness to steward street trees. For example, not involving residents in the planting process may lead to residents feeling no sense of ownership over the trees (Sommer et al. 1994), not recognizing themselves as responsible for taking care of the trees they didn't plant, and to having no desire to care for tree that they may not have wanted (Moskell and Allred 2013b). Also, residents' may not view themselves as responsible for caring for those trees because they may perceive that the trees are public property and thus, the local government or whoever planted them is responsible for their care (Rae et al. 2011; Moskell and Allred 2013b).

The Current Study

An understanding of the social and environmental determinants of street tree watering behavior may aid cities and urban forestry practitioners in creating settings that physically and socially support residents' ability and willingness to water trees. However, it is first necessary to assess which factors across the levels in the ecological model might impact tree watering by residents. This study applies the ecological model of street tree watering to a pilot study examining the following research question: What

is the effect of various ecological factors (i.e. at intrapersonal, interpersonal, organizational, community and policy levels of analysis) on street tree watering behavior?

Methods

Sampling

This study entailed a survey of residents (N = 114) who were part of a tree watering outreach program implemented in Ithaca, NY (see Moskell et al. 2016 for more information about the program). We conducted a census of the mailing addresses listed at one of the 81 street addresses where the City of Ithaca had planted a street tree between Fall 2011 and Spring 2012. There were more mailing addresses (114) than addresses where a street tree was planted (81) because some of the street trees were planted in front of multi-family homes or apartment buildings; all individual apartments were included in the sample.

Quantitative Data Collection

At the end of the tree watering outreach program, a written mail survey was administered via the Tailored Design method (Dillman et al 2009) to all residents involved in the program. A modified drop-off pick-up method was used for delivery of the survey (Allred and Ross Davis 2010). Prior to the survey, residents were notified of the upcoming survey via a mailed postcard. At the beginning of the following week, surveys were dropped off at residents' addresses in a clear plastic bag hung from the front door of each address (Figure 2.2).

Figure 2.2: Example of a survey drop-off. Surveys and a cover letter were included in a plastic bag hung from the front door of each residence.



The bag included the written survey and a cover letter with instructions to residents to return the survey in the mail (via prepaid postage included on the survey). Surveys were dropped off on two additional occasions (1 week apart) to residences that hadn't yet responded to the survey, resulting in three total drop-offs. After each drop-off, addresses also received a mailed postcard mid-week reminding them to complete and return the survey. By the fourth week, all mailing addresses that had not returned the survey were mailed a final copy of the survey with paid return postage and a final reminder postcard afterwards (see Appendix 2.1 for the survey instrument, cover letter and reminder postcards).

Constructs and Measures: Dependent Variable

The dependent variable, watering behavior, was measured with one survey item that asked residents whether they had watered their tree (yes/no) at any point over the summer in 2012. Previous studies on street tree watering measured watering behavior based on records from non-profit organizations about the watering strategies employed by residents for trees donated by the organization (Mincey and Vogt 2014; Vogt et al. 2015; Roman et al. 2015), but have not included residents self-report watering behavior.

Constructs and Measures: Independent Variables

To test the ecological model of street tree watering, the following independent variables were measured at each of the five levels of the ecological model of street tree watering (Table 2.2).

Table 2.2: Constructs and measures organized by the corresponding level of influences in the ecological model of street tree watering. Citations for each measure are discussed in the text.

Level of the Ecological Model	Construct	Measure	Number of Items	Cronbach's Alpha
Intrapersonal	1. Street tree beliefs	Composite scale of Likert items ¹	5	0.862
	2. Watering behavioral beliefs	Composite scale of Likert items ¹	3	0.898
	3. Watering attitudes	Semantic differential	2	0.717
	4. Lack of free time to water	Likert scale ¹	1	n/a
	5. Lack of knowledge	Likert scale ¹	1	n/a
	6. Lack of physical ability	Likert scale ¹	1	n/a
	7. Lack of money for water	Likert scale ¹	1	n/a
	8. Lack of a desire to water	Likert scale ¹	1	n/a
Interpersonal	9. Social norms	Composite scale of Likert items ¹	5	0.949
Community (relationships between organizations)	10. Responsibility for watering	Categorical	1	n/a
Community (physical environment)	11. Lack of access to water	Likert scale ¹	1	n/a
Public policy	12. Procedural fairness of city planting	Citizen influence scale ¹	4	0.883
		City communication scale ¹	2	0.818
¹ All Likert items were rated on a 5 point scale (1 = strongly disagree; 5 = strongly agree)				

There are twelve independent variables. Scales to measure six of the constructs were developed via principal components analysis (PCA). For an overview of measurement development and details for PCA results, refer to Appendix 2.2. The remainder of the results section is organized by the levels of influence in the ecological model of street

tree watering, with each subsection describing measures for the constructs pertaining to each level.

Constructs at the Intrapersonal Level

There were seven constructs at the intrapersonal level.

Street Tree Beliefs (Variable 1)

Street tree beliefs were measured with nine Likert scaled items (1 = strongly disagree; 5 = strongly agree). Street tree beliefs are defined as what people hold to be true about the benefits street trees provide. Items were adapted from previous studies of people's attitudes toward street trees (Lohr et al. 2004; Heimlich et al. 2008).

Principal components analysis (PCA) yielded a one factor solution explaining 67.03% percent of the variance and resulting in a five item summative scale. The Cronbach alpha of 0.862 indicates strong internal consistency (Table 2).

Watering Behavioral Beliefs (Variable 2)

Three Likert-scaled items (1 = strongly disagree; 5 = strongly agree) measured behavioral beliefs about watering, which are defined as the outcomes people expect from performing a behavior (Fishbein 2008), in this case the outcomes associated with watering street trees. All three items loaded onto one factor in a PCA with 84.9% total variance explained and resulting in a summative scale. The reliability of this scale is 0.898 according to the Cronbach alpha.

Street Tree Watering Attitudes (Variable 3)

Attitudes toward watering street trees were measured with three semantic differential items which rated the degree of pleasure (1 = unpleasant – 5 = pleasant),

difficulty (1 = easy – 5 = hard), and benefits (1 = harmful – 5 = beneficial) associated with watering, on a five-point scale. Street tree attitudes differ from street tree beliefs in that attitudes represent the evaluation of street trees with a degree of favor or disfavor whereas beliefs represent what a person holds to be true about street trees (Heberlein 2012). A PCA yielded a one-factor solution explaining 78.3% percent variance and a summative scale with two items: "street tree watering is 1) unpleasant – pleasant and 2) easy – hard (Cronbach's 0.717).

Other Individual Characteristics: (Variables 4 – 8)

The remaining four constructs – a lack of 1) free time, 2) physical ability, 3) money and 4) desire to water – were all measured by single items. These constructs measure perceptions of barriers to watering that manifest at the individual level (e.g. a person's sense of the time they have to water the tree). The question asked "did any of the following prevent or hamper you from watering the tree?" Reverse coding was not necessary (5 = strongly agreed they lacked one of the constructs). These constructs were measured on five point scales (1 = strongly disagree, 5 = strongly agree).

Constructs at the Interpersonal Level

Social Norms for Watering (Variable 9)

This construct was measured with five Likert scaled items (1 = strongly disagree; 5 = strongly agree). Example items were "watering the new street tree is important to my neighbors" and "the people in my household think it is important that I water the new street tree." All five items loaded onto one factor in a PCA which explained 84.4 percent of the variance. The Cronbach's alpha of the resulting scale was 0.949.

Constructs at the Community Level

Responsibility for Watering (Variable 10)

This construct pertains to the ecological model the community level, specifically the relationships between residents, city government, nonprofit organizations and their volunteers. Responsibility for watering was measured via one question, which asked “which groups should be responsible for carrying out the task of watering street trees in Ithaca?” Respondents could select any combination of the following groups: 1) local government, 2) nonprofit and volunteers or 3) residents. A categorical variable was created using the following values: 1 = residents only, 2 = residents share responsibility with another group, 3 = only another group. This measure was informed by Moskell and Allred’s (2013b) study of residents’ beliefs about which groups should be responsible for the stewardship of street trees and park trees.

Access to Water (Variable 11)

There was one measure for the construct access to water, which relates to the physical/built environmental dimension of the community level of the ecological model. One survey item asked whether lack of access to water prevented or hampered the respondent from watering the tree. Lack of access to water was assessed on a 1 – 5 Likert scaled item (1 = strongly disagree; 5 = strongly agree). The question was worded as “lack of access” so reverse coding was not required (i.e. a score of 5 meant they strongly agreed they lacked access).

Constructs at the Public Policy Level

Fairness of Tree Planting (Variable 12)

Eleven items measured the fairness of tree planting at the public policy level of the ecological model. Items were adapted to the context of street tree planting from Lauber and Knuth's (1999) study of the procedural fairness of moose management. PCA yielded two factors: "citizen influence" (Cronbach's alpha = 0.883) and "city communication (Cronbach's alpha = 0.818), which each explained 50.58 and 32.15 percent variance, respectively. The citizen influence scale included three items (1 = strongly disagree, 5 = strongly agree): 1) "I had no chance to tell the City of Ithaca about my preferences about planting the new street tree (reverse)," 2) "I did not have any input into the City's decision to plant the street tree (reverse)," and 3) "I had limited influence over the City's decision to plant the street trees (reverse)." The "city communication" scale included two items "I was well-informed by the City of Ithaca about the new street tree being planted in the first place and "I was well-informed by the City of Ithaca about how to care for the newly planted street tree."

Data Analysis

This research investigates the effect of multiple ecological factors (i.e. at the interpersonal, interpersonal, organizational, community, and policy levels of analysis) on street tree watering behavior. For the factors at the intrapersonal, interpersonal, community and public policy levels of analysis, independent samples t-tests were used to examine differences in the means of the independent variables between the group that watered and the group that did not water their trees. The effect of the variable

“responsibility for watering” at the community level of the ecological model on watering behavior was analyzed with a cross-tabulation and Fisher’s Exact Test (due to cell counts < 5). A binomial logistic regression could not be used to predict watering (yes/no) because the number of responses for the dependent variable in this study is less than 100, which is inappropriate for logistic regression (Long et al. 1997). Another reason why multiple regression analyses could not be used was this study would have required 120-180 cases (based on a rule of thumb of 10 – 15 cases per independent variable) in order to enter all 12 independent variables into a model to predict watering behavior.

Qualitative Data Collection and Analysis

A blank page on the back of the survey asked residents to provide any additional comments. Many residents hand wrote comments on this page that related to watering behavior or to ecological factors related to watering. Respondents’ open-ended survey comments were included in this study because they provide additional detail regarding the factors that support or discourage residents to water trees. Each comment was coded using an *a priori* coding system based on the definitions of the levels of influence in the ecological model of behavior (see Figure 2.1). Each comment was assigned one code based on the ecological level captured by the comment. Comments about issues not related to watering were excluded

Results

Survey Response Rate and Descriptive Statistics

There were 45 respondents (N=114) to the final survey, for a response rate of 39.4%. The majority of respondents were non-Hispanic (97.4%, n = 38), white (87.2%,

n= 34) and aged 55 and older (52.4%, n = 18), with an income \$50,000 or more (65.7%, n = 23). The majority of these respondents were homeowners (73.8%, n = 31). The majority of respondents had watered their tree at least once that summer (63.2%, n = 24). We did not conduct a formal non-respondent bias test; however, a non-response bias check comparing survey response rate and building type found marginally significant differences between respondents and non-respondents ($p = 0.085$). The majority of non-respondents (57.1%) and refusals (66.7%) came from residents of apartment buildings whereas the majority of respondents (60%) resided at single-family homes.

Ecological Factors

There were significant differences between the group that watered and didn't water for factors at multiple ecological levels (Table 2.3).

Table 2.3: Differences in constructs of the ecological model of behavior between the group that watered and didn't water

Level of the Ecological Model	Construct	N	Mean ^a		t	df	p-value
			Watered	Didn't water			
Intrapersonal	1. Street tree beliefs	36	4.58	3.62	-3.25	15.71	0.01***
	2. Watering beliefs	37	3.10	4.41	-3.70	23.20	0.00***
	3. Watering attitudes	34	3.11	2.37	-1.71	32.00	0.10*
	4. Lack of free time to water	34	2.11	2.74	1.07	32.00	0.29
	5. Lack of knowledge	35	1.43	2.53	1.71	18.03	0.10*
	6. Lack of physical ability	36	1.18	2.42	2.13	17.27	0.05**
	7. Lack of money for water	35	0.97	2.09	1.87	14.99	0.08*
	8. Lack of a desire to water	35	1.17	2.97	3.62	16.55	0.00***
Interpersonal	9. Social norms	30	3.25	2.18	-2.30	28.00	0.03**
Community (Built environment dimension)	10. Lack of access to water	35	3.41	2.08	2.10	33.00	0.04**
Public Policy	11. Citizen influence	35	2.75	1.62	-2.64	32.3	0.01***
	12. City communication	36	3.91	2.46	-2.72	19.35	0.01***

^a Means can be interpreted on a 1 = strongly disagree to 5 = strongly agree scale
*** p < 0.001, ** p < .05, *p < 0.1

At the intrapersonal level, the waterers had significantly stronger beliefs about street trees and watering. The group that watered held more positive attitudes about watering than did the non-waterers, but this difference was only marginally significant. The non-waterers were in stronger agreement that they lacked knowledge that the tree

needed to be watered and lacked money to water, but the differences between the two groups was only marginally significant. There was no difference between the groups in terms of their lack of free time to water. One significant difference between the two groups was that the non-watering group more strongly agreed that they lacked a physical ability to water.

At the interpersonal level, the waterers had significantly stronger agreement that there were social norms related to watering among the people in their household and their neighbors than did the non-waterers. At the community level, the group that watered also more significantly agreed that they lacked access to water than waterers. At the public policy level, the group that watered more strongly agreed that citizens have influence in the city’s tree planting process and that the city communicated about planting and watering trees than the group that didn’t water. For the construct “responsibility for watering” at the community level, the majority of residents who watered believed that residents have some level of responsibility in watering. However, the majority of respondents (72.7%) who believed that residents have no responsibility, did not water their tree (Table 2.4).

Table 2.4: Respondents views toward residents’ responsibility for watering (construct pertains to community level of the ecological model)			
	Didn’t water (n = 14)	Watered (n = 21)	Total (N = 35)
Residents have sole responsibility	12.5% (1)	87.5% (7)	8
Residents share responsibility	31.3% (5)	68.8% (11)	16
Residents have no responsibility	72.7% (8)	27.3% (3)	11
Fisher’s Exact test = 7.479, p = 0.02			

Qualitative Findings about Ecological Factors and Watering

Sixty-four percent of respondents (n = 29) wrote a comment on the back of the survey; ten of the comments were relevant to ecological factors in the ecological model of street tree watering (Table 2.5). The other comments pertained to residents' complaints about trees previously planted by the city of Ithaca, which was not relevant to this study. At the interpersonal level, one person commented that they only started watering their tree after a friend told them, rather than after receiving communication from the research team about their tree's watering needs. Regarding the dimension of the built environment at the community level, one respondent spoke to the challenge of lacking a way to transport water to the tree. Regarding the relationship between organizations and institutions at the community level, four respondents commented about the entities that should be responsible for watering trees. At the public policy level, respondents commented about their desires for being involved in the city's tree planting process, such as in the decision of which species of tree are planted and where.

Table 2.5: Respondents comments as they relate to factors in the ecological model of street tree watering

Ecological Level	Factor	Quote (Respondent Identification # from Survey)
Interpersonal	Social norms for watering	1. “Before I knew that the tree (+ we!) were involved in this study (a friend told us), I thought the city was taking full responsibility for watering. When we found out that we shared that responsibility, we started doing that more often.” (#101)
Community (Built environment)	Physical access to water	1. “I think [a bucket] should be provided. If it is, I would make time to water the tree next summer. Only takes 10 minutes I’m sure, but I didn’t have any large containers to make several trips outside.” (#35)
Community (Relationships between groups)	Responsibility for watering	<p>1. “The sidewalks are property of the city, with the trees, so the city should be in charge of them. Having volunteer groups helping is a great idea to take the burden off the city but it is the city’s responsibilities in the end.” (#204)</p> <p>2. “City property city trees! They should take care of them!” #38)</p> <p>3. “Residents tend the trees willingly, but my understanding is that the tree lawn belongs to the city. I do not think residents should be required to take care of trees and the tree lawn. We can be encouraged to help.” (#39)</p> <p>4. “I was happy to water the tree until I got a notice from the city water department that my water usage had spiked. And the water bill spiked too. If the city wants a public good like street trees, it needs to pay for it instead of once again asking residents to pay for it separately and in addition to the taxes we already pay...communication is vital.” (#75)</p>
Public Policy	Citizen involvement in tree planting process	<p>1. “While I appreciate the city planting the new tree to replace the old one that was dying, it would have been nice to be asked why type of tree we would like.” (#43)</p> <p>2. “I would not have chosen this tree...I would much prefer a local native tree to the Chinese tree that was planted in June. I would like a tree to survive/thrive and would prefer a large tree instead of this tiny one.” (#62)</p> <p>3. “I also wish the city told me they were planting beforehand. It just appeared one day with a door tag. I am removing some unnecessary sidewalk and it could have been placed a bit differently.” (#103)</p>

Discussion

We have presented the ecological model of street tree watering as a framework for understanding the influencing factors beyond the individual level of analysis that may shape street tree watering behavior. In line with previous research that has examined how individual level variables, such as attitudes toward trees, may shape stewardship behavior (e.g. Johnson et al. 2013), we also found that factors at the individual level of analysis may affect watering behavior. For example, we found that residents who watered street trees had stronger street tree beliefs, watering beliefs and watering attitudes than did residents who did not water their trees. We also found that residents who did not water more strongly agreed that they lacked free time, knowledge, physical ability, money and desire to water than did residents who had watered. The ecological model of street tree watering presented in this article extends the focus from individual-level psychological variables that may shape watering behavior to factors that extend beyond the individual to encompass interpersonal, organizational, community and public policy levels of analysis. For example, quantitative and qualitative data presented in this study shows that social norms (at the interpersonal level of analysis) and lack of physical access (at the built environment dimension of community level of analysis) to water may also influence watering behavior. For example, the finding that the waterers more strongly agreed that watering was important to their neighbors and people in their household is consistent with previous research that demonstrated the power of social norms in motivating people to water street trees (Mincey and Vogt 2014). Also, the finding that non-waterers more strongly agreed that they lacked access to water is not

surprising, given that people cannot water the tree if they do not have a source of water close to the tree. A comment from one respondent (#35) also suggested that having a way to transport water to the tree, such as with a bucket or hose, is also necessary for watering a tree.

Findings from this pilot study point relationships between organizations within a community (at the community level of analysis) may also shape watering behavior. For example, residents who watered believed that they shared some responsibility for watering street trees with nonprofit organizations and local government. This result differs from Moskell and Allred (2013b), who found that many New York City residents did not believe that they should be responsible for caring for trees planted by local government (Moskell and Allred 2013b). At the public policy level of the ecological model of street tree watering, results suggest that the residents' perception of the fairness of the city's tree planting process may also influence residents' willingness to water street trees. More specifically, residents' perceptions that they have influence in the tree planting process (e.g. the chance to select the species that is planted), and that the city clearly communicates to residents about the planting of the tree and how to care for it, may affect residents' willingness to water street trees. The following discussion lays out an agenda for future research that can build upon the strengths of this pilot study, as well as address the limitation of the current study.

Implications for Future Research

The ecological model of street tree watering presented in this study sets forth an agenda for future research on constructs at the intrapersonal, interpersonal,

organizational, community and public policy levels of analysis that may affect resident's willingness and ability to water street trees. A better understanding of the effect of each of the multilevel constructs throughout the ecological model would build the path for future research that examines the relationships between constructs at multiple levels of influence on watering behavior. One strength of the ecological model of street tree watering is that it provides a conceptual framework in which to integrate other theories to provide a more comprehensive understanding of street tree watering behavior (Sallis and Owen 2015). For example, one line of future research could further explore the role of social norms on watering behavior while another line of research could just explore the role of the procedural fairness of municipal tree planting processes on watering behavior.

Gaining a stronger understanding of each level of the ecological model of water behavior would provide the foundation for research studies that fully test the ecological model of street tree watering. Multivariate analyses were beyond the scope of this study due to a small sample size, but such analyses are critical for understanding the relationships between constructs at the intrapersonal, interpersonal, organizational, community and public policy levels of analysis and the ways in they affect watering behavior. Quasi-experimental or experimental research is needed to better determine the causal relationships between the constructs in the ecological model and watering behavior. Experimental designs can improve the internal validity of future studies by manipulating independent variables at one or more of the levels of analysis in the ecological model of street tree watering. For example, citizen influence in city's tree

planting processes (e.g. the opportunity to select the species of tree that is planted), physical access to water (e.g. via a hose or bucket), or signed watering agreements between neighbors could be randomly assigned to treatment and control groups. Such designs would achieve stronger internal validity than the current study by examining interactions between constructs at different levels of analysis. It is likely that factors at one level of analysis (e.g. physical access to water) may moderate the relationship between intrapersonal constructs (e.g. attitudes toward watering, street tree beliefs) and watering behavior. Furthermore, sense of ownership of a tree (at the intrapersonal level) may mediate the relationship between participation in a city's tree planting process level (at the public policy level) and watering behavior. These types of multilevel studies would provide a more holistic understanding of what dimensions of the socio-ecological system shapes residents' watering behavior.

One strength of this study is that reliable scales were developed to measure street tree beliefs, behavioral beliefs about watering, social norms for watering and procedural fairness of a city's tree planting process. While these scales had high internal consistency, test-retest reliability might also be assessed to further validate the scales. One way to further validate the scales and to strengthen the external validity of research that utilizes the scale is to test them in more diverse populations than was included in the current study. The study population here was relatively homogenous in terms of race and ethnicity. Previous research has found differences in attitudes toward trees (see Fraser et al. 2000), so testing the scales with more diverse populations would

be important for validating the scales across groups that may have different relationships to or views of trees.

Limitations of The Current Study

A main limitation of this study is weak internal validity because this research entailed a non-experimental design, meaning that this study cannot conclude that any one of the examined constructs has an effect on watering behavior. Additional study limitations included threats to construct validity. Mono-operation bias was an issue for the seven independent variables that were only measured with one item. At the intrapersonal level of the ecological model, these variables included lack of free time to water, knowledge about watering, physical ability, money and desire to water. Additional items can be developed to measure these constructs. For example, additional survey items about these constructs could be worded as statements (e.g. “I have enough money to pay to water the street tree”) rather than worded as questions as they were in this study (i.e. did the lack of “the construct” prevent you from watering?). The construct “responsibility for watering” at the organizational/community levels of the ecological model could also be measured with additional Likert items (e.g. “I believe residents are solely responsible for watering street trees planted by the city.”) Another response option in addition to residents, the city and nonprofits and volunteers could have been landlords or property owners.

The construct “lack of access to water” at the community level of the ecological model could also be measured with additional items. For example, asking whether residents have access to an outdoor spigot, a hose and a bucket can assess whether

people's residences are equipped with the physical resources necessary for watering trees. Houses or apartment buildings could also be visually inspected from the site where the street tree is planted to check if there is an outdoor spigot from which a hose could plausibly be run to the tree. However, such a visual assessment may be difficult because it may not be possible to see a spigot from the sidewalk and furthermore, a city employee or researcher likely cannot step foot on the private property to fully assess whether a spigot exists or not.

Furthermore, the face validity of the construct "lack of access to water" along with "lack of physical ability to water" could be improved. Some respondents who may not have had the physical resources to water the tree (e.g. an outdoor spigot, a hose, a bucket) could have said they did not have the physical ability to water the tree. The original intention of the "lack of physical ability" question was to assess whether people were able-bodied to water the tree, but residents who live on the upper floors of apartment buildings, for example, could have also said they lacked the physical ability to water trees if they also lacked ground level access to a source of water. Wording these constructs as statements can improve their face validity (e.g. "I am unable to find a way to transport water to the tree," "I do not have ground-level access to a source of water.")

A weakness of this study was mono-operation bias for the dependent variable watering behavior, which was only measured with one survey item. The sole self-report measure of watering behavior was problematic because respondents may have reported they watered due to social desirability. Also, the self-reported data may have been inaccurate because people may have forgotten whether they had watered over the

course of the summer. More frequent measures of watering behavior, such as on a weekly basis, rather than a one-time measure may have been more valid. Future research should measure watering behavior with more than one construct to address mono-method bias. For example, an observational tool could be developed to monitor whether tree irrigation bags are filled with water at a certain number of time points each week. City foresters, interns or volunteers could be trained in how to carry out the observational tool. Tree irrigation bags could also be equipped with sensors to monitor the water levels in the bag to achieve an objective measure of watering behavior.¹ Future research could also refine the methodology of Moskell et al. (2016) to “ground-truth” or validate self-reported watering behavior by correlating it to the objective soil moisture measurements taken at each tree. Moskell et al.’s (2016) methodology could be refined by also monitoring rainfall at each tree in order to control for other sources of water besides residents watering the tree.

Another direction for future research is to conduct qualitative studies that can capture the emotional aspects of stewardship. Watering and caring for trees to remember loved ones or to commemorate recovery from natural disasters. we know that urban environmental stewardship has many deeper personal, civic and cultural meanings that may not be easily predictable (Wolf et al. 2013; Krasny and Tidball 2015). Subjective details about the meanings associated with tree stewardship may be lost in quantitative research, but may be important for understanding what motivates people to water street trees. Qualitative research can also provide deeper

¹ I am not sure such technology exists, but I imagine “water sensors” have been invented for some other use that could be applied for this purpose.

understanding of how people's lived experiences with trees in specific contexts may shape their motivation and ability to steward trees; this level of detail has not been achieved in previous research on attitudes toward trees (Coles et al. 2013). Context-dependent knowledge is also important because the ecological model of street tree watering could include different factors in different community contexts. Combining quantitative and qualitative approaches can create breadth and depth of understanding about street tree stewardship. Qualitative research can help inform the operationalization of dependent variables to measure stewardship such that they are "concrete, vivid and situation-specific," (Kuo 2002, p. 342), which would improve the design of the above mentioned experimental and quasi-experimental avenues for future research.

Implications for Community Engagement in Urban Forestry

The ecological model of street tree watering can be considered as a conceptual framework for designing community engagement processes that account for factors at the interpersonal, organizational, community and public policy levels of influence that may support residents' ability to water street trees. It is plausible that community engagement approaches that address factors across these levels may be more effective for engaging residents in street tree watering than programs or strategies that only intervene at one level of analysis. The ecological model of street tree watering also points to dimensions of behavior settings that policy makers or urban forestry practitioners may be able to alter in order to encourage residents watering behavior. For example, involving nearby residents in the tree planting process and/or giving those

residents hoses or buckets may be easier things to change than individual level factors, such as residents' attitudes toward trees or knowledge about the importance of watering (Kuo 2003; Heberlein 2012). Conceptualizing community engagement strategies as multilevel interventions that address multiple dimensions of behavior settings may create "stewardship supportive" settings that encourage residents to water street trees.

Even though multilevel interventions are one of the main principles of the ecological model of behavior from public health, it is worth noting that multilevel interventions for addressing various health issues have faced major obstacles related to the logistics of coordinating intervention components across multiple levels of influence, especially at the organizational, community and public policy levels (see Golden et al. 2012 and Schölmerich et al. 2015 for reviews). Scholars have recently called for multilevel interventions to be designed based on the complementarity principle, which argues that introducing a change at one level may leverage a change at another level. This would reduce the number of levels that would need to be targeted in an intervention (Schölmerich et al. 2015). In the context of street tree watering, providing residents with free buckets or hoses to address the built-environment dimension of the community level, may increase residents' personal motivations to water trees at the individual level. Additionally, a city may be able to leverage residents' motivation to water street trees if they involved residents in deciding which tree species the city plants outside their residence. Resident's involvement in the tree planting process may enhance their sense of ownership over the tree (Sommer et al. 1994) which may encourage them to care for the tree.

Conclusion

The watering of newly planted street trees is critically important for trees' establishment and survival and ultimately for the provision of the health and environmental benefits provided by street trees. Given that cities are likely going to continue to depend on residents to help water street trees, it is important to understand what factors encourage residents to water street trees. The pilot study data presented in this article points to variables at interpersonal, organizational, community and public policy levels of analysis that may affect residents watering behavior. The essence of the ecological model of street tree stewardship is that it can help guide researchers and practitioners to explore how the physical and social attributes of the settings where street trees are planted can best support residents to water street trees. Future research based on the ecological model of street tree can further our understanding of how the settings where trees are planted can better support people's ability and willingness to water street trees. The ecological model of street tree watering can also inform strategies for community engagement that address the multiple levels of influence on watering behavior. Such an approach may better encourage residents to water street trees than just focusing on changing attitudes toward trees or raising awareness about watering alone.

Appendix 2.1: Survey Materials

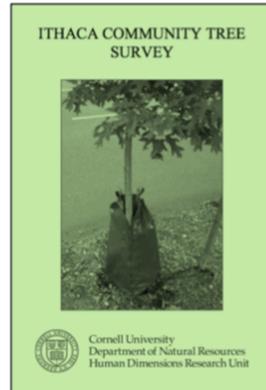
Survey Notification Postcard

Upcoming Community Tree Survey

Next week, we will be dropping off a questionnaire at this address. This questionnaire will ask about your opinions toward trees planted near this property, and about your opinions toward the management of trees planted throughout Ithaca. Your participation in this survey will help improve tree planting and management in Ithaca.

The questionnaire will include free return postage. Once it is filled out, you can just drop it in your mailbox.

We thank you in advance for taking a few minutes to fill out the questionnaire.



This is an image of the front cover of the questionnaire. We will drop it off at your mailbox or front door in a clear plastic bag.

You were selected for this survey because the City of Ithaca planted a tree in front of or near this address in the past year.



Cornell University
Cooperative Extension

Dept. of Natural Resources
122 Bruckner Hall, C. Moskell
Cornell University
Ithaca, NY 14853

Survey Cover Letter

ITHACA COMMUNITY TREE SURVEY

Research conducted by the
Human Dimensions Research Unit, Department of Natural Resources
Cornell University

Dear Ithaca City Resident,

You were selected to participate in this survey because the City of Ithaca planted a new street tree outside your residence in the past year.

The purpose of this survey is to learn about your opinions toward trees planted along streets (street trees) in the community and about your views toward the role that different actors, such as local government and non-profit organizations, should play in street tree management in the City of Ithaca. You will also be asked questions about factors that may shape your views toward street tree management, such as your general environmental attitudes and political ideology. We also want to learn about whether you watered the tree, and if so what that experience was like, and if you did not, what the barriers were.

Cornell University is conducting this survey to provide urban forest managers with important information about residents' views toward street tree management in their community. This information will be used to guide decisions about community tree planting and management in Ithaca.

Please complete this questionnaire as soon as you can, seal it with the white re-sealable label provided, and drop it in any mailbox; return postage has been paid. Once you complete the survey, you will not receive any follow-up reminders. Your participation in this survey is voluntary, but we sincerely hope you will take just a few minutes to answer our questions. Your identity will be kept confidential and the information you give us will never be associated with your name.

Sincerely,



Christine Moskell
Graduate Research Assistant
Dept. of Natural Resources

THANK YOU FOR YOUR HELP!

Survey Reminder Postcard

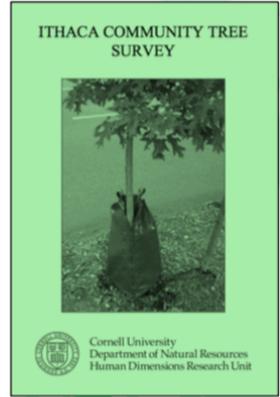
Please fill out the community tree survey!

Dear Ithaca City Resident,

Earlier this week, I dropped off a survey at your address. This survey asks about your attitudes toward a tree that was planted in front of or adjacent to your property in the past year, and about your attitudes toward trees planted throughout Ithaca.

If you have already completed the survey, please accept our sincere thanks! If not, I encourage you to complete the survey. Your participation in this survey can help to improve the management of trees planted in the city. It is only by asking people to share their insights that we can learn about residents' views toward the trees planted in their community. As a reminder, your responses are voluntary and will remain confidential. Thank you for your participation!

Christine Moskell
Graduate Research Assistant
Dept. of Natural Resources, Cornell University



This is an image of the front cover of the questionnaire. It was dropped off at your mailbox or front door in a clear plastic bag.

Dept. of Natural Resources
122 Bruckner Hall, C. Moskell
Cornell University
Ithaca, NY 14853

You were selected for this survey because the City of Ithaca planted a tree in front of or near this address in the past year

 Cornell University
Department of Natural Resources
Human Dimensions Research Unit

 Cornell University
Cooperative Extension

Appendix 2.2: Measurement Development

Six constructs in this study involved principal components analysis (PCA).

PCA is a type of exploratory factor analysis which is used to explore the underlying dimensions of the data. PCA informs the development of scales to reduce the number of questionnaire items to a cluster or “factor” that represents related variables (Vaske 2008). PCA was conducted for three constructs at the intrapersonal level of the ecological model, the only construct at the interpersonal level and both of the constructs at the public policy level. Varimax rotation was used for all PCAs in order to achieve simple structure such that each variable loads highly onto one factor. A simple structure aids in the interpretation of the factor (Hair et al. 2009). The appropriateness of factor analysis for these data was assessed using two statistical tests. First, a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy assesses the degree of intercorrelation among the variables (Hair et al. 2009) and the power of the items to represent the concept being measures (Perry and Roberson 2002). Second, the Bartlett test of sphericity measures the presence of correlations among the variables (Hair et al. 2009). A KMO measure > 0.5 and a significant Bartlett test are required for factor analysis (Hair et al. 2009). Item loadings represent the correlation between variables.

Because this is a pilot study, the sample size is small ($n = 45$); item loadings must be high (i.e. > 0.75) for a sample of 50 (Hair et al. 2009). de Winter et al. (2009) recommends that studies using factor analysis for samples less than 50 requires “well-conditioned” data, that is high factor item loadings, a low number of factors and a high number of variables. Other criterion for retaining factors in factor analysis include

eigenvalues > 1 (Fabrigar et al. 1999) and at least 50% cumulative variance explained (although the more is better) (Beavers et al. 2013). KMO measures, Bartlett tests, item loadings, variance explained and descriptive statistics are presented in tables for each PCA. Scales were created for each factor by averaging the scores of each item within the factor. Cronbach's alpha was calculated for each scale to measure reliability. The below sections are ordered by the construct numbers from Table 2.2.

Street Tree Beliefs (Variable 1)

Nine Likert-scale questionnaire items measured street tree beliefs (Table 2.6)

Table 2.6: Original items measuring street tree beliefs

Item #	Item wording
1	I consider trees important to my quality of life
2	Street trees enhance the value of the property where I live
3	Street trees enhance the character of the community.
4	Street trees make my neighborhood look beautiful.
5	Shade from street trees helps to cool my surroundings in the summertime.
6	Street trees provide nice views from my windows.
7	Street trees attract the types of wildlife I enjoy.
8	Street trees in my neighborhood help me to feel more calm.
9	Street trees help to keep the air clean where I live

Three PCAs were conducted in order to arrive at a component matrix in which item loadings were > 0.75. Items with loadings < 0.75 were removed in the first and second PCA. The first PCA had three item loadings that did not pass the 0.75 threshold for studies with sample sizes of 50. Those items were removed and a second PCA was conducted which extracted a 5 component solution which passed the item loading threshold and all other requirements for PCA. These five items are a reliable scale (Cronbach's alpha = 0.862) (Table 2.7).

Table 2.7: Item loadings and ratings of items retained in street tree beliefs factor analysis

Item #	Item	Corrected Item-Total Correlation	Factor Loadings	Mean	SD
1	I consider trees important to my quality of life	0.77	0.88	4.56	0.83
2	Street trees enhance the value of the property where I live	0.66	0.78	4.40	1.00
4	Street trees provide nice views from my windows.	0.74	0.78	4.12	0.64
6	Street trees attract the types of wildlife I enjoy.	0.75	0.82	3.60	1.10
7	I consider trees important to my quality of life	0.77	0.84	4.56	1.29
KMO = 0.735, Bartlett Test p = 0.00 Eigenvalue = 3.352, Total and cumulative variance explained = 67.03%					

Watering Behavioral Beliefs (Variable 2)

In a PCA, the three Likert items measuring behavioral beliefs loaded on one factor that comprised a reliable scale (Cronbach's alpha = 0.898) (Table 2.8).

Table 2.8: Item loadings and ratings of items in watering beliefs factor analysis

Item #	Item	Corrected Item-Total Correlation	Factor Loadings	Mean	SD
1	My watering the new street tree will help it to grow	0.85	0.94	4.12	1.15
2	My watering the new street tree will enhance its survival	0.84	0.94	4.16	1.16
3	Watering the new street tree is important to me	0.75	0.88	3.46	1.51
KMO = 0.725, Bartlett Test p = 0.000 Eigenvalue = 2.547, Total and cumulative variance explained = 84.89%					

Watering Attitudes (Variable 3)

Attitudes toward watering street trees were measured with three semantic differential items which rated the degree of pleasure (unpleasant – pleasant), difficulty (easy – hard), and benefits (harmful – beneficial) associated with watering on a five-point scale. PCA first produced a three item factor. However, the item “benefits (harmful-beneficial)” was removed because its item loading was < 0.75 . In a second PCA, one factor was extracted with the remaining 2 items; these items represent a reliable scale (Cronbach’s alpha = 0.717) (Table 2.9)

Table 2.9: Item loadings and ratings of items in watering attitudes factor analysis

Item #	Item “Watering the street tree is...”	Corrected Item-Total Correlation	Factor loadings	Mean	SD
1	Unpleasant – pleasant	0.57	0.89	4.23	1.77
2	Hard – easy	0.57	0.89	3.91	2.08

KMO = 0.5, Bartlett Test = 0.000
Eigenvalue = 1.566, Total and cumulative variance explained = 78.315%

Social Norms for Watering (Variable 9)

All five original items measuring social norms for watering were retained in a PCA. These five items comprise a reliable scale (Cronbach’s alpha = 0.949) (Table 2.10)

Table 2.10: Item loadings and ratings of items in social norms for watering factor analysis					
Item Number	Item	Corrected Item-Total Correlation	Factor loadings	Mean	SD
1	Watering the new street tree is important to my neighbors	0.91	0.95	2.81	1.27
2	My neighbors think that it is important that I water the new street tree	0.91	0.95	2.75	1.45
3	My neighbors think that it is important to water the new street tree	0.89	0.94	2.75	1.40
4	The people in my household think it is important that I water the new street tree	0.85	0.90	3.05	1.62
5	Watering the new street tree is important to the people in my household.	0.79	0.86	3.29	1.63
KMO = 0.757, Bartlett's test p = 0.00 Eigenvalue = 4.219, Total and cumulative variance explained: = 84.38%					

Procedural Fairness of City Planting (Variable 12)

Eleven items measured the fairness of tree planting (Table 2.11).

Table 2.11: Original items measuring procedural fairness of city planting

Item Number	Item Wording
1	The City of Ithaca had a good reason for its decision to plant the new street tree
2	The City of Ithaca took the proper steps to correctly plant the tree
3	The City of Ithaca tried to address the barriers that make it difficult to water the tree
4	I was well-informed by the City of Ithaca about the new street tree being planted in the first place
5	I was well-informed by the City of Ithaca about how to care for the newly planted street tree
6	I had no chance to tell the City of Ithaca about my preferences about planting the new street tree (reverse)
7	I wish I could have told the city what type of tree I wanted to have planted (reverse)
8	The City of Ithaca gave me an opportunity to share any concerns I had about the planting of the new street tree
9	I did not have any input into the City's decision to plant the street tree (reverse)
10	I had limited influence over the City's decision to plant the street trees (reverse)
11	I believe residents are able to influence the City's tree planting policies

An initial PCA extracted four components, but the third and fourth factors, produced unreliable scales (Cronbach's < 0.8). Those items were removed in a second PCA in which items loaded onto two components. However, one of the item loadings was < 0.75 , so that item was also excluded. The final third PCA produced a two factor solution. The first factor was named "citizen influence" and captures the degree to which the city involved residents in their tree planting decisions. The second factor was named "city communication" and encompasses how well the city communicated with residents about planting trees and trees' watering needs (Table 7). Both scales were reliable (Cronbach's alphas were 0.883 and 0.818, respectively) (Table 2.12).

Table 2.12: Item loadings for procedural fairness factor analysis. Only item loadings > 0.6 are shown.

Item Number	Item	Corrected Item-Total Correlation	Factor 1: Citizen Influence	Factor 2: City Communication	Mean	SD
6	I had no chance to tell the City of Ithaca about my preferences about planting the new street tree (reverse)	0.77	0.908		2.28	1.52
9	I did not have any input into the City's decision to plant the street tree (reverse)	0.84	0.929		2.10	1.55
10	I had limited influence over the City's decision to plant the street trees (reverse)	0.70	0.855		2.26	1.48
4	I was well-informed by the City of Ithaca about the new street tree being planted in the first place	0.70		0.919	3.10	1.79
5	I was well-informed by the City of Ithaca about how to care for the newly planted street tree	0.70		0.917	3.54	1.60
	Cumulative variance explained		50.582%	32.153%		
	Eigenvalues		2.529	1.608		
KMO = 0.636, Bartlett test p = 0.000 Total variance explained = 82.734%						

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CHAPTER 3: COMMUNITY EXPRESSION, CELEBRATION AND CONVERSATION: INSIGHTS FOR COMMUNITY ENGAGEMENT IN URBAN GREENING FROM THE GREEN SCHEME IN WASHINGTON, DC

Abstract

Urban green spaces, such as trees and gardens, provide numerous health, community and environmental benefits. Cities are engaged in efforts to expand these spaces, especially in low-income neighborhoods, which tend to have less green space than do affluent areas. Community engagement in the maintenance of urban green space is associated with the provision of benefits from these spaces. However, there are a number of community engagement challenges stemming from the lack of inclusion and participatory processes around the creation and maintenance of these spaces. These challenges are especially prevalent in low-income communities. Despite these challenges, there are many practitioners who are actively involved in urban greening. Yet, literature on community engagement in urban greening has not captured the complexity of what the practice of community engagement actually entails on the ground. In this study, narrative interviews were conducted with staff from the Green Scheme, a nonprofit organization selected for this research because they work with low-income communities to plant trees and community gardens in Washington, DC. The interviews were used to develop practitioner profiles, which provide key insights about the dimensions of practice of community engagement in urban greening. An analysis of the Green Scheme's profiles through the lens of the literature on community interventions demonstrates the nuances of engaging low-income populations in urban greening.

Introduction

In an age of global climate change and urbanization, many cities are implementing urban greening initiatives to create public green spaces, such as street-side trees and gardens and parks (e.g. Lovell and Taylor 2013). The presence of nature in urban settings provides a wide range of health and environmental benefits, including improved air and water quality, noise abatement, places for outdoor recreation and community gatherings (see Wolf and Robbins 2015 for a review). Many urban greening initiatives target low-income communities, which tend to have less green space than more affluent areas, in order to equitably distribute the benefits provided by green spaces (Pincetl 2013). For example, one health benefit of trees is their ability to reduce asthma and other respiratory illnesses, which may be higher among low-income communities than in the general population (e.g. Lovasi et al. 2009). For this reason, “million tree” planting initiatives in New York City and Los Angeles prioritized planting trees in low income neighborhoods before middle and high income neighborhoods (Lu et al. 2009; Pincetl 2010a). However, municipal agencies do not always have the funding or staff to properly maintain these expanded urban green spaces. Thus, agencies often partner with nonprofit organizations who are better equipped to directly engage residents and volunteers in maintaining urban green spaces (Perkins 2009; Pincetl 2010b). Recent studies in urban forestry have found that the stewardship of trees by volunteers of nonprofit organizations may positively affect tree growth and survival (Jack-Scott et al. 2013; Mincey and Vogt 2014; Vogt et al. 2015; Roman et al.

2015), and ultimately enhance the provision of health and environmental services (Roman et al. 2014).

Despite the benefits of urban greening, the public is not always supportive of greening initiatives due to negative perceptions that green spaces attract crime (Maruthaveera and van den Bosch 2014), fuel gentrification (e.g. Checker 2011) or will be burdensome in terms of maintenance (Pincetl 2013a). Negative perceptions may also arise from the sometimes procedurally unfair processes through which green spaces are created, such as cities planting trees in residential neighborhoods without asking residents for their permission (Moskell and Allred 2013). These conflicts may diminish public support for green spaces, which can then pose significant challenges for community engagement efforts to expand and maintain urban green space.

Nevertheless, there are many community groups and nonprofit organizations that are actively working in low-income communities. While previous research has investigated the importance of nonprofit organizations and community groups engaged in urban environmental stewardship for urban environmental management, there has been little focus on the process of community engagement in stewardship (e.g. Svendsen et al. 2016; Krasny and Tidball 2015). Previous studies have not captured the processes through which these organizations engage participants (Wolf et al. 2013). Given the challenges associated with the creation and maintenance of green spaces, the community engagement activities performed by urban environmental stewardship groups are likely more complex in practice than suggested by the academic literature. Research is needed that can capture the first-hand, practice-based knowledge about

community engagement that may be held by practitioners of urban environmental nonprofit organizations. Their practice-based knowledge may shed light on the nuances of community engagement that may help both practitioners and researchers imagine new possibilities for ways to engage communities in urban greening. The purpose of this study is to uncover insights on the practice of community engagement in urban greening revealed through the narratives of staff members from the Green Scheme, a small nonprofit organization actively engaging residents in tree planting and gardening in low-income communities in Washington, DC.

Community Engagement in Urban Greening

Community engagement in urban greening entails the involvement of residents and volunteers in the planting and maintenance of urban green spaces. Many urban greening initiatives are implemented as public-private partnerships between city agencies, nonprofit organizations (and their volunteers) and community groups. Within these partnerships, volunteers and residents are often viewed as supplying the labor needed to maintain urban green spaces (Perkins 2009; Pincetl 2010a; Campbell 2014). However, public involvement in urban greening has also been characterized as urban environmental stewardship (UES) (Romolini et al. 2012, civic ecology (Krasny and Tidball 2015) or civic stewardship (Fisher et al. 2012), all of which involves the management, conservation and monitoring of urban natural resources (Svendsen et al. 2016). The involvement of residents and volunteers in UES is associated with a number of beneficial outcomes at multiple scales. For example, UES improves the health and well-being of individuals through hands-on exposure to natural resources, which has

been shown to increase attention span and reduce stress (see Wells and Rollings 2012). At the community level, collective UES activities can strengthen relationships and empower groups to address social issues in their communities. For example, Svendsen (2009) argues that stewardship activities such as community gardening address the built environment features, social context and social stressors that contribute to negative public health outcomes, such as crime, poor diet and inadequate housing conditions. UES can build people's confidence, strengthen their social ties and broaden their social networks while building the stewards' (or group of stewards') reputation as positive contributor to the community. These individual and social outcomes may empower people or groups engaged in stewardship to address other issues in their community beyond the environment (see also Krasny and Tidball 2015). Urban ecosystems benefit from UES through the expansion of trees, parks and other green spaces that improve air and water quality, provide habitat for wildlife and reduce greenhouse gas emissions (Lovell and Taylor 2014).

The UES literature situates urban greening activities within an organizational context. For example, the US Forest Service's StewMap project has inventoried government agencies, community groups and nonprofit organizations involved in UES in cities across the US (Svendsen et al. 2016). Findings from these inventories suggest that many UES groups have formal 501c(3) nonprofit status and are working in a variety of site types (e.g. parks, waterways, streets, gardens). These groups are characterized by their efforts to manage urban ecosystems, such as street trees, community gardens, waterways, parks and green roofs. Urban greening activities are rooted in civic

environmentalism, which entails collaboration, a place-based focus on environmental and community enhancement and involves direct public engagement in the restoration of places (Sirianni and Friedland 2001). Thus, while focusing on urban environmental issues in their program activities, many UES groups also aim to address broader social and economic needs of local communities in urban areas (Romolini et al. 2012; Fisher et al. 2012). For example, inventories of the program activities of UES groups found that many of them address issues related to youth development, arts and culture, recreation, housing and public health (Svendsen et al. 2016).

Despite the presence of UES groups, green spaces are inequitably distributed in many cities. For example, an analysis of urban forests in cities across the US found a positive correlation between tree canopy cover and median household income (Schwarz et al. 2015). Other studies have found that minority neighborhoods have less tree cover and access to parks than do non-minority neighborhoods (e.g. Heynen et al. 2006; Boone et al. 2009). Moreover, some studies have found that urban minority populations are less likely to participate in tree planting programs than are residents in more affluent areas. (e.g. Locke and Grove 2014; Watkins et al. 2015). This disparity may be due, in part, to ineffective community engagement practices by nonprofit organizations; for example, communicating about trees with messages that do not resonate with residents in areas with fewer trees (Locke and Grove 2014), or due to nonprofits not having as much of a presence in poor neighborhoods as they do in more affluent neighborhoods (Watkins et al. 2015).

Equitable access to green space is important so that all people can benefit from the environmental and health services provided by trees. To address unequal access to green space, many cities, including New York City and Los Angeles, have targeted some of their tree planting activities in low-income neighborhoods (Pincetl 2010; Campbell 2015). As cities expand urban forests and other green spaces into areas that have not previously had much green infrastructure, community engagement of residents will be critical for raising public support for these initiatives and for the stewardship of newly created green spaces (Pincetl 2010b). However, challenges arise for community engagement due to negative perceptions of green spaces and the processes through which these spaces are created.

Community Engagement Challenges

Initiatives to expand urban green space have stirred various conflicts that reduce public support for these spaces. Some conflicts relate to negative perceptions of potential social and economic risks posed by these spaces. Wolch and colleagues (2014) explain that a negative and often unintended consequence of planting street trees and community gardens is gentrification. The creation of green space can increase property values, which can displace the residents who cannot afford higher housing costs (see Wolch et al. 2014 for a review). Studies have documented residents' negative perceptions of planting street trees, the creation of parks, and community gardens as harbingers of gentrification (Checker 2011; Battaglia et al. 2014). Checker (2011) found that many residents in Harlem, NY believed that local government was implicitly creating new parks to benefit the affluent residents moving in to newly

developed areas of the neighborhood, rather than local residents who already had access to small parks. Battaglia et al. (2014) found similar concerns among residents in East Baltimore, MD who believed that local government was planting trees to benefit affluent residents rather than the local population. Also many residents in low-income communities may perceive community gardens as associated with affluent white communities (Birky and Storm 2013; Colasanti et al. 2012), which tend to be the types of residents moving into gentrifying neighborhoods (e.g. Eckerd 2011; Curran and Hamilton 2012). Indeed, a study in Philadelphia found that many African-American and Hispanic residents felt socially excluded from community gardens and urban farms that were run by white people (Meenar and Hoover 2012).

Another perception is that urban green spaces will attract crime. A meta-analysis of studies examining the relationship between urban green space and crime found that fear of green spaces was associated with the attributes of vegetation, such as sidewalks darkened by the shade of vegetation (Maruthaveera and van den Bosch 2014). The fear that trees would attract crime was a challenge faced by the Million Trees Los Angeles initiative. Many community members feared that trees would harbor criminal activity, which deterred them from signing up to have trees planted on or near their property. Many police officers were also unsupportive of tree planting for similar reasons (Pincetl 2010a). Likewise, some residents have also perceived community gardens as unsafe spaces that attract criminal activity (Wakefield et al. 2007).

Furthermore, the maintenance of urban green space can be burdensome for community members (Pincetl 2013). For example, urban trees can result in falling tree

branches, debris (leaves, fruit, nuts) and tree roots that uplift sidewalks and other infrastructure. These issues have long frustrated residents who must deal with resultant property damages to buildings, underground sewage systems and sidewalks (McPherson and Ferrini 2010). Trees also require a basic level of maintenance (e.g. watering, pruning) and many residents lack access to the training and resources (buckets, hoses, shears) required for the proper care of trees. Tensions related to this issue may be especially high when public trees cause private property damage, and it is unclear who should pay for those damages (Lyytamaki et al. 2009). The maintenance of community gardens, specifically a lack of resources such as money, water and tools, has also been reported as a barrier to community engagement in gardening (Wakefield et al. 2007; Corrigan et al. 2011; Guitart et al. 2012; Reynolds 2015). Other challenges unique to the maintenance of community gardens include unclear property rights in spaces where gardens are planted (Armstrong 2000; Twiss et al. 2003; Wakefield et al. 2007; Corrigan et al. 2011; Guitart et al. 2012), pressure for land from developers (Guitart et al. 2012; Reynolds 2015) and coordinating gardeners (Corrigan et al. 2011).

Community Engagement as Community Interventions

Evidence from the case of urban forestry suggest that many community engagement strategies often fail to recruit enough stewards to adequately maintain the large number of trees planted by cities (Young 2011; Young and McPherson 2013; Pincetl 2010a; Campbell 2014). These initiatives have used a number of strategies to engage residents in stewardship, including adopt-a-tree programs, public tree planting and stewardship events, stewardship workshops and digital and social media to market

these opportunities (Young 2011; Young and McPherson 2013). Other programs, such as “Citizen Pruners” train volunteers in tree stewardship and permit them to steward or prune street trees on public property (e.g. Schwab 2006; Campbell and Monaco 2013). Some of these strategies are based on stakeholder analyses that assessed people’s attitudes, knowledge and values associated with urban forests (Elmendorf and Luloff 2001; Thompson et al. 2005). Other strategies have entailed the involvement of community members in the urban forest management decision-making process (Thompson et al. 2005; Janse and Koninjendik 2007; Campbell 2014).

Despite these programs and strategies, it is not clear that these approaches have always led to residents becoming involved in urban greening initiatives or in urban environmental stewardship. Interviews with agency officials responsible for implementing “million-tree” programs in New York City (Campbell 2014; Young 2011; Young and McPherson 2013) and in Los Angeles, Houston, Baltimore, Seattle, Denver, Albuquerque, Sacramento, and Salt Lake County (Young 2011; Young and McPherson 2013) revealed that the recruitment of volunteers and resident stewards was a significant challenge. The physical lack of access to water was cited as a barrier for residents’ involvement of stewardship in New York City (Young 2011; Young and McPherson 2013; Campbell 2014). Other challenges stemmed from ineffective public advertisements (print and online) that did not resonate with the general public (Young 2011; Campbell 2014). New York City and Houston had contracted the maintenance of newly planted trees for the first 2-3 years post planting to private firms, but many interviewees reported a lack of certainty about who would maintain the trees after the

expiration of those contracts (Young and McPherson 2013; Campbell 2014).

Interviewees from New York City and Los Angeles reported hosting tree care workshops, but reported that those workshops did not meet the cities' stewardship needs (Young and McPherson 2013). Interviews with practitioners in New York City responsible for carrying out stewardship workshops indicated that a major challenge was the delivery of a large number of programs (172 workshops in 2012 alone) in all weather conditions (Campbell 2014).

I argue that the ineffectiveness of the engagement programs and strategies cited above may be due to a lack of understanding about people's everyday experiences with street trees, and how the political, cultural, social and built-environmental where trees are planted influence people's willingness and ability to become involved in urban greening. Literature on community interventions in public health offer guidance for the design of community engagement in urban greening. Community engagement in urban greening can be viewed as community interventions, which are defined as planned strategies to introduce positive changes for individuals and communities (Schensul and Trickett 2009). While the term "intervention" may seem like a top-down approach for community engagement, the principles underlying community interventions may be relevant for urban greening initiatives.² Principles of community intervention design suggests that interventions 1) include activities and components that are culturally situated and 2) enhance community capacity (see for example Trickett 2009; Trickett et

² The public health literature also refers to community interventions as multilevel interventions (Trickett et al. 2011) or socioecological interventions (Sallis and Owen 2015).

al. 2011; Trickett and Beehler 2013).³ A culturally situated intervention is one in which the activities, programs and language, images, symbols contained therein reflects the community's own meaning, values, identities and lived realities (Trickett 2009; Trickett et al. 2011; Palmer-Wackerly et al. 2014). The community context for a culturally situated intervention includes "the meaningful sites in which targeted groups live their lives," (Kral et al. 2010, p. 4). Culture has many meanings, but for the purposes of this study, it is defined as the belief systems, values, norms, traditions and their associated practices, rituals and behaviors (see Kral et al. 2010).

The second principle involves community capacity, which encompasses the community's resources and strengths that can be drawn upon for the intervention. These resources and strengths may include social or inter-organizational networks, skills, knowledge, leadership, and social settings where the targeted behaviors or issues occur or can be addressed (Trickett et al. 2011). The gains in community capacity that can result from the intervention process is viewed as a positive ripple effect stemming from the intervention that will operate as a feedback loop to support the long-term sustainability of the intervention (Trickett 2009). Community interventions that follow these principles are expected to "leave a lasting footprint" on a community system because they draw upon a community's strengths in a way that fits the cultural context (Hawe et al. 2009). These principles may also be applicable to the design of community interventions in urban greening.

³ There are two additional principles of community interventions: that they are 1) based on an "ecological" understanding of the social and environmental determinants of behavior and 2) include intervention components that simultaneously address two or more social and environmental determinants of behavior.

The Current Study

In light of the challenges of engaging communities in urban greening, research is needed to better understand how urban greening groups engage residents in UES activities into their efforts (Wolf et al. 2013), especially in low-income communities that may be most in need of expanded access to green space. Stories of practitioners' experiences working to engage communities in urban greening can offer important insights into the nature of the practice of community engagement in specific real-world contexts. In this study, I recount the experiences of The Green Scheme, a nonprofit organization working in Washington, DC to engage low-income communities in tree planting and community gardening. I employ narrative inquiry in a case study design (Wells 2011) to examine the Green Scheme's community engagement strategies.

Before describing the methodology of narrative inquiry, I will first explain how the Green Scheme came to be my opportunistic emergent sample for this study (Patton 2004). There are three reasons why this explanation is necessary. First, my experience of coming to know the Green Scheme demonstrates why the Green Scheme represents an appropriate case for examining community engagement in urban greening in low-income communities. Second, it is important that I tell the story of how I got to know the Green Scheme to acknowledge the ways in which my decisions as a researcher shaped my investigation of the Green Scheme (Wells 2011; Riessman 2008). Third, my introduction to the Green Scheme generated my research question for this study, which I will present at the end of the following section.

Meeting the Green Scheme

I first encountered the Green Scheme in April 2013. At the time, the community engagement director of the Urban Forestry Administration (UFA), an agency in DC city government, reached out to me about my research on community engagement in urban forestry. We had a common interest in urban forest stewardship and started planning a collaborative research project to develop, implement and evaluate strategies for engaging low-income communities in street tree stewardship in Washington, DC. Our project was going to expand the UFA's "Canopy Keepers" program, which recruited tree stewards via tags that were hung from newly planted street trees. The tags had quick response (QR) codes that people could scan with smart phones to sign up to adopt and steward a tree. The "Canopy Keepers" program had also recruited stewards by handing out brochures and canvassing residents at the residences adjacent to where street trees were planted. While the "Canopy Keepers" approach had successfully recruited stewardship volunteers in the District's affluent areas, this approach had been ineffective in low-income areas, where the UFA was targeting future tree plantings. In these communities, many residents had "outright antagonistic" views toward trees due to the perception that they signaled gentrification and redevelopment that would price people out of their neighborhoods.⁴

After we had initially connected about our common interests in urban forest stewardship in April 2013, the UFA community engagement director emailed an article in the Washington Post that profiled the Green Scheme's successful efforts to plant a

⁴ Phone conversation with UFA's community engagement director, 4/30/13

community garden and fruit trees in low-income areas in the city. The article also described the inequality in tree canopy cover between the District's affluent and less affluent communities (Gowen and Melnik 2013). The article described residents' negative views toward trees. For example,

Doris Gudger of Anacostia is among those who see little to like about lots of trees. When city crews showed up one recent day and planted some in front of her rowhouse in Southeast Washington, she wanted them gone. The pollen would aggravate her allergies, she said. The leaves would be a pain to rake. The shade would draw drug dealers. And, she feared, soon would follow affluent gentrifiers and higher taxes, pushing out older residents like herself. "To me, the trees create more problems than when they weren't there," said Gudger, 61, a retired secretary. (Gowen and Melnik 2013)

In April 2014, the UFA suggested that we (Cornell University) pursue a formal partnership with the Green Scheme for the "Canopy Keepers" project. The UFA had previously worked with the Green Scheme to canvass residents about stewarding newly planted trees. At the time, the Green Scheme had been working on the ground with residents in public and privately owned low-income housing. They had primarily focused on education around nutrition, but were getting more involved with tree planting.⁵ Our UFA partners described the Green Scheme as a group of "young guys who grew up in one of the lower income areas [of DC] and are creating activities to make gardening and tree planting hip..."⁶ and as an "organization with a wide network of support...that is diverse, young, [resourceful] and has a different way of looking at things."⁷ Hence, the Green Scheme represents an opportunistic emergent sample (Patton 2004) because

⁵ Notes from phone call with the Director of UFA, 4/11/14

⁶ Notes from phone call with UFA community engagement director, 4/30/13

⁷ Notes from phone call with the Director of UFA, 4/11/14

my introduction to them was an opportunity to explore the community engagement strategies of an organization that had been described as successful at reaching low-income audiences (according to the Washington Post article and conversations with key informants in the UFA).

Research Questions

Due to the lack of practice-based knowledge in the academic literature about strategies for engaging low-income communities in urban greening, I conducted an exploratory analysis into the Green Scheme's approach for community engagement to examine the following research questions: What insights can the Green Scheme provide about the complex nature of community engagement in urban greening in the context of low-income communities?

Methodology

This section provides an overview of narrative inquiry (including its epistemological foundation), the participants, data collection and data analysis.

Narrative Inquiry

My goal in conducting the study was to better understand the Green Scheme's experiences in community engagement and how they make sense of those experiences. Thus, I employed narrative inquiry which allows for me to build theory on community engagement in urban greening based on people's interpretations of their experiences. Narrative inquiry is based on the central role of storytelling in the human experience. Story telling helps people to make sense of their lives in that it helps them to reveal their personal truths that represent their interpretation of their experiences in

the contexts in which they live their lives. While people's stories may exclude important details, they are valuable interpretations of events so long as attention is paid to the contexts and worldviews that shape their creation (Personal Narratives Group 1989). As a research methodology, narrative inquiry examines aspects of society through the analysis of stories that are told by individuals or groups (Ospina and Dodge 2005). Narrative inquiry examines stories about people's lived experiences of specific events, and their evaluations of the meanings of the event for themselves and others (Landman 2012). Narrative inquiry originally developed from the examination of literary works, but many disciplines in the social sciences now treat narratives (written, oral, visual) as objects for study (Riessman 2008). Narrative inquiry has been used in many applied social science fields, including natural resource management. For example, Lejano et al. (2013) examined the role of narratives in building cross-national networks for natural resource conservation and local conservation partnerships between community members, farmers and scientists. Russ et al. (2015) employed narrative inquiry to explore the ways that urban environmental education fosters the development of sense of place in youth from the Bronx, New York.

The rise of narrative inquiry in the social sciences has stemmed from criticism of research methods that focus only on explaining and predicting behavior (Flyvbjerg 2001; Ospina and Dodge 2005; Riessman 2008; Wells 2011) and represents a shift toward using methodology that involves the interpretation of social events (Ospina and Dodge 2005). Narrative inquiry reflects the human activity of communicating experiences through the structure of stories that have characters, settings, plots and

drama. Narratives are a way of communicating and making sense about certain “truths,” such as the pursuit of positive aspirations via community engagement in urban greening, that cannot be captured with quantitative research methodology (Flyvbjerg 2001). As such, narrative research can complement positivist research by capturing the meanings that are lost in quantitative studies, as in “the how and the why behind the what,” (Lin 1998 as cited in Dodge et al. 2005, p. 289).

Narratives focus on specific events and include a beginning, middle and end (Ospina and Dodge 2005). In the context of the current study, the purpose of my central research question— *what are the Green Scheme’s perceptions of effective strategies for community engagement in urban greening?* — is not to “measure” the degree to which the Green Scheme was effective, but rather to capture the ways in which staff members make sense of experiences and events that they viewed as successful (Riessman 2008). Narrative research allows me to capture ways in which staff members experience their work (Ospina and Dodge 2005), including the emotional dimensions of their practice that convey their subjective understanding of events and the ways in which they experienced those events (Landman 2012). Thus, narratives are not factual reports of events because individuals may decide to embellish or exclude details in telling their stories (Riessman 2008). As such, narratives are personal interpretations of events from a specific perspective (Dodge et al. 2005). Another characteristic of narratives is that they are co-constructed by the narrator and the interviewer (Ospina and Dodge 2005). This means that I shape the narratives via the questions I ask to elicit their stories (Wells 2011). The Green Scheme shapes their narratives by deciding how

they want to be known and perceived through the details they decide to share in their stories and the ways in which they tell told their stories (Riessman 2008).

The knowledge captured in the Green Scheme's narratives represent practical wisdom (phronesis) or context-dependent knowledge that details in-depth how the Green Scheme interacts with specific people and issues in a larger environment (Flyvbjerg 2001; Landman 2012). Using narrative inquiry for this study allows me to draw valuable insights from the Green Scheme's narrated experiences of community engagement in a specific context. These insights can enhance the ability of practitioners working in similar contexts to imagine new possibilities for their practice (Ospina and Dodge 2005; Landman 2012), as well as to exemplify theoretical concepts as they play out in real world settings (Wells 2011). In the context of urban greening, narratives of community engagement can integrate practitioner-based knowledge into urban environmental management and planning (Campbell et al. 2015).

The following sections provide additional details about data collection, data analysis and issues of validity in narrative inquiry. First, I provide a basic introduction of the participants and describe how I built a relationship with them, as an important element of qualitative research is the establishment of trust and rapport between the researcher and participants in order to develop a shared understanding about the research and to prevent the betrayal of the participants (Newkirk 1996; Lincoln and Guba 1985). In describing the process of relationship building, I introduce my personal observations from my field notes about the communities in which the Green Scheme

was working to illustrate the context in which the Green Scheme's narratives (presented later) are to be understood (Wells 2011).

The Participants

All four staff members of the Green Scheme participated in interviews for this study: 1) Ronnie Webb, 2) Joelle Robinson, 3) Xavier Brown and 4) India Jackson. Interviews were not confidential, as all four staff members consented and desired to have their names be included in this study.⁸ It is common for participants in narrative research to want their names and experiences to be publically shared (Wells 2011). All four staff members are African-American. At the time of this study, all of them were in their late 20s. Each of them has a full time job besides The Green Scheme (Table 3.1).

⁸ This research was approved by the Cornell University Institutional Review Board (Protocol ID # 1409004938)

Table 3.1: Background of each Green Scheme staff member. More detailed information about their backgrounds will be presented in the Findings section.



Ronnie Webb

- **Position:** Founder, Executive Director
- **Education:** North Carolina A & T, Agricultural Economics (Bachelors Degree)
- **Other:** Environmental Leadership Program, Yale University Conservation Finance Program
- **Full time job:** Environmental science, history and government teacher, GED program



Xavier Brown

- **Position:** Director of Urban Agriculture
- **Education:** North Carolina A & T, History (Bachelors Degree); currently enrolled in "Sustainability Leadership" MS program at University of Vermont
- **Other:** Environmental Leadership Program, Master Gardener (University of the District of Columbia), Citizen Forester (Casey Trees)
- **Full time job:** Small Parks Specialist, DC Department of Parks and Recreation



Joelle Robinson

- **Position:** Deputy Director (left the Green Scheme in Spring 2015)
- **Education:** Spelman College, Sociology and Anthropology (Bachelors Degree); Columbia University, Masters of Public Health
- **Other:** Environmental Leadership Program
- **Full time job:** Research Social Scientist, Tobacco Prevention, FDA



India Jackson

- **Position:** Legal, Business and Administrative Assistant
- **Education:** East Carolina University, Psychology and Criminal Justice (Bachelors Degree); Juris Doctorate
- **Full time job:** Attorney in personal injury and entertainment law

Getting to Know the Green Scheme

I met the Green Scheme twice in Washington, DC before data collection began in Fall 2014. The first time I met the Green Scheme was in April 2014 when I attended a tree planting co-hosted by the UFA and the Green Scheme. The UFA had invited me to attend so that I could meet Ronnie in advance of our research project. The tree planting took place at Lincoln Heights, the second largest public housing development in DC.⁹ Located in Ward 7 in Northeast DC, the majority of residents in Lincoln Heights are African-American (96%) and 30% of residents live below the federal poverty line (Green Scheme 2014). Lincoln Heights is part of the New Communities Initiative, a city initiative to revitalize distressed subsidized housing with high rates of poverty, crime and economic segregation (New Communities Initiative 2016). Lincoln Heights is also classified as a food desert, meaning residents lack access to fresh produce and healthy food (Shank 2013).

I met Ronnie at the event, but I did not get a chance to speak with him for very long because he was busy coordinating the food and music for the event. I kept busy by helping to plant trees. I planted a tree with two other people, an office assistant in the UFA and a forester from Casey Trees. The forester joked about how the tree we planted wouldn't get watered. I laughed too, in part because I knew he was probably right. I knew from my personal experiences working in urban forestry in low-income neighborhoods in Syracuse, NY and New York City that watering newly planted trees was likely not a top concern of many residents. A few months later, the UFA project was

⁹ Lincoln Heights is a neighborhood in DC that expands beyond the public housing development.

not funded, but I pursued a relationship with Ronnie in order to continue the current study.

In July 2014, I visited the Green Scheme again. Ronnie invited me to a farmer's market that the Green Scheme helped to introduce (in partnership with other organizations) to the River Terrace neighborhood in Ward 7.¹⁰ As I approached the market, I saw that it was located in the parking lot of a health center that looked like a big-box store. There were two tents. Under one tent, there were two young white women holding papers and standing behind a table in front of African-American customers. There was only one farm there, which was under the second tent. Their produce displayed on three tables arranged like a U in big plastic bins. The farmer's market was not as fancy as the farmer's markets in the communities where I've lived. It was late in the afternoon and the sun was scorching. Ronnie was over an hour late to the farmer's market.¹¹ While I was waiting for him, I observed what was going on and spoke to people from some of the other organizations that were there. I learned that there was a program in which a local doctor was writing prescriptions for people to eat healthier food. In exchange for showing their prescription, or their SNAP benefits card and identification, residents received a \$10 voucher to purchase produce from the farmer's market.

I learned that the two young white women were from DC Greens, a partner nonprofit of the Green Scheme. They were busy taking down people's information for

¹⁰ I later learned this was part of their Code Green grant

¹¹ When he arrived, he apologized and told me he was late getting out of school. This was when I first realized the Green Scheme was not his full time job.

the voucher program. They were surprisingly disorganized, so I jumped in to inform customers about which documents to show and where to go. I also introduced myself to the farmers, who were actually the two children of the real farmers and a friend (they appeared to be in their early 20s). They were also disorganized, so I helped them pass out bags to customers to fill with produce. I also visited with a nutrition educator from the University of the District of Columbia who was demonstrating how to cook a black bean salsa with chicken using seasonal produce.

During one period of downtime (it was about 4:30pm), one of the “farmers” gave Chris (one of Ronnie’s friends from another nonprofit) and I two peaches from their stand. The “farmers” and the nutrition educator left to get a snack while Chris and I were talking and eating our peaches. When they all came back, the “farmers” had McDonalds and the nutrition educator had a big bag of Cheetos and a soda. I was shocked. The people who were supposed to be advocating to local residents about healthy food chose unhealthy food themselves. Even worse, they were eating it while selling their fresh produce and demonstrating how to cook healthy meals. I was thinking so *this is what the Green Scheme is up against here.*

By that point, Ronnie had arrived and was busy taking people’s information down for the vouchers. The market ended soon after, at which point Ronnie took me on a short tour of nearby convenience stores to demonstrate that we were in a food desert. Then Xavier met us so we could visit the community garden at Lincoln Heights. Before visiting the garden, I had the chance to engage Ronnie and Xavier in short conversation (separately) so that we could get to know each other. By the end of each of those

conversations, I introduced my research interests to Ronnie and Xavier. I framed my research as aiming to document the Green Scheme's model of community engagement through storytelling. Both Ronnie and Xavier seemed excited about the opportunity to tell stories about their work.

Then we visited their community garden at Lincoln Heights, where we met Joelle. I was expecting them to have a formal program like a workshop going on, but we just hung out in the garden for about an hour. I was confused about why there was no workshop going on, as I was under the impression the whole point of them taking me there was to have me sit in on one of their programs. I assumed they were like other nonprofit organizations I was familiar with that often host workshops for residents about various topics. Seeing as there was no workshop, we just stood around in the garden. They were talking to each other (and occasionally to me) about garden related tasks. They said they would be coming back that weekend to move tools and supplies for their garden into a storage unit. Kids and residents were coming over to say hello. Xavier was engaging the kids with the head of a sunflower he pulled down for them so they could eat the sunflower seeds. I did not get the chance to speak to Joelle about my research interests. She gave me the impression that my presence at the garden was the first time that she had heard about me. It seemed like Ronnie had forgot to tell her about me and why I was there, and I did not want to introduce my research interests to her without first introducing myself as a person (not as a researcher) who was interested in the Green Scheme (as a way to build trust).

A few weeks later in August, I followed up with Ronnie by phone to plan a visit to DC in September to interview the Green Scheme staff. India was also on the call and she was also supportive of my research project.

Narrative Interviews and Constructing Practitioner Profiles

This section describes my approach for data collection with the Green Scheme. I employed two types of data collection. First, I took field notes about my interactions with the Green Scheme before, during and after our interviews. It was important to collect this “narrative-related data” (Wells 2011, p. 43) to later deepen my analysis of their stories, as my field notes included many details the Green Scheme staff excluded from their stories. I always wrote my field notes on the metro ride back to my hotel and elaborated on them as I typed them up on my computer when I returned to the hotel. The second type of data collection was the semi-structured interviews I conducted with each staff member. As I present the interview protocol below, I describe the contexts in which the interviews took place, as these contexts may have shaped each staff members’ sharing of information with me (Wells 2011) and also represent the interactional context in which narratives were constructed (by me) and performed (by the Green Scheme) (Gubrium and Holstein 2009 in Wells 2011).

Following Seidman’s (2012) approach for in-depth phenomenological interviewing, I conducted 2-3 interviews with each staff member of the Green Scheme between September 2014 and November 2015. Seidman’s (2012) approach combines interview questions about the interviewee’s life history with questions about a phenomenon in order to contextualize the meanings of their experiences. Interview

questions were designed using the practitioner profile protocol developed by Forester and Peters (2005) (see Appendix 3.1 for interview questions). A practitioner profile includes a story or stories about how practitioners handle memorable cases that demonstrate the nature of their work. Practitioner profiles are “windows into practice” and have been used in city and regional planning and in education to reveal insights into the ways in which practitioners deal with the challenges and messiness of their everyday work (Forester 1999; Forester and Peters 2005). The practitioner profile interview protocol included semi-structured questions focused on three categories. The first category includes questions about the interviewee’s life history in order to understand how their life experiences led them to be interested in the environment, their current profession and role in the Green Scheme. The second category of questions were designed to elicit “practice stories,” while the third set of questions pertained to the interviewee’s reflections on lessons learned from their work (Forester and Peters 2005).

Life History Interviews

Interviews related to learning their life history were conducted with Ronnie, India and Xavier in September 2014. I interviewed Ronnie and India at their grandfather’s house,¹² and Xavier at a restaurant. I digitally recorded and transcribed all interviews, as recording interviews enhances the trustworthiness of narrative data by allowing the narrator’s words to be accurately represented (Riessman 2008). Questions were also designed to initially identify “practice stories” that they would be excited to talk about in-

¹² Up until this point, I had assumed the Green Scheme had an office because they are a formal 501(c)3 nonprofit organization, but it turns out the official address for the Green Scheme is Ronnie’s grandfather’s house.

depth in later interviews. Joelle was not interviewed at this stage of the research as she was not available during my trip to the field site. I followed up with Joelle by phone so that I could introduce myself and my research interests and schedule an interview. That first phone call with Joelle was not recorded because it was not a formal interview.

Practice Story Interviews

The second category of questions in the practitioner profile protocol asks practitioners to tell their “practice stories” about memorable cases or events that represent the lived experience of their work (Forester and Peters 2005; Seidman 2012). I conducted interviews for this category of questions in October 2014. The goal of these interviews was for the Green Scheme to tell the full version of the “practice stories” they had briefly told me about in our first interviews. Additional questions were asked to fill in the details of their life history, as well as to elicit their reflections on the lessons learned from their practice stories. I interviewed Ronnie and India again at their grandfather’s house and Xavier at the same restaurant as before. I also interviewed Joelle at a café. My interview with her also included questions about her life history. I recorded and transcribed all of these interviews.

Personal Reflections

These interviews focused on the third category of questions in the practitioner profile protocol which relate to personal reflections of their work, specifically about critical moments, surprises and lessons learned (Forester and Peters 2005). These interviews also focused on filling in the details of their “practice stories.”

Practitioner Profiles

Excerpts from my interviews with each person were edited into a practitioner profile, one for each staff member. The editing process followed four guidelines recommended by Forester and Peters (2005). First, details and stories about Green Scheme projects were cut and pasted from each staff member's interview transcripts into chronological order to produce an easily followed story that contained a plot or plots with a beginning, middle and end. Second, I edited grammar and removed filler words and phrases (e.g. like, um, so, "if you know what I mean") to create readable language. Editing was minimal in order to preserve the style, rhythm and sound of the speaker in a way that honored their own words and meanings. Third, I shared drafts of the profiles with each practitioner to ensure they were comfortable with the document. Drafts were shared in September/October 2015. Fourth, I gave each of them the opportunity to edit their profiles by asking for their feedback and comments on the draft. Ronnie, Xavier and Joelle had reviewed a draft of their individual profile by the time I traveled to DC for the final time in October 2015. Prior to my visit, India was unresponsive to my emails, text messages and phone calls about meeting in October 2015. I sent her a draft of her final profile, but I never heard back from her. However, she gave me permission to use her interviews in my dissertation the last time we met in October 2014.

Data Analysis

The final drafts of the practitioner profiles were analyzed using holistic content analysis (Wells 2011), a type of thematic analysis (Riessman 2008). Analysis began during transcription, as transcribing interviews provided the first opportunity to observe

themes within the interviews (Riessman 2008). Holistic content analysis of narrative data involves reading passages to identify major patterns and themes, recording notes on those themes and integrating theory, which serves as a resource for interpreting and analyzing the themes (Wells 2011; Riessman 2008). The two design principles for community interventions—that they be culturally situated and designed to enhance community capacity—informed my analysis of the profiles. In the last steps of data analysis, I identified passages of the Green Scheme’s profiles that represented their “practice stories” and drew conclusions about the ways in which these stories demonstrate the Green Scheme’s efforts to culturally situate their work in the community and to enhance community capacity (Wells 2011).

Validity

I have established the validity of this research by documenting the process through which I collected data and analyzed the practitioner profiles (Riessman 2008; Wells 2001). In the following section, I continue to establish the validity of this research by providing excerpts from the practitioner profiles which allows for the reader to check whether the claims I make through my interpretation and analysis of the texts are supported by language in the narratives (Riessman 2008; Wells 2011). (See Appendix 3.2 for the full version of the profiles).

Findings

This section begins with background on each staff member of the Green Scheme, starting with Ronnie who founded the organization. The backgrounds of each

staff member and the origin story of the Green Scheme, as told by Ronnie, frames the narratives of their work presented later in this section.

Introduction: Ronnie Webb

Ronnie grew up in Washington, DC as a star athlete, especially in basketball. In college, Ronnie enjoyed throwing parties with his friends. He and his friends hosted parties featuring musicians from DC that they brought down to North Carolina A & T. At the same time, Ronnie's childhood mentor was encouraging him to get involved in politics and connected him with his friend who had founded the Hip Hop Caucus. The Hip Hop Caucus is a national nonprofit organization that connects the hip hop community with civic engagement (Hip Hop Caucus 2016). Ronnie helped organize parties for Hip-Hop Caucus as a way to increase youth participation at the Hip Hop Caucus' voter registration events. This was Ronnie's first exposure to the nonprofit world. After college, Ronnie returned to DC to intern with the Congresswoman Eleanor Holmes Norton. His internship taught him how to navigate the world of politics. After the internship, Ronnie returned to the Hip Hop Caucus as a Sustainability Fellow. He was in charge of conducting community outreach and designing community events for the Caucus' environmental programs. Leadership in the Hip Hop Caucus looked to Ronnie for ways to make their events relevant and "sexy" for communities. Ronnie realized he was skilled in connecting environmental issues to different communities. He describes how he realized he wanted to start his own non-profit around this time.

The whole time [I was at the Hip Hop Caucus], I was thinking this would be a good model for an environmental organization, just making it sexy, fly, fun and making our community more engaged, teaching them about it. In the back of my mind, I was thinking I'm going to do this. After my

fellowship was over, I had a much better understanding of what it took to start an organization. At that period, I was telling people “look I’m about to start it.” One day Xavier and I were with a friend drinking some beers after work and I was like “dog, watch I’m going to start this. Just watch.” So I started it. I wrote a mission statement. I think I wrote a paragraph, just explaining my idea.

Here is how Ronnie described the mission of the Green Scheme:

We provide leadership, education, training and awareness on a wide variety of environmental topics. We work to engage and empower communities where poor health outcomes and poor environmental conditions are most prevalent to promote healthy living in conjunction with environmental issues. The goal of the Green Scheme is to be on the forefront of the environmental movement in these urban communities. We’re the people that people look to to get answers, to get resources, to get all types of guidance and to really show them how these issues are affecting them on a firsthand basis and how it is relevant to them. And to make it fun. We make ways to dress it as cool. We’re making it something that these communities and buying more and more into.

I asked Ronnie what inspires him to do this work. He replied:

I used to be so competitive in sports, but sports aren’t here right now, so this is my new sport. I want to be successful in what I do. I see it as being the best job in the world because you’re helping people. It’s given me a platform. It’s given me a voice. The more that I do this work, the more I see the growing level of importance of it. When I first started off, I just wanted to build gardens, but now it’s like whoa, this is all about food deserts and environmental justice issues. It’s nutrition, it’s obesity, it’s high blood pressure issues. It’s like you open one door you open a thousand doors, so it keeps me thrilled. I never want to be bored and I’m never bored doing this type of work.

One of the things that motivates me is that people don’t expect somebody like me to do what I do. That puts a chip on my shoulder. I go places a lot of times and people have no clue that I’m with Green Scheme or anything like that. [I’m most passionate about] being known for producing results. Not just being out there doing something and like “oh yeah we went out and did it,” but no, there was a direct impact. These stories coming back about these seeds that we threw out there are actually sprouting in one form or fashion or another.

Introduction: Xavier Brown

Xavier was childhood friends with Ronnie and they attended college together. Growing up, Xavier learned a lot of lessons from his family. He remembers his parents were always working to help other people. For example, they raised two of Xavier's older cousins after Xavier's aunt had died from drugs. Xavier's older sister and his older cousins have also dealt with drugs and jail time. Xavier said *"I grew up watching them and their struggles and learning from them their mistakes and what not to do."* In college, Xavier majored in history. After he graduated, Xavier intended to get a Master's Degree in agricultural economics, but the program he was in was canceled due to low enrollment. He describes what happened afterward and how he eventually found his way to environmentalism:

I didn't have a job, so I was at home sitting on the couch bumming, hanging out all night. This was back in 2011. My father told me to take this Master Gardener class at the University of DC. He was retired and I think he was doing Master Gardening to stay busy. It was something fun that he got interested in at the time. He was like, 'man you should take the class. If you take it, I'll pay for it.' I was like alright, and that's when I really got into it...I didn't do anything with agriculture until I took that Master Gardener class. I didn't grow anything. I don't even think I ate vegetables. I took the class. I fell in love with vegetables. It was fun, it was something different. There weren't any black people in the class and I was the youngest person. I really got into agriculture once I started to understand and make different connections about environmental justice and sociocultural justice. In undergrad I was understanding things, because I had some pretty cool professors. But then I got interested in how history and environmental stuff comes together. Now, when people ask me about growing food, they assume I was an agriculture major and when I tell them I was a history major, they wonder what does that have to do with agriculture. And I tell them when you think about the history of black people and agriculture in this country, they're tied together perfectly.

It was around this time that Ronnie called Xavier to ask him to be part of the Green Scheme. As the Director of Urban Agriculture, Xavier primarily coordinates their tree planting and gardening programs and activities. Xavier describes his passion:

I'm passionate about building community. The agriculture is a tool to help build community and to help food help people. I like helping people. If I was good at doing something else I would use that to help people, I'm just good at agriculture...

Xavier described the mission of the Green Scheme:

The mission of the Green Scheme is to get low income communities and communities of color involved in the environmental movement. [If there was a trailer for a documentary about the Green Scheme], it would show a whole bunch of young black folks planting, growing, teaching, smiling, laughing, educating. You would see regular people on the street who might get stereotyped as thugs planting trees or harvesting some kale or cleaning one of those abandoned lots that captures all the trash. The goal is to create new leaders that you wouldn't see in great diversity in the environmental movement. We're doing it in a fun way that other people aren't doing, with music and culture and fashion. You probably won't see too many people doing what the Green Scheme does anywhere else, I think that's what's unique. We're unique because we work with people who are rooted in the community. We come in as partners in the community and we look to the community to appeal to what they want to do. We're not like some nonprofits that come in to save the community. That's not what we're trying to do. We're trying to create self-sustaining communities by teaching them how to build their own raised beds, how to plant and prune and take care of their own trees. We try to connect them to the resources and eventually we'll fade back and do that with another community. In between that we have music and all types of other fun activities that we intertwine with environmental and community building work.

Introduction: Joelle Robinson

Joelle grew up in Maryland outside of Washington, DC and met Ronnie when she was in college. Joelle always cared about the environment (thanks to Captain Planet) and was always interested in public health. Joelle attended Spelman College in Atlanta,

GA where she double majored in anthropology and sociology. After college, she received a Masters of Public Health from Columbia University. Then she returned to DC and worked in the Department of Health evaluating health interventions for tobacco prevention, nutrition and physical activity. Joelle also wrote and reviewed a number of multi-million dollar grants. While she was at that job, Joelle was frustrated with the amount of work on her plate. She was thinking she wanted to work for herself, and then remembered that Ronnie had told her he was planning to start his own organization. She called him to let him know she wanted to be part of it. Joelle describes why they started the Green Scheme:

The reason we started the Green Scheme was this was our community, like we're from here. It's our uncles and aunts who have diabetes and heart disease. We all grew up in this area. The mission of the Green Scheme is to bring forth environmental and health issues to our communities—people of color, black people and people who are underserved. Often those are the people who have different health disparities, but also are not involved in or not seen in the environmental movement. I'm talking about the typical, cliché environmentalists who are all about the ozone and the polar bears. Not to say that that stuff's not important but, it's not on people's minds in our communities. It's an afterthought, it's the last thing on their mind and it's the last thing on their plate. How can we bring forward some of these issues to those communities? I think the key thing in our vision is making sure that it's sexy, it's relevant, not crunchy. It's not granola-y, it's shiny and sexy.

As the Deputy Director, Joelle played the role of figuring out how to operationalize the Green Scheme's vision for what it wanted to accomplish into an actual plan. Joelle drew on her experience in grant writing and program evaluation to figure out the specific steps the Green Scheme needed to take to reach their goals. I asked Joelle what motivates her to do this work, but she had trouble articulating what drives her. She said *"I think that the ability to say 'hey this is something that we came up*

with' or 'this is something that is working that I feel like is having an impact' is I think the motivation factor." My impression of Joelle was that she was passionate about helping people. Ronnie and Xavier told me that the reason she joined the Green Scheme was because she made it her New Year's resolution to start getting more involved in community work.

Introduction: India Jackson

India is Ronnie's younger cousin, although India described them as having a brother and sister type relationship. India attended East Carolina University and majored in psychology and criminal justice. After college, she received her law degree and is now an attorney in personal injury and entertainment law. India got involved in the Green Scheme when Ronnie needed help getting 501(c)3 nonprofit status for the organization. India was an original board member for the Green Scheme. Now, India provides legal, business and administrative assistance to the Green Scheme. India does a lot of behind-the-scenes work for the organization related to the paperwork required for managing a nonprofit. India describes her other role:

[One of my other roles within the Green Scheme] is partnership outreach to try to get other organizations or people we can work with on board. Basically, it's a trial and error type thing. Mostly I look people up on Google, make phone calls, send emails and just hope that someone's interested. What I'm really looking for is somebody who wants our involvement with their organization as much as possible.

India had successfully built partnerships between the Green Scheme and a number of different organizations. India describes what makes the Green Scheme unique from other organizations:

...number one we are a group of young people. Not to say that other groups don't have that, but when you have people who look just like the

people in the communities that you're targeting, some people in the group can actually relate to the problems that these people are going through. I think that the people we are targeting get that sense of sincerity from us, so it makes it easier for them to just say "ok, they genuinely care, they really want to help us, let's give this a try."

The Green Scheme in Lincoln Heights

The Green Scheme's narratives relate to work they've done at Lincoln Heights,¹³ the primary focal area of their work. This section describes how the Green Scheme came to work at Lincoln Heights, which frames their "practice stories" that come in subsequent sections. Ronnie's skills in making connections and building relationships opened the door for the Green Scheme to work in Lincoln Heights. An excerpt from India's profile speaks to Ronnie's personality and his ability to connect to people, an important skill for building relationships.

[What motivates me to do this work for the Green Scheme?] Ronnie does. I saw him speak one time to a group of men who were unemployed. They were looking for jobs at a time when there were all these new green jobs opening up in this area. He was reaching out to this group of men who were not easy to convince by any means. Here were these guys, they're jobless, they have certifications in these different areas, struggling to find employment, in a sense having given up on somebody telling them "hey you can do this. You can start your own business." So there was Ronnie. He had a PowerPoint, but we didn't have an HDMI cord and he couldn't show any of that. So then he just went off the top of his head. To watch those guys go from slouching and looking like "ok what does he have to sell us today that we're not going to buy?" to being attentive, giving feedback and being engaged in the conversation by then end of the presentation. It was just amazing to watch him be as passionate as he is and to be able to rub that off onto somebody else who wouldn't easily be persuaded. That was the number one memorable moment in my book. I'm completely behind the mission of the Green Scheme, but knowing Ronnie and us having

¹³ Lincoln Heights was the neighborhood where I met with the Green Scheme twice before data collection began

grown up together and then seeing him do something that he absolutely loves, I am in full support.

I always had the impression that many people (like my partners at the UFA) viewed Ronnie very highly, and by extension, also the Green Scheme. India tells a story that relates to how the Green Scheme's reputation helps them build partnerships.

[Something about my work with the Green Scheme that's been memorable for me has been] any time I run into somebody that knows about the organization, but who I don't know personally, they always have positive stuff to say about us. For example, there was an opening of a barbeque restaurant called KBQ in Largo, Maryland, about 15 minutes from DC. I went there because the Green Scheme was supposed to have a table set up. The restaurant used some of the vegetables we grew in the Lincoln Heights garden as their produce to make the food in the restaurant. As part of the grand opening, they had a sidewalk set up with the tables, buffet style like a taste testing type of thing for people walking by. At the end of the buffet line we had a Green Scheme table set up and it had some of the fresh produce on the table. I was the one there to let people know that they were using fresh vegetables from our garden, to tell them more about the Green Scheme and to get people's email addresses to get them involved with us too. It was supposed to be a win-win for everybody.

Ronnie knows the restaurant owner very well, but it was my first time meeting her. So I'm at the table, but here she was doing the selling of the Green Scheme more than anything. She just spoke so highly of the organization and of Ronnie in general. She was supposed to be promoting her restaurant, but to everybody that came to the end of the table, she was like "oh this the Green Scheme they do X, Y and Z." She just had so many positive things to say...I brought this up just to say that everybody that I met and that knows something about the organization has nothing but positive stuff to say. To see that spreading and then to see someone pass it on to somebody else right in front of you, in front of several people mind you, and to try to help us out with other partnerships, its rewarding to know that we're doing a good thing and that other people think so too. She passes it on to the next person and over time we hope to build more partnerships that way. Most of the relationships up until this point have been made just like that. We hope it continues to grow.

Ronnie built the partnership with Lincoln Heights in the same way as India described. His journey to working at Lincoln Heights began at another community event where the Green Scheme had a table with a poster of their logo.

“...a lady from the public housing authority, Ms. Iris, walked up, saw the logo and said “I get it.” Ms. Iris has been a professional mentor for me. She’s actually seeing young people trying to do something and she went out of her way to do some things for us, make some introductions. [I think she supported us because] we were so young but also because we were organized. We wanted to do community gardening. She really didn’t know how serious we were, but she believed in some of the things we were doing and she really did believe in us. I think she was just giving us the opportunity in an area that really needed something. They didn’t have funding or anything. It was sort of like, you said you wanted a garden so here’s a spot and they left us in charge of it, so as long as you don’t have any questions or ask us to pay for it. She gave me the number of Ms. Dinkins, the Resident Council President at Lincoln Heights, and that’s what got us started. Lincoln Heights has been a spark plug for everything we’ve done.”



Figure 3.1: The Green Scheme’s logo

While I don’t have additional details about what Ronnie’s conversation with Ms. Iris entailed that day, Ronnie must have done a great job selling the mission of the Green Scheme to her. Joelle had also mentioned Ronnie’s skills in building relationships.

Ronnie started the relationship with Lincoln Heights. He just always finds people and makes connections. It’s just his nature, like I don’t even know how he met you. He just always finds people and makes connections. He’s just really good at that.

Ronnie goes on to explain how he built a relationship with Lincoln Heights.

Once Ms. Iris connected us with Ms. Dinkins from Lincoln Heights, I sat down in a series of meetings with Ms. Dinkins and Mr. Hill who was the

treasurer of the Resident's Council. I met with them for about 2 or 3 times, maybe 3 or 4 times. We sat down and I explained my idea of what I wanted to do [for the community garden]. Then I bought Xavier and Joelle in... This was a couple years ago, it had to be in 2012. We had a couple series of meetings and then we said we were going to build the garden. We were going to run events off of it and take care of it. We wanted to make it have its own identity. We wanted it to blend in and to really match the community. They were fully open to it, and they wanted it. The Residents Council and Ms. Dinkins were very excited about doing that stuff.

The following sections presents the Green Scheme's "practice stories" that describe what they went on to do at Lincoln Heights.

"We gave them a spark"

Xavier's account of how the Green Scheme began working in Lincoln Heights was similar to Ronnie's.

Around the time the Green Scheme was getting started, Ronnie, Joelle and I were part of this group Healthy Affordable Food for All. It's about food justice. Lincoln Heights is in a place where people don't have fresh food. We were thinking about that and community gardens as a way to engage people. Everybody likes to eat and agriculture is deeply engrained in our history. So we were going with that and it took off from there... Ronnie met Ms. Dinkins through someone else. She wanted to do a garden and we came to her and told her we can help her do a garden. She was like "alright, ok I'll give you guys a try."

Xavier spoke more about Ms. Dinkins:

*Ms. Dinkins talks a lot about how her family is Gullah from South Carolina. They're known for growing rice. Everybody has agriculture in their history, so I'm sure **gardening was a matter of somebody just giving her a spark. She had the match, she just needed some people to strike it for her.** She's an elder, so I don't think she would have actually built the garden herself, but if there were some people who were out there who had the idea and who had the excitement to go do it, then she was down. That's how we got started, with Ms. Dinkins wanting to give us a chance because we were young, we were black, we were coming up. I think there were some other white folks who wanted to do it, but she wanted to give us a chance, try to sell it. She*

was the reason why we got into Lincoln Heights in the first place just by her giving us the opportunity.

It is not clear from Ronnie and Xavier's profiles whether the planting of the garden was really Ms. Dinkins' idea or the Green Scheme's idea. On the two occasions when I visited Lincoln Heights, I met Ms. Dinkins inside the community center. The garden is planted directly in a fenced in area directly outside the center. I had the impression that in addition to being the President of the Residents' Council, Ms. Dinkins ran the community center and was the gatekeeper for what goes on there. Xavier's above quote makes it sound like a garden would not have been planted without "a spark" from someone else. The Green Scheme convinced Ms. Dinkins that they were the right group to plant the garden (whether it was her idea or the Green Scheme's idea), perhaps because they were young and African-American, just like many residents in the Lincoln Heights community.

Once they had the support of Ms. Dinkins, the Green Scheme set about to plant the community garden in 2012. Ronnie tells the story of the planting of the garden.

For the first year we had to use our own money for the garden. We went and bought all the materials for the garden. We used our personal money to show that I was that confident in our idea and what we were doing and that I knew it would work. I was trying to get it done before the fall because I wanted to market it throughout the winter so that I could start getting the funding and something to work with.

One of the "sparks" for the garden was the Green Scheme's personal money. Based on conversations outside of our interviews, it sounded like Xavier, India and Ronnie all contributed money to pay for supplies to build the garden. Ronnie continues the garden's origin story:

It took 4 months to get the garden planted. We started talking in May and got the garden done by August...[That first year] we built the L shape [raised bed] for the garden. We set out our day to build the garden with the community. We do 3 service events a year at Lincoln Heights where we have all the music out, the food out, the performers out, we're really doing a maintenance day on the garden, so those keep us pretty active because those are high visibility events. The community actually built all this stuff, and we just led it.

The Green Scheme's personal financial investments into the garden demonstrated their vision of themselves as facilitators and leaders of the garden. Xavier goes on to tell us about many additional "sparks" the Green Scheme invested so that the community could plant the garden.

We came up with the idea to have a garden kick-off and to have a big community day where we would build just one raised bed. My role was to do all the organizing for this big garden kick-off. I had to figure out how big the garden was going to be, how much soil we needed, how much that would cost, seeds, where to buy the tools from. That was really everybody's first time organizing something and playing different roles, so we were learning right on the fly...my main focus was on the garden, making sure things looked good...That event was our first time that me, Ronnie and Joelle put an event together. Everybody had their own role. Everybody nailed it, it came together. I think that was a big accomplishment for us. It gave us some confidence, like damn we can do this. It was like our first time popping a wheelie.

These other "sparks" were the provision of technical knowledge and resources necessary to build a garden. They also coordinated a community event to get the garden planted (more details on this are to come later). While the community helped plant the garden, they might not have been able to plant it without the wood, the soil, seeds, and tools that the Green Scheme purchased with their own money. The following year, the Green Scheme expanded the garden. The raised beds for the garden were constructed in the shape of an L and an H for Lincoln Heights.

“It was more than just a tree planting”

Another way in which the Green Scheme “sparked” the community garden was by having a big community events to plant the garden. Xavier describes the first community event they hosted in 2012 to plant the L shaped raised bed.

The first time we constructed that raised bed was a big event. Kids were out there. We had a go-go band from Lincoln Heights out there. We had a lot of people out there. It was like an urban hood event. Nobody does it like that. We had a moon bounce out there, we had food out there, we had pit bulls, we had a go-go band and a DJ. All these different organizations were there. I think one was Empower DC, they do work around the state of public housing. A brother had “Friends and Family of Incarcerated People” they were out there. There was an organization that does pampering for little girls. We had face-painting. Rodney Stotts, the black falconer, was there with his birds.

One of the purposes of having a big community event with lots of activities was to get people to show up to the event. Joelle explains:

Our strategy [for engaging communities in these issues] is to reflect the community. We start out with an event and there’ll be music and food and people come out for that. But then all of a sudden they’ll be building their own garden that they didn’t really know was going to be there. It was on the flyer, but people don’t really pay attention to flyers. They pay attention if they see a whole bunch of people outside and they come to see what’s happening.

India elaborates further on the Green Scheme’s strategy to grab people’s attention through food and music.

I would say the things or events we use the most to entice people to come to our events is music, like some type of singing or rap contest. The biggest one is probably free food. People come out for that. No matter what type of community you go to, people hear free food and they’ll be like “ok I’ll go if there’s free food involved.” So I think that’s the number one activity that we use first. Over time, it’s like if they come to this event and they meet us and they see that we’re down to earth, they see what kind of good can come out of this. If you don’t know anything about going green, then you hear that stuff and it sounds boring, it doesn’t sound like it pertains to you. They might not be interested, so if

you can just get them to come out, just once or twice to see what's going on, then they might not say "hey I absolutely love this" but at least they're open to it. They might say this might not be a bad thing after all.

The purpose of these big community events may be as simple as it was a way to attract people outdoors to attend. However, Xavier tells another story that speaks to the ways in which food and music can help the Green Scheme overcome the challenges associated with getting people to participate in tree planting. This story was Xavier's most meaningful moment associated with his experiences with the Green Scheme. Xavier knows first-hand the challenge of engaging residents in tree planting, particularly in African-American neighborhoods. Xavier had volunteered in community tree plantings with Casey Trees in order to keep his Master Gardener certification. He describes the first time he volunteered at one of Casey Trees' events with his Dad.

There were a lot of people there who weren't from DC. DC is made up of a lot of people that come from all over the country, all over the world. So I'm thinking dang DC, this is our town. My Dad grew up in DC too, so we're both native Washingtonians. We grew up here, we had our first memories here, our fun, love, loss, just life in general. I felt like black folks in DC should take pride in taking care of our city, of our town. Of course other folks could do it, but we should be a part of it too. I just thought it was important. I wanted to get more black folks involved in this. That motivated me.

Xavier continued volunteering with Casey Trees and made similar observations about subsequent community plantings.

Casey Trees is dope, they do real good work, they plant trees all over the city. They might plant trees in this neighborhood dominated by African-Americans, but it wouldn't be with anybody from the neighborhood there planting trees. It's usually white folks planting trees in the neighborhood. I'm usually the only black person up in the joint planting trees. I was like 'this is crazy, we got to get out here and do this, be part of this, this is our neighborhood. If you're not actively engaged in this process, then you're eventually going to lose your

neighborhood to gentrification in DC.' I was just making all these connections that were spurring me to get more of my people involved.

Xavier's experience volunteering with Casey Trees inspired him to organize a tree planting in Lincoln Heights, which was Xavier's first time taking the lead to organize a community event as part of the Green Scheme. He describes the steps he took to organize the event:

We started planning it in 2012 even though the planting wouldn't be until 2013. It was a ton of planning. We did a couple meetings in Lincoln Heights. I met with Lincoln Heights initially about the trees. I worked with Mr. Hill, the treasurer of the Resident's Council. Mr. Hill was the main agricultural person. Mr. Hill grows fruit trees at his house. He's got sage and seeds and oranges and lemon trees and he grows them in his house. He's probably in his 50s and he's been growing stuff for years...He's all into arboriculture. It would be dope if he were to become an arborist, but that's another story...Anyways, Mr. Hill, myself and Josh (a co-worker of mine) scoped out Lincoln Heights, figuring out the spacing, making sure we had enough space on the hill, figuring out where the trees would go. Mr. Hill and I were working together trying to get what he was interested in. He was definitely interested in peach trees, interested in where we could put them in a space that was easy to maintain, where we could water and keep an eye on them. That hill was the best space because it got a good amount of sun. Mr. Hill and I sat down, walked it, talked about it for a while. Once I got that information from him, it was on me to take that back to the drawing board, pick out the trees, figure out the date. I called the utility to make sure there was no gas line. I figured out who was going to get the food. I told Ronnie and Joelle that we're going to need some music, so I came up with that idea. I have a pretty good rapport with Casey Trees, so I applied to get trees and they donated 17 trees.

[As far as getting the community involved], it was talking to people, going to meetings. The only thing I was nervous about was the community outreach, but that's when I realized one of my biggest strengths is the community I'm part of. I realized I have my social capital and I know people. I think people see you doing good work and they want to help further that work if they can. That's how it happened. I emailed [my mentor] Dennis Chestnut the information, he pumped it out to some people. He helped get the word out, he got the word out to people in Lincoln Heights and in the area surrounding Lincoln Heights. We were going to have the music out there, make it a party. I called up

a good dude from another public housing project, Benning Terrace. I asked my girlfriend, who's a chef, to do a real nice kale salad. I was trying to pull out everything I could from my utility belt, pumping it out to get as many volunteers as we could. I was pulling out any trick of the trade that I felt like could make this tree planting stand out, but also attract people in

Next, Xavier describes what happened on the day of the planting.

On the day of the planting, I was nervous. I didn't know how many people would be out there. I was thinking it's going to take forever to plant these trees and I thought I would have to plant all these trees myself. When we got out there, I was like damn, there are a lot of people out there. It was a boatload of people, like 60 – 70 volunteers, more people than I had anticipated coming out...It was definitely more people than we needed to plant trees.

During the planting, I was checking any holes that were made, making sure that everyone was enjoying themselves, had water. I think we planted one southern magnolia. We planted fruit trees, we had two figs, some peaches, plum, pear, apple, cherry, paw paws and persimmons. It was like a mini orchard. On the inside [of the community center], people were painting the pavers to match up with the trees. Joelle, Ronnie and I went to this place and picked up these old pavers and we had paint to paint the pavers. We had persimmon, paw paws, cherry trees, figs, so they were painting them out so people would know this is that tree. We had a lot of volunteers working with the kids, everybody enjoyed it. Everybody was doing it, there was enough room for everybody, the food was good. People were super encouraged by that type of thing. It was awesome and people painted, got talking, got to know each other. It was definitely a dope experience and I definitely give thanks for that. It was a beautiful experience.

Ronnie shared his reaction to what happened.

What was so crazy to me was that, we planted 17 trees and basically, we had too many volunteers participate in the tree planting. We had so many volunteers. And in the middle of the hood like that, getting people to plant trees pretty early in the morning and to have too many volunteers, its unheard of.

Earlier, Xavier had spoken about what he did to get people to show up. But perhaps what was most successful in bringing people out was the music. He explains further.

*We had a DJ out there. That's the beautiful thing about the music. Lincoln Heights is the second biggest public housing development in DC, so it's hard to reach everybody. Going door to door is not that effective, so we were able to get the word out to as many people as possible through community meetings, through word of mouth as we possibly could. But the music brought even more people out as time went on... Once things were shut down around 12, the music was still playing and people were still coming out, talking and wanting to get involved. The vibe was real DC, real community. It was a different vibe than just a regular old boring tree planting. Not saying that other tree plantings are boring, but we had our own jazz to it. I've been to a lot of tree plantings. [What made it different than regular tree plantings] was the music, it was flashing. It was just like a real fun type of event. Other tree plantings you come out and it's cool, there's people talking to each other. They plant trees then they go back home. But we had music, it was flashy. It was a real fun event. We had a DJ, people on the mic... **It was more of a community event with the tree planting than just tree planting...** I hired a young lady to come out and record a video. She had done music videos for rappers in the area. I think they were shooting music videos before we did our joint, and now there were tree videos and giving it a whole new vibe.*

This passage confirms what Joelle and India had told us earlier about using food and music as a way to draw people to their event. Xavier believed it was the music that brought people to their event, even after the trees were planted.¹⁴ Ronnie shared additional details about having music, a mic and a DJ that day, and how that event represented the Green Scheme.

Then we had live performers that were community-based. We had a go-go band that was from Lincoln Heights. Go-go style music is a DC style tradition. It's like a band of 4 or 5 people in the front line on the mics, usually a rapper, a singer and a lead mic talker. Then you have Congo drums and they're just playing music. Go-go is like a movement, it's like a DC tradition. We had a band perform and it was all community. They were very excited. We had a young man come up who was incarcerated for a long time who had just come to the event and who had just enjoyed it so much, he got on the mic and said a prayer. It was

¹⁴ The Arbor Day planting I had attended in April 2014 was organized in much the same way. Ronnie was the DJ for the event. I saw that many residents showed up after the planting was over to enjoy the music and food.

just bands and youth groups pulling up, there were just so many people there. It showed who we were. It was like our introduction: "This is Green Scheme ya'll and we're up and going now, look out for us."

Xavier reflected on the event, describing it as *"one of Casey Trees' best tree plantings."*

He discussed why the Green Scheme's tree planting had been more successful than the type of tree plantings he had previously described.

That tree planting event was my first time doing everything and it worked out. It was awesome. The best part of that event was being able to sit back, chill and to soak it in. Ronnie was like "hey man, you should slow down and take it in, sit back and enjoy." So I slowed down, just watching everybody work, everybody being happy. Ms. Dinkins got to speak her piece. Mr. Hill performed one of his poems. It was a peaceful event. It went well. It was beautiful. I was on top of the world. It was vicious, it was dope.

Usually with tree plantings, they're done in reverse. There's people outside of the community planting trees somewhere. But we had people really in the community, hands on in the planting process, what they want, how they want to do it...If you don't have those connections in the community already, it's going to be hard to get people out there. If you don't make the tree planting culturally appropriate or if you don't tap into the culture of the neighborhood, then you might not get people to come out. I think there's a disconnect with [Casey Trees] not knowing how to get out there and talk to people. But also for folks in those communities, planting trees might not be on their top 10 list of things that's important to them. Most people are trying to get jobs, they have regular life. But I do think, because I've done it successfully before, that if you can make those community connections and do the footwork in the beginning, then it can be a success. Kids enjoy it, people enjoy it, families enjoy it, people will come out and it will be a beautiful family event.

This was the first event Xavier described when I asked him to tell me about his most meaningful moments from the Green Scheme. I could tell he was extremely proud of this event when he told me the story. After all, he had achieved his goal of engaging African-Americans in planting trees in an African-American community. However, it wasn't clear from our interviews how many of the volunteers who showed up that day

were actually from Lincoln Heights. Some of the volunteers were from Casey Trees, George Washington University, and Benning Terrace, a nearby neighborhood. Xavier's connections to those groups via his social network¹⁵ might have been part of what brought so many people out that day. But, Xavier does tell us that making the event culturally appropriate was important as well. One way they did this was by having a local style of music performed and recorded by people in the community.

Beyond the music, they also had an open mic at the event in which people could get up on the microphone to share a message. I wasn't sure whether this was deliberate on their part or not, but Ronnie made it sound like the man who had been in jail who said something on the mic got up there spontaneously, suggesting it was indeed an open mic. Lincoln Heights has a high crime rate and that's what many people associate with the neighborhood. Xavier goes on to tell us that the tree planting was more than just a tree planting because it was an opportunity to change people's perceptions of Lincoln Heights. Xavier explains:

There are artificial gaps [between neighborhoods] in multiple ways. Some neighborhoods might have differences on a class and race level. We can break those gaps through planting trees. Anybody can plant a tree, no matter how poor you are or whatever imaginary label is put on you. Some neighborhoods have friction on a street level. There's violence in Lincoln Heights in the summertime and in Benning Terrace. A lot of times if you get people from different neighborhoods, especially if you get people coming from outside the city, you hear things like "don't go over there because you might get shot." We're trying to recreate that story because a lot of that was put on by an outside force. There's good shit that goes on 90% of the time, but the 10% negative stuff that happens is what gets all the attention. The story was written by somebody else, it wasn't written by the community. If Mr. Hill or Ms. Dinkins or one of the other community members in Lincoln Heights

¹⁵ Xavier was a volunteer for Casey trees and he was friends with a football coach from Benning Terrace, who brought his players to the event. I wasn't sure of his connection to G.W.

wrote the story of the community, the story wouldn't be just about drugs or violence. That wouldn't define the whole neighborhood. That might be a part of it, but there would be so much more love and light and humanity given to the neighborhood.

But you would only know that if you had spent time with folks. I've been with people in all different neighborhoods across the city, even some of the neighborhoods that have the worst stereotypes and names on them, and I haven't had any problems with anybody. I've only seen, kids, mothers, fathers, brothers, sisters, families, just regular people trying to live. I think that's how the picture should be painted of the neighborhoods. By planting trees, there's something good you can say about the community.

"It's about being there all the time."

As Xavier said above, you can only gain an understanding of a community if you spend time there. Joelle tells a story that demonstrates the importance of having a consistent presence in the community. She describes helicopter programs that are put on by organizations who "come in and just leave." She tells a story about a helicopter program in Lincoln Heights.

I remember there was one of those groups in Lincoln Heights when we were about to do the second year planting [of the garden] at Lincoln Heights. The day we went up there, apparently there was some group that had come the day before or a few days before and planted a whole bunch of stuff in the space where we had already planted and already done some work. They had ripped out the flowers that some of the people in the community had planted and people were pissed. And then they planted half dead stuff. It was a mess. And we were like who did this? Who was this organization? Of course they meant well, they were trying to help the community and provide fresh green vegetables. But they really undid a lot of hard work and a lot of things we had been trying to do. They came up here, they pulled it out, but plants were already there. They planted this stuff that's probably going to die and nobody even knows who they were or how they got there. They just came one day and didn't even run it by us. I remember being like what the heck? Like oh man, who did this? And Mr. Hill was pissed. He thought that we did it.

Joelle explains the intentions of “helicopter programs” and the perhaps unintended consequences of their work.

I always prefer them to partner with an organization that's existing and not just be like 'oh hey community, lets pick one out of the stack' and then go in and plant some stuff and then leave. It's not going to work, but that happens a lot. It happens a lot particularly in the larger public housing developments where people automatically assume that it's someplace destitute and they clearly need us and blah, blah, blah. I'm not trying to take away from their intention, but sometimes these communities get used to that because it happens so often to people. Like in Lincoln Heights and in low-income communities, there are always people coming in with the intention of doing community service work. But it happens so often that people are like ok whatever, there's some more people here. It makes it a lot more difficult, it takes longer to prove that you're there, that like we're really here.

She goes on to describe what the Green Scheme has done to consistently “be there” in Lincoln Heights and why that consistency is important.

“...I have an anecdote from Lincoln Heights that speaks to consistency in being there, like when people are surprised and recognize that we're still there. We've been there a long time. That's where we first started actually doing our work. We'd have workshops or be out in the garden. Kids come when they see you at the center. We're just out there planting stuff or weeding or somebody's doing a food demo. It's not a big event every time.

*Anecdotally, I've overheard people say “oh ya'll are still doing this?” I don't remember exactly what the setting was where people said that or if it was at workshop. We were just there. People are surprised when the Green Scheme has been there every Wednesday for 3 years or every other Saturday. People get to know your face. People are used to seeing you around. They might not know my name, but they know me, she's with the people who plant stuff, she's with the Green Scheme. You can't just build a garden or do a workshop and think people are going to change their eating habits or eat their vitamins. **It's about being there all the time** because then they feel like they can call me or when they see me that I'll ask them how is this going. For me, it's like an unexpected accountability. I'm accountable to them for being there and they're accountable for being engaged. That consistency is an important part of the model or the approach. [It was deliberate on our part] to really be present there. When people were like “ya'll are still*

doing this?” it makes me take a step back and be like “yeah, we are still doing this!” When that surprise turns into expectation, I think that’s when I feel like we’re doing the work.”

What might Joelle have been doing while she was “there” in the community that helicopter programs might not have been doing? It’s likely Joelle was talking to residents, realizing that she could learn from them, but also check in on them and how they were doing. This presence fostered a sense of expectation, perhaps even trust, that the Green Scheme would be there and that residents needed to be engaged. She describes a few lessons she learned from residents in Lincoln Heights.

We also try to bring community members in and try to empower them to be able to facilitate or lead things. We don’t just say, “oh we’re going to come in and show them this.” We’re like “you could probably show me how to do something!” [An example of the community teaching me something] was using peppermint oil for pest management. You can use it to keep away rodents or other pests. You can put it around your plants, like roses, and the pests don’t like the smell or something like that. Another example is we might have been talking to residents about ways to do meal prep and they suggested how to chop something up or a quick way to do something. I think that it’s important to have that space for that type of discussion instead of being like ok here’s how we do it, this is what we’re doing today, this is how you do it. No, it’s like people have been eating somehow, living somehow, they’re not dying in the streets. Obviously someone has figured out ways to manage. It’s not a one-way kind of communication.

[It’s important to learn from the community] because we recognize that we have a cultural, historical propensity toward sustainable agriculture. This isn’t new, people have been doing this forever. Somebody’s grandmother, or great grandmother or great-great grandmother already knew this. We just might have forgotten it somewhere, or it missed us somehow. I think it’s really important to recognize that and to create that mindset. Somehow it hasn’t been transferred to everybody, but recognizing it was probably transferred to Ms. Dinkins or to whoever. And she’s transferring it to me. I think it’s really important to recognize that and to know that this isn’t new, we’re just trying to put a spin on it to make it more appealing to people like us who it might have skipped over.

I got the sense that the “helicopter programs” that were quickly coming to and from Lincoln Heights were communicating their messages to residents without listening to or learning from residents in the way that Joelle describes above. I witnessed this dynamic during a community trash clean-up I attended in September 2014 in the River Terrace neighborhood in Ward 7. Joelle organized the clean-up as the capstone to her Environmental Leadership Fellowship program (Ronnie had invited me to the event, which the Green Scheme co-hosted). When I got there, I met an elderly woman Ms. Peggy. She complained to me about the amount of trash in the neighborhood and explained how she cleans up her neighbors’ trash, even though some of her other neighbors didn’t understand why she felt the need to do that. Then a young man named Albert (about my age) from an environmental nonprofit in DC joined in our conversation. He told us about an article published in *Science* about the “broken windows theory” and used academic jargon to describe the relationship between trash attracting more litter and crime. The extension educator in me was thinking that Albert could have delivered his message using non-academic language. By that point, all the volunteers arrived and Joelle announced the instructions for the day and thanked everyone for showing up. Then Albert announced that it was an international ocean conservation day and he informed us that the clean-up would ultimately help the oceans. I was thinking that his message “*sort of seemed out of place*” given the very local types of concerns Ms. Peggy had shared with me. I wondered *had he not been listening to Ms. Peggy?*

Looking back on this now, I wondered what Joelle was thinking at that moment.

In our later interviews, she had talked to me about the sort of traditional environmentalism that was evident in Albert's message. Joelle told me:

[If I were to give advice to someone who wanted to work on environmental and health issues], my advice would be to put people first, especially in environmentalism. I think that the reason why [environmentalism] hasn't worked is because the crunchy folks, for lack of a better term, have made it all about the trees or the animals or the water or the ocean and people don't care. People care about what's affecting them. So you telling me about some polar bear, what's that got to do with me? And I mean yeah that's sad, people should be more empathetic, people should care, people should care about the future and the planet, but they don't.

That's why making the connection between health and environment is so difficult because for so many years they've been seen as two totally separate things, but they're not. They're the same thing. And I think that if people understood people, then people's health would be better and the environment would be better...In my personal opinion if someone wants to get involved in community and grassroots environmental whatever stuff, I would say put people first. What are you saving the planet for, a planet with no people?

Joelle was putting people first¹⁶ when she was talking earlier about the importance of listening to and learning from the community. Albert had struck me as representative of the type of "helicopter programs" Joelle had discussed because it was not clear that Albert had not put the people first in his message at beginning of the clean-up, nor was it clear that he or his organization would be coming back to the neighborhood. The Lincoln Heights community had been accustomed to "helicopter programs" like his coming in and leaving after short periods of time. By not spending time in the

¹⁶ Joelle struck me as a person who lived her life putting other people first. On the day of the clean-up, I learned from her neighbors Deon and Tawana (with whom I collected trash) that Joelle had recently moved to River Terrace. They both had nothing but positive things to say about her and that she "hit the ground running as soon as she moved in to the neighborhood," getting involved in various community issues.

neighborhood, those organizations can't get to know the people because they were never there long enough to speak with the residents. Xavier had talked about only coming to know communities *"if you spend time with folks."* Joelle and Xavier have shown us that "being there" in the community, beyond flashy public events or workshops, can be as simple as just talking with people.

"What we were doing was something new."

Ronnie and Xavier recounted one story that further demonstrates what the Green Scheme's presence looked like in Lincoln Heights. Both Ronnie and Xavier told this story after I had asked each of them (in separate interviews) to tell me about their most meaningful moments from their work with the Green Scheme. Ronnie first told me this story in September 2014 after the River Terrace clean-up. Ronnie had seemed tired that day, but when he told me this story, his eyes lit up and his demeanor changed to reflect his excitement to tell this story. Xavier was also excited to tell me this story.

The story occurred in early summer 2014 after the Green Scheme began their Code Green program, which included cooking classes for families and youth.¹⁷ In these classes, they would cook meals using ingredients from the garden. Ronnie and Xavier set the scene, then tell the story and what it represented to them.

We were outside one day before the class. We were picking the food because we were about to cook our normal meal that we'd cook with parents and adults, and we were discussing whatever the class topic was for that particular class. (Ronnie)

At this point in time it was summertime, a lot of kids, everybody's outside after school, after work. The garden is at the top of the hill, you

¹⁷ The Green Scheme was awarded a \$140,000 grant from the USDA to fund this program. See Ronnie's profile for the story of how they acquired the grant. The Code Green program aimed to "address the redevelopment of low-income communities in Wards 7 and 8 through urban agriculture projects" (Green Scheme 2014).

can see everything and everyone can see us. I don't think we had any music playing or anything like that. We may have been planting, but there was a lot going on. Some kids were on the other side of the fruit tree fence doing something, planting over there. Some people were over there eating some snap peas. Everybody was engaged in something to do with the garden, people were watering trees. (Xavier)

Here, Xavier and Ronnie are just hanging out in the garden with the kids, much in the way Joelle had described earlier and in the same way I had seen when I visited the garden in Summer 2014.

We were all picking vegetables and the ice cream truck comes down the street. I was a little hungry, so I look up listening to the ice cream truck. I looked back at all the kids, and we had at least 10 kids out there at the time, probably more than that. All of them were so focused on picking the vegetables. They were tasting something, I can't remember what it was, the lemony stuff, they were tasting that and they were just so fascinated by the healthy food that not one of them turned their head and tried to go to the ice cream truck. In Lincoln Heights, it's the hood so the ice cream truck stays out there. The ice cream truck came right when there was nothing going on but us sitting in the garden, nobody else outside. The ice cream truck popped right by us and the kids just kept staying focused. I was surprised because some of those kids have money, so you know they would have ran to the ice cream truck. (Ronnie)

At this particular time, everybody was so engaged in whatever they were doing—weeding, planting, eating something, watering something—and they were not paying attention to the ice cream truck. I was like 'man what's going on here?' Usually a few of them run to the truck. That will engage them and keep their attention. But nobody budged. I was thinking 'damn, is this the twilight zone or something?' I was thinking 'man, this is what it's all about.' I wish we could have captured it with video, but I think Ronnie and I were too shocked to pull out our phones and record it. (Xavier)

This was a meaningful moment for both Ronnie and Xavier. I asked them both to personally reflect on that moment.

[What had we done that kept them engaged?] There had been times earlier in the summer when they would all run and some might go over there and get ice creams. But this time, the ice cream truck didn't get

anybody. There were a lot of people out there. We had given them different tasks to do, like you do this or do this, or if four kids come up the hill, help out to water, don't spray anybody. They were all doing stuff, so everybody was focused on what they were doing and not on ice cream. It was dope. That moment shows that if you're able to do good work, you can capture kids' attention among so many other things that are vying for their attention. It shows that it can be done. We can do it. We've planted some different types of vegetables that were new and that tasted different, so I think that may have been part of it. They enjoyed it. I know everyone enjoys eating. Some of the vegetables we had growing had different tastes and different smells and I guess that was more engaging than the ice cream truck, which is nothing new. **What we were doing was something new**, and that was awesome. I know they were definitely looking forward to going to the class. There's always new food, like the vegetables, vegetarian meals for the most part. They always enjoy the food. (Xavier)

[The ice cream truck moment] was a milestone because we had these kids concentrating on eating healthy as opposed to running to the sugar truck. I was thinking in this community right here, where that's what these kids want, candy and all those snacks, not curry this or that or all the healthy options. As attractive as the ice cream truck was, they were so focused on these healthy food items. It just shows that you've given them a chance to be exposed to some of the right things, as opposed to them having their limited options. You'll never know what was the trigger for being fascinated by the healthy food for this kid as opposed to what was the trigger for this kid. To me, it's the element of exposure. There's some kids who grow up who never know that you're supposed to eat fruits and vegetables. They think that Oodles of Noodles is not bad for you because it's not fast food, or like they just confusing myths and ignorance and stuff. You're exposing them to this, and it's a clear exposure, and if they're listening it will definitely, for some of them, be something that sticks with them as far as making later decisions on eating or whatever it is. [That moment was memorable] because it showed that they were able to choose and they chose the healthy food option. A few months before that they wouldn't have took the healthy food option. They would have taken the ice cream truck option. [That story of the ice cream represents] just how genuine the work is going on that the team is doing. It just shows that no matter what, this is real people, these are real lives, you can give them the gift to cook and eat together, to really execute healthy things knowing you can make the community healthier. (Ronnie)

Both Ronnie and Xavier touch upon notions of novelty in their reflections on why the kids didn't run to the ice cream truck. Xavier noted that the ice cream truck was "nothing new," as the kids always had the opportunity to get ice cream from the truck. Ronnie said the ice cream truck offered them what they always wanted, also nothing new. There were a few elements of exposure to new things in their story, all of which were centered around the garden. For example, the garden had provided kids with access to vegetables. Earlier in his profile, Ronnie explained the types of vegetables they planted and why they planted them:

We're famous for trying to bring out the most exotic unseen things and expose our community to it, the healthiest, edgiest things we can bring. And in order for kids to eat more carrots, they have to be purple or white or something like that, so if we can bring that to them, we're going to bring that to them...

Ronnie tells us that these weren't just any vegetables; they were "edgy" vegetables. It was also a new experience for the kids to have a garden to weed, plants to weed and dirt to dig around in. Perhaps the kids were too busy with those tasks to run to the ice cream truck. Overall, the garden represented a new opportunity to grow food that was "exotic" in their appearance, taste and smells, to eat food that they had helped to grow and cook (unlike Oodles of Noodles) and to learn about healthier food choices than ice cream from the Code Green classes. Ronnie and Xavier's story shows us that the Green Scheme's presence at Lincoln Heights—from the cooking classes to the garden—involved a variety of new experiences which may have looked boring relative to the new activities the Green Scheme had introduced to them.

“We shouldn’t have to be there for 10 years.”

Joelle demonstrated the importance of having a consistent presence in the community, and Xavier and Ronnie’s story about the ice cream truck provided more detail about what their presence looked like. However, the Green Scheme knows that they can’t have a presence in Lincoln Heights forever. Joelle explains:

*This is also where it was frustrating because we never intend to be in the community forever. To use a metaphor, we’re like the training wheels of a bicycle. The community will use the wheel until they don’t need them anymore and then they’ll just ride the bike on their own. We’re the training wheels for how to grow your own food, but the point is to be able to have enough confidence or efficacy or support so that the folks that live in whatever neighborhood we’re working in can run that garden on their own without us. **We shouldn’t have to be there 10 years**, that’s ridiculous.*

Xavier had also used a bicycle metaphor to describe what it is that he does at Lincoln Heights in relation to the amount of time he’ll be at the garden.

I would say I’m a coach. My goal is to get the garden to the point where residents in Lincoln Heights feel comfortable maintaining the garden and they have complete ownership of the garden. I’ll work with them until they feel like they’re connected to all the resources they need to make their garden an annual thing and to get more people involved. That’s a sustainability piece. The garden won’t be sustainable if I’m always there. By me subtracting myself from the situation, but through the work I’ve put in, I’ve been able to pass on my knowledge and that makes the garden sustainable. I’m just like a coach to get them going until they’re on two wheels, then popping wheelies. That’s the goal.

Here, Xavier is talking about building the community’s capacity as a way to sustain the garden. However, the extent of that community capacity was not captured in their profiles. But, Xavier spoke in depth about one source of community capacity: Mr. Hill, the secretary of the Resident’s Council at Lincoln Heights. I asked Xavier to talk about his relationship to Mr. Hill.

I built a relationship with him by going over there, talking to him about gardening, exchanging ideas and knowledge, talking about stuff outside of planting. I've been inviting him to different things so he could see what was going on...[I've learned some important lessons from Mr. Hill]. I'm not sure how much he has monetarily but he's able to make the most of what he has. His apartment has this big window that gets a lot of light. He's growing stuff out of everything. He repurposes things and has shown me you don't need a lot of money to grow stuff. All you need is the seeds. If all you have is the seeds, just put them in the soil and they're going to grow. He can make that stuff work. I'm pretty sure he didn't go to school for agriculture or arboriculture, but gaining that knowledge through the indigenous work, just working with it, learning, teaching yourself. He just has a really good spirit and he keeps pushing forward.

Mr. Hill's arboricultural and horticultural knowledge combined with his familiarity of the spot where the tree orchard was planted was a source of community capacity for the tree planting event. Xavier views Mr. Hill as a model for the future maintenance of the trees:

Mr. Hill will probably be the person to maintain the orchard, but we hope to get more people to do it. I've been taking a role, but right now there hasn't really been too much maintenance of the trees because they're still young... That's something we'll probably tackle in the future. We need 3 or 4 Mr. Hill's up there and then I think it'll expand more. I think there are folks like Mr. Hill already there in the neighborhood, they just have to be approached. That curiosity has to be awakened in them. It might be a little person, an older woman, a middle aged person, a young girl. I think they're already there and they just need to be given the opportunity to learn. I think once they learn and get into it and see what type of vehicle it can be for the community, I think they'd be all in. I think we're almost there. Initially we didn't think it would take this long [to get the garden planted]. But now we know it's going to take between 2 – 4 years. It's just about getting people to buy into the idea. Lincoln Heights is a big community so there's a lot of things outside of the Green Scheme they're doing that make it difficult for people to come together to focus on the garden.

In contrast to the “come and go” helicopter programs that Joelle had previously described, Xavier tells us it takes at least a few years to accomplish planting a garden

and the tree orchard. Their goal is not to be there forever. They want Lincoln Heights to take ownership of the garden. Even though they've identified and worked with Mr. Hill as one person who can take over the maintenance of the garden, Xavier admits there is more work to be done on that front.

Community Engagement Challenges

The excerpts from the Green Scheme's profiles presented thus far have demonstrated some of the difficulties associated with building the community capacity necessary to sustain a community garden. The Green Scheme faced other challenges, although I had difficulty getting them to open up about the obstacles they faced. Joelle explained some of the obstacles, (but only during my last interview when she was no longer working for the Green Scheme):

But it's hard because you come across obstacles working with particular communities. Like when the property manager is against you when the higher ups have given you the green light. Another obstacle could be political opposition. When I say that I don't mean like with politicians, but sometimes there may be other folks who might have a relationship or a past history with some of the people you're working with and they don't get along. Then by proxy, they don't like you and they don't want to support you. Then they have a relationship with someone else and then they're not going to help them either. You will be surprised because suddenly it gets really childish. Some folks have been involved in their community for many years and sometimes if they feel like they've been slighted or you didn't come to them first, even though they may not be the appropriate person, then they might do everything in their power to oppose you.

We definitely faced that in Lincoln Heights. I hate to say this, but it's just one of those communities where people are profiting off of poor people. People have their agenda for what they think should happen and if you are doing something that they view as in opposition to their agenda, then they're going to oppose you. There are a lot of politics now with gentrification and tearing down public housing developments. There are some folks who support tearing down this community because it's going to bring a new community and new and better things are going to come.

They might view doing something now, like planting a garden, as in opposition to that. They're like "why are you doing this? We're moving, we're not about to be here, so what are you doing?" Or another obstacle could be something as simple as "you're working with that person and we don't get along so I don't like you either." It could be as simple as that! There are those little things you cannot let go and stop whatever work you're doing.

Here, Joelle describes the challenges of navigating existing relationships between residents as well as the politics around land development in DC. Ronnie had spoken briefly about similar challenges, although it was always difficult to get Ronnie to acknowledge the challenges they encountered. Ronnie always spoke positively about the work the Green Scheme had been doing. His positivity was evident in his response to my question about obstacles:

[Did we face any obstacles to get the garden planted?] No, I was just so determined to make it happen, I wasn't thinking about failing. I did have some difficulties later on dealing with the DC Housing Authority, with managers and things. It was definitely a bunch of politics going on from the highest leadership on the totem pole to like the lowest rung of the leadership on the totem pole dealing with leaders' running these low income housing developments. There was a lot of stuff that was done that was not exactly in the best interest of the community from the leadership role, so we had to navigate relationships on the ground that weren't always so positive.

What might have made navigating these politics was the fact that all of the Green Scheme staff were doing this work in their free time. All four of them had other full time jobs and career aspirations beyond the Green Scheme, not to mention families,¹⁸ friends, hobbies and professional development.¹⁹ All four of them were

¹⁸ Ronnie and India both had kids who were under the age of 5 when I interviewed them

¹⁹ For Xavier, this included graduate school between 2015 – 2016. During the course of this study, Ronnie, Xavier and Joelle had all completed various trainings and were guest speakers on various panels in the DC region.

incredibly motivated to be doing work for the Green Scheme, but whether and how they ever expended the energy to navigate the types of politics Joelle and Ronnie described was beyond the scope of what they shared during our interviews. Nevertheless, I think they were most concerned with doing the on-the ground work with residents in Lincoln Heights and less concerned with navigating the politics that comes with such work.

Just as Xavier described residents in Lincoln Heights having lives that sometimes prevented them from participating in the garden, the Green Scheme's own lives may have prevented them from being able to build the community capacity to sustain the garden in the way had all envisioned. Even if they wanted to be in Lincoln Heights for another 10 years or for however long it would take to build that capacity, I am not convinced any of them would want to be there for that long. Each of them described future aspirations beyond the Green Scheme. Ronnie wants to draw on his business background to follow in the footsteps of the environmentalist Majora Carter to create his own "Ron Green, the Urban Environmentalist" brand of a hybrid for-profit/non-profit organization that addresses urban environmental issues. Xavier is also working on creating his own hybrid organization called Soilful that will use environmentalism to address social issues. Joelle was thinking about how she could continue to contribute to the environmental movement at the regional level. India hadn't been involved much in the on-the ground work at Lincoln Heights, but expressed an interest in doing so on the Green Scheme's next projects.

Discussion

Reflecting on these narratives, I return to my central research question: What insights can the Green Scheme provide about the complex nature of community engagement in urban greening in the context of low-income communities? The validity of narrative research can ultimately be checked through its “pragmatic use” in the development of scholarly knowledge (Riessman 2008; Wells 2011). In the following sections, I highlight three key insights about strategies for community engagement in urban greening in low-income communities. Insights are discussed in light of the academic literature on community engagement in urban greening.

Insight #1: Engagement as community expression and reflection

Community engagement should include activities and programs that reflect the community (Johnston and Shimada 2004; Elmendorf 2008). For example, Johnston and Shimada (2004) suggest hosting music and art festivals as a way to engage multicultural ethnic communities in urban green spaces through cultural expression. The Green Scheme’s tree planting event, and “kick off” events for the garden, are in line with this recommendation. Beyond planting trees and gardens in the party-like atmosphere the Green Scheme created, the Green Scheme has shown us that engagement is also about letting the community reflect. Out of all the things that happened at the event, both Xavier and Ronnie chose to speak in depth about the importance of the music that was performed by local residents. They also both mentioned people who got up on the microphone to share a message; Ronnie mentioned the young man who had been incarcerated for a long time and Xavier mentioned Mr. Hill reading a poem and Ms.

Dinkins “speaking her piece.” While Ronnie and Xavier did not reveal details about the messages that were shared, these “performances” represented community members expressing themselves and reflecting on their community.

Xavier had told us that many of the people in the neighborhood never had a chance to tell their stories, and that those stories got lost among the stereotypes that people outside the neighborhood had put on the Lincoln Heights community. Thus, it was significant that their tree planting event invited the community to express themselves and participate through performance beyond just planting trees. Xavier viewed planting trees as a way to enable the community to reflect a positive image of itself which it did on an overall level. After all, Ronnie and Xavier were surprised that so many people had volunteered to show up. Ronnie said “*in the middle of the hood like that...it’s unheard of.*” But by pairing tree planting with music and an open microphone, individuals were able to reflect a positive image of themselves as well. Ronnie and Xavier’s comments suggest that providing residents with an opportunity to express themselves in a public manner may be a powerful experience. Take the case of the young man who had been incarcerated for many years, who, as Ronnie said, got up on the microphone because “*he had enjoyed [the event] so much.*”

While measuring the impact of the tree planting event on individuals who participated that day was beyond the scope of this research, Ronnie’s comment suggests that the event had a positive experience on this man. It is likely that high rates of incarceration among African-American men is an issue in Lincoln Heights (Vogel and Porter 2015). That issue (and whatever social forces are sending the men to jail)

represents a disturbance in the community that negatively impacts families and quality of life. Planting trees in communities rife with violence and poverty similar to Lincoln Heights has been described as the means through which both individuals and communities can adapt, recover and transform to better cope with those hardships in the long term. The experience of visual and physical access to trees during and after planting can provide a number of mental health benefits, including increased attention span, reduced feelings of aggression and recovery from stress (see for example Tidball and Krasny 2014) The health benefits provided by trees can help people cope with stressors they may be facing, while the physical act of planting trees can build the community's capacity to address other issues in the community (see for example Tidball and Krasny 2014). The Green Scheme's tree planting event suggests that perhaps the combination of tree planting with opportunities for expression (e.g. music and an open mic) can enhance the suite of benefits people and communities can enjoy from urban greening activities.

Insight #2: Transfer local knowledge in a new way

The Green Scheme was conscious that what they were doing was both new and old "local knowledge" at the same time. I first viewed this as a tension between the profiles. In reference to the garden, Xavier said "*what we were doing was something new.*" But when Joelle referenced agriculture, she said "*this isn't new, people have been doing this forever.*" Xavier too had also mentioned the history of agriculture in African-American culture. However, what I viewed as a tension was actually a strategy for community engagement: The Green Scheme was humble in realizing what they were

doing was not entirely new, but recognized the importance of presenting that existing knowledge in a new way.

Recognizing local knowledge in Lincoln Heights was important to the Green Scheme's model of community engagement. Local knowledge is viewed as an important resource for community capacity (Trickett 2009). Local knowledge has been described as experiential, personal, lay, situated, tacit, implicit, non-expert, informal knowledge (see Raymond et al. 2010). A helpful way to understand local knowledge is to view it as "ordinary knowledge," which is knowledge "that does not owe its origin, testing, degree of verification, truth, status or currency...to professional techniques, but rather to common sense, casual empiricism and thoughtful speculation and analysis," (Lindblom and Cohen 1979, p.12).

The Green Scheme recognizes and acknowledges community members' local knowledge. For example, Joelle acknowledged community members' local knowledge about pest management and meal preparation. Xavier viewed Mr. Hill as a wealth of local knowledge on horticulture and agriculture inside and outside his home at Lincoln Heights. Xavier had also heard from Ms. Dinkins about growing rice as part of her Gullah heritage. Moreover, Joelle recognized that local knowledge on these topics may not have been "*transferred to everyone*" or that "*people forgot it somewhere.*" That loss of knowledge was evident in Ronnie's reference to the kids' local knowledge about food when he said "*There's some kids who grow up who never know that you're supposed to eat fruits and vegetables. They think that Oodles of Noodles is not bad for you because it's not fast food.*" What is evident in these quotes is a respect for the local knowledge in

the context of Lincoln Heights. I had the impression that Xavier was impressed by Mr. Hill's ability to grow many different types of plants at his apartment (in a public housing development nonetheless). Joelle's sharing of the lessons she's learned from residents was powerful given what she had said about the helicopter programs coming and leaving without hardly speaking to anyone there. Ronnie talking about the kids' knowledge of healthy food doesn't necessarily represent respect for that knowledge in terms of admiration, but he knows that that knowledge simply reflects those kids' reality.

The Green Scheme is also conscious of the process through which that local knowledge about agriculture is lost. As Joelle described, they were transferring this knowledge by "*[putting] a spin on it to make it more appealing to people like us who it might have skipped over.*" In many ways, that transfer of knowledge involved acknowledging it as something new, as in the case of the youth at Lincoln Heights. The notion of novelty was evident in Xavier and Ronnie's story about the ice cream truck. The garden and the food it produced generated new experiences for the youth at Lincoln Heights. Planting culturally appropriate or symbolic trees, vegetables and other plants has been suggested as a strategy for engaging multicultural audiences in urban greening (e.g. Johnston and Shimada 2004; McLain et al. 2013). While planting species that people are already familiar with and that are important to them may be an effective tool for community engagement, the Green Scheme's narratives suggest that planting something new can also be engaging for certain audiences, as in the case of the purple carrots for the youth at Lincoln Heights.

In other cases, the transfer of knowledge entailed pairing tree planting and gardening with a local style of music performed by local residents, or inviting non-environmental groups that would be of interest to local residents. These decisions represented the ways in which they put a “new spin” on activities that may have had historic and cultural importance in the African-American community in which they were working. Each staff member of the Green Scheme knew the importance of making their activities culturally appropriate, especially Xavier who had been to tree plantings that weren’t culturally appropriate for the community context where they occurred. Having food, music and other non-environmental groups present at their events made it feel like a party (in Xavier’s words). While there are many efforts to plant trees and gardens in places devoid of green spaces or access to fresh healthy food (e.g. Campbell 2014), these efforts may overlook the simple fact that planting gardens and trees are new and novel activities for neighborhoods that haven’t previously had those spaces. The Green Scheme shows us that celebrating that transfer of old knowledge in a new way that reflects the community context (i.e. a local style of music) is important.

Insight #3: Community engagement can simply be talking and listening to people

The Green Scheme’s narratives speak to the importance of spending time in communities beyond running formal programs. They have shown us that community engagement can be as simple as talking and listening to people for the purpose of just getting to know people. This insight is rooted in what the Green Scheme’s presence looked like at Lincoln Heights, which often involved conversation with residents or the informal exchange of ideas between two people. Joelle demonstrated the importance of

physically “being there” on a consistent basis, but also “being there” engaged in a two-way conversation with residents. Joelle and Xavier had hinted at many “helicopter programs” being engaged in only a one-way conversation with residents in Lincoln Heights in which they *talked at* residents, rather than *talked with* residents. For example, Joelle demonstrated she was talking with residents when she described the lessons she learned from them about different ways to prepare meals or manage pests. She was *talking with* residents because she gave them the opportunity to share their own knowledge and experiences within their conversation. Based on my own observations of the Green Scheme’s presence at their community garden, I can imagine that Ronnie and Xavier were engaged in two-way conversations with the youth in the garden on the night of their ice cream truck story. Both Ronnie and Xavier had shared with me outside of our interviews that they always enjoyed getting to know the youth, and that they appreciated many lessons they learned from them about “what’s cool” (among other things).

The Green Scheme’s presence at Lincoln Heights, in terms of the amount of time spent they spent there interacting with residents, contrasts to the temporary presence of the “helicopter programs” that never established a real presence at Lincoln Heights as Joelle described. While the narratives do not speak to exactly what those organizations were doing when they were in Lincoln Heights, it’s easy to imagine that the people from those organizations did not get to know the community or individual residents in the ways that the Green Scheme showed that they did in their narratives. Comments from Joelle and Xavier suggest that the “helicopter programs” were never there long enough

to engage in conversation with residents because they wanted to come in, share their message and leave so they could move on to “save” the next community. Spending time to get to know residents through conversation was important for the Green Scheme to show the Lincoln Heights community that they cared about people in the community and about the work they were doing. After all, each staff member could relate to the people in Lincoln Heights as they were all African-American and from the DC area. On a deeper level, Joelle related to the health issues that many of the residents were facing. Xavier could relate to some of the residents’ facing crime and jail time. Ronnie and India had young children and thus could relate to the issues families were facing. Furthermore, residents in Lincoln Heights were meaningful participants in the conversations the Green Scheme had with them. The Green Scheme made room in their conversational interactions with residents for the residents to share their own experiences and knowledge.

The community engagement literature in urban forestry discusses the importance of getting to know the local community context for the purpose of assessing the local capacity of a neighborhood to plant and care for trees (e.g. Grove et al. 2005), what kinds of activities occur in green spaces (Austin 2002), and to better understand people’s views toward trees (e.g. Thompson et al. 2005; Elmendorf and Luloff 2001). These activities are considered to be part of a “stakeholder assessment” that can produce knowledge that can be used to plan activities, workshops and events that are appropriate for the community capacity and views toward urban forests and their management. This suggests that getting to know the community context has a narrow

utilitarian purpose: get to know the context for the purpose of designing and implementing programs. Similarly, local knowledge is often viewed as something that already exists among the community, as something that needs to be “tapped into” in order to best manage land, as in the case of natural resource management (Raymond et al. 2010).

The Green Scheme shows us that spending time in communities speaking to residents doesn't have to serve a utilitarian purpose related to engaging communities in a specific environmental or health issue. Community engagement can be as simple as just talking with people and listening to their stories out of a very human desire to want to relate to other people. Joelle did mention that they by getting to know people on a personal level, their presence did create a sense of accountability among residents to be engaged in what the Green Scheme was doing. But their profiles do not suggest that that was why they were talking with people and spending time there. Each of them could relate to the residents of Lincoln Heights and were passionate about helping the community address the they were facing. They cared about the people and wanted to get to know them better.

Additional Insights About Community Engagement in Urban Greening

The Green Scheme's narratives provide additional lessons about the nature of the practice of engaging low-income communities in urban greening. First, the Green Scheme had to “spark” the community garden in Lincoln Heights by investing their personal money, time and labor into constructing the raised beds for the garden and coordinating flashy events to plant the garden. They did many of the same things for the

tree planting event. Especially for small organizations like the Green Scheme with limited staff and financial capacity, community engagement may take initial personal investments to get the work started.

Second, the Green Scheme's narratives demonstrate just how much time it takes to do engage communities in urban greening. I think Ronnie, Joelle, Xavier and India all experienced tensions on a personal level between recognizing they needed to spend time in Lincoln Heights to do the work, but that they couldn't always be there in the short term (due to other life commitments) or in the long term (due to their personal career aspirations). They know that this work takes time and while they were all hesitant to acknowledge it with me, they know that this work is hard. The tremendous amount of personal time and energy they all invested into the Green Scheme and into Lincoln Heights (in their free time, nonetheless) is evident in their profiles. However, their personal investments of money, time and energy can pave the way for building their reputation that enables them to form partnerships with other organizations and communities (as they did with Lincoln Heights. A positive reputation and partnerships may also eventually lead to the acquisition of funding from local or federal government to continue doing the work. The Green Scheme eventually got their Code Green grant in 2013 and they almost got funding from the "Canopy Keepers" research project that we were originally supposed to work on together.

Limitations to Narrative inquiry

One of the limitations of narrative inquiry in this study was that the staff members from the Green Scheme may have wanted to present their organization and their work

in the best light possible. For example, there were times when I sensed that Ronnie wanted to impress me because he viewed me as a researcher from Cornell University. When he introduced me to his mom and his grandfather when I first visited his house, he noted I was from Cornell University in a voice that suggested they should be impressed that I was interviewing him. Along those lines, Ronnie had mentioned to me once that a group of business students from the University of the District of Columbia profiled the Green Scheme. I had the impression that Ronnie capitalized on any opportunity to promote the Green Scheme and their work, which may have partly shaped the types of stories and details he shared with me.

The Green Scheme may have faced community engagement challenges and struggles that were not captured in this study. I found it difficult to get Ronnie and Xavier to speak about the challenges they had faced in their work. Even Joelle was hesitant to share details about the challenges they faced during our last interview, at which time she was not with the Green Scheme anymore. I told Joelle that Ronnie and Xavier had always talked about the Green Scheme's work as if it were easy, and she told me it was just their personalities to be positive about everything. Indeed, Ronnie and Xavier both seemed to have an extremely positive outlook on life in general. As narrators, they decided what stories and details they wanted to share with me in part to shape their personal identities that would be reflected in their narratives (Riessman 2008). Thus, they may have been hesitant to share stories that would reflect negatively on them or the Green Scheme.

Conclusion

Many cities are actively expanding urban green spaces, such as urban forests and community gardens, in order to enhance the livability and sustainability of cities. Urban greening initiatives often target low-income communities which tend to be devoid of access to green space relative to more affluent areas. Engaging residents in low-income communities in the creation and maintenance of urban green spaces can be challenging due to the social conflicts that arise from the creation and maintenance of these areas. The practitioner profiles of the Green Scheme presented in this study highlight important dimensions of the practice of community engagement that have not been captured in the urban greening literature. Narratives from staff members from the Green Scheme revealed the importance of 1) providing an opportunity during tree plantings for people to reflect and express themselves and their community, 2) recognizing that knowledge about tree planting and gardening isn't always new, and celebrating the presence of that knowledge and transferring it in a new and culturally appropriate way and 3) engaging with local residents through conversation outside of formal programs for a relational, rather than utilitarian, purpose.

Appendix 3.1: Interview Questions

The questions below provide a basic framework for the types of questions I asked during each interview session. I may not have asked staff members every question below, and sometimes questions were developed during interviews to clarify certain details shared by staff members (not included below).

September 2014 Interviews (Round #1)

(Getting to know the Green Scheme, initial identification of practice stories)

Involvement in the Green Scheme

1. What is your role in the Green Scheme?
2. Do you have an official title?
3. How did you come to be involved in the Green Scheme?
4. Tell me about the history of the Green Scheme. How did the organization start?
5. What was the motivation for starting the Green Scheme?
6. How would you describe the mission of the Green Scheme?
7. What specific issues do you work to address?
8. At what scale(s) do you hope to see the impact of your work?
9. Changes in individuals? Changes in community? Changes in policy?
10. How would you describe the Green Scheme's model or approach to community engagement?
11. How do you decide what projects or programs to do?
12. How do you decide which groups or audiences to target?
13. I know that the Green Scheme staff members all have other full time jobs.
14. What is your other job?
15. How do you balance your full time job with your work for the Green Scheme?
16. What is it like to balance the two?
17. When do you do your work related to the Green Scheme?
18. How often does the Green Scheme come together as a group, and for what purposes?

Community Engagement Approach

1. Would you say that the Green Scheme is unique from other organizations in the communities where you work? If so in what ways?
2. Summarize some of the Green Scheme's recent projects or programs.
3. Who were the target audiences of those projects or programs?
4. What were the intended impacts of that work?
5. How does the Green Scheme measure the success of its work? What does success mean to the group?
6. What are some of the main challenges the Green Scheme faces related to achieving your mission?
7. Partnerships with people in the community seem really important to the work that you do.

- a. How do you build those relationships? Any challenges?
- b. How do those partnerships help the Green Scheme achieve their mission?

Practice Stories

1. What are the 3-5 most important projects you've done or been involved with as part of the Green Scheme? Maybe it was something that meant a lot to you personally, something that was an all out success, or maybe something that didn't quite work out but that you learned a lot from.
2. Ask why each of the 3-5 projects was important to them.
3. What has been an aspect of your work that you've been especially proud about?
4. Of those things you've just talked about, which one do you think best represents the work of the Green Scheme and what the group is trying to achieve?

October/November 2014 Interviews (Round #2)

(Life history, full version of practice stories, initial reflections on lessons learned)

Life History

1. What most motivates you to do this work?
2. What are you most passionate about?
3. What are the goals you most want to accomplish in your work? Not so much the goals that are in your job description, but the goals you hold personally?
4. Now I'd like to go way back.
5. Where did you grow up?
6. What was it like?
7. Where did you go to college, what was that like?
8. Did you have any key mentors or people who deeply influenced who you are, what you believe in and what you're committed to in your work and life? Tell me about them.
9. Did you have any life-changing experience that put you on the path that led you to be doing what you're doing today? Tell me about them.

Practice Stories

1. Can you give a brief overview of the project and where did it end up? Then we can go back and fill in.
2. I'd like to hear more about your specific role and contributions in the project. Let's start with the first thing you did.
3. When did this project get started? What do you identify as the start date?
4. What was it? What got things going?
5. In the course of the story:
6. Who were the main players in this project? Who was involved?
7. When that happened, what did you do?
8. Were there any key turning points in this project?
9. Were there any surprises?

10. What were the key relationships that mattered most? What were the key sources of support or resistance you encountered?
11. Tell me about some of the memorable characters in this story, the ones that give this story color, or brought in drama, comedy, conflict, etc.
12. What was most difficult or challenging? What did you do to deal with these challenges?
13. Did the work fail in some ways? How? What might you have done to prevent those areas of partial failure?
14. What was most rewarding?

Reflections and Lessons Learned

1. What are the lessons for someone who might be embarking on a project similar to this one?
2. If you could do this project over again, would you do anything differently?
3. Why, and what would you do?
4. What did you learn from the people you worked with in this project?
5. What do you think you taught them?
6. Do you view your contributions as successful? In what ways?
7. What specifically was accomplished?
8. Do any metaphors come to mind to describe the kind of work you do, especially in this project? (If needed, give examples like “orchestra conductor,” “coach,” etc.)
9. What were the skills you had to have to do the work you just told me about?
10. Where and how did you learn those skills?
11. What does the project you’ve just talked about tell us about raising community awareness in environmental health and sustainability?
12. When you think of the future of the kind of work you’ve talked about here, what gives you a sense of hope?
13. What makes you concerned or worried?
14. What’s next for you in your work? What are you looking forward to?

Questions and prompts for following up on details in their stories:

1. If you want them to talk about their role in the story using the first person “I”
 - a. I’m curious about your role in X. What did you do?
 - b. Remind them that I’m trying to understand your role
 - c. “We” means whom? Who were the players?
2. If the story needs more action
 - a. How did you handle...
 - b. How did you respond to...
 - c. How did you deal with...
 - d. I’m trying to imagine if I had been a fly on the wall at the garden, what would I have seen going on?
 - e. Can you tell me a story about a time that illustrated what you’re talking about?

October 2015 (Round #3)
(Lessons learned)

1. What have I missed the past year? What's been going on?
2. (Specific questions related to edits on each staff member's profiles)
3. So what's the story with the Green Scheme?
4. Imagine I was going to make a trailer about the Green Scheme.
 - a. What would the first few lines of the trailer say?
 - b. What would the first few scenes show?
5. Was there ever a moment in doing this work that you thought it was all going to fall apart?
6. Let me be provocative here. So all it takes to do this work is...
7. Why are groups like the Green Scheme important? I think these are the 3 key insights your stories provide
8. What does the project you've just talked about tell us about raising community awareness in environmental health and sustainability?
9. What would people be surprised to know or learn about you?
10. What's next for you? What are you looking forward to?

Appendix 3.2 Practitioner Profiles

[A Profile of Ronnie Webb](#)

[A Profile of Xavier “X” Brown](#)

[A Profile of Joelle Robinson](#)

[A Profile of India Jackson](#)

“MAKING IT SEXY TO BE HEALTHY, TO GET YOUR HANDS DIRTY AND TO PLANT YOUR OWN FOOD”

A Profile of Ronnie Webb

Interviews conducted by Christine Moskell
9/20/14, 11/1/14 and 10/31/15

Ronnie Webb is the founder and Executive Director of the Green Scheme. Ronnie tells us how his experiences hosting parties and events for the Hip Hop Caucus during and after college inspired him to start his own environmental nonprofit organization. Ronnie's stories provide insights into what it's like to run a small urban environmental nonprofit organization with limited funding and staff. He also shows us the importance of building relationships for initiating community projects in tree planting and community gardening.

My name is Ronnie Webb. I'm the founder and Executive Director of the Green Scheme. I founded the Green Scheme in 2011. We provide leadership, education, training and awareness on a wide variety of environmental topics. We work to engage and empower communities where poor health outcomes and poor environmental conditions are most prevalent to promote healthy living in conjunction with environmental issues. The goal of the Green Scheme is to be on the forefront of the environmental movement in these urban communities. We're the people that people look to to get answers, to get resources, to get all types of guidance and to really show them how these issues are affecting them on a firsthand basis and how it is relevant to them. And to make it fun. We make ways to dress it as cool. We're making it something that these communities and buying more and more into.

Growing up, I was very athletic, I played almost every sport. Boxing, track, football, swimming. I got second in Maryland in the state for triathlon for my age group. I was into a lot of different athletics. I went to Gonzaga, which is a catholic high school here, for my freshman and sophomore years. I was in a program called EQOS, Equal Opportunities in Sports, which was a nonprofit run by one of my mentors, Walter "Walt" Ray. He took kids that were playing basketball and he got us into private prep schools and colleges. In my junior year, I went to the Berkshire School in Sheffield, Massachusetts which was like a \$25,000 - \$35,000 school per year. Not too many kids had the opportunity to go to a school like that. That was a very, very, very good school. It was a very different look being a city kid going out there. I was exposed to different type of cultures there. At the Berkshire School, I was a year ahead and they wanted me to stay back a year for basketball purposes. But my grandmother passed away and my other grandfather died three months before her, so I just wanted to be back around family. I came back to DC to graduate high school.

Then I ended up going to North Carolina A & T. I majored in agriculture. I had a good support system down there, a good advisor who kept me in school, kept me out of trouble. I wasn't playing basketball there, so Walt was always in my ear encouraging me to do something else, like getting into politics. I had seen flyers for going out at clubs and I was like I want to do that. I was good at throwing parties when I was young. Me and my cousin, India, she used to invite all the girls and I'd invite all the boys and we just had some of the best parties in middle school. I was like the most powerful kid when I got to high school, I always threw the best parties, so I just wanted to go with that. I ended up calling up Walt one day and I was like Walt, I'm going throw parties alright? So he was like alright I'm going to get you with Jeremy, we were the youngest and the smallest of the bunch that came out of that EQOS program. Jeremy went to Quinnipiac and then there were two other guys, Justin and Troy, they both went to another school for basketball. So we started this party thing where we would bring go-go bands from DC to the different youth at North Carolina A & T University and stuff like that. Walt was supporting us and helping to fund that whole party thing. We were moving it from DC to these different cities.

The party thing really came full course when we got into politics. Walt was putting together a Speakers Bureau in Atlanta, Georgia with the Reverend "Rev" Lennox Yearwood. Rev founded the Hip-Hop Caucus. Walt and the Rev were friends and Walt was letting the Rev utilize some office space in his office. Walt was supporting Rev's thing. Rev was doing the "Make Hip Hop Not War" tour and their team was trying to get people to not support the war and stuff like that. Walt was essentially trying to get us to promote the Hip Hop Caucus down at North Carolina A and T. He was really stressing getting into politics and giving us resources to Rev's organization. So when I was down there at college, Walt called me and was like '*Ronnie, I know you know kids, I know that you've got some things going on down there, can you get us some attendance with the Rev down there? Do you have relationships and connections to set it up?*' And so basically I set it up. We threw a party for it and in the clubs we had different DJs. It was successful and it made the news down there. It was crazy.

After that, Rev was like '*I kind of like this kid. He can help me do some things.*' So the Hip Hop Caucus came down, doing a lot of voter registration things, stuff like that. They were doing big time campaigns, getting different celebrities. [The rapper] T.I. was the partner for the "Respect My Vote Campaign." That campaign had the biggest attendance at North Carolina A & T. Now up to this day, the Hip Hop Caucus is heavily planted in Greensboro, where North Carolina A & T and Bennett College are. That's where they're launching all of their campaigns out of, working on anything dealing with voter registration. So as we started to do different projects like that when I was at North Carolina A & T, I was really able to be visual and to see that Walt through us, was really

utilizing his nonprofit. Just seeing that stuff has helped me now when I'm running different angles of creative events in the nonprofit world.

I graduated from college in 2009. I was supposed to graduate in 2008, but I stayed around for a year. When I finally graduated from college, I went back to DC and I did an unpaid internship with Eleanor Holmes-Norton. She's been the delegate to Congress representing DC for the last three years. [That internship taught me important lessons about] politics. She showed me how to move in DC, helped me figure out who was who. I started learning how to really navigate through the government. Now, the more and more I'm doing the work I'm doing, I'm learning more about this department, that department, who do I have to talk to there? And that's very helpful as far as when I'm talking and trying to relate to people, and trying to be strategic with different partnerships.

After that, I went and talked to Rev and he was very excited to have me come [work with them again], just from working in the past with each other. I did a fellowship with the Hip-Hop Caucus. I was the Sustainability Fellow. Rev was focused on voter registration and he had a small department that was getting some funding to do some climate change things. They had really built a platform for environmental issues and environmental justice. I was the one who was put in charge of designing community events and getting people out and doing the outreach for these events. Rev gave me the arena to do my thing. So I was able to incorporate go-go music into environmental events. I was able to use different platforms to use different people with influence that I had been able to get in contact with on a regular basis.

The Hip Hop Caucus was a small organization with a pretty big budget. They were doing all types of national tours with tour buses, concerts and they were working with different artists and things like that. I was able to maneuver and see ways to move and sit in on executive meetings when I was very young and watched how the system worked. I was the youngest person in those meetings, but my opinion weighed heavy, so people wanted to holler at me. I'll give you a prime example. We had this one strategic planning month where we went through these months of putting these plans together. Every meeting, the Chief of Staff would stop and she would say "*Ronnie, Ronnie ok, hold up what do you think? I need you to make it sexy for me.*" They respected me and they knew I would be able to connect whatever initiative they were trying to push and find a bridge to connect it with community. That was when I realized I had some talent doing it. Rev was a key mentor for me.

The whole time [I was at the Hip Hop Caucus], I was thinking this would be a good model for an environmental organization, just making it sexy, fly, fun and making our community more engaged, teaching them about it. In the back of my mind, I was thinking I'm going to do this. After my fellowship was over, I had a much better understanding of what it took to start an organization. At that period, I was telling people

“look I’m about to start it.” One day X and I were with a friend drinking some beers after work and I was like *“dog, watch I’m going to start this. Just watch.”* So I started it. I wrote a mission statement. I think I wrote a paragraph, just explaining my idea.

I told a few people what I was going to do. Walt was like *“I’ll be your fiscal sponsor until you can get your own paperwork together.”* And I was like cool, so that’s what it was. And then I met with Joelle. She was just finishing up school at Columbia. She called me one day and said her New Year’s resolution was to be more involved with community service organizations and she wanted to see what I was doing. I showed her what I wrote down, where I was going and I said *“are you interested?”* and she said *“yeah.”* And there was no looking back from there.

My mother was having a conversation with her friend Terry, who was getting some big million dollar contracts for DC public schools. They were talking and grants and contracts got brought up and I was explaining to him what I did. When he heard about it, he automatically took me under and was like *“man, I want to talk to you.”* He was the one who gave me the clearest understanding of where I was going. It was a point where I was blind as far as moving this organization forward and being the leader. Terry really came up and nonprofit wise, helped clear my stuff up. It’s just a lot of stuff in the blind like, what documents do I need? Who’s going to help me develop these? Do I need to do this? How much money is this going to cost? Do I need a consultant for this? You’ve got to find a grant that makes sense. You have to make sure you have all the documents the application needs. You need to have a grant writer. You have to know what’s a good grant writer. How do you know what’s a good grant writer? How do you know what to pay a grant writer? It’s just a lot of stuff. Terry was one person that was very busy, like his time is gold, and we might have met once a month. When we met, I’d have a list of questions and he’d be alright let’s go and we’d go straight down the list. He’d be just straight business. It was like a business meeting. He’s one of the best mentors I have.

I was able to submit a board in for the Green Scheme. I had X. I had been trying to get him on board for many years. We had played high school basketball together and went to college together, so I had always been telling him about what we were doing and where we were trying to go. He came home from grad school and he wanted to see what we were doing. Finally, when he got back, he was fully on board. Once everybody seen what the game plan was, and who was on board and what their credentials were, it just grew from them.

Then we had one table at a Mayor’s Youth summit down in southwest at a little rec center and we just had a poster. We had that painting of our logo. For the logo, I knew I wanted a head of a skeleton and a tree to be his brain. So I asked my cousin who was a graphic design artist to come up with different sketches. Joelle then showed it to someone and they put a silhouette around the head and we liked it, we thought it

was more kid friendly. Then we had the painting done by an artist and they added some stuff to it. My cousin added some more stuff to it, like he put the name inside of it. We had a couple of people working with us on the logo, donating their time, their skills. A lot of people helped with that, just people we knew.

[At the workshop], a lady from the public housing authority, Ms. Iris, walked up, saw the logo and said “*I get it.*” Ms. Iris has been a professional mentor for me. She’s actually seeing young people trying to do something and she went out of her way to do some things for us, make some introductions. [I think she supported us because] we were so young but also because we were organized. We wanted to do community gardening. She really didn’t know how serious we were, but she believed in some of the things we were doing and she really did believe in us. I think she was just giving us the opportunity in an area that really needed something. They didn’t have funding or anything. It was sort of like, you said you wanted a garden so here’s a spot and they left us in charge of it, so as long as you don’t have any questions or ask us to pay for it. She gave me the number of Ms. Dinkins, the Resident Council President at Lincoln Heights, and that’s what got us started. Lincoln Heights has been a spark plug for everything we’ve done.

Once Ms. Iris connected us with Ms. Dinkins from Lincoln Heights, I sat down in a series of meetings with Ms. Dinkins (the President of the Lincoln Heights Resident’s Council) and Mr. Hill who was the treasurer of the Resident’s Council. I met with them for about 2 or 3 times, maybe 3 or 4 times. We sat down and I explained my idea of what I wanted to do [for the community garden]. Then I brought Xavier and Joelle in. I think Xavier might have just been coming into the organization around that time. This was a couple years ago, it had to be in 2012. We had a couple series of meetings and then we said we were going to build the garden. We were going to run events off of it and take care of it. We wanted to make it have its own identity. We wanted it to blend in and to really match the community. They were fully open to it, and they wanted it. The Residents Council and Ms. Dinkins were very excited about doing that stuff.

For the first year we had to use our own money for the garden. We went and bought all the materials for the garden. We used our personal money to show that I was that confident in our idea and what we were doing and that I knew it would work. I was trying to get it done before the fall because I wanted to market it throughout the winter so that I could start getting the funding and something to work with.

It took 4 months to get the garden planted. We started talking in May and got the garden done by August. That year we planted purple carrots, collards and kales, we’re pretty famous for doing those. The collards and kales were real good because it was getting toward the cold season. We’re famous for trying to bring out the most exotic unseen things and expose our community to it, the healthiest, edgiest things we can

bring. And for in order for kids to eat more carrots, they have to purple or white or something like that, so if we can bring that to them, we're going to bring that to them.

The first year in 2012 we built the L shape for the garden. We set out our day to build the garden with the community. We do 3 service events a year at Lincoln Heights where we have all the music out, the food out, the performers out, we're really doing a maintenance day on the garden, so those keep us pretty active because those are high visibility events. The community actually built all this stuff, and we just led it. The community wanted to be involved. The kids then naturally wanted to do this stuff. When they see us out there, when they see they can get their hands dirty, they see they can plant some stuff, they see some healthy food, it's just a natural connection. We just want to provide the environment for them to be able to do that, so that's how and it gets like a snowball effect and gets bigger and bigger and bigger.

Then the next year we did the tree planting and we extended the garden. That's when we made the LH. We did the L for Lincoln Heights by our self and then X's cousin, who does carpentry came to volunteer. It just so happened we had a certain amount of wood and we had a certain amount of soil. X's cousin looked at it for a little while and he was like 'why don't you all cut it like this?' and he came up with the L and the H on the spot. It was like a gift, a blessing came down. Those types of little things have a big impact. We're famous now for doing raised beds in letters.

[Did we face any obstacles to get the garden planted?] No, I was just so determined to make it happen, I wasn't thinking about failing. I did have some difficulties later on dealing with the DC Housing Authority, with managers and things. It was definitely a bunch of politics going on from the highest leadership on the totem pole to like the lowest rung of the leadership on the totem pole dealing with leaders' running these low income housing developments. There was a lot of stuff that was done that was not exactly in the best interest of the community from the leadership role, so we had to navigate relationships on the ground that weren't always so positive.

[The planting of the garden] was the same time we did the tree planting and that was a pretty successful event. The tree planting was in March 2013, I remember because I was mad at X because he scheduled the tree planting on my birthday. We had the 17 fruit trees being planted which was done by the community. That was a multifaceted event because we had an indoor workshop with the youth with the kids doing the artwork for the trees. They were in there painting the blocks to identify the trees. For each tree of the 17 trees, they planted 17 concrete blocks that had pictures on it. If it was a peach tree, it had a picture of a peach on it. What was so crazy to me was that, we planted 17 trees and basically, we had too many volunteers participate in the tree planting. We had so many volunteers. And in the middle of the hood like that, getting people to plant trees pretty early in the morning and to have too many volunteers, its unheard of.

Then we had live performers that were community-based. We had a go-go band that was from Lincoln Heights. Go-go style music is a DC style tradition. It's like a band of 4 or 5 people in the front line on the mics, usually a rapper, a singer and a lead mic talker. Then you have Congo drums and they're just playing music. Go-go is like a movement, it's like a DC tradition. We had a band perform and it was all community. They were very excited. We had a young man come up who was incarcerated for a long time who had just come to the event and who had just enjoyed it so much, he got on the mic and said a prayer. It was just bands and youth groups pulling up, there were just so many people there. It showed who we were. It was like our introduction: "*This is Green Scheme ya'll and we're up and going now, look out for us.*"

Xavier organized the relationship with Casey Trees, who actually donated the fruit trees for us, which was a good look. My role for the tree planting was organizing the DJ, organizing the food, making sure the business components were taken care of between Green Scheme and Lincoln Heights, making sure we were covered from any liabilities. Making sure the promotions were done for it. We had to make sure we had the marketing materials, make sure flyers and stuff were done. Making sure we had the right people organizing the workshops, which was not a lot of work but was an important piece. Making sure we had someone facilitate the artwork. Make sure we got somebody to facilitate the actual tree planting, the tools, who was going to bring the tools, how were they going to be out there, how were they going to be distributed. That's what I do; the event timeline. From when you're going to get here, this is what it's going to look like at this time, these people need to talk at this time, this group needs to go on at this time, the food needs to be distributed at this time. Basically that's what I do. My background really is in putting on shows and productions and events. I used to do open-mics in college, like a bunch of different types of events at different venues on on campus through the college and outside of the college.

From then on, we still used our own money except for the trees that were donated. We were just confident in the model and that it would work. Then we applied for the grant from the USDA. That was the only major grant we had went for. Everybody on the team thought we should go for it. We were just now starting to really work together and we were excited, so we were like let's just go for some money. I had an under the table grant writer, so I paid for it to get written up, but we needed to come up with a program. So me, Joelle and Xavier sat at the table in my grandfather's house and we came up with the plan of what we wanted to do. The grant writer came and sat with me and the team to discuss it and figure out what exactly it was going to look like so she could write it up. I paid the grant writer underneath the table. I probably paid her \$1,400 for it, just for the narrative. It was part of a common grant application she was doing for me too. It was our first proposal so I looked at it like an investment, like even if we don't get the grant, now I have some of this language I can play with and send out to

Profile of Ronnie Webb

proposals when I go for more stuff. It gave me a background to go off of, a framework to play around with.

By a couple of months later, I forgot about the grant. I didn't even care. Then we found out we got it in June. Joelle called me because on the grant, I put her as the project director of the Code Green project. She was the first contact of communication with the USDA. When she called to tell me we got the grant, that was pretty cool. I was excited. I went and bought a bottle of Moet, a Rose Moet, right when I found out. I was with my cousin, he's somebody who's always supported what I was doing. I remember I was outside on the block and I just went straight to the store by myself. Then I told my cousin, I was like "*cuz man I just got this grant for like \$140,000.*" We were just sitting there, drinking Mo, just celebrating.

We couldn't really start the grant until August or September of 2013. In the meantime, we were just chilling waiting to strike up and get ready for that. We were already doing a lot of different stuff, building different partnerships, being everywhere. During that time, I was doing a lot of the strategic outreach. I was basically being the face of the organization, introducing it, showing everybody what's going on. Being able to be like '*oh we need to be in in this.*' '*Oh, you all got this program? OK, the Green Scheme needs to be in this.*' I was really advocating for the organization, really making its presence known, showing that we are a DC organization, so we're not outsiders coming in, we are here, we've been here, getting that demeanor, setting the tone for us.

Then just doing one of our first workshops, which was around the corner at my rec center. Our first workshop was at the Langdon Park Recreation Center (right down the street from where I live) and it was called the "You Are What You Eat" workshop. It was me, Xavier, Joelle and another friend of mine. What we did was we went and got all of these organic sweet potatoes, we got sweet potato chips, sweet potato juice and sweet potato pie. We had brought all of these mason jars and what we did was we let the kids put a toothpick in the yams, set them in the jars and then we let them name their jars. And we ate all of the food that comes from a sweet potato, so we tasted the pie, tasted the drink, tasted the sweet potato chips. And just really sharing all that they were learning about being healthy and things like that. And then the sweet potatoes grew roots and things like that, so they were able to get a nice science literacy piece out of it. It was just something nice to do. The director of the Langdon rec center, Ms. TJ, has moved on to other centers. But it was funny, just the other day, one of my old students was saying "*Mr. Webb, I just came across a picture of you in Ms. TJ's office. I saw a picture of you in Ms. TJ's office when you were doing the Green Scheme.*" And the picture was of our first event. I guess it was special to her.

During that time, I was setting up workshops like that, getting those done, coming up with concepts and themes. And that's the most important thing: coming up with the identity of Green Scheme. Just fishing your way from doing this and this and this from

your mission statement. Our mission statement is pretty broad, so to really carve out lanes through that mission statement that makes sense. I'm still doing that to this day, getting a clearer understanding and vision and how to be more precise and execute better.

We found out about the USDA grant in June and we started it in August, but then we had that federal government shutdown so we couldn't get the money we were supposed to get. We didn't get our money till like November, December, so we were just putting up our own money paying for materials. Then finally, November came and we got our stuff. In that meantime, in the first month or two, we were creating our curriculum. We'd be sitting right here [at my grandfather's dining room table]. I have pictures of India sitting right here, Joelle, everybody, just sitting at the table directing our curriculum. Darryl was the only one who wasn't on the Executive Team with Green Scheme who we brought in. I had been on Darryl and I know what type of work he does and he was a perfect fit for what we're doing here. We got our curriculum done. Darryl and X, one was going to focus on family, one was going to focus on youth at 2 different sites.

There's not a boring person that works in the Green Scheme. Everybody that's part of this team was strategically put here, especially the ones who are out in the communities like Darryl and Xavier. You can see the personality traits in them and you can see how you can connect them with the people on different levels. That's why X was the youth coordinator and Darryl was the family coordinator in our Code Green program. And that's very important because as far as doing the work we do in the community, you just can't target the youth. If you just target youth, how do you then get to where you're going? Who's going to encourage them? Making it intergenerational is really what makes the most sense. So you have to have the right people who can spark the interest and not only just spark the interest, but can motivate people to come be part of this stuff and make it make sense to them why they should be part of some of the things that the Green Scheme is doing.

[Having the two coordinators] worked very well. Darryl was very good with both age groups and he was able to bring some other community people in. We had a lady who does culinary storytelling, so Darryl was doing his class, he brought her in to work with the youth while he was working with the adults, so we just had the chemistry together. We were able to eat healthy meals from stuff in the garden and then have dialogue and sit together while the kids would prepare one thing and the adults prepared another thing.

The Code Green grant was a good look for us and we were able to continue to do classes at Lincoln Heights. We had programming running, we tried to be up there once a week depending on funding and staffing, but then usually one day on the weekend at least one or two Saturdays a month. We had our garden, people working

out there, people come and volunteer and plant different things. We had high interest but people weren't always following up. We had spots in the garden they could claim and plant something, or claim two or three separate plants, and then claim their plants when it was time to harvest them. Getting the Code Green grant] was when we were able to be really consistent in the community as far as being there on a weekly basis. As that started to happen, we were really starting to build relationships with the kids, consistency in attendance to our programs.

We had Wednesday night classes at Lincoln Heights on a weekly basis. It was a family style class so the kids were the most consistent with coming. We were outside one day before the class. We were picking the food because we were about to cook our normal meal that we'd cook with parents and adults, and we were discussing whatever the class topic was for that particular class. We were all picking vegetables and the ice cream truck comes down the street. I was a little hungry, so I look up listening to the ice cream truck. I looked back at all the kids, and we had at least 10 kids out there at the time, probably more than that. All of them were so focused on picking the vegetables. They were tasting something, I can't remember what it was, the lemony stuff, they were tasting that and they were just so fascinated by the healthy food that not one of them turned their head and tried to go to the ice cream truck. In Lincoln Heights, it's the hood so the ice cream truck stays out there. The ice cream truck came right when there was nothing going on but us sitting in the garden, nobody else outside. The ice cream truck popped right by us and the kids just kept staying focused. I was surprised because some of those kids have money, so you know they would have ran to the ice cream truck.

That was just a moment when, wow. That was a milestone because we had these kids concentrating on eating healthy as opposed to running to the sugar truck. I was thinking in this community right here, where that's what these kids want, candy and all those snacks, not curry this or that or all the healthy options. As attractive as the ice cream truck was, they were so focused on these healthy food items. It just shows that you've given them a chance to be exposed to some of the right things, as opposed to them having their limited options. You'll never know what was the trigger for being fascinated by the healthy food for this kid as opposed to what was the trigger for this kid. To me, it's the element of exposure. There's some kids who grow up who never know that you're supposed to eat fruits and vegetables. They think that Oodles of Noodles is not bad for you because it's not fast food, or like they just confusing myths and ignorance and stuff. You're exposing them to this, and it's a clear exposure, and if they're listening it will definitely, for some of them, be something that sticks with them as far as making later decisions on eating or whatever it is.

[That moment was memorable] because it showed that they were able to choose and they chose the healthy food option. A few months before that they wouldn't have

took the healthy food option. They would have taken the ice cream truck option. It's just like my son. His mother's mad because he won't eat McDonalds and I'm like, you know that's garbage and I'm like man don't eat that. I'm just telling him it's not good for you and he tells his mother that, so she's mad. But it's the truth and I'm just telling him that. I feel like kids should know that. It's the ignorance, you have to know what's actually in this stuff.

[That story of the ice cream represents] just how genuine the work is going on that the team is doing. It just shows that no matter what, this is real people, these are real lives, you can give them the gift to cook and eat together, to really execute healthy things knowing you can make the community healthier. [I have lots of moments like the one that happened during the ice cream truck] where I stand back and am just like "wow." I tend to get like that. I get caught in moments all the time where I'm usually the one working and moving so fast. Sometimes I just look up and it's one of those types of moments when I want to capture it on picture but the moment is such a raw state that you just want to enjoy it. You don't even want to catch it on picture, you just want to sit there and be like *alright, I'm used to this now*. And that's where I'm getting to the point now where I'm like yeah that's some cool shit, but I'm used to this now. It's supposed to be like this, let's keep it going.

[The Green Scheme is important for achieving the city's health and sustainability goals] because in order to make our city reach its peak in economic potential, the health of our city has to change. The government doesn't really have the infrastructure to go and truly implement these initiatives all the way down to the grassroots level. They basically need nonprofits in order to do this work to really support them. The nonprofits are here to provide the services that the government doesn't have the infrastructure to do. The government can't go into every DC Housing Authority or every rec center and put together these classes. We specialize in that, so I think that's how beneficial we can be to the government. Not only that, as we implement these programs and do these things and create these spaces, we add economic value to the city. Saving the city money from health, helping the city's property values go up by greening it, by making it low on crime. I could just talk on and on about it, the benefits that it brings to the community.

[What makes the Green Scheme unique] is that we're able to directly able to tap into the culture of the communities that we're serving. We're able to tap directly into the culture of the environmental health movement, so we're definitely bridging these two worlds together as one piece. I think the other piece is that we're making it very, very cool. We're making it very sexy to be healthy, to get your hands dirty and to go plant your own food. We continue to make it as engaging as possible. We know our culture and that's why we're getting big numbers of attendance.

[There are] other nonprofits that really get deep into their work. Something that we bring to the table as far as creating different partnerships, we're able to say "*look what you're doing is great and what you want to do this in in this community is great. We can help you, but we're working on the same things. Let us help you make sure people are seeing this. Let us make sure that they know about you. You doing all of this great work, but the community doesn't know anything about you. Let us introduce you. We have credibility when we come introduce you because we're doing the same type of work.*" We really straddle the lines of bringing organizations who have nothing to do with the environment. If we can build that bridge between the environment and these other groups and these other issues and show ways that they're tied together, then were able to work with other groups and get our message across while they're able to get their message across too.

I think one of the things that makes the Green Scheme unique is that we find a way to relate the culture to the work we're doing to the work that somebody else as doing as much as possible. And that's what we take pride in, trying to create those lanes. There's not always a way to create that, but if there is a will and a way we try to create new things or new models and really work with people or organizations that typically don't work together. I think that we really take pride in that. So you know we want to try our best to do that, so we just encourage any and everybody to really reach out to us and let's try to find ways to work together and support each other.

[One thing it takes to do this work] that people overlook is training. I've been through several trainings from executive director peers, peer training to different other types of training. The training is very big, just knowing how to deal with with the governance of your organization and management. Leadership management, program management, learning to submit grants, grant training, accounting training, marketing, fundraising. It also takes a motivating team to be successful as the Green Scheme has been. When you have a motivated team, you have results. That's a big part of our success. [Building relationships is important too. My strength in that is] just part of my personality. But I think it also takes respecting the craft. Like being able to see how the type of work a person is doing that I just talked to for a minute raises a lane for the kind of work that I'm doing. It's about recognizing they're a little deeper into it than me and respecting and valuing their work. My approach and my conversation with them is going to be from a very respectful level.

[One of the biggest lessons I've learned] is how to become a better leader. For example, Code Green was the first program that I've ever really have led with a budget like that. I didn't know all that I needed to really pull this project off. We could have spent more money on staffing than on supplies and materials. Now that I have a better balance of that, I know what it takes as far as staffing wise to pull these projects off. So that's just one thing, the amount of staffing to do different projects so it's not

overwhelming on one person, or you're not stressing one person or how these people are working together. Management and staffing I think is a big thing that I learned from Code Green.

[What do I wish I knew then that I know now?] I know this sounds random, but I was intimidated with writing. For instance, when I got the proposal written and I got all the pieces, I had to make some changes to the narrative. I would be intimidated to write it. But now I've done grants with Code Green and having to deal with materials and documents to put out, pages upon pages of stuff. When money was getting low, it couldn't keep coming out of my pocket to pay for a writer. So I actually had to sit down and concentrate and really start adopting that technical writing skill. I've gotten better with that. Now I can sit down and put together a narrative and I feel pretty confident in it.

There have been a lot of learning moments with the Green Scheme, mixed with moments of happiness, mixed with moments of frustration. I'm not going to lie, everything is not always all gravy. There are some challenges. [It's hard balancing everything.] The other day, I had to call in sick so that I could go do a demo. In high school, my jaw was broken in two spots so I get these real painful nerve attack. I'm in pain and I get these headaches. They don't last all day, but if I have one in the morning, I'm not going to work that day. If I'm not doing that, then I'm not going to waste any of my free time so I'm working on the Green Scheme around the board. It's like days that I'm sick I have to go to work but days that I have the Green Scheme I use those days as sick days. It's just like being able to truly work with what you're working with to make lemonade.

[What inspires me?] I used to be so competitive in sports, but sports aren't here right now, so this is my new sport. I want to be successful in what I do. I see it as being the best job in the world because you're helping people. It's given me a platform. It's given me a voice. The more that I do this work, the more I see the growing level of importance of it. When I first started off, I just wanted to build gardens, but now it's like whoa, this is all about food deserts and environmental justice issues. It's nutrition, it's obesity, it's high blood pressure issues. It's like you open one door you open a thousand doors, so it keeps me thrilled. I never want to be bored and I'm never bored doing this type of work.

One of the things that motivates me is that people don't expect somebody like me to do what I do. That puts a chip on my shoulder. I go places a lot of times and people have no clue that I'm with Green Scheme or anything like that. [I'm most passionate about] being known for producing results. Not just being out there doing something and like "*oh yeah we went out and did it,*" but no, there was a direct impact. These stories coming back about these seeds that we threw out there are actually sprouting in one form or fashion or another. And then just being me, just having a business edge, just being competitive, wanting to be a top organization in the city,

wanting to be respected and seen as that, not just in the city but in the country. Taking the steps and going through the process is motivation. Just going from one level to another level is good.

There's just something inside of me that gives me a sense of hope for the future. It's like something personal, like there's just never no looking back. Let's either do this, or go be a bum or go nowhere near touching the potential. My motivation is this an avenue to bigger things in life. This is sort of defining me and who I am right now. I have no choice but to invest in that, one way or another, so I feel like that's my motivation all the way. [Those bigger things in life are] being able to take my personal brand I believe in a lot further. Being able to leverage a lot of the work I've done here and being able to build a personal brand where I'm really able to go and discuss and follow up and report and write and support things that I feel are important in life, as opposed to going someplace from 9-5 and supporting what they think is important in life.

[What's next for me in my future?] I'm hoping to keep going for the Echoing Green Fellowship. It would provide a salary for 16 or 18 months. It would just help me run the Green Scheme and then I could get an additional money from consulting and budgeting and things like that. The Echoing Green Fellowship works with you and helps you build your organization and that's one thing that I would love to see. The second thing is really the beginning stages of implementing the Ron Green brand. This is the new thing I'm doing, Ron Green the Urban Environmentalist, it's going to be the brand. I've got like 3 or 4 campaigns that I'm running off of it. I'll be going into the community, trying to get different resources with people doing different things. It's really about highlighting a lot of the things that are going on in my community, and putting a cool spin on it, incorporating the culture, the same things we do for Green Scheme, music, fashion, sports, entertainment. I'll be doing videos, blogs, interviews, green tips of the day. I've got some powerful people that I'm connecting with and I'm going to run a campaign on social media so I'll get these followers. I'll be saying something in different arenas and in different places with high visibility that really bring these initiatives we support to the front line. I'll be doing green job development, community engagement, green literacy, consulting businesses, different communities and different organizations on some of the distressed things in the area and ways we can help them be more successful.

[Majora Carter of the Sustainable South Bronx] has inspired me. She was able to secure funds to run her own projects to benefit the community that focus on the environment and health. That's inspiration for me because she's done this before me, she's reached a level of success with it that I hope one day I can reach. She's coming from a community similar to mine, so I just hope that I can build off of what she's already done and other people have done and to keep this thing going for the next young leaders that come up that start their own organizations. She definitely

Profile of Ronnie Webb

transformed her brand from a nonprofit brand to a full profit entity. I feel like she's really built something that was sustainable to helping the community that she was serving and it's still going on. Her work still present now today and it's still successful. Now she's able to take that success and her hard work that she's put into the nonprofit entity and leverage that into the for profit sector and be successful business wise. I feel like that a great move, it's all about continuing to grow and that is something that I definitely want to model.

It's going to be interesting because I'll have the Green Scheme and then really going out and seeing if I can work with other organizations and things too. I'll be seeing if I can balance the Green Scheme with another career or doing something else. I'm open right now. Just seeking out these other opportunities. Maybe being able to go and take Majora Carter's model and explore new options for incorporating yourself more with the environment, or getting to work with more hybrid corporations, a hybrid nonprofit, or benefit corporations or working the food systems maybe, or just having more projects that are more replicable. So taking the model that we've been creating or the model from people before us and really enhancing those. Just taking the work that us and others have done and to adjusting it to the time that we're in and trying to add more value to it.

“BE DETACHED FROM THE GARDEN...IT’S BIGGER THAN YOU”

A Profile of Xavier “X” Brown

Interviews Conducted by Christine Moskell

9/21/15, 11/2/14 and 11/1/15

Xavier Brown is the Director of Urban Agriculture for the Green Scheme. Xavier wasn’t interested in the environment until after he graduated college when his father encouraged him to take a Master Gardeners class. That class set Xavier on the path to learn how to garden and plant trees. Xavier was often the only African-American male in attendance at various urban forestry and community gardening events and workshops, which inspired him to work to engage his own community in urban environmental stewardship. Xavier’s stories show us the power of making tree plantings and community gardening a party as a tool for community engagement.

My name is Xavier “X” Brown. I’m the director of urban agriculture for the Green Scheme. Primarily, I do the vegetables, but I do a little bit of everything. I do a lot of stuff with trees, sometimes I teach classes. I come up with ideas, fundraising, community outreach, getting communities on board, meeting with people. I’m passionate about building community. The agriculture is a tool to help build community and to help food help people. I like helping people. If I was good at doing something else I would use that to help people, I’m just good at agriculture.

The mission of the Green Scheme is to get low income communities and communities of color involved in the environmental movement. [If there was a trailer for a documentary about the Green Scheme], it would show show a whole bunch of young black folks planting, growing, teaching, smiling, laughing, educating. You would see regular people on the street who might get stereotyped as thugs planting trees or harvesting some kale or cleaning one of those abandoned lots that captures all the trash. The goal is to create new leaders that you wouldn’t see in great diversity in the environmental movement. We’re doing it in a fun way that other people aren’t doing, with music and culture and fashion. You probably won’t see too many people doing what the Green Scheme does anywhere else, I think that’s what unique. We’re unique because we work with people who are rooted in the community. We come in as partners in the community and we look to the community to appeal to what they want to do. We’re not like some nonprofits that come in to save the community. That’s not what we’re trying to do. We’re trying to create self-sustaining communities by teaching them how to build their own raised beds, how to plant and prune and take care of their own trees. We try to connect them to the resources and eventually we’ll fade back and do that with another community. In between that we have music and all types of other fun activities that we intertwine with environmental and community building work.

Profile of Xavier Brown

I'm currently enrolled in the Leadership for Sustainability program at the University of Vermont. It's a low-residency program so I can still be working in DC at the same time. I work full time as a small parks specialist with the DC Department of Parks and Recreation (DPR). I got that job back in 2013. A council member put the legislation in that opened up a position for my job in the Parks Department. When I saw the job, I applied to it. In DC government, there are these ranking factors, so a lot of my experience for those factors was being drawn from my work with the Green Scheme. I had experience working with stressed communities, agriculture work and outreach work in creative ways to create community spaces. So that's how I got that job. There's the Green Scheme stuff I do, but then there's other work I do in the city, growing work outside of the Green Scheme.

It's the easiest for me [out of anyone in the organization] to balance my job for DPR and the Green Scheme. For DPR, I work outside anyways, or I'm in the office but I have the option to go outside and work in the environment. A lot of the stuff I'm learning from DPR I'm bringing to the Green Scheme and vice-versa. Last week it was National Parking Day, it was about creating mini-pop up parks in parking spots. That's something that we might do for the Green Scheme, just rock out with it. One thing from the Green Scheme I'm going to bring to DPR is with Green Scheme, we have a lot of excitement and energy about our stuff, we always have music, we always have fashion, so bringing those types of ideas to activate large spaces.

As a small parks specialist in DPR, the parks I'm working on are 1/3 of an acre to a whole acre, the smallest parks in the city. One thing I'm planning for my parks job is Park Mania. It's about activating pieces of property to get people back outside, reconnecting with each other because the biggest problem is whatever you're doing, you're disconnected from nature. That's why people don't care about trees, they don't care about plants in general. What I'm going to do is a series of pop-up events all around the city in parks. I'm going to have different types of dance, guided meditation, farmers markets, arcade games, sports. I'm going to get Rodney Stotts, he's a falconer, he's one of the only black falconers in the country. I'm going to have hip-hop education about go-go music, which is DC homegrown music. The DC library has a go-go archive, so I'm going to incorporate that. I have a \$25,000 budget so I'm trying to figure out how to host the pop-ups this summer. I'm working with some other people to work out the dates, the times, the supplies and materials, trying to figure out what part of the city it will go in, who's the council member over there so I can get the information out to them. Another thing I'm going to do is have happy hours in the parks with a DJ, ping pon and foosball and monopoly and checkers. People would be walking down the street and just come across the event at the park and come hang out and enjoy. Longer term, I'm hoping to name some of the parks. A lot of them are just addresses, so I want to bring a name in to try and give them some identity.

Profile of Xavier Brown

I always like to have a clear line of demarcation between my Green Scheme job and my parks job. For something like Park Mania, I would have Ronnie and Joelle put in for a Green Scheme activity at Park Mania. Park Mania is my idea and I'll be doing that by myself and I would set it up so that the Green Scheme would have a space. Before, I don't think too many people at DPR knew that I was doing the Green Scheme. There were some articles in the newspaper and I was on the radio with WAMU, and then people at my job were like *"hey man, I just heard you on the radio!"* Now it's coming out that I do the Green Scheme too.

I grew up in Northwest, DC. Growing up in DC was cool. [My passion for building community] comes from my parents. My folks are always helping folks out, helping other people out. In one of my grad school classes, we had a conversation about the word helping just last week. If you help somebody, that means that you're almost looking down on them. I don't know if I want to use the word helping, but my parents were working to empower people, I guess that's the word. I think they passed that down to me in a way. I was growing up going with the flow when I was younger. I played basketball, hung out with all of my friends. I didn't even know what I wanted to do with myself, I was just rolling. Through my life and maturation, I wanted to figure out what I wanted to do with myself other than just having a regular job. I wanted to do something that makes my spirit feel good, but also that helps people.

I learned a lot growing up in DC about what to do, what not to do, right and wrong, and trying to be street smart. That's carried me a long way. I definitely learned a lot in DC, hanging out and watching other people's mistakes. I have a younger sister and an older sister and my parents also raised two of my older cousins because their mom had died from drugs. My older sister had drug issues, she's still dealing with that. I have a cousin who's been in and out of prison. He's finally gotten his life together. He's got a little house and a wife and everything. And my older cousin, he's been in prison for 24 years and he gets out next year. He's locked up in the same prison where the DC Sniper is. It's a super max prison way out in Virginia, close to Kentucky. He's been in there a long time. He's never met his daughter, his grandson. He emails me now through this app. We've been talking all the time since high school. He's been guiding me to steer me from what he's done.

I grew up watching them and their struggles and learning from them their mistakes what not to do. Sometimes you hear about someone leaving a party and they end up getting shot. You have to be careful with who you hang out with and the energy that the people you hang out with have because that energy surrounds you too. I wanted to surround myself with people who have positive energy. I've tried to be smarter than my some of my family members to not actually try it out myself. I've tried as much as possible to stay on that straight and narrow path and apply my street smarts and stuff I've learned to book smarts. Learning how to cope with people and to navigate

Profile of Xavier Brown

different situations gave me the ability to move through spaces where other people might not feel as comfortable.

[As far as experiences that put me on the path toward urban agriculture], I used to go to Texas when I was younger and my grandmother used to make me write papers about ants and stuff like that. That was my earliest memory of doing something with the environment. I was really studying ants at the time. I knew a lot about ants. I guess they were my favorite animal. I used to make like a little report about ants and what they do. Ants are amazing beings. My grandma was a teacher and she wanted to keep me busy in the summertime to keep those skills sharp. Between middle school and high school, I wasn't really into environmental issues. Ronnie and I went to high school and college together. We went to college at North Carolina A & T. I majored in history, so I was learning about social justice but not too much about environmental justice. I graduated in 2009. After college, I was down there hoping to get my master's degree in agricultural economics, but the program I was in shut down. They didn't have enough enrollments or funding for it. So I was just living down there trying to figure out my next move.

After college was when I started to get more into the environmental realm intentionally. I ended up moving back to DC. I didn't have a job, so I was at home sitting on the couch bumming, hanging out all night. This was back in 2011. My father told me to take this Master Gardener class at the University of DC. He was retired and I think he was doing Master Gardening to stay busy. It was something fun that he got interested in at the time. He was like, *'man you should take the class. If you take it, I'll pay for it.'* I was like alright, and that's when I really got into it. And it's funny because my Dad got me into it, but then he retired from the game. He said my work is done.

I didn't do anything with agriculture until I took that Master Gardener class. I didn't grow anything. I don't even think I ate vegetables. I took the class. I fell in love with vegetables. It was fun, it was something different. There weren't any black people in the class and I was the youngest person. I really got into agriculture once I started to understand and make different connections about environmental justice and sociocultural justice. In undergrad I was understanding things, because I had some pretty cool professors. But then I got interested in how history and environmental stuff comes together. Now, when people ask me about growing food, they assume I was an agriculture major and when I tell them I was a history major, they wonder what does that have to do with agriculture? And I tell them when you think about the history of black people and agriculture in this country, they're tied together perfectly.

Around the same time that I got into Master Gardening, I went with my Dad to a community tree planting at Catholic University hosted by Casey Trees. We did it because you have to have a certain number of volunteer hours to keep up with your Master Gardener's certification. I had been to a party the night before, I was hungover, I woke up at the last minute, I don't think I showered. But I rode with him and I'm in the

Profile of Xavier Brown

joint at Catholic University. There were a lot of people there who weren't from DC. DC is made up of a lot of people that come from all over the country, all over the world. So I'm thinking dang DC, this is our town. My Dad grew up in DC too, so we're both native Washingtonians. We grew up here, we had our first memories here, our fun, love, loss, just life in general. I felt like black folks in DC should take pride in taking care of our city, of our town. Of course other folks could do it, but we should be a part of it too. I just thought it was important. I wanted to get more black folks involved in this. That motivated me.

After I went with my dad to that first planting, I started volunteering with Casey Trees more and more. Casey Trees is dope, they do real good work, they plant trees all over the city. They might plant trees in this neighborhood dominated by African-Americans, but it wouldn't be with anybody from the neighborhood there planting trees. It's usually white folks planting trees in the neighborhood. I'm usually the only black person up in the joint planting trees. I was like *'this is crazy, we got to get out here and do this, be part of this, this is our neighborhood. If you're not actively engaged in this process, then you're eventually going to lose your neighborhood to gentrification in DC.'* I was just making all these connections that were spurring me to get more of my people involved.

I started to learn about environmental issues and I felt like it became a part of me. I said to myself, in 2012, I'm going to try to be the best urban farmer I can be. I'm going to put in everything I could and master every skill that composes what it is to be an urban farmer. That was around the same time that Ronnie was calling me up about the Green Scheme. I'm not sure he had a name for it at the time, but he called up and said he was trying to start a nonprofit and he asked if I wanted to be a part of it. I knew you always had to be looking for funding, money is always iffy, so I didn't know if I really wanted to mess with that. But then when I was back home and didn't really have anything to do that was constructive, I was like well I might as well help my friend out with his organization. Things were aligning, the universe was working as it should. It started off organically like that to where we are now.

Since then, I've just been rolling real hard once I realized the way to learn agriculture is to get knee deep up in it. I was going out with other farmers that were more experienced, going to different meetings to learn about the issues, connecting with people and being around the information, reading a lot. I realized that's the only way you can learn is just by doing it and reading it and surrounding yourself with people like Ronnie who know about this stuff, who take a little bit of time to come up real, real fast. That's why I'm always taking a composting class or an African cooking class. I realized that it's basically just working and things happen for you on your path. If you're doing the right thing, doors will open up for you. I read about this in a Deepak Chopra book.

Profile of Xavier Brown

Last year when I went to Brooklyn, NY for a conference I met this dude named Morgan. He was asking what I was doing and I was like “*I’m in DC growing vegetables.*” And he was like “*dude, you need to meet Akiima Price.*” So I looked her up. I email her and I come to find out she’s from this area. She’s just real cool and so she started sharing her charisma and wisdom with me and challenged me to be better than what I had settled for now. For example, she checked me on how I typed emails or messages. I’m always rushing and I might have misspelled words that don’t make sense. She helped me be better with that. That’s something that’s stayed on my mind. She also taught me not to be afraid to speak your own truth and what’s on your mind and your heart.

Another mentor I’ve had was Dennis Chestnut. Dennis Chestnut was the first black person I saw here who was knee deep out there doing environmental things. He’s a history buff and he has a lot of knowledge about the city. He helped point me in the right direction. Before him, I was only seeing white folks doing environmental stuff. He was a little older than my father and he’s from DC. He does the work in his neighborhood where he grew up in ward 7. He’s bringing about impact toward ward 7 through tree plantings, water restoration projects, storm water mitigation, all this different types of stuff. He’s taken what he’s learned and has taken it back to the community, back to the streets to the people. I thought that was dope.

He has an organization called Groundwork Anacostia. He’s on the Board of Directors at Casey Trees. He suggested that I take this Master Watershed Stewards program at the Center for Green Urbanism. Then I ended up using that training toward this fellowship I had called the Environmental Leadership Program (ELP). Me, Ronnie and Dennis Chestnut did the ELP. Joelle took it last year. It was a dope program. It was my first time being in a space that was about self-development and expanding on ideas and encouraging yourself. It was a diverse group of people. A lot of other people from the Atlantic Region were in there, so it was cool to meet people. It was an awesome experience.

Around the time the Green Scheme was getting started, Ronnie, Joelle and I were part of this group Healthy Affordable Food for All. It’s about food justice. Lincoln Heights is in a place where people don’t have fresh food. We were thinking about that and community gardens as a way to engage people. Everybody likes to eat and agriculture is deeply engrained in our history. So we were going with that and it took off from there. Ms. Dinkins is the Resident’s Council President for Lincoln Heights. Ronnie met Ms. Dinkins through someone else. She wanted to do a garden and we came to her and told her we can help her do a garden. She was like “*alright, ok I’ll give you guys a try.*”

Ms. Dinkins talks a lot about how her family is Gullah from South Carolina. They’re known for growing rice. Everybody has agriculture in their history, so I’m sure

gardening was a matter of somebody just giving her a spark. She had the match, she just needed some people to strike it for her. She's an elder, so I don't think she would have actually built the garden herself, but if there were some people who were out there who had the idea and who had the excitement to go do it, then she was down. That's how we got started, with Ms. Dinkins wanting to give us a chance because we were young, we were black, we were coming up. I think there were some other white folks who wanted to do it, but she wanted to give us a chance, try to sell it. She was the reason why we got into Lincoln Heights in the first place just by her giving us the opportunity.

This was back in 2012. We came up with the idea to have a garden kick-off and to have a big community day where we would build just one raised bed. My role was to do all the organizing for this big garden kick-off. I had to figure out how big the garden was going to be, how much soil we needed, how much that would cost, seeds, where to buy the tools from. That was really everybody's first time organizing something and playing different roles, so we were learning right on the fly. It was my first time building a raised bed. I helped out with the food. We were getting the word out. I was getting my hands dirty in everything, but my main focus was on the garden, making sure things looked good.

The first time we constructed that raised bed was a big event. Kids were out there. We had a go-go band from Lincoln Heights out there. We had a lot of people out there. It was like an urban hood event. Nobody does it like that. We had a moon bounce out there, we had food out there, we had pit bulls, we had a go-go band and a DJ. All these different organizations were there. I think one was Empower DC, they do work around the state of public housing. A brother had "Friends and Family of Incarcerated People" they were out there. There was an organization that does pampering for little girls. We had face-painting. Rodney Stotts, the black falconer, was there with his birds. That event was our first time that me, Ronnie and Joelle put an event together. Everybody had their own role. Everybody nailed it, it came together. I think that was a big accomplishment for us. It gave us some confidence, like *damn we can do this*. It was like our first time popping a wheelie.

In 2013, we built more raised beds in the shape of an L and an H for Lincoln Heights. My cousin Donny was out there helping us for a little bit. Through all his trials and tribulations, he learned how to build stuff. He's really good with his hands and he has a better vision of design and I do. He showed us how to move the pieces of wood around to look like an L and an H. Ronnie, Joelle and I did that one Saturday or Sunday, it had to be in the fall because it was cold outside. We were working together, hammering the wood until it looked like an L and an H. It made sense because with the H, people can access it from all sides.

Profile of Xavier Brown

We all figured out what we were going to plant in there, figure out what makes sense there, what makes sense for the season, for the community, what they would like eat. I figured out what's going to go in the garden, how we're going to get it to the garden, how much it's going to cost, who's going to do it, where are we going to get the stuff for all that's going into it. And then once we figured it out and are doing it, it's all on me. I helped plant all that stuff. We've since added 3 more beds this year along the sides of the space. We had another community event to do it.

In 2013, we planted a tree orchard in Lincoln Heights. It was my first time organizing a tree planting on my own by myself. I had the idea of doing an orchard because I had helped plant an orchard the year before at Clay Terrace. It's officially called Richardson Dwellings, but Clay Terrace is the street name. I helped another group called Beet Street Gardens do a fruit tree planting over there. That's where I got the idea from, like *damn, we could plant fruit trees in the city*. I knew I wanted to get fruit trees in at Lincoln Heights. I was just watching how they got people out. They didn't have a whole bunch of people out, but it was still a successful planting in my opinion because they were banging out peaches and I said I want to bang out peaches next year.

We started planning it in 2012 even though the planting wouldn't be until 2013. It was a ton of planning. We did a couple meetings in Lincoln Heights. I met with Lincoln Heights initially about the trees. I worked with Mr. Hill, the treasurer of the Resident's Council. Mr. Hill was the main agricultural person. Mr. Hill grows fruit trees at his house. He's got sage and seeds and oranges and lemon trees and he grows them in his house. He's probably in his 50s and he's been growing stuff for years. Involving him made sense. He has a son whose high school age and he wanted to do good stuff for the youth, for his son, to keep his son off the streets. He's all into arboriculture. It would be dope if he were to become an arborist, but that's another story. I built a relationship with him by going over there, talking to him about gardening, exchanging ideas and knowledge, talking about stuff outside of planting. I've been inviting him to different things so he could see what was going on.

[I've learned some important lessons from Mr. Hill]. I'm not sure how much he has monetarily but he's able to make the most of what he has. His apartment has this big window that gets a lot of light. He's growing stuff out of everything. He repurposes things and has shown me you don't need a lot of money to grow stuff. All you need is the seeds. If all you have is the seeds, just put them in the soil and they're going to grow. He can make that stuff work. I'm pretty sure he didn't go to school for agriculture or arboriculture, but gaining that knowledge through the indigenous work, just working with it, learning, teaching yourself. He just has a really good spirit and he keeps pushing forward.

Anyways, Mr. Hill, myself and Josh (a co-worker of mine) scoped out Lincoln Heights, figuring out the spacing, making sure we had enough space on the hill, figuring out where the trees would go. Mr. Hill and I were working together trying to get what he was interested in. He was definitely interested in peach trees, interested in where we could put them in a space that was easy to maintain, where we could water and keep an eye on them. That hill was the best space because it got a good amount of sun. Mr. Hill and I sat down, walked it, talked about it for a while. Once I got that information from him, it was on me to take that back to the drawing board, pick out the trees, figure out the date. I called the utility to make sure there was no gas line. I figured out who was going to get the food. I told Ronnie and Joelle that we're going to need some music, so I came up with that idea. I have a pretty good rapport with Casey Trees, so I applied to get trees and they donated 17 trees.

[As far as getting the community involved], it was talking to people, going to meetings. The only thing I was nervous about was the community outreach, but that's when I realized one of my biggest strengths is the community I'm part of. I realized I have my social capital and I know people. I think people see you doing good work and they want to help further that work if they can. That's how it happened. I emailed Dennis Chestnut the information, he pumped it out to some people. He helped get the word out, he got the word out to people in Lincoln Heights and in the area surrounding Lincoln Heights. We were going to have the music out there, make it a party. I called up a good dude from another public housing project, Benning Terrace. I asked my girlfriend, who's a chef, to do a real nice kale salad. I was trying to pull out everything I could from my utility belt, pumping it out to get as many volunteers as we could. I was pulling out any trick of the trade that I felt like could make this tree planting stand out, but also attract people in. I hired a young lady to come out and record a video. She had done music videos for rappers in the area. I think they were shooting music videos before we did our joint, and now there were tree videos and giving it a whole new vibe.

On the day of the planting, I was nervous. I didn't know how many people would be out there. I was thinking it's going to take forever to plant these trees and I thought I would have to plant all these trees myself. When we got out there, I was like damn, there are a lot of people out there. It was a boatload of people, like 60 – 70 volunteers, more people than I had anticipated coming out. We had little young ones, elders. It was definitely more people than we needed to plant trees. You can tell in the beginning how fast the tree planting's going to go by how many people show up. If you have 50 or 60 people out there, you're going to be done in like 30 minutes. So I knew it was going to go fast. They blazed through the trees. It was done in an hour, less than hour. It probably took more time because people were talking to one another, but if everybody was just focused on planting trees, we probably would have been done in like 20 – 30

Profile of Xavier Brown

minutes. I was just happy that so many people showed up and felt that it was important to do community work.

During the planting, I was checking any holes that were made, making sure that everyone was enjoying themselves, had water. I think we planted 1 southern magnolia. We planted fruit trees, we had 2 figs, some peaches, plum, pear, apple, cherry, paw paws and persimmons. It was like a mini orchard. On the inside [of the community center], people were painting the pavers to match up with the trees. Joelle, Ronnie and I went to this place and picked up these old pavers and we had paint to paint the pavers. We had persimmon, paw paws, cherry trees, figs, so they were painting them out so people would know this is that tree. We had a lot of volunteers working with the kids, everybody enjoyed it. Everybody was doing it, there was enough room for everybody, the food was good. People were super encouraged by that type of thing. It was awesome and people painted, got talking, got to know each other. It was definitely a dope experience and I definitely give thanks for that. It was a beautiful experience.

We had a DJ out there. That's the beautiful thing about the music. Lincoln Heights is the second biggest public housing development in DC, so it's hard to reach everybody. Going door to door is not that effective, so we were able to get the word out to as many people as possible through community meetings, through word of mouth as we possibly could. But the music brought even more people out as time went on. The tree planting started early Saturday morning before people usually wake up. I want to say 20 - 25 people from Lincoln Heights showed up when it started, it got to maybe 30 people on a rolling basis. Once things were shut down around 12, the music was still playing and people were still coming out, talking and wanting to get involved. That was a good experience and it was a good way to meet more people from the community.

The vibe was real DC, real community. It was a different vibe than just a regular old boring tree planting. Not saying that other tree plantings are boring, but we had our own jazz to it. I've been to a lot of tree plantings. [What made it different than regular tree plantings] was the music, it was flashing. It was just like a real fun type of event. Other tree plantings you come out and it's cool, there's people talking to each other. They plant trees then they go back home. But we had music, it was flashy. It was a real fun event. We had a DJ, people on the mic. Ms. Dinkins got up there to say some things. Mr. Hill performed one of his poems. It was more of a community event with the tree planting than just tree planting.

It was also a different type of tree planting because we got the community out there, allowing the community to take ownership of it, inviting other communities out there. A lot of times you might not have Lincoln Heights and Benning Terrace in the same sentence together in something that's positive. People from Benning Terrace and Lincoln Heights coming together to plant trees together. It's like where they do that at? Having people from Benning Terrace out and participating that was all Coach Mike.

Profile of Xavier Brown

He's a football coach in Benning Terrace and I had met him through someone else. He's really big on empowering his community, so he does a lot of work in his neighborhood. He's a real good dude. I told him about the event, so he brought a van of his players, high school kids, little ones, big ones. He brought a real big gang, that was dope.

I think that's one of the things that epitomizes the Green Scheme because we're using environmental work to pinch these artificial gaps between communities and neighborhoods by getting people to come together and lift each other up. There are artificial gaps in multiple ways. Some neighborhoods might have differences on a class and race level. We can break those gaps through planting trees. Anybody can plant a tree, no matter how poor you are or whatever imaginary label is put on you. Some neighborhoods have friction on a street level. There's violence in Lincoln Heights in the summertime and in Benning Heights. A lot of times if you get people from different neighborhoods, especially if you get people coming from outside the city, you hear things like "*don't go over there because you might get shot.*" We're trying to recreate that story because a lot of that was put on by an outside force. There's good shit that goes on 90% of the time, but the 10% negative stuff that happens is what gets all the attention. The story was written by somebody else, it wasn't written by the community. If Mr. Hill or Ms. Dinkins or one of the other community members in Lincoln Heights wrote the story of the community, the story wouldn't be just about drugs or violence. That wouldn't define the whole neighborhood. That might be a part of it, but there would be so much more love and light and humanity given to the neighborhood.

But you would only know that if you had spent time with folks. I've been with people in all different neighborhoods across the city, even some of the neighborhoods that have the worst stereotypes and names on them, and I haven't had any problems with anybody. I've only seen, kids, mothers, fathers, brothers, sisters, families, just regular people trying to live. I think that's how the picture should be painted of the neighborhoods. By planting trees, there's something good you can say about the community. I think that's what it's about, so you get that good feeling off of doing that type of work.

That tree planting event was my first time doing everything and it worked out. It was awesome. The best part of that event was being able to sit back, chill and to soak it in. Ronnie was like "*hey man, you should slow down and take it in, sit back and enjoy.*" So I slowed down, just watching everybody work, everybody being happy. Ms. Dinkins got to speak her piece. Mr. Hill performed one of his poems. It was a peaceful event. It went well. It was beautiful. I was on top of the world. It was vicious, it was dope. We had way more people from outside Lincoln Heights than we expected, people from Lincoln Heights and so it was just a win-win on all fronts.

Profile of Xavier Brown

I think that was one of Casey Trees' best tree plantings. Usually with tree plantings, they're done in reverse. There's people outside of the community planting trees somewhere. But we had people really in the community, hands on in the planting process, what they want, how they want to do it. [The Casey Tree's model of planting that I was talking about before is helping, rather than empowering]. I don't think they've thought about it that way because organizing one of the tree plantings takes a lot of ground work. If you don't have those connections in the community already, it's going to be hard to get people out there. If you don't make the tree planting culturally appropriate or if you don't tap into the culture of the neighborhood, then you might not get people to come out. I think there's a disconnect with them not knowing how to get out there and talk to people. But also for folks in those communities, planting trees might not be on their top 10 list of things that's important to them. Most people are trying to get jobs, they have regular life. But I do think, because I've done it successfully before, that if you can make those community connections and do the footwork in the beginning, then it can be a success. Kids enjoy it, people enjoy it, families enjoy it, people will come out and it will be a beautiful family event.

The next year, 2014, was just watching the trees, making sure the grass was mowed, making sure the trees were watered. Those were things that we did during the summertime. We'd come out there with the classes and put the water hose out for the kids to water them. They would be eager to water the trees and all that type of stuff. They know it hasn't rained, so the watering bags are empty, just stick the hose in the watering bag and the bags will fill up, so they have the concept of how to do that. That's stuff they look forward to doing. I think the fact that some of them helped plant the trees, and then some of them got to eat the cherries on the trees and the cherries taste good. I think it's always exciting to taste the fruits of your labor. That's always good.

It was a rough winter the first year. Two fig trees died because they're tropical trees and they don't really like the climate. I don't think they actually died, they just died back. I think somebody pulled them up, but otherwise they probably would have survived. But it's all good. [If I were to do it again], I probably would not plant the apples, and have 4 figs and no apple trees. I think people got into figs, baking pies and I think people would enjoy figs. Apples are just too difficult to maintain. Everything else is rocking. We had cherries and pears. The peaches went pretty good. The cherries went well. We probably would have had persimmon, but I think somebody's been taking a lot of the fruit of the trees before it became ripe, and so we haven't had the time to have a major harvest. But in a roundabout way, it works to the benefit of the trees because if you pull the fruit off the trees when they're still at that young stage, it allows the trees to focus their energy on their growth. Hopefully, this next year the trees will really be vigorous.

We hope to have come classes on the trees and on urban tree maintenance and really work to put the word out to people to keep their eyes out for fruit coming in and to take it off the tree, wash it, do something with it. In the first two summers of the orchard, people were free to take what they wanted. I don't think its reached its pinnacle yet. There is still work to be done in that arena. One thing we need to do is put a lot of signage out there that says "*wait until X date to touch the fruit, let me grow so you can enjoy. Just take what you need so you'll have an abundance forever.*" Some people [realize stuff is there for the taking], but it's a big neighborhood. So it's getting that word out to everybody. It's a challenge. It's like a labyrinth you have to try to navigate. I think we can do it. Even if we just focus on the kids. They'll just come home with fruit one day and it'll get passed up to the parents. They'll be our messengers of what's up on the hill.

Then in early 2014, we got the grant for Code Green from the USDA. It was the first time we got a big grant. I was surprised we got it. It was cool to have some resources to do the work. For that program, we did cooking classes with families and youth. Before the classes, we'd be outside gardening, planting, weeding, tasting something or just be out there in the garden with the youth. There was one night we were out there. At this point in time it was summertime, a lot of kids, everybody's outside after school, after work. The garden is at the top of the hill, you can see everything and everyone can see us. I don't think we had any music playing or anything like that. We may have been planting, but there was a lot going on. Some kids were on the other side of the fruit tree fence doing something, planting over there. Some people were over there eating some snap peas. Everybody was engaged in something to do with the garden, people were watering trees.

Then the ice cream truck comes around. The ice cream truck's probably out there right now, it's always there. It plays the song. At this particular time, everybody was so engaged in whatever they were doing—weeding, planting, eating something, watering something—and they were not paying attention to the ice cream truck. I was like '*man what's going on here?*' Usually a few of them run to the truck. That will engage them and keep their attention. But nobody budged. I was thinking '*damn, is this the twilight zone or something?*' I was thinking '*man, this is what it's all about.*' I wish we could have captured it with video, but I think Ronnie and I were too shocked to pull out our phones and record it. That was an awesome experience.

[What had we done that kept them engaged?] There had been times earlier in the summer when they would all run and some might go over there and get ice creams. But this time, the ice cream truck didn't get anybody. There were a lot of people out there. We had given them different tasks to do, like you do this or do this, or if four kids come up the hill, help out to water, don't spray anybody. They were all doing stuff, so everybody was focused on what they were doing and not on ice cream. It was dope. That moment shows that if you're able to do good work, you can capture kids' attention

Profile of Xavier Brown

among so many other things that are vying for their attention. It shows that it can be done. We can do it. We've planted some different types of vegetables that were new and that tasted different, so I think that may have been part of it. They enjoyed it. I know everyone enjoys eating. Some of the vegetables we had growing had different tastes and different smells and I guess that was more engaging than the ice cream truck, which is nothing new. What we were doing was something new, and that was awesome. I know they were definitely looking forward to going to the class. There's always new food, like the vegetables, vegetarian meals for the most part. They always enjoy the food.

Another time that summer that was pretty cool was when we cut down a sunflower. We had just one that year, and we cut it down, its head was so big it was leaning over. We were showing it to the kids. I don't think any of them really knew that sunflower seeds come from sunflowers. It's like you eat them, just like the birds do. So that was pretty dope too. I think they were really excited about that. There were some kids fighting each other over them. I didn't know it would go over so well there. I mean sunflowers are beautiful plants. I think it would be cool to have like a whole row of sunflowers growing and allow the people and kids to harvest them. They could sell them or something. There's an oven inside the enhancement center. I think it would be awesome to roast the sunflowers, season them and have them make their own sunflower seeds. We'll probably expand on that and grow more sunflower seeds that have the seeds that are edible, the ones that are exactly like the ones you buy in the store.

[What metaphor describes what it is that I do?] I would say I'm a coach. My goal is to get the garden to the point where residents in Lincoln Heights feel comfortable maintaining the garden and they have complete ownership of the garden. I'll work with them until they feel like they're connected to all the resources they need to make their garden an annual thing and to get more people involved. That's a sustainability piece. The garden won't be sustainable if I'm always there. By me subtracting myself from the situation, but through the work I've put in, I've been able to pass on my knowledge and that makes the garden sustainable. I'm just like a coach to get them going until they're on two wheels, then popping wheelies. That's the goal.

Mr. Hill will probably be the person to maintain the orchard, but we hope to get more people to do it. I've been taking a role, but right now there hasn't really been too much maintenance of the trees because they're still young. As they mature it will be more maintenance, which is why I was a little bit leery about the apple trees and trying to figure out natural ways to take care of them and preventing diseases and pests and stuff like that. So that's something we'll probably tackle in the future. We need 3 or 4 Mr. Hill's up there and then I think it'll expand more. I think there are folks like Mr. Hill already there in the neighborhood, they just have to be approached. That curiosity has

to be awakened in them. It might be a little person, an older woman, a middle aged person, a young girl. I think they're already there and they just need to be given the opportunity to learn. I think once they learn and get into it and see what type of vehicle it can be for the community, I think they'd be all in. I think we're almost there. Initially we didn't think it would take this long [to get the garden planted]. But now we know it's going to take between 2 – 4 years. It's just about getting people to buy into the idea. Lincoln Heights is a big community so there's a lot of things outside of the Green Scheme they're doing that make it difficult for people to come together to focus on the garden.

[The Green Scheme is important for helping the city to reach its sustainability and public health goals] because it's a grassroots thing. It comes from the people. A lot of times, the city might do something like a top-down approach, so they're looking at things their way. A budget is involved and other politics are involved, but when you're coming from the dirt, from the people, it's authentic. Not saying that the city isn't authentic, but it's authentic because the sustainability comes from working with the people. The longer term effects come from that grassroots community. I think it's important to have the grassroots organizations helping people for the people. It's almost like that balance that nonprofits hold the city accountable and help to galvanize, organize and encourage people.

Up to this point, our reputation is solid enough to get into the places where most folks can't get to. We're able to connect to people. That's the number one thing. Our resume is solid. It's not just all talk. There's action and work behind the talk which is important. A lot of people will tell you they're green, but what is that? What does that mean? What do you actually do? There has to be solid material work behind words because I think actions speak louder than words.

[If someone wanted to start a garden at another public housing development, I would tell them] entertain those people. Start a community garden. Figure out who's already gardening, most likely it's people who already have the skills. Figure out where you're going to put your garden. Figure out money's, it's always going to come into play, so if you don't have access to some funds how are you going to fundraise. You have to have money and basic supplies, like a raised bed and some seeds. If they have the people, a good space, community support, that's pretty much it. You need people from the neighborhood to be your feet on the ground. You need to use their assets and their knowledge of community to help empower each other. At Lincoln Heights, nothing would have been successful without Mr. Hill and Ms. Dinkins. They're both catalysts for everything that goes on. We can do as much as we want, but we need people we can work with in the community.

[What else does it take to do this work?] Just love. You have to love people. I don't think it's necessarily hard, you just have to be consistent and understand that it's

going to be valleys and peaks. Things might not work out like how you initially planned them but that doesn't mean they're not going to work out. A lot of the skills I use in this work are just natural skills. Being able to talk to people, being able to connect to people, being able to listen. A lot of people don't have the opportunity to tell their story, so being able to listen, being able to compromise is important.

[Some of the biggest lessons I've learned are to] definitely be organized in planning. Planning is extremely important. Taking notes too. If you didn't write it down it didn't happen, so take your notes. I take notes on everything. Definitely allow communities to be at the decisions table. Try to make sure that they have the capacity to do what they think they can do. If they want to plant something that's going to be very labor intensive, make sure they understand that. Make sure you have fun, you're just planting vegetables so there's nothing serious besides just to have fun. Be detached from the garden. Remember it's not your garden, it's the community's garden. It's bigger than you and that's the main thing to keep in mind. I've learned through trial and errors. The best way to get together growing vegetables is to show somebody else how to do it, it's like testing my skills and what I need help on and that type of stuff. I used to go to school, so I know how to work with kids for the most part. We're working in DC, so I understand it from a cultural angle, so that helps me. But most of it is just natural stuff and I just try to use my natural abilities for good benefit.

[What's been most surprising to me about doing this work] is the work in general. I was never one of those people in high school who knew they wanted to be a doctor or whatever. I didn't really know what I wanted to do. I never really put that much thought into it, I didn't apply myself. I talk to people from high school and college who excelled more than I did academically and they're like '*dang man, you're doing good work.*' So knowing that I'm still free and alive and doing something positive has surprised me. I've gained a better understanding of my life and how to achieve. I've learned more about myself and have had spiritual growth. I could talk about that forever.

And really enjoying the work. It makes me happy. Fortunately, I'm not doing something that stresses me out that I hate. It's very difficult and time consuming work, but it's always a work of love, so it doesn't really seem like its work like that. I have enough energy to do DPR and go home and do community work. Most people are done with their 9-5 and then they go home and sit. I don't even have a TV in my house so that keeps me focused. I go home and I might go garden, I might go do something else. I might read a little bit. The more I read, the more I learn and the more you learn, the more you learn what you don't know. You open one door, and then there's a bigger door, so I'm just realizing there is just so much intersectionality between so many different things and I'm trying to figure out how do I play both those sides and ride those waves. I'm inspired. I think that's the surprising thing, to be inspired.

[What's next for me?] Well I'm in grad school now. I found my way there through the Environmental Leadership Program. The facilitators for the program directed me to the program I'm in at the University of Vermont. I'm in the first cohort of the Leadership in Sustainability program. It's helped me develop this organization called Soilful. I guess it's an organization, but also a verb or an action, like it's a feeling. I want to create it where it's not necessarily a nonprofit or a for-profit but maybe some type of hybrid. It's going to involve going to different places and working with communities or whatever neighborhood that's going through stress. It's about how can agriculture, nature and environmental work be combined with spiritual work or working against policy brutality. I want to create it in such a way so that if I wanted to leave, the organization itself would be full of people who could step up, take over and go. I want to create something that could be left behind to the work once I'm gone. I want to show people this has been my experience, this is what I have learned, but once I leave, I hope it could be going on for the next 100 years. People could be doing community work and working on whatever the big environmental issues are 100 years from now. People would be bringing to Soilful that hip-hop, street, urban, whatever city perspective to it.

I'm still cultivating Soilful, but the genesis of the idea came out of the personal leadership plan that we did in my grad program. I'm trying to figure out how do I branch off the Green Scheme with that. It's helped me meet new people, it's helped me boost my self-confidence in it. I'm in a field where I go to farmer conferences and a lot of times, I'm the only black person there, I'm the youngest person there, and I'm the only person from the urban environment because its people with rural backgrounds. So being able to go in there with confidence and realizing *ok, I'm where I need to be*. The program has helped me build on that, to get me into that, to help me going forward and to realize yeah, I can do it.

I want to leave my mark on the world. I want to leave things better than it started. I think the folks like myself, Ronnie and Joelle and the other people who are doing this type of stuff are inspiring people. I think we can start a change, like a real revolutionary type of change. That's what I want to do. These are our weapons for our time. I'm doing what I'm supposed to be doing. Plus, it makes me feel good to continue to move forward and work forward. I think for a lot of people their life is stagnant. They lose their inner inspiration of what it is they want to be and then they give up on that because it didn't work out one time. My goal is to stay motivated and to enjoy life. And to just try to be the best I can be.

“IT’S BEING THERE ALL THE TIME”

A Profile of Joelle Robinson

Interviews Conducted by Christine Moskell
10/30/14 and 10/31/15

Joelle Robinson was the Deputy Director of the Green Scheme from 2011 – 2015. With a background in public health, Joelle is passionate about helping people see the connections between human and environmental health. Joelle believes in an environmentalism that puts people first by relating environmental issues to people’s everyday concerns. The stories told by Joelle show us the importance of talking with, listening to and learning from people’s ordinary knowledge, from cooking to pest management, as a way to engage communities in environmentalism.

My name is Joelle Robinson. I am the Deputy Director of the Green Scheme. I am employed full time as a research social scientist with the Food and Drug Administration working on tobacco prevention programs. I’ve been studying public health since 2005.

I grew up in Maryland. I went to school in Atlanta at Spelman College. I double majored in sociology and anthropology and minored in public health. I left Atlanta to go to graduate school for my Masters in Public Health at Columbia. I always knew I was going to be in public health. Well, not always. I went to undergrad undecided and I said I would figure it out when I got there. I actually took the time to do some research and figure it out, unlike some other professionals that have an MD or did something else and then realize an MPH sounds cool.

I’ve always cared about the environment. I watched Captain Planet growing up and I just knew it’s not right to throw trash on the ground. I probably spent a lot more time playing outside than kids my age when I was younger. My family did travel to the beach almost every weekend, so maybe that is where my care for the environment comes from if I had to try to figure it out. What strikes me the most [about the environment] is trying to figure out how to make the connection [between environment and health] easy for people. It’s so obvious to me, but like I said, I’ve been doing this for a while. I understand how your environment affects your personal health, but to articulate that into one sentence or a 2-minute spiel or a 30 second block is always in the back of my mind. For me, it’s always about how to make those two connections. How do you articulate all of those things into a concise and compelling manner that’s really easy to understand?

After grad school, I moved back to DC permanently. I knew I didn’t want to live in New York City, but at the time, the economy was really bad. It was really frustrating because I wasn’t finding the jobs that I wanted to find. It took me forever to find a job, no

one was hiring. This was back in 2010 right after the recession in 2008, 2009. In October 2010, I started working for the city, the Department of Health. My position was part of one of the public health projects funded through the American Recovery and Reinvestment Act (ARRA). I was doing evaluation for the “Communities Putting Prevention to Work” (CPPW) program funded through the Centers for Disease Control. CPPW focused on interventions around tobacco control, nutrition and physical fitness. It was giving local and state governments money to do different policy level interventions for public health. It was a good experience. I would definitely say I learned a lot. Looking back now, I’m like oh wow, I evaluated whole programs by myself. Other states or communities had teams of researchers or a university evaluating their project. It wasn’t until I went away to conferences and other programs would introduce their team and I was like yeah, it’s just me here.

Somewhere along the line in that 6-month period from May to October in 2010 before I had my first job, I was like *man I want to work for myself, F this*. Ironically, Ronnie mentioned to me that he was trying to start his own nonprofit organization. (Ronnie and I had met in college even though we went to different schools). So I called him and was like *“if you really want to do this, then lets really do this.”* Then we sat down in December or January at his grandfather’s kitchen and we sketched out what we thought the vision of this organization could be.

The reason we started the Green Scheme was this was our community, like we’re from here. It’s our uncles and aunts who have diabetes and heart disease. We all grew up in this area. The mission of the Green Scheme is to bring forth environmental and health issues to our communities—people of color, black people and people who are underserved. Often those are the people who have different health disparities, but also are not involved in or not seen in the environmental movement. I’m talking about the typical, cliché environmentalists who are all about the ozone and the polar bears. Not to say that that stuff’s not important but, it’s not on people’s minds in our communities. It’s an afterthought, it’s the last thing on their mind and it’s the last thing on their plate. How can we bring forward some of these issues to those communities? I think the key thing in our vision is making sure that it’s sexy, its relevant, not crunchy. It’s not granola-y, it’s shiny and sexy.

It’s hard [to characterize my role within the Green Scheme.] I work on the the logistics, like what is the logic model for operationalizing this piece of the project. I helped write the grant for the Code Green grant proposal because when I was at the Department of Health, I wrote many million-dollar grants that were successful. The Green Scheme, the grant, all of that is a community public health intervention. If I’m thinking strategically as a founder or a leader of the organization, then I think about what would funders want to know to continue to fund it? I review grants now in my job, so I know what I’m looking for on the other side. I’m thinking ok, what can we do to

address the questions that I'm anticipating from people who might give funding? I was always harping on certain things because I was thinking about how to move this up to bigger picture thinking. I also add the evaluation lens to some of our projects, thinking about what are these outcomes going to be? In the work around a grant or a project, there's thinking about ok what do we need to do? Thinking through the logistical steps that need to take place and what do they look like and who's involved. It's great to have a big vision, and you need to have that vision first, but then how do we go to really implementing this practice? What is the bulleted list of things we have to do? I have to be able to visualize what is going to happen. Like what are we saying needs to be done and then what are we saying are the steps under each of those things.

For the Code Green program at Lincoln Heights, we all developed the curriculum. We talked about the curriculum and what should be in it, again sitting at the dinner table in Ronnie's grandfather's kitchen. Ronnie started the relationship with Lincoln Heights. He just always finds people and makes connections. It's just his nature, like I don't even know how he met you. He just always finds people and makes connections. He's just really good at that. Xavier ran the youth workshops and Darryl ran the family workshops. I'm very much about what do things look like in real life. Who's going to do it? What do we need? How does it flow? When people are like this is what it should be, I'm like "ok great, how do we get from there to here?" I bring some of my experience from the Department of Health, like this is how it goes and this is what we need to know and this is what it needs to have in it.

[The impact we're trying to make] is at the individual level, the community change level and even something bigger. I think it's all three of those levels. There are definitely individuals we've impacted through our interactions with them or they've shared stories with us, or they've changed their way of doing one thing or many things. When we show up and all the kids run to the garden because they are like "oh I grew this" or "I picked this." It's a relationship with a community as well as with individuals. One story at the individual level that I thought was cool was a photo contest in Willow Terrace, one of the low-income neighborhoods that we worked in. Wheeler Terrace is managed by a community development corporation, which are pretty popular across the country. We were running the photo contest at the same time we were at Lincoln Heights. It was back in January 2013 or 2014. I made up the contest, I made up the rules and I put out a newsletter that went out to the residents through the housing people. The contest had a name, but I don't remember what it was. Basically the photo contest was you had to take pictures of yourself doing something healthy, green, sustainable and then write a caption about what it was that you were doing and put the caption under the picture. You had to submit them all either on social media or email them or print them out and put your name on it. Whoever took the most pictures won the photo contest and won a prize.

The photo contest by many standards was a failure. Nobody participated, some people knew about it but they didn't do it anyway. It was a failure in terms of engaging people to think in a different way or to think of things that aren't on top of their radar because they have so many other things on their radar. At Wheeler Terrace, the granddaughter of one of our resident gardeners got shot. When that happens, you just don't care about somebody's photo contest. Anyways, I would talk to people and they would say they've heard about it or they knew about it, but they wouldn't do it because they thought they weren't going to win. We didn't tell anybody what the prizes would be. We just said just send them in, you'll win, it's a contest. They didn't think about the prize because we didn't tell them what the prize was, so they were like oh I'm not going to win.

Whatever, nobody did it. Except for one woman. She lives in the community and she just heard about it. She submitted all these pictures and she did a crap load of stuff. There's one photo of her riding a bike as if she was coming at you. That's the one that sticks out in my head because she submitted a lot of them. This woman didn't care about winning. I had told her she was the only one who submitted photos so far and she had a good chance so she kept on submitting. That woman won of course because she was the only person that did it. She said "*I did so many things that I didn't think I was going to do and I didn't do it for the prize. I just wanted to get healthy.*" And that's essentially what it was all about it. It was supposed to engage people to become more active or to think about how they could be more sustainable, and that's exactly what happened. She won \$100, and when she found out she won, she was over the moon. She said "oh my god I didn't know I was going to win, I had no idea, I thought it was going to be like \$10 or something small. I just did because I wanted get more active." To me, that is a small success on an individual level.

We're also trying to have an impact at the community level in the communities that we work in. There are several other organizations that do similar work as us. I think the way that we're unique is that everybody on our team is from here. We're about trying to make environmentalism relevant and sexy. We also try to bring community members in and try to empower them to be able to facilitate or lead things. We don't just say, "*oh we're going to come in and show them this.*" We're like "*you could probably show me how to do something!*"

[An example of the community teaching me something] was using peppermint oil for pest management. You can use it to keep away rodents or other pests. You can put it around your plants, like roses, and the pests don't like the smell or something like that. Another example is we might have been talking to residents about ways to do meal prep and they suggested how to chop something up or a quick way to do something. I think that it's important to have that space for that type of discussion instead of being like *ok here's how we do it, this is what we're doing today, this is how you do it.* No, it's like

people have been eating somehow, living somehow, they're not dying in the streets. Obviously someone has figured out ways to manage. It's not a one-way kind of communication.

[It's important to learn from the community] because we recognize that we have a cultural, historical propensity toward sustainable agriculture. This isn't new, people have been doing this forever. Somebody's grandmother, or great grandmother or great-great grandmother already knew this. We just might have forgotten it somewhere, or it missed us somehow. I think it's really important to recognize that and to create that mindset. Somehow it hasn't been transferred to everybody, but recognizing it was probably transferred to Ms. Dinkins or to whoever. And she's transferring it to me. I think it's really important to recognize that and to know that this isn't new, we're just trying to put a spin on it to make it more appealing to people like us who it might have skipped over.

Our strategy [for engaging communities in these issues] is to reflect the community. We start out with an event and there'll be music and food and people come out for that. But then all of a sudden they'll be building their own garden that they didn't really know was going to be there. It was on the flyer, but people don't really pay attention to flyers. They pay attention if they see a whole bunch of people outside and they come to see what's happening. I think that is like the splash, but then just the consistency. Often many times in the communities that we work in, they're used to having these helicopter programs from all types of organizations come in and just leave.

I remember there was one of those groups in Lincoln Heights when we were about to do the second year planting at Lincoln Heights. The day we went up there, apparently there was some group that had come the day before or a few days before and planted a whole bunch of stuff in the space where we had already planted and already done some work. They had ripped out the flowers that some of the people in the community had planted and people were pissed. And then they planted half dead stuff. It was a mess. And we were like who did this? Who was this organization? Of course they meant well, they were trying to help the community and provide fresh green vegetables. But they really undid a lot of hard work and a lot of things we had been trying to do. They came up here, they pulled it out, but plants were already there. They planted this stuff that's probably going to die and nobody even knows who they were or how they got there. They just came one day and didn't even run it by us. I remember being like *what the heck? Like oh man, who did this?* And Mr. Hill was pissed. He thought that we did it.

Then there are people from organizations who have service projects, and those are great. But I always prefer them to partner with an organization that's existing and not just be like *oh hey community, lets pick one out of the stack and then go in and plant some stuff and then leave*. It's not going to work, but that happens a lot. It happens a lot particularly in the larger public housing developments where people automatically

assume that its someplace destitute and they clearly need us and blah blah blah. I'm not trying to take away from their intention, but sometimes these communities get used to that because it happens so often to people. Like in Lincoln Heights and in low-income communities, there are always people coming in with the intention of doing community service work. But it happens so often that people are like ok whatever, there's some more people here. It makes it a lot more difficult, it takes longer to prove that you're there, that like *we're really here*.

At the community level, I have an anecdote from Lincoln Heights that speaks to consistency in being there, like when people are surprised and recognize that we're still there. We've been there a long time. That's where we first started actually doing our work. We'd have workshops or be out in the garden. Kids come when they see you at the center. We're just out there planting stuff or weeding or somebody's doing a food demo. It's not a big event every time. Anecdotally, I've overheard people say "*oh ya'll are still doing this?*" I don't remember exactly what the setting was where people said that or if it was at workshop. We were just there. People are surprised when the Green Scheme has been there every Wednesday for 3 years or every other Saturday. People get to know your face. People are used to seeing you around. They might not know my name, but they know me, she's with the people who plant stuff, she's with the Green Scheme. You can't just build a garden or do a workshop and think people are going to change their eating habits or eat their vitamins. It's about being there all the time because then they feel like they can call me or when they see me that I'll ask them how is this going. For me, it's like an unexpected accountability. I'm accountable to them for being there and their accountable for being engaged. That consistency is an important part of the model or the approach. [It was deliberate on our part] to really be present there. When people were like "*ya'll are still doing this?*" it makes me take a step back and be like "*yeah, we are still doing this!*" When that surprise turns into expectation, I think that's when I feel like we're doing the work.

This is also where it was frustrating because we never intend to be in the community forever. To use a metaphor, we're like the training wheels of a bicycle. The community will use the wheel until they don't need them anymore and then they'll just ride the bike on their own. We're the training wheels for how to grow your own food, but the point is to be able to have enough confidence or efficacy or support so that the folks that live in whatever neighborhood we're working in can run that garden on their own without us. We shouldn't have to be there 10 years, that's ridiculous. But it takes years to build that trust, it takes years to build the relationships, especially in these places where there's repeated influx of folks who just come and go.

But it's hard because you come across obstacles working with particular communities. Like when the property manager is against you when the higher ups have given you the green light. Another obstacle could be political opposition. When I say that

I don't mean like with politicians, but sometimes there may be other folks who might have a relationship or a past history with some of the people you're working with and they don't get along. Then by proxy, they don't like you and they don't want to support you. Then they have a relationship with someone else and then they're not going to help them either. You will be surprised because suddenly it gets really childish. Some folks have been involved in their community for many years and sometimes if they feel like they've been slighted or you didn't come to them first, even though they may not be the appropriate person, then they might do everything in their power to oppose you.

We definitely faced that in Lincoln Heights. I hate to say this, but it's just one of those communities where people are profiting off of poor people. People have their agenda for what they think should happen and if you are doing something that they view as in opposition to their agenda, then they're going to oppose you. There are a lot of politics now with gentrification and tearing down public housing developments. There are some folks who support tearing down this community because it's going to bring a new community and new and better things are going to come. They might view doing something now, like planting a garden, as in opposition to that. They're like "*why are you doing this? We're moving, we're not about to be here, so what are you doing?*" Or another obstacle could be something as simple as "*you're working with that person and we don't get along so I don't like you either.*" It could be as simple as that! There are those little things you cannot let go and stop whatever work you're doing.

Also on top of [having an impact at the individual and community level], we're engaging other organizations in highlighting how environmentalism can be implemented and how to engage a broader community. How can we fit into the whole DC environmental community and bring new and innovative things to that movement? It's not just "oh we're bringing the movement to these people," it's what are we also bringing to the movement. [What do we bring to the movement?] When I'm talking about the environmental movement, I'm talking about the group of people that you would consider to be part of the typical environmental groups. They have these conferences or these events or they write grants, so they have in their minds an agenda about what the issues are and what they should be. What I'm saying is that we're bringing to that agenda other things that might not be on the table because of the demographics of who is in those groups. We're going to that table and adding to it by showing there are other people doing environmental work that don't fit into that typical demographic that do have important contributions to bring that add a nuance to what environmentalism is or add a different layer of what it means to work in this area.

We're seen as experts in how to do community engagement, how to introduce or start conversations about nutrition and food justice or environmental issues. At that level, meaningful moments have been us bringing our approach, method and experiences, good or bad, to the environmental community, to the movement. All of us

were in the Environmental Leadership Program. Ronnie and Xavier had spoken on several panels that are environmental focused. Xavier was on a panel at University of Maryland and it was all older white people. They were talking about whatever it is that they talk about. And I was on a panel last week and it was about some film about environmentalism. Those are proud moments, for being recognized for the work that we've done and being able to be seen and respected as a leader and contributor to community, to engagement, to food justice. It's about being present in those places as well and being recognized in those spaces as not necessarily a quote on quote expert, but as a person who is also of value or brings something to the table. [Being young and African-American from the city] is definitely a part of it and bringing that perspective to the table. There are a ton of black environmental justice folks, but there are certain issues that are really focused on even in those groups, like lead and asthma and bus terminals and those types of things. So it's being able to contribute to the broader context of what "environmentalism" is in addition to the actual work.

[If the city wanted to work with us], they'd have to understand that, not just for an organization like the Green Scheme, but for community work in general, people work so meetings need to be in later in the afternoons or even better later in the evening type of hours. No one's going to come to your thing at 1:00 in the afternoon to talk about whatever it is you want to talk about. Community meetings are never in the middle of the day. They're always at like 6:30pm. [Another important thing for the city to know if they wanted to work with us] is if we got a grant from them, we need that money to do the work, to do the work. Other more established organizations that have been around for 25-30 years have money in reserve so they can just go and do their stuff. We can do that up to a point, but that doesn't work for us. So government agencies should understand that the smaller organizations they're trying to work with probably don't have the budget or the time to immediately support or provide whatever the project is without the money upfront. Some organizations really understand that and they're like "*ok come get it, we got it, here you go, here's a pot get started*" and then others make you wait. I know from my experience working in government and knowing other small organizations [that getting the money upfront is important].

There are these initiatives that local government or these agencies have and they're like we want to increase vegetable and fruit consumption or we want more trees. But the government doesn't understand that there might be only 3 or 4 people working in one agency on that particular topic. Those folks are not going out and doing the grassroots kind of outreach and education that whatever the initiative calls for to get this work done. The easiest thing to do is to give some money to existing community organizations that are able to have more of the impact because they've built those relationships, because they live in the community and they can reach more folks in an innovative way. And in a lot less time, they can be more innovative and they'll have less

restrictions than a regular government worker. I think that small organizations like the Green Scheme are important because they are able to have a broader more impactful reach to get those initiatives done.

[If I were to give advice to someone who wanted to work on environmental and health issues], my advice would be to put people first, especially in environmentalism. I think that the reason why it hasn't worked is because the crunchy folks, for lack of a better term, have made it all about the trees or the animals or the water or the ocean and people don't care. People care about what's affecting them. So you telling me about some polar bear, what's that got to do with me? And I mean yeah that's sad, people should be more empathetic, people should care, people should care about the future and the planet, but they don't.

That's why making the connection between health and environment is so difficult because for so many years they've been seen as two totally separate things, but they're not. They're the same thing. And I think that if people understood people, then people's health would be better and the environment would be better. If people understood the connection between their health and the environment, then I think both of them would really benefit. But because they are totally disconnected, it's going to stay that way. And people's health is going to continue to decline, and the environment's health is going to continue to decline. In my personal opinion if someone wants to get involved in community and grassroots environmental whatever stuff, I would say put people first. What are you saving the planet for, a planet with no people?

[What is it like balancing the Green Scheme with a full time job?] You come across your own obstacles, like actually being able to get to a certain place. It's your own personal stuff, like "*I can't get off work until 5 o'clock but then we have this thing that's at 530 so after work I have to get halfway across town and how do I get there?*" I think what's unique about the Green Scheme is that everybody does work a full time job and other people are like wait what? It's was always this weird balance of not wanting to tell tell people that. We didn't intentionally withhold that information, but we didn't make it a well-known, we didn't put that up front. Most of the organizations that do this type of work, that's their whole thing, and that's what we were trying to get to. It's like you've got to maneuver. There's a meeting at a library and you might have to take an hour off of work and just allow some sick days.

When people ask what do you do, it's like where am I? Who am I? Who are you? Because then I know how to respond. Because I work in my community. I do work in my neighborhood. I teach Zumba. I work for the YMCA. When they ask that, it's like what hat do I have on now? What setting am I in? Who am I talking to? A simple question can put you in this state of like *oh god, what do I even say? What's the most appropriate title?* Everybody kind of says their made up title so I'm like I should just be important in

everything and just make stuff up. I have all these hats. Maybe I'll never get to this state of having just one hat on, but maybe consolidating.

I don't know [what motivates me to do community work]. This is a lot of work now, and it will always be a lot of work. This work is not easy. But I think that the ability to say hey this is something that we came up with or this is something that is working that I feel like is having an impact is I think the motivation factor. As far as my community in River Terrace, I felt like I'm in all these other communities, I have to do something in my own neighborhood where I actually live. I organized a community cleanup in Fall 2014. We had another one this year, so I'm definitely still very much involved in my community and I'm thinking about maintaining this type of work there in my immediate neighborhood.

[What's next for me in my future?] I've been thinking a lot about what is unique that I bring to the table. There are other black farmers and people who are doing this work who are young in this Mid-Atlantic region, like in Philly and DC. One person connects you to one person, then to another person and then you start seeing the same people. Then that's your network. I realized I know such and such who works on a farm in Baltimore and I know this person on the shore and this person down in Southeast and I know this person over in Northeast. All of us know each other and there's a whole other groups of folks who are thinking about this. That is something that's interesting to me.

I'd like to help connect the dots for how a network of those types of people can work together and think about how to engage different groups. How to create economic opportunities addressing not just the natural environmental factors but the social environmental, physical environmental factors in your immediate location and then making those connections to other places internationally. I was in Brazil for a month and I was there learning about people affected by dams and the issues around that. There's a movie about it. What I learned there and what the film brings home is that all of these quote on quote environmental issues are not necessarily environmental issues. They're about economics, colonialism and power a lot of times. When I'm thinking about the international connection, locals growing their own food or buying from the local black farmer or from the CSA are small acts of resistance because they're not participating in huge agro-business which are contributing to the desecration of the planet. I want to make all those connections to strategies of resistance and show people that this isn't just happening in the US or in Brazil. It's happening in India. It's happening in Africa, in Berlin, in Montana. It's happening in DC. It's happening in every place that you would think are totally different, but the same exact things are happening there. I've been thinking a lot about that, but scaling down to what are the immediate things to work on.

I still have my full time job at the FDA. I think I'll probably be there for another year. I don't really see myself there in the long term. I'm honestly just trying to get lots of

Profile of Joelle Robinson

papers out. It's cool because they have a lot of money and there's a lot of support. Yes, people smoke. Yes, it's bad. Yes, it's due to these companies, but I don't really care [about tobacco]. I'm trying to think of tobacco like as a case study for other things and trying to be more intentional about taking lessons and applying it to other things. There are other researchers there and I love the people, but they're young and that's their jam. And I'm like go ahead, right on. I just don't feel that way.

[What's my jam?] I'm trying to figure out how to articulate it. I think it's about actual actions. I just need to do stuff. I can't sit and think that I'm going to figure it all out in my bedroom. I just need to get out there and start doing stuff. This winter is going to be reflection for me and then I think in the spring kick some ideas around for whatever it is. I think it will be fine.

“GET THEM TO COME OUT, JUST ONCE OR TWICE”

A Profile of India Jackson

Interviews conducted by Christine Moskell
9/20/14 and 11/1/14

India Jackson is the legal, business and administrative assistant for the Green Scheme. As Ronnie's first cousin, India was one of the first people he recruited to be part of the organization. Even though India hasn't been involved much in the Green Scheme's tree planting and gardening activities, India tells us how she plays important roles behind the scenes. India's stories demonstrate the ways in which the Green Scheme has built partnerships with other nonprofit organizations.

My name is India Jackson. I provide legal, business and administrative guidance to the Green Scheme. I also work to build partnerships with other organizations and the Green Scheme.

I was born and raised in DC. I grew up with Ronnie. Ronnie and I are cousins. We were in school together up until maybe 7th or 8th grade because he was a year ahead of me. We used to come here to Ronnie's house afterschool. Our grandfather used to pick us up after school every day and we would fight. We would have weeks we would fight over the front seat and the remote. So my grandfather came up with this scheme, where for one full week, you could sit in the front seat and have the remote. Then he'd cook us dinner and we'd do homework. Ronnie and I have always probably had more of a brother sister relationship than just first cousins. Then we went our separate ways in high school.

I went to college in North Carolina at East Carolina University. I majored in psychology and criminal justice, but if I could have, I would have just gone straight from high school to law school. Picking a major in college was the worst thing ever. I was always a good student, but I didn't really like any of the courses enough to say ok, I'm going to major in this. I took AP psychology in high school and I think that probably appealed to me the most out of all the classes I had ever taken. So when I got to college, I got into intro psychology and I was like ok I already know this stuff, I'm actually interested in studying it so I'll just go with this for now. My goal was to always end up in law school, I just needed to get through college to get there.

Now I practice law full time. Right now I'm doing personal injury and entertainment law. [What motivates me professionally?] Aside from the paycheck, I like the work. It varies because no client is like the one before or like the next one after, so there's never a dull moment. It's people's real life situations and its always just crazy stuff going on that just comes up. I think that the work is interesting. Research can get a little tedious sometimes but just the chance to interact with so many different people in

different scenarios that you just have no idea about. I mean because you really never know what's going to walk through the door.

I live in Ashburn, Virginia, but my parents live maybe 3 minutes from here. From Ashburn to there is 50 minutes without traffic, but during rush hour time it's an hour and a half. Right now, I'm working as my own boss with another attorney. It's actually her office, I'm renting space from her, so that frees up some of my schedule and flexibility. I also do a lot of work from home. I don't like to have to travel an hour and half because that's a 3-hour commute, on top of gas and wear and tear on my truck. If I'm home or even if I'm in my office, I have that flexibility to get everything done. I can work late, with either job, whether it's the Green Scheme or the legal stuff, so I just do it when I have time. Because I'm so far away in Ashburn, I don't do the Green Scheme programs as much. The weekend stuff is primarily where they see me at. It's like the cleanup activities or if we're partnering with another organization outside of Code Green to plant trees or just community presence events. Everyone else is more of the actual hands on ones, but when I'm here I don't mind getting dirty.

Initially, I was brought on to the Green Scheme as a board member. Ronnie wanted to have a sufficient level of credentials for board members and I'm the only person that brings the legal background to it. Once they started the Code Green grant, then he still needed extra people to help out with that. That's how I got my foot in the door. As far as my background with nonprofits, I took a small business clinic and I took a pro-bono clinic in school, and that's it really in that area. I'm just learning about nonprofit law as I go.

The Green Scheme as a whole hasn't really run into any legal issues or anything that required a lot of legal knowledge. The most important thing, which Ronnie ended up doing on his own actually, was getting incorporated as a formal 501(c)3 nonprofit organization. The government has the paperwork done now so that its user friendly and straightforward, so he didn't really need much help with that. Now we haven't really run into anything where we don't know what to do about it. There was one time when Ronnie asked me something legal related. But other than that, more of my perspective on the business side of it has come into play.

Because of my legal background and the formal training in law, my perspective of things is a little different when it comes to the business structure as a whole. I'm the person who says, "*ok well lets focus on really why this is important.*" Or they're like "*we have to do this, we have to do that*" and then I'm like "*ya'll are stressing over this, like why are we doing this? How is this helping the organization?*" I'm in lawyer mode with everything we do. Most of the time it helps, sometimes its overthinking it, but I bring that to the table. I think it keeps everybody grounded and balanced.

[In my current role with the Green Scheme], I'm primarily more of an administrative person. Ronnie is not very paper savvy so I help him out with that.

Joelle's definitely the most paper-savvy one out of the bunch. She's spearheading getting organized from the business side, so I help her out on a need basis. She knows that if there is somebody else that wants the same type of organization it's going to be me. If she needs help with something, she knows that I'm going to be the one that will stay on top of what's supposed to be done as far as the books and the paperwork more than anybody else. That's the stuff nobody wants to do. We haven't always been so used to functioning with paperwork day to day, which does need some work. Everybody has their own personal lives, so it gets a bit strenuous to try to get everybody on one page to keep everything organized.

With Code Green, everything's been so new. Now that there's government money involved, there's actually someone looking over our shoulder making sure everything's in order as far as paperwork. If the worse case scenario happens and the government wants to audit you, you need to be prepared. With the Code Green stuff, I'm like "*ok we need to keep this the same every week, everything needs to look like this, the paperwork needs to reflect what's going on.*" Everything will move smoothly if everybody knows their role and it's on paper and you can read what you're supposed to be doing so that we also know what everybody else is responsible for.

That probably has been the biggest conversation, which actually goes on almost every meeting because there is just so much work to be done as far as getting the business portion cleaned up. It's a work in progress. It's an area that still needs much work. It comes up probably in every meeting, if not every other meeting. It's a reminder of what we need to do and it might not always happen. We have to still remind each other because everybody struggles with it, me too, Joelle, Ronnie, everybody has the same issue when it comes to the paperwork support. I think that's probably one of our weak spots, if I had to name one.

[One of my other roles within the Green Scheme] is partnership outreach to try to get other organizations or people we can work with on board. Basically, it's a trial and error type thing. Mostly I look people up on Google, make phone calls, send emails and just hope that someone's interested. What I'm really looking for is somebody who wants our involvement with their organization as much as possible. Most of the time they are interested, especially when kids are involved, because they are hearing "*oh, they want to come here and they want to plant community gardens for free.*"

The most recent organization that I've connected the Green Scheme with is F.A.N. It's a group home type thing, maybe something a little bit better, but they're doing their best to keep kids off the streets and out of illegal activities and keep them focused. We had an intern working in our law office who did volunteer work with F.A.N. She makes jewelry on the side, so she makes bracelets with the kids there. She just kept going on and on about some of the events she had to do with them. So I asked her what organization is this? And she said they do a lot of events like that and they even have

money to sponsor people to come in to put on programs with the kids. So I asked her what else are they interested in and whether they would be interested in pairing with the Green Scheme. I told her a little bit more about the Green Scheme. And she said yeah, they'd be interested.

She sent me the link for their website, I did a little research, looked at it myself. She gave me a person to contact, Marlin, I can't even remember his last name. I called him at his office. I got his secretary or someone who answers the phone. I didn't get a call back immediately, so I had to call again. He ended up calling me back from his cellphone. You'd be surprised at how personal these people are with their organizations. It's almost like it's a part of their lives, because he called me from his cell phone. But I missed the call. I called him right back, it was about 6:00 in the evening, and at that time he was in the grocery store, but we still talked a little.

I told Marlin a little about the organization, just enough to get him interested. I set up a meeting for Xavier to meet with Marlin so they could discuss going forward how they could put the program on there for the kids. Xavier is the youth coordinator for Code Green and Xavier would be the one going there to put the programs on for the kids. It was better for Xavier to meet with Marlin than for me. On top of that, I didn't have the time and Xavier does so I figured why even go through me, just jump straight to X. Then I called X and I said *"we have a new organization that's interested in Code Green programs. I met someone who knows someone else from FAN, I called them, finally got in touch with him, they're interested so I'm going to set up a meeting for this day so that you can go up there and put the programs on for the kids."* And X said ok.

I think Marlin and Xavier talked on the phone first, then they met in person and they just took off from there. I think they consolidated a few weeks' worth of Code Green programs into one week there with the kids. They did the general Code Green program that they were also putting on at Willow Terrace, like the planting and the eating healthy, talking about diseases that target the community, how to grow plants starting from seedlings and how you can make your own food. It covered basic stuff from nutritional facts to how to grow your own food and how to make it.

It worked out well. [At the time] we were in the process of still trying to find enough people to satisfy the grant requirements in terms of number of participants. F.A.N. was another large groups of kids, so it worked out well. I think the only issue with them was the timing, because a lot of their availability with the kids to put the programs on was during the daytime and everybody still has their 9 - 5 jobs, so it conflicted a little bit but they made it work. I didn't actually go up there to put the programs on, but Ronnie, X and Darryl made it work that week with their schedules.

[If I were to give advice to someone about how to build partnerships], I'd say you have to think outside the box. F.A.N. was a new avenue for us, targeting orphanages. We didn't even think about them, but once we thought about it, it was like we should

have thought about this a while ago. Before that, we all took on the role of targeting churches and schools. Initially we were trying to get kids to come to us to put on the workshops. But when we were realized we were a little low on numbers, it might be more convenient that we go to them. X actually compiled a list of churches and schools that were in the targeted wards in DC for us to call and do some outreach to see if we could get in touch with them.

Had we thought outside the school and church box, the orphanage was a hit on hit for us. You have the kids there, they have to do certain things and meet requirements to stay there. F.A.N. can keep tabs on them and what they're doing, so they need the participants to put in this program, they can make them do that. At the same time, the kids benefit from it and they like the programs. You don't have too many people coming around saying "*hey, let me show you how to plant this garden, grow it and make food from it.*" There's a lot of different stuff the Green Scheme offers, so people would have to not think just the traditional avenues as far as partnerships. You've got to really think outside the box.

Other than that, you just have to go for it. Several times I didn't know anybody where I was calling. F.A.N. just happened to work because someone in our office recommended it. But even still I didn't know anybody there, they didn't know me. Most of the time when you say you're from a nonprofit and you're offering to do something for kids or the community in general, you're not going to get people who just turn you down and who are just completely not interested. The biggest issue you might run into, they'll say "*well we might not have money to do this,*" but then we have our own money and funding and stuff to do this. I've never seen a situation that's like "*oh, no we don't want you to come in and help our kids plant community gardens.*"

Professionalism is definitely [an important skill to have when you call groups trying to sell your own organization]. You're cold-calling people most of the time and in order for them to even want to hear you out or to listen to what you're saying, you have to come off as a respectful, professional person. On top of that, you're calling them from a business to another business, so that's something to think about. Then you have to be a good communicator because you have to be able to effectively tell them what it is that we do. You even you have to sell the Green Scheme because they have no idea about this brand new organization that they have probably never heard of. You have to be able to tell them everything good that we've done and why we would be good for their organization. You have to do it in a short amount of time because nobody has all day to sit and listen on the phone to everything you have to say. You have to be able to sit there and convince them that this is a good organization, we'd be good for you, and a partnership together in general would be great.

I'm comfortable with cold-calling. Usually when you call, you get the secretary. It's never the person you want to talk to first. So you have to leave this long detailed

message basically explaining our mission, what we're involved in right now and how it probably connects or relates to whatever their mission is. It may take a while for me to get a call back from the person I really need to talk to, and I might have to call a few more times, but eventually the message gets through. Then they'll usually say "*ok, you can come in, show us a little bit about what you all have done so far.*" Then once we show them newspaper clippings or just a program structure then they're open to it. But most of the time, I definitely am just like "*hey, this is India you don't know me but...*"

The problem with cold-calling when you first hear the person calling is that you think the question they'll ask is what are you trying to sell? If you're calling to collect money from people, then that's one thing. But if you're calling to offer something that is just strictly beneficial to whomever you're calling, most of the time it's a positive response from them. It just makes the experience of cold-calling more successful because it's not just picking up the phone and dialing number after number after number with no success at all.

I don't think I've ever talked to anybody who is just not interested in all. Usually if it's a no, then it's usually a time conflict, sometimes people are just too busy, or they don't have the funding to keep us coming back but people are usually open to us coming once or twice. Even if somebody can't do something for us on the spot, there's always at least "*oh, let me get your information*" or "*take my email down*" or "*send me a newsletter, let me know what's going on in the future.*" There's some level of success somewhere, and again the product that we're selling with the Green Scheme is not doing anything to hurt anybody. It's purely beneficial to whoever we're reaching out to, so it makes it easier.

When I call these groups, sometimes I'll be in my car and I'll just pull up Google and see I'll have a number and be like "*oh I forgot to call this person.*" I'm always doing Green Scheme in the middle of whatever I'm supposed to be doing [for work]. So I'm like "oh let me call them." I'll just be in the car like a normal conversation. "*I'm calling from the Green Scheme, we're a nonprofit organization aimed at health, environmental sustainability and social justice.*" I give them the spiel but then I get away from the scripted part. The only scripted part I have is just really about the Green Scheme, it might be 1 or 2 sentences. Then I try to relate to what it is they do and then try to tie that in to what it is we do to make our organization or a partnership more appealing to them.

The skills I use when I'm calling these groups to try to build partnerships I got from working. I've worked in a lot of agencies since I was 15. I've worked for NASA, for the Department of Labor, the Department of Veterans Affairs, the National Science Foundation, a couple of DC governments. I think from being around so many government agencies and being in the work environment for so long, I've learned how to deal with different people. And also just being grown up into an adult and being away

at school, just from life in general, you learn how to talk to people, what works, what doesn't work, what people are receptive to.

I would say the things or events we use the most to entice people to come to our events is music, like some type of singing or rap contest. The biggest one is probably free food. People come out for that. No matter what type of community you go to, people hear free food and they'll be like "*ok I'll go if there's free food involved.*" So I think that's the number one activity that we use first. Over time, it's like if they come to this event and they meet and us and they see that we're down to earth, they see what kind of good can come out of this. If you don't know anything about going green, then you hear that stuff and it sounds boring, it doesn't sound like it pertains to you. They might not be interested, so if you can just get them to come out, just once or twice to see what's going on, then they might not say "*hey I absolutely love this*" but at least they're open to it. They might say this might not be a bad thing after all.

[What makes the Green Scheme unique from other nonprofit organizations working in the same area] is number one we are a group of young people. Not to say that other groups don't have that, but when you have people who look just like the people in the communities that you're targeting, some people in the group can actually relate to the problems that these people are going through. I think that the people we are targeting get that sense of sincerity from us, so it makes it easier for them to just say "*ok, they genuinely care, they really want to help us, let's give this a try.*"

[Something about my work with the Green Scheme that's been memorable for me has been] any time I run into somebody that knows about the organization, but who I don't know personally, they always have positive stuff to say about us. For example, there was an opening of a barbeque restaurant called KBQ in Largo, Maryland, about 15 minutes from DC. I went there because the Green Scheme was supposed to have a table set up. The restaurant used some of the vegetables we grew in the Lincoln Heights garden as their produce to make the food in the restaurant. As part of the grand opening, they had a sidewalk set up with the tables, buffet style like a taste testing type of thing for people walking by. At the end of the buffet line we had a Green Scheme table set up and it had some of the fresh produce on the table. I was the one there to let people know that they were using fresh vegetables from our garden, to tell them more about the Green Scheme and to get people's email addresses to get them involved with us too. It was supposed to be a win-win for everybody.

Ronnie knows the restaurant owner very well, but it was my first time meeting her. So I'm at the table, but here she was doing the selling of the Green Scheme more than anything. She just spoke so highly of the organization and of Ronnie in general. She was supposed to be promoting her restaurant, but to everybody that came to the end of the table, she was like "*oh this the Green Scheme they do X, Y and Z.*" She just had so many positive things to say. It's a place that we're definitely looking into

partnering with because they have the funds to move the organization along and they have the connections and resources.

I brought this up just to say that everybody that I met and that knows something about the organization has nothing but positive stuff to say. To see that spreading and then to see someone pass it on to somebody else right in front of you, in front of several people mind you, and to try to help us out with other partnerships, its rewarding to know that we're doing a good thing and that other people think so too. She passes it on to the next person and over time we hope to build more partnerships that way. Most of the relationships up until this point have been made just like that. We hope it continues to grow.

[What motivates me to do this work for the Green Scheme?] Ronnie does. I saw him speak one time to a group of men who were unemployed. They were looking for jobs at a time when there were all these new green jobs opening up in this area. He was reaching out to this group of men who were not easy to convince by any means. Here were these guys, they're jobless, they have certifications in these different areas, struggling to find employment, in a sense having given up on somebody telling them *"hey you can do this. You can start your own business."* So there was Ronnie. He had a PowerPoint, but we didn't have an HTML cord and he couldn't show any of that. So then he just went off the top of his head. To watch those guys go from slouching and looking like *"ok what does he have to sell us today that we're not going to buy?"* to being attentive, giving feedback and being engaged in the conversation by then end of the presentation. It was just amazing to watch him be as passionate as he is and to be able to rub that off onto somebody else who wouldn't easily be persuaded. That was the number one memorable moment in my book. I'm completely behind the mission of the Green Scheme, but knowing Ronnie and us having grown up together and then seeing him do something that he absolutely loves, I am in full support.

Going forward, I would like to be more hands-on involved not just on the paperwork end. My goal after this, I told myself for the next grant or whatever we do, is I'm going to try to go to more of the programs and do more of the planning and the digging and stuff. I'm ready to get my hands dirty. With the schedules and my car and the distance, it's not always possible, but I would like to be able to do that more going forward.

You can see that we're making a difference, even if it's just one person. It's always more than one, but you can easily tell its impacting the communities, its impacting the kids. They love it, they show it. I think to know that a difference is being made and that there's some good as a result of it, then it keeps me going. It keeps everybody going and I think we all keep each other going so as long as that motivation is there to push us individually. As a whole, we have the Green Scheme so I think we push each other and then the people we're reaching out to are pushing us.

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CHAPTER 4: THE CONTRIBUTIONS OF VOLUNTEERS AND VOLUNTEER MANAGEMENT PRACTICES TOWARD THE ORGANIZATIONAL RESILIENCE OF URBAN ENVIRONMENTAL NON-PROFIT ORGANIZATIONS

Abstract

In an age of global climate change and urbanization, environmental nonprofit organizations play an important role in the conservation and management of urban natural resources. Many of these organizations rely on the service of volunteers to carry out their environmental missions and may especially benefit from volunteers during times of crises, such as natural disasters or economic downturns. The ways in which volunteers contribute to urban environmental nonprofit organizations (beyond donating their time and labor) have not been explored in depth. However, previous research on volunteerism suggests that effective volunteer management practices can improve the recruitment and retention of volunteers and thus, may also be important for an organization's ability to carry out its mission in times of crisis. This study examines the contributions of volunteers and volunteer management practices toward the organizational resilience of urban environmental nonprofit organizations, which is defined as an organization's ability to adapt and recover from crises. Hierarchical multiple regression and stepwise regression models were estimated to identify the degree to which volunteer management practices and volunteer contributions predict organizational resilience, relative to organizational characteristics. Results suggest that volunteer management practices and volunteer contributions are important predictors of organizational resilience for urban environmental nonprofits, specifically the management practice of ensuring volunteers feel supported by staff and volunteer

contributions toward organizations' response to crises. Volunteer management practices and volunteer contributions accounted for more variance in organizational resilience than did organizational characteristics, such as the age of the organization and level of assets. Organizations that ranked highest in organizational resilience had statistically higher levels of agreement on items measuring volunteer management practices and volunteer contributions than did organizations that had medium and low levels of organizational resilience. Implications for future research on organizational resilience, volunteer management practices and volunteer contributions are discussed.

Introduction

Nonprofit organizations in the U.S. play an important role in civil society by engaging in a number of activities for the public good, such as education, community engagement, and environmental conservation (e.g. Salamon 2003; 2012). As of 2012, there were approximately 1.44 million nonprofit organizations in the United States (McKeever and Pettijohn 2014) and 4.5% of these organizations focus on environmental issues and animals (McKeever and Pettijohn 2014). Urban environmental nonprofit organizations (hereafter "UE nonprofits") are a growing subsector of environmental nonprofits, as many local governments across the United States are increasingly reliant on the nonprofit sector to assist in urban environmental management (Perkins 2009; Sandberg et al. 2015). UE nonprofits engage volunteers in various activities, including the conservation, management, monitoring, restoration, advocacy and public education of urban natural resources in cities across the US (e.g. Svendsen et al. 2016). Given that the majority of the US population (80%) lives in urban and urbanizing areas (UN

2015), UE nonprofits play an important role in increasing and maintaining people's access to the public health, community and environmental benefits of natural resources (see Wolf and Robbins 2015), as well as addressing broader social issues (e.g. environmental justice) (Romolini et al. 2012; Fisher et al. 2012).

The US nonprofit sector as a whole has been characterized as resilient (i.e. able to survive and thrive) in light of a number of chronic stressors in the last decade, such as economic downturns, policy changes for the delivery of public services, competition with the for-profit sector, and acute events like manmade and natural disasters (Salamon 2003; 2012; Dietz et al. 2014). The environmental nonprofit sector may be especially resilient, as environmental nonprofits (and arts organizations) were significantly less likely to close during the Great Recession of 2007 – 2009 than other types of nonprofit organizations (Dietz et al. 2014). UE nonprofits, in particular, may also be resilient given that a number of UE nonprofits emerged in response to many of these stressors, including 9/11 (Svendsen and Campbell 2010), Hurricane Katrina in 2005 (Tidball et al. 2010) and the tornadoes that devastated Joplin, MO in 2011 (Svendsen et al. 2014). Volunteers likely played critical roles in the ability of UE nonprofits to respond to these stressors, given that many of these organizations have small annual budgets and small staff sizes (Svendsen and Campbell 2008; Brinkley et al. 2010; Belaire et al. 2011; Fisher et al. 2012; Wolf et al. 2013; Westphal et al. 2014). Volunteerism often occurs in the context of formal organizations and involves people (i.e. volunteers) who freely chose to engage in deliberate activities over time on behalf of causes or individuals in need of assistance (Snyder and Omoto 2008). Beyond helping UE

nonprofits steward urban natural resources, the ways in which volunteers contribute to the organizational functioning of nonprofits (beyond donating time and labor), as well as the ways in which these organizations manage their volunteers, have not been explored.

Theory on organizational resilience (OR) from business management is relevant for understanding the ways in which volunteers contribute to nonprofit organizations beyond providing time and labor. OR is defined as the ability to recover from disturbances “in a manner that leaves the organization more flexible and better able to adapt to future challenges,” (Denhardt and Denhardt 2010, p. 333). OR is viewed as a function of the individual-level skills, knowledge and abilities of organizational members as well as a top-down function of organizational policies and practices (Lengnick-Hall and Beck 2011). OR theory has been developed and applied in the for-profit sector but has not been examined in detail in the nonprofit sector. In the context of nonprofit organizations, OR may be a bottom-up function of the skills, knowledge and abilities of volunteers as well as a top-down function of volunteer management practices.

The goal of this study is to examine the volunteer management practices and contributions volunteers offer to UE nonprofits, as well as the degree to which volunteer management practices, volunteer contributions and organizational characteristics enhance the OR of UE nonprofits.

Volunteerism in Urban Environmental Nonprofit Organizations

Volunteerism in UE nonprofits has been linked to the concept of urban environmental stewardship (see Wolf et al. 2013). Volunteers engaged in urban

environmental stewardship (also known as civic ecology) participate in a variety of activities to enhance and maintain the presence of natural resources in urban areas, such as community gardening, street tree planting, removal of invasive species and trash, streamside restoration and oyster gardening (e.g. Krasny and Tidball 2015), as well as educational activities related to their stewardship practices (Romolini et al. 2012). UES activities may occur in the context of different types of organizations, including government agencies, nonprofit organizations and community groups (Svendsen et al. 2016).

Inventories of organizations involved in urban environmental stewardship conducted in cities across the US have found that many of these organizations have small annual budgets and staff sizes. For example, a survey of 135 UE organization in cities across the Northeastern US found that 81% of groups had fewer than 10 full time staff. About 20% of organizations had annual budgets between \$200,000 - \$500,000, while about 16% had an annual budget of \$0 - \$1,000 (Svendsen and Campbell 2008). Another study of 369 UE groups in the Chicago metropolitan area found that 40% of organizations had no full time staff, 42% had no part-time staff, and that many had 1-5 full time or part time staff. Researchers also found that 30% of organizations had a budget of less than \$1,000 (Belaire et al. 2011). Another survey of UE organizations (N=2,796, n=506) in New York City found that the majority of nonprofits scored medium (23%) to high (34%) on a professionalization index (index based on paid staff and annual budget) (Fisher et al. 2012). Thus, all of these studies demonstrate that UE groups are highly reliant on volunteers. Svendsen and Campbell's (2008) multi-city

inventory found that many stewardship organizations only have part-time volunteer staff and either have small cohorts of between 10 – 30 volunteers or large cohorts of 100+ volunteers. Westphal and colleagues' (2014) inventory in Chicago found that the majority of UE organizations reported having fewer than 100 volunteers. Many of the UE organization inventoried in these studies also have formal 501(c)3 nonprofit status. For the purposes of this study, we are concerned with volunteerism that occurs in organizations with formal 501(c)3 status.

Volunteers engaged in urban environmental stewardship have been characterized as a source of human and social capital that UE nonprofits can use to effect positive environmental and social change (Burch and Grove 1993; Svendsen and Campbell 2008; Wolf et al. 2013). One recent study suggests that volunteers in UE nonprofits may serve these groups in non-environmental ways, such as providing general office services or managing events (Daniels et al. 2014). Yet, research has not examined, in-depth, the types of capital (knowledge, skills, abilities) that volunteers contribute to UE nonprofits, nor how UE nonprofits recruit, train, and manage volunteers and mobilize volunteer “capital” toward the achievement of organizational (and ultimately environmental and social) goals (Wolf et al. 2013). The lack of knowledge about the volunteer management practices employed by UE nonprofits mirrors a broader trend in the research on volunteerism, very little of which has empirically examined volunteer management practices (see Studer 2015 for a review).

Volunteer Management and Volunteer Contributions

Volunteer management is defined as “the systemic and logical process of working with and through volunteers to achieve the organization’s objectives in an ever changing environment” (Safrit and Schmeising 2012, p. 6). Volunteer management includes organizational practices such as the recruitment, orientation, training and recognition of volunteers. It also refers to the professional development of paid staff with regards to working with volunteers, training volunteers to carry out their roles, providing feedback to volunteers, recognizing the accomplishments of volunteers, and developing volunteer programs (Safrit et al. 2005; Cuskelly et al. 2006; Brudney and Meijs 2009; Safrit and Schmeising 2012). Volunteer management is important so that an organization can effectively provide public services (Studer and Schnurbein 2012). Also, ineffective volunteer management can discourage the retention of volunteers (Snyder and Omoto 2008; Brudney and Meijs 2009).

There is a debate within the literature on volunteerism as to whether the management of volunteers is different from the management of paid staff, resulting in the lack of a unified theoretical framework of volunteer management (see Studer and Schnurbein 2012). Nevertheless, volunteers are generally viewed as making contributions that are unique from those made by paid staff (see Studer and Schnurbein 2012) and that go beyond simple cost-savings for organization (Haski-Leventhal et al. 2011). For example, the very presence of volunteers within nonprofits can increase public support for programs, improve nonprofit’s community relationships (Brudney 2005) and can enhance potential donors’ perceptions of the altruism and

trustworthiness of the organization (Haski-Levanthal et al. 2011). While these non-economic benefits have been acknowledged in the literature, few studies have empirically measured these contributions (Haski-Leventhal et al. 2011).

The assumption that volunteers are a unique resource distinctive from paid staff requires volunteer management practices that develop and distribute volunteer contributions back to the organization, and ultimately back to the public good (Studer and Schnurbein 2012). Effective volunteer management that mobilizes volunteers' unique contributions may be especially important as environmental nonprofits themselves must be resilient in the face of acute and chronic stressors, such as manmade and natural disasters or economic downturns (Salamon 2003). OR theory can help to explain how both volunteer contributions and volunteer management may enhance the ability of nonprofits to respond and adapt to these stressors.

Organizational Resilience

Organizational resilience (OR) is the ability for organizations to plan, respond to and recover from disturbances in a way that leaves them better able to adapt to future challenges (Denhardt and Denhardt 2010; Whitman et al. 2013). OR has been described as the ability to absorb strain and “bounce back” to normal organizational functioning after an unexpected event (Horne and Orr 1998; Sutcliff and Vogus 2003; Somers et al. 2009), as well as the ability of an organization to survive and even thrive in the face of crisis (Seville et al. 2008). OR theory, much of it developed in business management and engineering, has focused on identifying the dimensions of OR and the attributes of resilient organizations. For example, Stephenson (2010) found that

organizations that are larger in size in terms of number of employees and cash reserves were more resilient than organizations without fewer employees and cash reserves. Initially OR was thought to be similar to the psychological factors that comprise individual psychological resilience (Egrelund et al. 1993; Mallak 1998; Coutu 2002). While a number of conceptual models of OR have been developed (see Lengnick-Hall and Beck 2011), scholars generally agree that OR is not the result of the cumulative resilience of individual employees, but rather results from the interaction and collaboration between multiple parts of organizations (see Stephenson 2010 and Fyffe 2014 for reviews). For example, OR is viewed as a function of human resource management practices or other organizational mechanisms and individual skills and abilities (Lengnick-Hall and Beck 2011; Cooper et al. 2014). While many conceptual models of OR exist, few of them have been empirically tested (Annarelli and Nonnino 2016).

The Resilient Organizations Institute in New Zealand has pioneered the development of quantitative measures of OR with the Benchmark Resilience Tool (BRT). Based on an extensive review of OR literature (see Stephenson 2010), the BRT has three primary indicators. The first indicator refers to the adaptive capacity provided by the organization's "leadership and culture." Staff are engaged in the organization, aware of its current performance and of any potential threats. Strong leadership enables decisions to be quickly made to handle a crisis. Staff also assist in decision making and contribute innovation and creativity to organization problem solving. The second indicator, "networks," is concerned with the internal and external relationships

developed by the organization that can be leveraged in times of crisis, including effective partnerships, strong relationships between staff that allow for knowledge and resource exchange. The third indicator, “change ready,” refers to the organization’s planning and visioning activities that prepare it to respond to change (Resilient Organizations 2015). The BRT measures 13 attributes of these 3 indicators (Table 4.1). Long (53 item) and short (13 item) versions of the BRT have had high internal consistency in studies conducted throughout New Zealand (see Stephenson 2010; Lee et al. 2011; Whitman et al. 2013). The Resilient Organizations Institute also adapted the short version of the BRT into a version for nonprofit organizations called the Resilience Thumbprint Tool for Nonprofit Organizations.

Table 4.1: Indicators and Attributes of OR as Measured in the Benchmark Resilience Tool (BRT)

Indicator	Attribute	Definition
Leadership and Culture	Leadership	Strong crisis leadership to provide good management and decision making during times of crisis, as well as continuous evaluation of strategies and work programs against organizational goals
	Staff engagement	The engagement and involvement of staff who understand the link between their own work, the organization’s resilience, and its long-term success. Staff are empowered and use their skills to solve problems.
	Situation awareness	Staff are encouraged to be vigilant about the organization, its performance and potential problems. Staff are rewarded for sharing good and bad news about the organization including early warning signals and these are quickly reported to organizational leaders.
	Decision-making	Staff have the appropriate authority to make decisions related to their work and authority is clearly delegated to enable a crisis response. Highly skilled staff are involved, or are able to make, decisions where their specific knowledge adds significant value, or where their involvement will aid implementation.
	Innovation & creativity	Staff are encouraged and rewarded for using their knowledge in novel ways to solve new and existing problems, and for utilizing innovative and creative approaches to developing solutions.
Networks	Effective partnerships	An understanding of the relationships and resources the organization might need to access from other organizations during a crisis, and planning and management to ensure this access.
	Leveraging knowledge	Critical information is stored in a number of formats and locations and staff have access to expert opinions when needed. Roles are shared

		and staff are trained so that someone will always be able to fill key roles.
	Breaking silos	Minimization of divisive social, cultural and behavioral barriers, which are most often manifested as communication barriers creating disjointed, disconnected and detrimental ways of working.
	Internal resources	The management and mobilization of the organization's resources to ensure its ability to operate during business as usual, as well as being able to provide the extra capacity required during a crisis.
Change Ready	Unity of purpose	An organization wide awareness of what the organization's priorities would be following a crisis, clearly defined at the organization level, as well as an understanding of the organization's minimum operating requirements.
	Proactive posture	A strategic and behavioral readiness to respond to early warning signals of change in the organization's internal and external environment before they escalate into crisis.
	Planning strategies	The development and evaluation of plans and strategies to manage vulnerabilities in relation to the business environment and its stakeholders.
	Stress testing plans	The participation of staff in simulations or scenarios designed to practice response arrangements and validate plans.
Source: Resilient Organizations 2014, adapted from Stephenson (2010)		

OR theory has received little attention in nonprofit literature. One study examined nonprofit OR, but did not cite OR theory. Kimberlin and colleagues (2011) conducted qualitative organizational histories of 12 human-service nonprofits and identified 1) leadership, 2) internal operations (e.g. program evaluation, administrative capacity, responsiveness to constituent needs), and 3) external relations (e.g. volunteer opportunities, policy engagement, diversified political and financial support) as important for OR and organizational growth. More recently, a doctoral dissertation examined the organizational attributes of resilient nonprofits. Informed by an extensive review of literature in nonprofit capacity and failure, open-systems theory, resource dependence theory, and OR. Fyffe (2014) conducted a qualitative case study examining the organizational attributes exhibited by seven nonprofits in Virginia before and after the recession of 2007-2009 and identified the attributes of resilient nonprofit organizations

(Table 4.2). Many of the attributes of resilient nonprofit organizations are consistent with the attributes of OR found within the BRT.

<p>Table 4.2: Attributes of resilient nonprofits (Fyffe 2014, p. 161). “Resilient nonprofit organizations...”</p> <ul style="list-style-type: none">• Anticipate and respond to changes in their environments• Embrace change, challenge the status quo and take risks, despite uncertainty• Remain flexible in their structures and processes• Place strong emphasis on forming strategic, successful, and mutually beneficial external relationships to fulfill their mission.• Have supportive and constructive internal relationships.• Have engaged, competent and effective leadership.• Continually seek new funding sources and have diverse revenue streams.• Have assets, systems and infrastructure needed to administer quality programs and that enhance their ability to address and benefit from situations that emerge.• Rely on their mission and identity to direct their activities, establish shared meaning, and shape their image to external stakeholders.
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While Fyffe’s (2014) attributes of resilient nonprofit organizations (Table 4.2) shares thematic overlaps with the BRT (Table 4.1) (e.g. leadership, internal and external relationships), the studies that informed the BRT did not account for the role of volunteers in nonprofits. OR may also have different dimensions in the context of UE nonprofits in which volunteers make contributions toward the organization.

Environmental Nonprofit Organizational Resilience (OR)

The concept of nonprofit OR has been acknowledged in natural resource management (e.g. Berkes et al. 2002). Gooch and Warburton (2009) conducted 25 semi-structured interviews with volunteers of Australian community-based

environmental groups to understand the individual and group level attributes that could help these groups adapt and respond proactively to change in socio-ecological systems. Results indicated that resilience was linked to the capacity of the group to access resources, but the lack of a constant stream of funding and the lack of committed volunteers were identified as a major challenge. Group resilience was also linked to sense of place, and having an effective group leader. The author cited only one theoretical OR paper from the field of information science.

Baral and Stern (2011) examined the OR of grassroots-level conservation area management committees (CAMCs) in Nepal. They define OR as “the capacity of CAMCs to maintain their function as agents of conservation management during and following the [Maoist] insurgency” in Nepal (p. 1014). They conducted semi-structured interviews and questionnaires with members of CAMCs in 2007 immediately after the Maoist insurgency. Their study measured the relationship between different forms of capital (physical, financial, social, human and natural) and OR. OR was measured by a 10-point scale ranking the degree to which each CAMC’s carried out its tasks (10 = all tasks, 0 = no tasks) during the insurgency and up to the time of the study. Results indicated that there was a strong positive relationship between social, human and natural capital and the OR of CAMCs and OR was negatively related to the diversity of age and ethnicity of CAMC members. Skill diversity and organizational memory among CAMC members had no significant effect on OR. Baral and Stern (2011) applied socio-ecological theory to their analysis of the resilience of CAMCs because they examined the impact of grassroots conservation on the resilience of a socio-ecological system in

Nepal. OR theory, rather than socio-ecological resilience theory, was selected for the current study because the unit analysis is nonprofit organizations, rather than socio-ecological systems.

The concept of resilience has been discussed in the context of nonprofit organizations engaged in urban environmental stewardship. In this context, resilience is understood as the ability of socio-ecological systems (and the people and communities within that system) to rebound and rebuild in the face of stressors, such as social conflicts or natural disasters (Krasny and Tidball 2015). Stewardship practices, such as planting trees and community gardens, represent a source of resilience at individual, community and environmental levels. UE stewardship enhances individual-level resilience because it entails hands-on exposure to natural settings, which can produce beneficial mental and physical health outcomes that help people cope with and overcome stress in an urban environment. Beneficial outcomes of stewardship can accrue at a community level as these practices can build community capacity between local nonprofit, government agencies, residents and community groups. Linking all of these levels, stewardship enhances socio-ecological systems level resilience because it produces outcomes at multiple levels in the system (e.g. at the individual and community levels), which interact to turn negative vicious cycles of poverty and decline into virtuous cycles of community prosperity and environmental health (Krasny and Tidball 2015).

Resilience has also been discussed in the context of urban environmental stewardship nonprofit organizations with regard to the way collaboration between

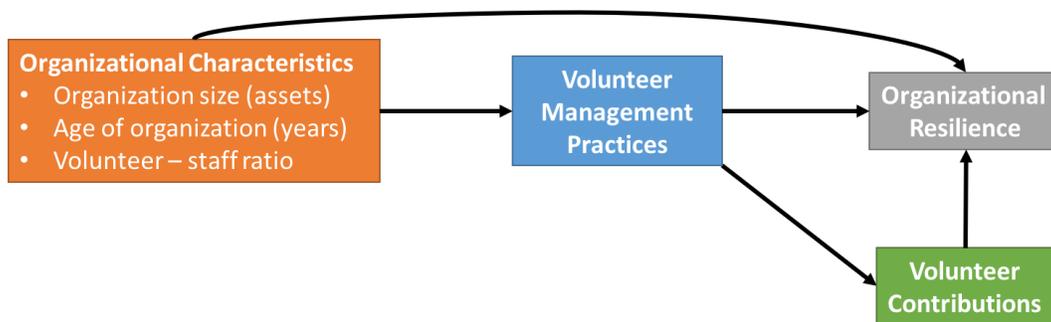
nonprofits can enhance socio-ecological resilience. Urban environmental stewardship is viewed as a governance activity that requires coordination between public, private and civil society actors (see Connolly et al. 2013 for a review). Social network analyses of urban environmental stewardship groups (e.g. Romolini and Grove 2010; Belaire et al. 2011; Connolly et al. 2013; 2014) have suggested that the institutional arrangement of these groups across multiple scales can build socio-ecological resilience by enabling social systems to respond to ecological change (Connolly et al. 2013).

Despite all of the ways that resilience has been discussed in the context of environmental nonprofit organization, we still do not know what makes these organizations themselves resilient as they engage volunteers in environmental activities.

The Current Study

The goal of this study is to measure the OR of UE nonprofits, specifically the degree to which OR is associated with UE nonprofits' 1) organizational characteristics, 2) volunteer contributions and 3) volunteer management practices (Figure 4.1).

Figure 4.1: Conceptual framework for the relationships between the dependent variable, organizational resilience, and the independent variables organizational characteristics, volunteer management practices and volunteer contributions



Research Questions and Hypotheses

1. **Research Question 1:** How are volunteer management practices and volunteer contributions associated with enhanced organizational resilience, relative to organizational characteristics?
 - a. **Hypothesis 1:** There will be a positive relationship between organizational resilience and organizational age, volunteer-staff ratio and organizational size (as measured by assets)
 - b. **Hypothesis 2:** There will be a positive relationship between volunteer management practices and organizational resilience
 - c. **Hypothesis 3:** There will be a positive relationship between volunteer contributions and organizational resilience
2. **Research Question 2:** Which volunteer management practices are most associated with organizational resilience?
3. **Research Question 3:** Which types of volunteer contributions are most associated with organizational resilience?

4. **Research Question 4:** How do volunteer management practices differ in organizations that score low, medium and high in organizational resilience?
5. **Research Question 5:** What kinds of contributions are volunteers making in organizations that score low, medium and high in organizational resilience?

Methods

This study entailed a national online survey of UE nonprofits in the United States . This section will describe the sample before discussing the survey instrument, constructs and measures and data analysis.

Sampling

The survey population is 501(c)3 independent nonprofit organizations classified by the IRS as “Environmental” that engage one or more volunteers and conduct work in urban or suburban areas. The sampling frame was drawn from the Internal Revenue Service’s Business Master File in October 2014 (Internal Revenue Service 2014). Organizations were included if they were an independent organization, had an NTEE code of “C: Environment” and had a zip code in an urban area or urbanized cluster as defined by the 2010 census (US Census 2014). More than eleven thousand (11,827) organizations met these criteria. The sample was constructed by submitting the sample frame to GuideStar, a nonprofit organization that digitizes Form 990s, the documents nonprofits must submit annually to the Internal Revenue Service, as well as collects additional information about nonprofits (e.g. email addresses for organizational contacts) (GuideStar Inc. 2016). A custom dataset was purchased from GuideStar that

included the email addresses, and the names and job titles associated with each email address, for the organizations in the sample frame. The survey was emailed to the sample of N= 2,676 unique contacts at 1,872 unique organizations. The survey was emailed to more than one contact at each organization because we wanted to achieve the greatest number of participating organizations.

Of the 2,676 sample members, 37 were substitutes who joined the sample when the person we contacted forwarded my emails for one of the following reasons: they emailed it to their replacement (if they were no longer employed at the organization), they emailed it to someone who was in a better position to fill out the survey due to the nature of their position or they had more time to fill it out, or to someone in the organization they thought would be interested in the survey. When a sampled contact forwarded their email to another colleague in their organization, the substitute was added to the sample (AAPOR 2016). People who received my forwarded email who worked for organizations that were not included in the sample frame (i.e. not classified by IRS as “Environmental”) were noted as ineligible and excluded from the final sample. The overall survey response rate among individual contacts was 41.2%, as calculated according to the American Association for Public Opinion Research response rate calculator (AAPOR 2016). (Table 4.3).

Table 4.3: The overall survey response rate, calculated according to AAPOR (2008). A more detailed overview of disposition codes is provided in Appendix 4.1

Complete, partially completed, surveys started	970
Non-interview, unknown eligibility, ineligible	324
Surveys sent	2676
Overall survey response rate	$(970/(2676 - 324)) * 100 = 41.2\%$

To determine the final sample for analysis, duplicate respondents from the same organization were removed because the unit of analysis for this study is the organization (therefore we only wanted 1 respondent per organization). To determine which duplicate respondent to include in the sample, the following decision criteria were applied: 1) prioritize executive director, assistant director, staff, chair/president of the board of directors, member of the board of directors, in that order, 2) prioritize surveys that were more fully completed than partially completed, 3) prioritize full time staff over part time staff over “neither part time or full time because serves on the board of directors,” 4) prioritize the respondent with the greatest number of years’ experience, 5) whoever completed the survey first. Then, organizations that reported that they engaged 1+ volunteers and that their work focused on urban or suburban areas were included in the final sample (N = 610 individuals representing 610 unique organizations).

Data Collection

An online survey was designed using Qualtrics, an online platform for surveys (Appendix 4.2). The survey instrument was pre-tested on Qualtrics in March 2015 with executive directors and environmental educators in Cornell University Cooperative

Extension offices across New York State (N=71). This sample was selected for the pretest because it represented leaders and staff from environmental nonprofit organizations. The pretest served to get feedback on the visual design of the online survey and the content and wording of survey questions. The survey instrument was updated based on feedback from the pretest. The final survey was administered on Qualtrics via the Tailored Design Method for Internet Surveys (Dillman et al. 2009), which entailed an initial email invitation, followed by four follow-up email reminders mailed in the four weeks after the initial invitation. The survey was administered between April and May 2015.

A random sample of non-respondents²⁰ to the survey were followed up via a phone survey conducted by the Cornell University Survey Research Institute. There were no significant differences in non-respondents and respondents in terms of age ($\chi^2 = 1.92$, $p = 0.22$), race ($\chi^2 = 9.84$, $p = 0.10$) or education ($\chi^2 = 3.12$, $p = 0.51$). However, the two samples differed in gender identity; the percentage of males among non-respondents (53.7%) was greater than the percentage of males among respondents (37.7%). We did not weight the data to reflect the gender identity bias because the proportion of males to females in the population of urban environmental nonprofit organizations is not known.

²⁰ The phone survey was conducted with 50 non-respondents. The same sampling criteria was applied to them so that non-respondents working at organizations that engaged 1+ volunteers were included (whether the organization worked in urban, suburban or rural areas was not included in the phone survey protocol). This resulted in a final sample of 41 non respondents.

Constructs and Measures

Variables used for reporting descriptive characteristics about the responding organizations include: 1) the type of environmental organization was measured by the NTEE code in the IRS Business Master File from October 2014, 2) environmental activities performed by the organization (categorical), 3) geographic focus of work (urban, suburban, rural), 4) geographic scale of work (international, domestic) and 5) activities performed by volunteers and 6) types of crises faced 2010 – 2015. Other variables measured the demographics of respondents. These include 1) job title, 2) employment status, 3) age, 4) gender identity, 5) race and 6) educational attainment.

Dependent variable

The dependent variable OR was measured with the Resilience Thumbprint Tool for Nonprofit Organizations (Resilient Organizations 2015) (Table 4.4).

Table 4.4: Items measuring organizational resilience from the Resilience Thumbprint Tool (Resilient Organizations 2015). All 13 items are measured on a 1-5 strongly disagree – strongly agree scale.
There would be good leadership from within the organization if we were struck by a crisis
People in my organization are committed to working on a problem until it is resolved
My organization proactively monitors the non-profit sector to have an early warning of emerging issues
My organization can make tough decisions quickly
My organization is known for its ability to use knowledge in novel ways
My organization builds relationships with others we might have to work with in a crisis
If key people were unavailable, there are always others who could fill their role
There are few barriers stopping us from working well with other organizations
My organization maintains sufficient resources to absorb unexpected change
My organization has clearly defined priorities for what is important during and after a crisis
My organization has a focus on being able to respond to the unexpected

The way my organization plans for the unexpected is appropriate

My organization believes emergency plans must be practiced and tested to be effective

Survey questions from the Resilience Thumbprint Tool for Nonprofit Organizations about financial data were excluded because we obtained the financial data for nonprofit organizations from the IRS. The order of the Likert items was randomized on the Qualtrics survey to average out any bias associated with the order of items (Dillman et al. 2009). The Resilience Thumbprint Tool for Nonprofit Organizations was adapted from the Benchmark Resilience Tool (BRT). The BRT was found to have high reliability in studies of the resilience of organizations throughout New Zealand (Whitman et al. 2013). However, the majority of organizations surveyed by Whitman et al. (2013) were for-profit organization. The Likert items from the Resilience Thumbprint for Nonprofit Organizations Tool were measured on a 7-point scale, but it was modified to a 5-point scale to be consistent with other Likert scales in this study.

The Cronbach's alpha for the Resilience Thumbprint Tool in the current study was 0.875, which was within the reliability range of previous studies that tested the tool (0.75 – 0.95) (Whitman et al. 2013). Scores from the 13 items were summed for an overall OR score. Based on the scale in the Resilience Thumbprint tool (adjusted for a 5-point scale) organizations ranking 0 – 38 = low resilience, 39 – 48 = medium resilience and 49 – 65 = high resilience.

Predictors

Organization size

Organization size was operationalized as the amount of financial assets reported in the IRS Business Master File as of October 2014. The operationalization of organization size as amount of financial assets follows the Internal Revenue Service's classification of organization size by amount of assets (Grantspace 2015). Amount of financial assets was reported as a categorical variable.

Age of organization

The organization's age was drawn from the "ruling date" in the IRS Business Master File from October 2014. The ruling date is when the organization received a determination letter or ruling granting its exempt status. The year in the "ruling date" was subtracted from 2016 to calculate the age of the organization in years.

Volunteer-staff ratio

Three survey questions asked respondents to identify the number of 1) full time staff, 2) part time staff and 3) volunteers. Respondents had the option to provide a range of full time, part time staff or volunteers (e.g. 10 – 15). This option was provided on the survey because of feedback from the survey pre-test in which many respondents told us they weren't sure of the exact number of staff or volunteers in their organization. For each variable, the minimum and maximum were averaged to obtain one value. Volunteer-staff ratio was calculated as the number of volunteers divided by the number of volunteers and staff. Organizations with a higher ratio have a higher number of volunteers relative to staff.

Volunteer management practices

Twenty-four survey items were obtained from previous studies of volunteer management practices (Table 4.5).

Table 4.5: Survey items measuring volunteer management practices. All survey items were measured on 1 – 5 Likert scaled items (1 = strongly disagree; 5 = strongly agree)	
Category of Volunteer Management Practices	Survey Item (Number for Citation)
Professional development of paid staff	Staff are formally trained in how to work with volunteers (1)
	Staff evaluate their knowledge, skills and abilities related to volunteer management (1)
	Staff participate in professional development activities related to managing volunteers (1)
Volunteer recruitment	We conduct targeted recruitment of volunteers based on the skills and abilities our organization needs (1)
	Volunteers are matched to specific volunteer positions based on their skills, experience and interests (2)
	We actively recruit volunteers from diverse backgrounds (e.g. minority ethnic groups, incomes, ages) (2)
Volunteer training and support	We provide volunteers with the resources they need to effectively carry out their tasks (2)
	Volunteers receive training specific to their roles and responsibilities (2)
	We mentor volunteers, particularly when they start a new role (2)
Volunteer performance management	We evaluate the performance of individual volunteers (2)
	We provide feedback to individual volunteers about their performance (2)
	We address performance problems among individual volunteers (e.g. volunteers who fail to complete essential tasks) (2)
Volunteer recognition	We recognize the outstanding work of individual volunteers (2)
	We thank volunteers for their efforts (e.g. informal thank you's) (2)
	We publicly recognize the efforts of volunteers (e.g. in newsletters, on a website) (2)
Volunteer program resource development	We identify fundraising needs to support our volunteer program (1)
	We build positive relationships with donors that are supportive of the volunteer program (1)
	We solicit funds from prospective supporters of our volunteer program (1)
Number for citation: (1) Safrit and Schmeising 2005 (2) Cuskelly et al. 2006	

Qualtrics randomized the order of items to average out any item bias associated with the order of items (Dillman et al. 2009). Previously developed scales for volunteer management were not borrowed in their entirety because they contained items not relevant to urban environmental management. For example, Cuskelly and colleagues (2006) created scales for volunteer management in youth sports. Safrit and Schmiesing (2005) developed scales for volunteer management, but item loadings for each factor were low (< 0.4). Thus, items were obtained from these two studies to develop improved volunteer management scales. The data meet the criterion for factor analysis because there was a Kaiser-Meyer-Olkin (KMO) measure < 0.5 (indicating a high level of intercorrelation between the variables) and a significant Bartlett's test of sphericity (indicating the level of correlation between variables) (Hair et al. 2009). A principal components analysis (PCA) was conducted to reduce the number of items for subsequent multivariate analyses (Hair et al. 2009). PCA yielded a five factor solution and five reliable scales; the five factors explained 66% of the total variance (Table 4.6). The first scale, "volunteer integration," included items relating to the organization's reliance on volunteers and the degree to which volunteers are involved in many activities and roles throughout the organization. The second scale, "volunteer support," refers to the degree to which volunteers are supported and acknowledged by staff. The third scale, "fundraising for volunteer programs" included items that related to soliciting donations to support volunteer programs. The fourth scale, "volunteer feedback," included items that relate to volunteers receiving an evaluation of their performance in

their roles. The final scale, “staff training,” included items about staff professional development about volunteer management.

Table 4.6: Factor loadings for volunteer management items retained in a PCA. Only item loadings greater than 0.5 are displayed. VI = Volunteer Integration scale; VS = Volunteer Support scale; FVP = Fundraising for volunteer programs scale; VF = Volunteer Feedback scale; ST = Staff Training scale. All items were measured on 1-5 Likert scales (1 = strongly disagree; 5 = strongly agree)

	VI	VS	FVP	VF	ST
Cronbach's Alpha	0.893	0.751	0.835	0.764	0.765
Mean	3.845	4.124	3.389	3.332	3.086
Number of Items	7	5	3	3	3
Percent Variance Explained	31.78%	13.23%	8.51%	6.75%	5.74%
My organization could not function in the long term without the service of volunteers	0.869				
My organization could not survive without the service of volunteers	0.859				
We strategically rely on volunteer leadership to achieve our organizational mission	0.783				
Many different roles within my organization are filled with volunteers	0.781				
We involve volunteers in many activities throughout the organization	0.684				
We integrate volunteers' knowledge into decision-making processes within my organization	0.667				
We make changes to our programs based on volunteers' guidance and advice	0.590				
We give volunteers direct access to paid staff who can make decisions if problems were to occur		0.836			
We take steps to ensure that volunteers feel comfortable interacting with paid staff		0.774			
We provide volunteers with the resources they need to effectively carry out their tasks		0.626			
Volunteers receive training specific to their roles and responsibilities		0.614			
We thank volunteers for their efforts (e.g. informal thank you's)		0.542			
We solicit funds from prospective supporters of our volunteer program			0.844		
We identify fundraising needs to support our volunteer program			0.841		
We build positive relationships with donors that are supportive of the volunteer program			0.796		
We provide feedback to individual volunteers about their performance				0.822	
We evaluate the performance of individual volunteers				0.746	
We address performance problems among individual volunteers (e.g. volunteers who fail to complete essential tasks)				0.686	
Staff are formally trained in how to work with volunteers					0.804
Staff evaluate their knowledge, skills and abilities related to volunteer management					0.737
Staff participate in professional development activities related to managing volunteers					0.763

KMO = 0.865, Bartlett's Test p = 0.00, Total % Variance Explained: 66.006%

Volunteer contributions

Thirty-three total survey items measured volunteer contributions. I developed twenty of these items based on the attributes of OR. Three items to measure volunteer contributions toward some of the attributes of OR were measured using items developed in previous studies. Ten items were borrowed from other studies that measured volunteers “unique” contributions to organizations (Table 4.7).

Table 4.7: Original survey items measuring volunteer contributions. Breaking silos, decision making, effective partnerships, innovation and creativity, internal resources, leadership, leveraging knowledge, situation awareness and staff engagement are attributes of the indicators of OR. All items were measured on a 1 – 5 Likert scale (1=strongly disagree; 5 = strongly agree)	
Category of Contributions (Number for Citation)	Survey Item
Breaking silos (1)	We take steps to ensure that volunteers feel comfortable interacting with paid staff
Breaking silos (1)	Contribute to a sense of camaraderie in my organization
Breaking silos(1)	Assist paid staff to carry out their tasks
Decision making (1)	We integrate volunteers’ knowledge into decision-making processes within my organization
Decision making (1)	Directly participate in important decision-making processes within my organization
Effective partnerships (1)	Help us build partnerships with other organizations
Effective partnerships (1)	Enhance our organizations reputation with other organizations
Effective partnerships (1)	Inspire other organizations to partner with us
Innovation and creativity (1)	Help staff “think outside the box” when problems arise
Innovation and creativity (1)	Apply their skills and knowledge in novel ways
Innovation and creativity (1)	Creatively carry out their tasks
Internal resources (2)	Provide cost-savings for my organization
Internal resources (2)	Enable us to provide services we otherwise could not provide
Internal resources (1)	My organization could not survive without the service of volunteers
Internal resources (1)	My organization could not function in the long term without the service of volunteers
Leadership (1)	We strategically rely on volunteer leadership to achieve our organizational mission
Leadership (1)	Lead other volunteers

Leveraging knowledge (1)	Many different roles within my organization are filled with volunteers
Leveraging knowledge (1)	We give volunteers direct access to paid staff who can make decisions if problems were to occur
Situation awareness (1)	We make changes to our programs based on volunteers' guidance and advice
Situation awareness (1)	Interact with staff enough to know what's going on in the organization
Staff engagement (1)	We involve volunteers in many activities throughout the organization
Staff engagement (3)	Feel responsible for the effectiveness of my organization
Unique (2)	Strengthen our community relationships
Unique (2)	Increase public awareness of my organization
Unique (2)	Recruit other volunteers
Unique (4)	Improve my organization's image
Unique (4)	Make my organization an enjoyable place to work
Unique (4)	Enhance my organization's sense of altruism
Unique (4)	Attract more financial resources to my organization
Unique (4)	Donate money to my organization
Unique (4)	Attract more volunteers to my organization
Unique (4)	Improve the marketing of our services
Number for Citation (1) Developed by first author to measure volunteer contributions toward attributes of OR (2) Brudney and Kellough 2000 (3) Boezeman and Ellemers 2008 (4) Haski-Leventhal and Handy 2011	

The order of items was randomized in Qualtrics to average out any bias associated with the order of items (Dillman et al. 2009). A PCA yielded a three factor solution which explained 63% of the total variance and three reliable scales (Table 4.8). The first scale was named “organization’s public profile” and it included items that relate to the ways in which volunteer contributions help the organization build a positive public image and build partnerships with other organizations. The second scale was named “crisis response” and it included all of the items measuring the ways volunteers contribute to the attributes of OR. The final scale, “organization’s atmosphere,” included items that relate to the ways in which volunteer enhance the internal culture of the organization, such as through creativity and making the organization an enjoyable place to work.

Table 4.8: Factor loadings for volunteer contributions items retained in a PCA. Only loadings greater than 0.5 are displayed. All items were measured on a 1 – 5 Likert scale (1 = strongly disagree; 5 = strongly agree)

	Public Profile	Crisis Response	Organization's Atmosphere
Cronbach's Alpha	0.938	0.937	0.872
Scale Mean	3.71	3.13	3.92
Number of items	11	10	7
Increase public awareness of my organization	0.834		
Enhance our organizations reputation with other organizations	0.833		
Help us build partnerships with other organizations	0.805		
Inspire other organizations to partner with us	0.795		
Strengthen our community relationships	0.776		
Attract more volunteers to my organization	0.774		
Recruit other volunteers	0.741		
Improve the marketing of our services	0.737		
Improve my organizations image	0.62		
Attract more financial resources to my organization	0.597		
Enable us to provide services we otherwise could not provide	0.559		
Volunteers enable my organization to shift rapidly from business-as-usual to respond to crises		0.839	
Volunteers make my organization ready to respond to early warning signals of crises		0.821	
Volunteers have clearly defined priorities for what is important during and after a crisis		0.808	
Volunteers enable us to collaborate with other organizations to manage crises		0.797	
Volunteers provide leadership during crises within my organization		0.794	
Volunteers have critical information that we could access during a crisis		0.778	
Volunteers understand my organizations priorities for what is important during and after a crisis		0.768	
My organization's priorities for crisis recovery would provide direction for volunteers in a crisis		0.724	
We ask for volunteers help when we face organizational crises		0.702	
Paid staff listen to volunteers when they inform staff about potential crisis events		0.567	
Make my organization an enjoyable place to work			0.708
Contribute to a sense of camaraderie in my organization			0.702
Apply their skills and knowledge in novel ways			0.694
Creatively carry out their tasks			0.672
Feel responsible for the effectiveness of my organization			0.609
Directly participate in important decision-making processes within my organization			0.568
Enhance my organizations sense of altruism			0.547

Total Variance Explained: 63.319%

Data Analysis

Descriptive Statistics

Descriptive statistics were calculated for the organizations included in the final sample, specifically variables measuring background information about the organizations (NTEE code, environmental activities, geographic focus of work, geographic scale of work, activities performed by volunteers, types of crises) and respondent demographics (age, gender identity, race, education). A preliminary Pearson correlation analysis was also conducted to examine the strength and direction of a linear relationships between the dependent variable OR and the predictor variables (organizational characteristics, volunteer management practices, volunteer contributions).

Research Questions 1, Hypotheses 1-3

Hierarchical multiple regression (also known as sequential multiple regression) was used to predict OR. In this form of regression, predictor variables are entered into the model in an order determined by the researcher (Rajaretnam 2016). The first block or group of variables included organizational characteristics (organization age, organization size (assets) and volunteer-staff ratio). The second block included all five volunteer management scales. The third block included the 3 volunteer contributions scales. Variables were entered in this sequence in order to determine the degree to which volunteer management and volunteer contributions add to the model's ability to predict OR relative to the other predictors. Semi-partial correlations (sr^2) for each

predictor were squared to identify the percentage of variance explained by each predictor (Meyers et al. 2012).

Research Questions 2-3

Organizational characteristics, volunteer management practices and volunteer contributions were entered into a stepwise regression model to predict OR. Stepwise multiple regression was used to identify which volunteer management practices and volunteer contributions most significantly add to the prediction of OR. Stepwise regression is used when there are multiple independent variables, but the researcher has no expectation about which variables may be most important to include in the model (Rajaretnam 2016). All of the predictor variables (see above section) were entered into the model. SPSS considered variables one at a time based on a probability of $F = 0.05$ for entry and 0.10 for removal, meaning that variables that did not increase model fit were excluded (Meyers et al. 2012)

Research Questions 4-5

One-way ANOVAs were calculated for each of the five volunteer management practices scales and each of the three volunteer contributions scales across organizations with low, medium and high OR scores. Bonferroni post-hoc tests were conducted to examine significant differences between groups (Rajaretnam 2016).

Results

Final Sample Descriptive Statistics: Respondent demographics and organizational characteristics

The majority of respondents were Executive Directors (57%), full-time staff (63.2%), female (62.3%), aged 55-64 (27.2%), held a 4-year degree (40.8%) and Caucasian (92.9%). The majority of respondents represented organizations classified by the IRS as natural resources conservation and protection organizations (Table 4.9).

Table 4.9: Classifications for organizations according to the Internal Revenue Service’s National Taxonomy of Exempt Entities (NTEE) codes (National Center for Charitable Statistics 2016)

Type of Organization	N	%
Natural resources conservation and protection	114	18.9%
Land resources conservation	75	12.4%
Environmental education and outdoor survival programs	72	11.9%
Water resource, wetlands conservation and management	63	10.4%
Alliance/Advocacy organizations ^a	43	7.1%
Environmental beautification and aesthetics	37	6.1%
Botanical gardens, arboreta and botanical organizations	32	5.3%
Pollution abatement and control services	23	3.8%
Environmental quality, protection and beautification N.E.C. (not elsewhere classified)	19	3.2%
Garden club, horticultural program	19	3.2%
Energy resources conservation and development	18	3.0%
Recycling programs	17	2.8%
Single organization support ^b	13	2.2%
Research institutes and/or public policy analysis	13	2.2%
Forest conservation	11	1.8%
Fundraising and or fund distribution ^c	10	1.7%
Botanical, horticultural and landscape services	9	1.5%
Professional societies, associations	9	1.5%
Management and technical assistance ^d	6	1.0%
^a Organizations whose activities focus on influencing public policy within the Environment major group area. Includes a variety of activities from public education and influencing public opinion to lobbying national and state legislatures. ^b Organizations existing as a support and fund-raising entity for a single institution within the Environment major group area. ^c Organizations that raise and distribute funds for multiple organizations within the Environment major group area. ^d Consultation, training, and other forms of management assistance services to nonprofit groups within the Environment major group area.		

The majority of organizations in the final sample (59.6%) are involved in environmental education, work domestically in the United States (93.7%) and perform work in suburban areas (80%). While working in urban or suburban areas (regional focus of work) was a criterion for being selected in the sample, 63.6% of organizations also indicated that they perform work in rural areas. The top three crises that

organizations faced were financial: 1) loss of a key funding source (50.1%), 2) changes in donors or grantors funding priorities (49.2%) and 3) an economic downturn (47.2%).

Additional descriptive statistics about organizational characteristics are found below

(Table 4.10). The median level of assets was \$409,831.00.

Table 4.10: Descriptive statistics about organizational characteristics for organizations in the final sample

	Mean	SD	Minimum	Maximum
Full time employees	10.9	33.2	0	550
Part time employees	7.1	31.8	0	450
Volunteers	1424.2	10159.0	1	200,000
Volunteer - staff ratio	0.86	0.2	0.03	1
Organization age (years)	22.5	15.4	2	82
Assets	\$7,056,288.13	\$35,948,825.53	\$0.00	\$605,182,934.00

Correlations

There were moderate positive correlations between 10 out of the 11 predictor variables and OR ($p < 0.01$). Organizational age was the only predictor that was negatively correlated to OR; this correlation was minimal ($p < 0.01$). The correlation matrix is provided in Table 4.11.

Table 4.11: Correlations between the dependent variable, organizational resilience score, and the predictor variables (N = 346)												
Variable (N=346)	1	2	3	4	5	6	7	8	9	10	11	12
1. Organizational resilience score	1.00											
2. Organization age	0.06	1.00										
3. Organization size	0.21**	0.55**	1.00									
4. Volunteer-staff ratio	-0.16**	-0.06	-0.16**	1.00								
5. Volunteer Integration	0.10**	0.05	-0.10*	0.42**	1.00							
6. Staff support and training provided to volunteers	0.40**	0.16**	0.26**	-0.03	0.28**	1.00						
7. Fundraising for volunteer programs	0.25**	-0.03	-0.03	0.38**	0.43**	0.23**	1.00					
8. Volunteer feedback	0.35**	0.03	0.04	-0.14**	0.26**	0.43**	0.24**	1.00				
9. Staff training in volunteer management	0.33**	0.16**	0.13**	0.21**	0.45**	0.48**	0.48**	0.40**	1.00			
10. Contributions to public profile	0.23**	0.10**	-0.02	0.41**	0.66**	0.26**	0.45**	0.26**	0.49**	1.00		
11. Contributions to crisis response	0.38**	-0.03	-0.11**	0.22**	0.55**	0.24**	0.31**	0.26**	0.38**	0.50**	1.00	
12. Contributions to organization's atmosphere	0.28**	0.04	-0.04	0.20**	0.74**	0.33**	0.35**	0.38**	0.47**	0.71**	0.63**	1.00

Correlation is significant at ** p < 0.01, * p < 0.05

Research Questions 1, Hypotheses 1-3

1. Research Question 1: How are volunteer management practices and volunteer contributions associated with enhanced organizational resilience, relative to organizational characteristics?

- a. Hypothesis 1:** There will be a positive relationship between organizational resilience and organizational age, volunteer-staff ratio and organizational size (as measured by assets)
- b. Hypothesis 2:** There will be a positive relationship between volunteer management practices and OR.
- c. Hypothesis 3:** There will be a positive relationship between volunteer contributions and OR.

Organizational characteristics (assets, age, volunteer-staff ratio) were entered into the model in the first block (Model 1). The model was significant ($p < 0.001$) and explained 6.5% of the variance in OR ($R^2 = 0.065$, $F(3, 342) = 7.941$). The addition of the 5 volunteer management scales to the prediction of OR (Model 2) led to a statistically significant increase in R^2 of 0.217 $F(5, 337) = 20.400$, $p < 0.001$. The addition of the 3 volunteer contributions scales to the prediction of OR (Model 3) led to a statistically significant increase in R^2 of 0.082 $F(3, 334) = 14.367$, $p < 0.001$. The full model of organizational characteristics, volunteer management and volunteer contributions to predict OR (Model 3) was statistically significant $R^2 = .364$, adjusted $R^2 = 0.343$, $p < 0.001$.

Beta coefficients (see Table 4.12) indicated that 9 out of the 11 independent variables were significant predictors of OR ($p < 0.001$) (organization size, volunteer support, fundraising for volunteer programs, volunteer feedback, staff training and volunteer contributions to public profile and volunteer contributions to crisis response). 2 of those 9 significant predictor variables were negatively related to OR. Organizations with a higher “volunteer-staff ratio” ($\beta = -6.74$) and higher “volunteer integration” ($\beta = -2.13$) had lower OR. Two predictor variables, “organization age” ($\beta = -0.08$) and “volunteer contributions to organization atmosphere” ($\beta = 0.62$) were not significant predictors. Based on sr^2 values, volunteer contributions to the organization’s “crisis response” accounted for about 5% of the variance. “Volunteer-staff ratio” and “volunteer support” each counted for about 3% of the variance and (Table 4.12).

Table 4.12: Hierarchical multiple regression predicting OR with organization characteristics, volunteer management practices and volunteer contributions

Variable (Category)	Model 1		Model 2		Model 3		
	B	β	B	β	B	β	sr ²
(Constant)	49.12**		28.21**		23.85**		0.0%
Organization age (1)	-0.04	-0.07	-0.04	-0.09	-0.04	-0.08	0.5%
Organization size (1)	1.10**	0.23	0.71**	0.15	0.81**	0.17	1.8%
Volunteer-staff ratio (1)	-4.00**	-0.13	-6.44**	-0.21	-6.74**	-0.22	2.9%
Volunteer integration (2)	--	--	-0.26	-0.03	-2.13**	-0.26	2.3%
Volunteer support (2)	--	--	2.48**	0.22	2.38**	0.21	2.8%
Fundraising for volunteer programs (2)	--	--	1.41**	0.19	1.24**	0.17	1.8%
Volunteer feedback (2)	--	--	1.12**	0.14	0.80**	0.10	0.6%
Staff training(2)	--	--	1.43**	0.13	0.71**	0.07	0.2%
Volunteer contributions to public profile (3)	--	--	--	--	1.55**	0.13	0.7%
Volunteer contributions to crisis response (3)	--	--	--	--	2.68**	0.29	4.8%
Volunteer contributions to organization atmosphere (3)	--	--	--	--	0.62	0.06	0.1%
R ²	0.065		0.282		0.364		
Adj. R ²	0.057		0.265		0.343		
ΔR^2	0.065		0.217		0.082		

N = 346, ** p < 0.001

Categories of Variables: (1) = Organizational characteristics, (2) = Volunteer management practices, (3) = Volunteer Contributions

Research Questions 2 – 3

Recall my research question 2: Which volunteer management practices contribute most to OR? and research question 3: Which types of volunteer contributions contribute most to OR? Eight of the eleven predictors were retained in the model, which was achieved in eight steps (Table 4.13). The final model was statistically significant $F(8, 337) = 23.36, p < 0.00$. The model accounted for about 33% of variance ($R^2 = 0.357, \text{Adjusted } R^2 = 0.341$). The volunteer management practice that contributed most to explaining the variation in OR was the volunteer management practice “volunteer support.” This variable accounted for 6.3% of the variance in OR. All other volunteer management practices were significant predictors of OR, except for “staff training” which was excluded from the model because it did not increase the fit of the model. “Volunteer feedback,” “volunteer integration” and “fundraising for volunteer programs” accounted for 3.6%, 1.2% and 1.5% of the variance in OR, respectively. The type of volunteer contributions that contributed most to explaining the variation in OR was “crisis response,” which accounted for 3.1% of the variance. The only other type of volunteer contributions that predicted OR were contributions to the organization’s “public profile,” which accounted for less than 1% of the variance. Volunteer contributions toward the “organization’s atmosphere” was excluded from the model because it did not improve the fit of the model.

Table 4.13: Stepwise regression predicting OR with organization characteristics, volunteer management practices and volunteer contributions			
Predictor (Category)	B	β	sr²
Constant	24.95**	0.23	3.6%
Volunteer support (2)	2.58**	0.31	6.3%
Volunteer contributions to crisis response (3)	2.89**	-0.22	3.1%
Volunteer-staff ratio (1)	-6.86**	0.19	2.5%
Fundraising for volunteer programs (2)	1.39**	0.13	1.5%
Organization size (1)	0.62**	-0.24	2.6%
Volunteer integration (2)	-1.96**	0.16	1.2%
Volunteer contributions to public profile (3)	1.81**	0.11	0.9%
Volunteer feedback (2)	0.94*	0.23	3.6%
N = 346, ** p < 0.001, *p < 0.05 (1) = Organizational characteristics (2) = Volunteer management practices (3) = Volunteer Contributions			

Research Questions 4 – 5

- 1. Research Question 4:** How do volunteer management practices differ in organizations that score low, medium and high in OR?
- 2. Research Question 5:** What kinds of contributions are volunteers making in organizations that score low, medium and high in OR?

The majority of organizations had medium OR (46.8%). Slightly fewer organizations (43.7%) had high OR and 9.5% had low OR. In general, organizations with high resilience had statistically higher agreement than organizations of medium and low resilience that they employed the five volunteer management practices. Similarly, organizations with high resilience had statistically higher agreement than organizations of medium and low resilience that volunteers make contributions to their public profile, crisis response and organizational atmosphere (Table 4.14).

Table 4.14: One-way ANOVAs between volunteer management practices and resilience scores, and volunteer contributions and resilience scores

	Low resilience (Mean)	Medium resilience (Mean)	High resilience (Mean)	Total Mean	N	F
Volunteer management practices						
Volunteer integration	3.85	3.77	3.86	3.82	442	0.52
Volunteer support**	3.46 ^c	4.09 ^b	4.32 ^a	4.13	440	33.55
Fundraising for volunteer programs**	3.18 ^b	3.23	3.65 ^a	3.42	437	10.99
Volunteer feedback**	2.95 ^c	3.23 ^b	3.63 ^a	3.38	442	18.29
Staff training in volunteer management**	4.08 ^c	4.20 ^b	4.49 ^a	4.31	445	14.80
Volunteer contributions						
Organization's public profile**	3.73	3.56 ^b	3.84 ^a	3.70	424	12.14
Crisis response**	2.72 ^c	3.03 ^b	3.36 ^a	3.15	397	15.46
Organizational atmosphere**	3.75 ^c	3.83 ^b	4.04 ^a	3.92	426	6.98
ANOVA: **p<.05. ***p<.01 Bonferroni post hoc test: Letters represent significant mean differences (p<.05 between clusters where a>b>c)						

Discussion

This study surveyed urban environmental organizations, the majority of whom were engaged in natural resources conservation and protection, environmental education and work in urban and suburban areas in the US. We examined the OR of these organizations in light of major financial crises they reported facing in between 2010 - 2015 (e.g. loss of a key funding source, change in donors or grantors funding priorities and an economic downturn). A hierarchical multiple regression and a stepwise regression found that volunteer management practices and volunteer contributions enhance OR when controlling for organizational characteristics. Results demonstrate the statistical validity of regression models predicting OR from organizational characteristics, volunteer management practices and volunteer contributions. However,

both the hierarchical model and the stepwise model only accounted for about 33% of the variance in OR, meaning there may be other important predictors of OR that were not examined in this study.

This study also developed reliable scales to measure volunteer management practices and volunteer contributions, as well as validated the previously developed “Resilience Thumbprint Tool for Nonprofit Organizations” in the new context of a national survey of urban environmental organizations in the United States. With regard to the scales measuring volunteer management practices, “volunteer support” accounted for the most variance (6.3%) in the stepwise model. It contributed to 2.8% of the variance in the hierarchical model, which was the third highest contributing variable to the prediction of OR. “Volunteer support” may be important for OR given that volunteers who feel supported by the organization and by staff may be more committed to ensuring that the organization succeeds (Snyder and Omoto 2008). The “volunteer support” scale included items that relate to volunteer’s having access to paid staff to whom they could report problems. These volunteer management practices may be important for OR because supported volunteers may serve as additional “eyes on the ground” who can notice issues and feel comfortable reporting them to people in the organization who can address the issue. This finding is in line with previous research that suggests that volunteer management practices with organizational settings in which volunteers feel appreciated and supported may better retain volunteers (Boezeman and Ellmers 2007).

Volunteer contributions toward the organization's "crisis response" accounted for the most variance among other volunteer contributions in the hierarchical model (4.8%) and in the stepwise model (3.1%). It is not surprising that this category of volunteer contributions would be the best predictor for OR, given these items had strong face validity with items that directly referred to crises in their wording. The finding that volunteers help organizations respond to crises further demonstrates the value of volunteers to UE nonprofits beyond their donations of time and labor. Previous research on volunteer management has not examined this type of volunteer contributions (see for example Studer and Schnurbein 2012). Nonetheless, it is important to note there that volunteer contributions only accounted for less than 5% of the variance in the hierarchical model and less than 4% in the stepwise model.

Surprisingly, the organizational characteristics that were hypothesized to contribute to OR were not significant predictors of this variable, especially in light of previous research that has suggested OR was associated with characteristics such as number of employees and cash flow and resources (see Stephenson 2010 for a review). One organizational characteristic, "volunteer-staff ratio," was negatively related to OR, suggesting organizations with more volunteers are less resilient. "Volunteer integration" was also negatively related to OR. This result may be explained by the fact that volunteers may be free to leave the organization in times of crisis, whereas paid staff cannot. Organizations that are highly reliant on volunteers and in which volunteers are strongly integrated may struggle with keeping volunteer "labor" on board during times of crisis, which may weaken OR.

Comparisons of volunteer management practices and volunteer contributions across groups with low, medium and high OR suggest that there is a positive linear relationship between these variables; the higher an organization's resilience score, the more strongly they agreed that they employed volunteer management practices and that volunteers made contributions to their organizations. Total means for the volunteer management scales suggested that organization's do best at training staff in volunteer management, but when paired with the regression results, organizations may need to strengthen providing support to volunteers if their volunteer management practices are to pay off in enhanced OR. Volunteer contributions followed a similar trend across organizations scoring low, medium and high in that organizations scoring higher in OR more strongly agreed that volunteers are making contributions in the three categories examined in this survey.

Limitations and Future Research

This study used a scale to measure OR that had been initially developed in the context of for-profit organizations. While the OR scale was reliable in this study, content validity could be improved in future research, as there may be dimensions of OR that are unique to nonprofit organizations that were not captured by the Resilience Thumbprint Tool for Nonprofit Organizations (Resilient Organizations 2015). Future research should utilize qualitative methodologies to better understand what OR means to UE nonprofit organizations, as well as nonprofit practitioners' interpretations of the concept of OR, in order to develop additional items that may increase the reliability of the scale. Qualitative research may also provide insights into additional predictors of OR

in the nonprofit context. There was unexplained variance in OR in our regression models, so there may be other dimensions of organizational resilience or predictors of OR that were not covered in this study.

One limitation to this study that may have weakened internal validity was that we had no measure of how knowledgeable respondents were about volunteers in their organization or about their volunteer management practices. Thus, sampling bias may have been a threat to the external validity of the study. For example, Executive Directors may not interact as much with volunteers as staff who coordinate volunteer programs. However, there may be some organizations in which Executive Directors or staff with some other job title play a major role in managing volunteers. Including an additional sampling criterion that measures the degree to which staff members are familiar with their organization's volunteer management practices or the degree to which they interact with volunteers can avoid sampling bias. Another limitation applies to our measurement of OR. Some respondents may not have been able to speak to the organization's ability to respond to a crisis. Future research may need to include multiple types of staff members from each organization who can best speak to volunteer management and who has perspective on the functioning of the organization as a whole. While purchasing the custom dataset from GuideStar was a convenient way to access contact information and emails for contacts at nonprofit organizations, future researchers may also want to search organizations' websites to verify which staff members at those organizations may engage directly with volunteers.

Conclusion

This study bridges volunteer management and OR theory to test the hypothesis that both volunteers and organizational volunteer management practices are associated with UE nonprofit resilience. By utilizing OR theory in a national study of UE nonprofits, this study builds new knowledge regarding how nonprofits can enhance OR through effective volunteer management. This was the first study to empirically measure the OR and volunteer management practices of urban environmental nonprofit organizations, as well as the types of contributions that volunteers offer to these organizations. The volunteer management practice of providing support to volunteers and volunteer contributions toward an organization's response to crises were significant predictors for OR. These variables accounted for more variance in OR than organizational characteristics, such as organizational age, the ratio of volunteers to staff and amount of assets. Results suggest that OR may have additional dimensions and or predictors that are unique to the nonprofit context. This study demonstrates the importance of volunteers and volunteer management practices in improving the ability of urban environmental nonprofit organizations to carry out their missions in light of economic crises.

Appendix 4.1: Survey Disposition Codes

Table 4.15: Full list of survey disposition codes, following AAPOR's (2016) standard definitions for disposition codes		
1.1	Completed survey	822
1.2	Partially completed survey	31
1.3	Started survey	80
1.4	Substitute	37
2	Nonresponse	1271
2.1	Explicit refusal (in an email)	83
2.11	Refusal; claimed they're not an environmental organization	9
2.12	Session Expired	16
2.2	Auto Response	3
3.3	Invitation returned undelivered	215
3.9	Returned from a non-sampled organization	3
4.1	Not an environmental organization (based on IRS classification)	6
4.2	Doesn't use volunteers	59
4.3	No longer employed at the organization	32
4.4	Nonprofit no longer in operation	4
4.5	Duplicate person with different email addresses	5
	TOTAL	2676

Appendix 4.2: Survey Instrument

Q1 Welcome to the "Volunteers in Environmental Non-Profit Organizations" survey. The purpose of this survey is to understand volunteer management in environmental nonprofit organizations, as well as the ways volunteers contribute to these organizations, especially during difficult times such as economic downturns or natural disasters.

We understand that a number of different types of volunteers are involved in the work of nonprofit organizations, and that these volunteers may be engaged in various activities, such as serving on a Board of Directors, helping to fundraise, and stewarding the environment. For the purpose of this survey, please consider all types of volunteers except Board of Directors as you answer each question.

Tips for Taking this Survey:

- Please answer all survey questions to the best of your ability.
- Many questions provide an "I Don't Know" option in case you feel that you can't accurately answer a question.
- Click the "Go Back" button in the bottom right hand corner to review or change your responses to previous questions.
- If you don't have time to finish the survey once you start, you can revisit the survey at any time to finish your responses.
- After exiting the survey, revisit and follow the link at the bottom of the email I sent to you to return to your survey.

Your participation in the survey is entirely voluntary and all of your responses will be kept confidential. No personally identifiable information will be associated with your responses.

At the end of the survey, you will have the opportunity to share your contact information with us if you are interested in receiving a final report of the results of this study.

If you have any questions about the study, or if you need further instructions, please contact Christine Moskell at csm94@cornell.edu.

Thank you for your participation!

Q1 What is your position with \${e://Field/EmbeddedDataB}?

- Executive Director, President or CEO (1)
- Assistant Director, Vice-President or Co-CEO (2)
- Chair or President of the Board of Directors (3)
- Member of the Board of Directors (4)
- Staff Member (Please indicate your job title below) (5) _____
- Other Position (Please explain below) (6) _____

Q2 How long have you worked in your current position at \${e://Field/EmbeddedDataB}? Enter number of years below.

Q3 Are you employed at \${e://Field/EmbeddedDataB} part-time or full time?

- Part-time (1)
- Full-time (2)
- Neither; I serve on the Board of Directors (3)

Q4 Your organization may employ different types and numbers of paid full-time employees throughout the year. On average, approximately how many paid employees work full-time during the year? Please answer this question to the best of your ability.

- Number of full-time employees (Enter 0 if there are no paid full-time employees) (1)

- If unsure, enter a range of the number of full-time employees (e.g. 40 - 50) (2)

- I don't know (3)

Q5 Your organization may employ different types and numbers of paid part-time employees throughout the year. On average, approximately how many paid employees work part-time during the year? Please answer this question to the best of your ability.

- Number of part-time employees (Enter 0 if there are no paid part-time employees) (1)

- If unsure, enter a range of the number of part-time employees (e.g. 25 - 35) (2)

- I don't know (3)

Q6 What environmental topics does your organization work to address? Consider topics that your organization spends at least 20% or more time working on.

Please check all that apply.

- Agriculture or food systems (1)
- Parks, recreation and leisure facilities (2)
- Land use planning (3)
- Environmental and urban beautification (e.g. cleanup campaigns, rail trails, urban tree planting) (4)
- Botanical and aquatic gardens (5)
- Plant conservation (e.g. native plant species reintroduction) (6)
- Energy resource conservation and development (e.g. energy efficiency, renewable energy sources) (7)
- Forest conservation (e.g. reforestation, forest management) (8)
- Land conservation (e.g. open land preservation, land trusts) (9)
- Water resources, watersheds and wetlands conservation (e.g. shoreline protection, wastewater management) (10)
- Air pollution (11)
- Climate change (12)
- Control of environmental hazards (e.g. soil contaminant testing, oil spill cleanup) (13)
- Recycling (including composting) (14)
- Waste management (15)
- Wildlife preservation and protection (16)
- Environmental policy (17)
- Environmental education (18)
- Environmental law (19)
- Other topic (Please describe): (20) _____
- Other topic (Please describe): (21) _____
- Other topic (Please describe): (22) _____

Q7 Does your organization conduct work in the United States or internationally?

Please check all that apply.

- My organization conducts work in the United States (1)
- My organization conducts work internationally (2)

Q8 In which type of setting(s) does your organization work? Consider not just where your organization's physical address is located, but where your organization carries out its program(s). Please check all that apply.

- Rural areas (1)
- Suburban areas (2)
- Urban areas (3)

The next section of the survey asks about the involvement of volunteers (not including the Board of Directors) in your organization.

Q9 To the best of your knowledge, approximately how many volunteers (not including the Board of Directors) participate in your organization per year?

- Number of volunteers (Enter number below): (1) _____
- If unsure, enter a range of the number of volunteers below (e.g. 100 - 150) (2)

- I don't know (3)

Q10 What types of activities do volunteers (not including the Board of Directors) perform in your organization? Please check all that apply.

- Conduct environmental stewardship (e.g. caring for water bodies, forests, gardens, parks and natural areas) (1)
- Habitat restoration and/or monitoring (e.g. aquatic invasive species removals, native plant reintroductions) (2)
- Deliver educational programming (3)
- Engage in peer communication and/or outreach with other volunteers (4)
- Perform general office services (e.g. answering phones, mailing newsletters, database management) (5)
- Conduct research (including Citizen Science) (6)
- Complete training programs (7)
- Conduct community outreach (e.g. tabling at community events, distributing brochures) (8)
- Fundraising (9)
- Other activity (Please explain): (10) _____
- Other activity (Please explain): (11) _____
- Other activity (Please explain): (12) _____

The questions on the next 3 pages ask about your organization's management of volunteers, not including the Board of Directors.

Q11 The items below relate to staff training in volunteer management and how your organization recruits and trains volunteers. How much do you agree or disagree with the following statements? Please select one bubble for each item.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
Staff are formally trained in how to work with volunteers (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff evaluate their knowledge, skills and abilities related to volunteer management (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff participate in professional development activities related to managing volunteers (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We conduct targeted recruitment of volunteers based on the skills and abilities our organization needs (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers are matched to specific volunteer positions based on their skills, experience and interests (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We actively recruit volunteers from diverse backgrounds (e.g. minority ethnic groups, incomes, ages) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We provide volunteers with the resources they need to effectively carry out their tasks (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers receive training specific to their roles and responsibilities (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We mentor volunteers, particularly when they start a new role (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 The items below ask about the evaluation and recognition of volunteers and the development of resources for volunteer programs. How much do you agree or disagree with the following statements? Please select one bubble for each item.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
We evaluate the performance of individual volunteers (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We provide feedback to individual volunteers about their performance (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We address performance problems among individual volunteers (e.g. volunteers who fail to complete essential tasks) (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We recognize the outstanding work of individual volunteers (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We thank volunteers for their efforts (e.g. informal thank you's) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We publicly recognize the efforts of volunteers (e.g. in newsletters, on a website) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We identify fundraising needs to support our volunteer program (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We build positive relationships with donors that are supportive of the volunteer program (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We solicit funds from prospective supporters of our volunteer program (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13 This is the last question about your organization's volunteer management practices. The items below relate to how staff in your organization interact with volunteers, not including the Board of Directors. We recognize not all staff may not have the same interactions with volunteers, but please answer these questions based on your general knowledge about staff interactions with volunteers (not including the Board of Directors). How much do you agree or disagree with the following statements? Please select one bubble for each item.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
My organization could not survive without the service of volunteers (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We strategically rely on volunteer leadership to achieve our organizational mission (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We integrate volunteers' knowledge into decision-making processes within my organization (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We involve volunteers in many activities throughout the organization (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We make changes to our programs based on volunteers' guidance and advice (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We take steps to ensure that volunteers feel comfortable interacting with paid staff (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Many different roles within my organization are filled with volunteers (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization could not function in the long term without the service of volunteers (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We give volunteers direct access to paid staff who can make decisions if problems were to occur (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The questions on the next 2 pages relate to the different ways volunteers (not including the Board of Directors) may contribute to the functioning of your organization and to your organization's relationship with external communities.

Q14 Please tell us about the ways volunteers (not including the Board of Directors) may contribute to the functioning of your organization: "Volunteers...

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
Lead other volunteers (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directly participate in important decision-making processes within my organization (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help staff "think outside the box" when problems arise (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply their skills and knowledge in novel ways (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creatively carry out their tasks (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel responsible for the effectiveness of my organization (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interact with staff enough to know what's going on in the organization (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contribute to a sense of camaraderie in my organization (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assist paid staff to carry out their tasks (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make my organization an enjoyable place to work (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance my organization's sense of altruism (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve my organization's image (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Attract more financial resources to my organization (13)	<input type="radio"/>					
Donate money to my organization (14)	<input type="radio"/>					
Provide cost-savings for my organization (15)	<input type="radio"/>					
Enable us to provide services we otherwise could not provide (16)	<input type="radio"/>					

Q15 Please tell us about the ways volunteers (not including the Board of Directors) may contribute to your organization's relationship with the community or communities where it works. "Volunteers...

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
Help us build partnerships with other organizations (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance our organizations reputation with other organizations (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inspire other organizations to partner with us (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strengthen our community relationships (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase public awareness of my organization (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recruit other volunteers (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attract more volunteers to my organization (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve the marketing of our services (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next section of the survey relates to your organization's experience handling crises. We define a crisis to be anything that causes significant impact or stress on the organization's operation and its ability to carry out its mission. A crisis

may occur in the short-term or in the long-term, and may be an event that happens within or outside of your organization.

Q16 In the table below, please check the crises that threatened your organization's operation and ability to carry out its mission in the past 5 years (2010 - 2015).

- Natural disaster (e.g. hurricanes, tornadoes, earthquakes, wildfires, drought, flooding) (1)
- Climate change (2)
- Terrorism (3)
- Loss of a key organizational partner (4)
- Loss of a key funding source (e.g. a donor, a grant) (5)
- Changes in donors' or grantors' funding priorities (6)
- Significant reductions in staff (7)
- High turnover of volunteers (8)
- Information security breach (e.g. a hacked database) (9)
- Economic downturn (10)
- Keeping up with technology (11)
- Other crisis (Please explain): (12) _____
- Other crisis (Please explain): (13) _____
- Other crisis (Please explain): (14) _____
- My organization did not face a crisis in the past 5 years (15)

If My organization did not fac... Is Selected, Then Skip To Volunteer contributions in crises

Q17 The items below are the crises you indicated your organization faced in the past 5 years. Were volunteers (not including the Board of Directors) involved in helping your organization maintain its operation and ability to carry out its mission during or following the crisis or crises?

Q18 Listed below is the crisis or crises in which you indicated that volunteers helped your organization. How effective were volunteers (not including the Board of Directors) in helping your organization maintain its operation and ability to carry out its mission during or following that crisis or crises?

Q19 We want to know more about how volunteers (not including the Board of Directors) help your organization to maintain its operation and ability to carry out its mission during crises. We define a crisis as anything that causes significant impact or stress on the organization's operation and and its ability to carry out its mission. Thinking about the crises your organization has faced in the past, how

much do you agree or disagree with the following statements? Please select one bubble for each item.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
Volunteers understand my organization's priorities for what is important during and after a crisis (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization's priorities for crisis recovery would provide direction for volunteers in a crisis (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers have clearly defined priorities for what is important during and after a crisis (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers enable my organization to shift rapidly from business-as-usual to respond to crises (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers make my organization ready to respond to early warning signals of crises (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers enable us to collaborate with other organizations to manage crises (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers provide leadership during crises within my organization (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paid staff listen to volunteers when they inform staff about potential crisis events (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteers have critical information that we could access during a crisis (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We ask for volunteers help when we face organizational crises (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q20 This is the last question about crises. Think generally about crises, or anything that causes significant impact or stress to your organization’s operation and ability to carry out its mission. How much do you agree or disagree with each of the following statements? Please select one bubble for each item.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
There would be good leadership from within the organization if we were struck by a crisis (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in my organization are committed to working on a problem until it is resolved (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization proactively monitors the non-profit sector to have early warning of emerging issues (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization can make tough decisions quickly (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization known for its ability to use knowledge in novel ways (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization builds relationships with others we might have to work with in a crisis (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If key people were unavailable, there are always others who could fill their role (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are few barriers stopping us from working well with other organizations (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization maintains sufficient resources to absorb unexpected change (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization has clearly defined priorities for what is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

important during and after a crisis (10)						
My organization has a focus on being able to respond to the unexpected (11)	<input type="radio"/>					
The way my organization plans for the unexpected is appropriate (12)	<input type="radio"/>					
My organization believes emergency plans must be practiced and tested to be effective (13)	<input type="radio"/>					

The questions on the new few pages ask for additional information about your background. This is the last section of the survey.

Q21 What is your gender identity? Please select one.

- Male (1)
- Female (2)
- Transgender (3)
- Other (4)
- I prefer not to say (5)

Q22 What is your age? Please select one.

- 18 - 24 (1)
- 25 - 34 (2)
- 35 - 44 (3)
- 45 - 54 (4)
- 55 - 64 (5)
- 65 or older (6)
- I prefer not to say (7)

Q23 What is your highest level of education? Please select one.

- High school or GED (1)
- Some college or technical school (2)
- 4-year degree (e.g. B.A., B.S.) (3)
- Master's degree (e.g. M.A., M.S.) (4)
- Doctorate or professional degree (e.g. Ph.D., M.D., J.D.) (5)
- I prefer not to say (6)

Q24 What is your race or origin? Please select one

- Black, African-American (1)
- Hispanic, Latin or Spanish origin (2)
- American-Indian or Alaska Native (3)
- Asian (4)
- White, Caucasian (5)
- Some other race or origin (Please explain): (6) _____
- I prefer not to say (7)

Q25 We would be happy to share the results of this study with you. Would you be interested in receiving a copy of the results?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Survey

Q30 Thank you for your interest. Please provide your email address below.

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CONCLUSION

The three studies presented in four chapters in this dissertation explored community engagement in urban environmental management using quantitative and qualitative methodologies (Table 5.1).

Table 5.1: Titles of dissertation chapters

Chapter	Study Title	Methodology
1	Engaging Residents in Street Tree Stewardship: Results of a Tree Watering Outreach Intervention	Quantitative (quasi-experimental design, mail survey)
2	The Ecological Model of Street Tree Watering: A Conceptual Framework for Research and Community Engagement in Urban Forest Stewardship	Quantitative (mail survey)
3	Community Expression, Celebration and Conversation: Insights on Community Engagement in Urban Greening from the Green Scheme in Washington, DC	Qualitative (narrative inquiry)
4	The Contributions of Volunteers and Volunteer Management Practices to the Organizational Resilience of Urban Environmental Nonprofit Organizations	Quantitative (web survey)

Chapters 1 and 2 were based on a study of residents' street tree watering behavior in Ithaca, NY. Chapter 3 involved a narrative inquiry of an urban environmental nonprofit organization working in low-income neighborhoods in Washington, DC. Chapter 4 entailed a national survey of urban environmental nonprofit organizations' volunteer management practices, volunteer contributions and organizational resilience. This dissertation explored various aspects of community engagement, including the design, practice and evaluation of community interventions, principles of community interventions, volunteer management practices and organizational resilience. In this

conclusion, I outline the overall findings of the dissertation, highlight main contributions, examine cross-cutting findings between chapters, and discuss an agenda for future research.

Overall Findings

Overall, the findings of this dissertation highlight various dimensions of engaging residents in activities related to urban environmental stewardship. This dissertation examined the phenomenon of community engagement in the context of 1) an educational intervention to promote street tree watering Ithaca, NY, 2) the practices of a nonprofit organization in Washington, DC to involve residents in tree planting and tree gardening and 3) the volunteer contributions and volunteer management practices of a national sample of urban environmental nonprofit organizations. Chapter 1 found that the educational intervention of mailed postcard reminders may prompt residents to remember to water newly planted street trees. Chapter 2 shows that many intrapersonal, interpersonal, social, organizational, community, built-environment and public policy factors and processes occurring in the places where street trees are planted may need to be addressed by interventions to most effectively encourage residents to water street trees. Chapter 3 reveals the nuances of the practice of community engagement in urban greening that are often overlooked, such as the importance of providing opportunities for community expression and reflection, celebrating the transfer of old knowledge in new ways, and conversing with residents for a relational purpose, rather than for stakeholder assessment. Chapter 4 found that volunteer management practices and volunteer contributions can enhance the resilience

of urban environmental nonprofit organizations to overcome crises, such as economic downturns, in pursuit of their environmental missions.

Main Contributions

This dissertation makes six major contributions to the literature on community engagement in urban environmental stewardship

Contribution 1: Application of the ecological model of behavior to urban environmental stewardship

Chapter 2 builds upon Moskell and Allred's (2013) ecological model of urban forest stewardship, which was the first study in natural resource management to apply the ecological model of behavior. This chapter meets the call made by Stokols et al. (2013) to integrate principles from the social ecology model of health promotion (part of the foundation for the ecological model of behavior) to natural resource management. While research on the determinants of pro-environmental behavior have acknowledged the role of contextual-environmental factors in shaping pro-environmental behavior (see Steg and Vlek 2009 for a review), previous studies have not applied the ecological model of behavior to understand the social and environmental determinants of urban environmental stewardship.

Contribution 2: Exploration of Social and Environmental Determinants of Street Tree Watering

Chapters 1 and 2 were the first studies in urban forestry to examine the determinants of street tree watering. While previous research has examined the outcomes of street tree watering (and urban forest stewardship more broadly) for tree

survival and growth, research has not explicitly examined the social and environmental factors that may affect residents' street tree watering behavior. The ecological model of street tree stewardship presented in Chapter 2 sets forth an agenda for future research in this area. That chapter also contributes reliable scales to measure constructs in the ecological model of street tree watering.

Contribution 3: Narrative Inquiry of Community Engagement in Urban Greening

Chapter 3 of this dissertation was among the first studies (e.g. Russ et al. 2015) in the urban environmental stewardship literature that employed narrative inquiry as a methodology. Furthermore, Chapter 3 was also the first study in the literature on urban environmental stewardship to explicitly examine strategies for community engagement in tree planting and urban greening.

Contribution 4: Quantified the organizational resilience of urban environmental nonprofit organizations

Chapter 4 was the first study to collect empirical data on the organizational resilience of environmental nonprofit organizations. Previous studies in natural resource management had alluded to the concept of organizational resilience, but did not draw on theoretical frameworks of organizational resilience from the business management or on validated scales to measure organizational resilience. Chapter 4 was the first study in natural resource management to measure organizational resilience of environmental nonprofit organizations.

Contribution 5: Identified the Relationship between Volunteer Contributions, Volunteer Management Practices and Organizational Resilience

Chapter 4 builds upon the organizational resilience literature by demonstrating that volunteer contributions and volunteer management practices may be important predictors of resilience for urban environmental nonprofit organizations. This study developed reliable measures of different types of volunteer contributions and volunteer management practices for urban environmental nonprofit organizations.

Contribution 6: Examined the volunteer management practices of urban environmental nonprofit organizations

Chapter 4 builds upon previous literature in urban environmental stewardship on volunteer motivations by examining volunteerism at the organizational level. The examination of the volunteer management practices of urban environmental organizations enhances our understanding of the organizational context in which volunteerism occurs, which may also affect volunteer recruitment and retention.

Cross-Cutting Findings

Chapters 1 and 2

Chapter 1 and Chapter 2 were both based on a study of a tree watering outreach program conducted in Ithaca, NY that was designed to encourage residents to water newly planted street trees. Chapter 1 presents biophysical data collected at each tree, as well as self-reported watering behavior collected from a survey of residents. Chapter 2 presents additional data collected from the survey of residents. While Chapter 1 found that mailed postcards may encourage residents to water street trees, the ecological

model of street tree watering presented in Chapter 2 suggests that the intervention may have needed to include other components to more effectively encourage residents to water street trees. Chapter 2 found significant differences in residents' perceptions of factors at multiple levels of analysis in the ecological model of street tree watering. The mailed postcards discussed in Chapter 1 represented an intervention component at the intrapersonal level because postcards were mailed to individual residents and they were meant to increase residents' awareness of the important of street tree watering. While results from Chapter 1 suggested that the postcards were effective, results from Chapter 2 suggest that additional intervention components may be needed to more effectively promote residents' street tree watering behavior and to leverage the impact of the postcard. For example, altering social norms for street tree watering, providing physical access to water and watering supplies (e.g. hoses, buckets), and involving residents in the city's tree planting process may also encourage residents to water street trees. Pairing those intervention components with the mailed postcards may have a stronger impact on residents' watering behavior than the mailed postcards alone.

Chapters 1-3

There are two categories of cross-cutting findings from these chapters. I will first discuss cross-cutting findings at a theoretical level. Chapter 1 and Chapter 2 represent a case of community engagement in Ithaca, NY while Chapter 3 represents a case of community engagement in Washington, DC. The research in Chapter 1 and Chapter 2 was conducted from a post-positivist epistemology in which I (as the researcher) collected empirical data that I interpreted from an objective standpoint based on the

conceptual framework of the ecological model of behavior. I used quantitative methodology in order to make predictions about future human behavior (Greenwood and Levin 2007). The narrative research conducted in Chapter 3 was conducted from constructivist and interpretivist epistemologies, meaning I co-constructed knowledge with other people (who weren't scientists) that represented our interpretations of reality (Riessman 2008; Wells 2011). Narrative research does not allow me to make predictions about human behavior, but allowed me to capture detailed knowledge about the phenomenon of community engagement in urban greening in a specific context in Washington, DC (Landman 2012).

Chapters 1 – 3 demonstrate that behaviors of watering street trees and engaging other people in tree planting and community gardening are complex. This sounds like an overly simplistic finding, but it is one that is symbolically important in academia. These chapters demonstrate the value of epistemological pluralism in understanding multiple dimensions of the practice of community engagement in urban greening and of the behavioral outcomes that those practices seek to achieve among individuals and communities. The use of post-positivist and interpretivist epistemologies in these chapters mirrors conversations in the academic literature on the ecological model of behavior (applied in Chapter 2) about using mixed methodologies that can capture the complexity of human behavior. The ecological model of behavior arose out of the recognition that there is a complex system of individual, social and environmental factors that shape human behavior and that interactions between those factors can be chaotic and difficult to predict. Public health scholars have increasingly integrated

complexity and chaos theory as it applies to health behavior and the social contexts where it takes place, recognizing that linear models of behavior change are not sufficient for explaining behaviors in light of this complexity (e.g. Plsek and Greenhaugh 2001, but also see Buchan et al. 2012 and Taplin et al. 2012 for a review). Interestingly, the qualitative methodology of narrative inquiry also arose in part out of criticism of the ability of social science to explain and predict human behavior. Flyvbjerg (2001) argues that social science is not suited to make universal predictions about human behavior due to the diversity of the social contexts that shape human activity. The rise of the ecological model of behavior in public health perhaps represents a similar recognition in the behavioral science. Recently, public health scholars have called for the use of narrative inquiry to understand how people in a specific context experience health issues and the interventions designed to address those issues (see for example Nastasi and Hitchcock 2009; Richard et al. 2011; Stokols et al. 2013; Trickett and Beehler 2013). Furthermore, findings from Chapters 1-3 are timely in light of a similar call for epistemological pluralism in urban environmental management. Researchers in the US Forest Service's Stewardship Mapping Project called for future research on the integration of expert and practice-based knowledge in order to integrate insights from diverse types of knowledge into urban environmental planning and management (Campbell et al. 2016).

The second category of cross-cutting findings between Chapters 1 – 3 are on a practical level. The insights on community engagement provided by the Green Scheme's narratives in Chapter 3 suggest ways to improve the tree watering outreach

program discussed in Chapter 1. For example, the tree watering outreach program could have been improved by changing the process of community engagement. The practice of mailing postcards was similar to the “helicopter program” that Joelle discussed in that the postcards quickly landed in residents’ mailboxes without meaningful face-to-face interactions with the recipients. The tree watering outreach program could be improved by integrating some form of interaction with residents to build the type of trust and accountability that Joelle described the Green Scheme was able to achieve. Another way the community engagement process of the outreach program in Ithaca could be improved is by giving residents an opportunity for expression. It was interesting that many residents did express themselves in the form of the comments they wrote on the back page of the survey. Many of the comments not presented in this dissertation entailed residents’ sharing their past or current grievances about trees to the city. Providing residents with an opportunity to meaningfully share those views at some point in an outreach program/intervention may enhance their perceptions that the city (or researchers like myself) running the program listens to residents and hears their concerns. That practice may also improve residents’ perceptions of the procedural fairness of the tree planting process, which Chapter 2 suggested may positively affect residents’ watering behavior.

Chapters 3 and 4

Chapters 3 and 4 both examined nonprofit organizations, albeit at different scales with Chapter 3 focusing on the practices of one organization and Chapter 4 focusing on the practices of hundreds of organizations. The Green Scheme is one case of an urban

environmental nonprofit organization that does not have any paid full time or part time staff, of which there were many in the final sample in Chapter 4. Ronnie, Xavier, Joelle and India could all be considered volunteers because none of them were paid staff. The Green Scheme only spoke of volunteers in the context of their community tree planting event in Lincoln Heights. The ways they managed those volunteers was not the focus of Chapter 3, but the insights they provided about community engagement more broadly demonstrate volunteer management as practiced in a very specific context. The only volunteer management principle from Chapter 4 that was evident in the data presented in Chapter 3 was the concept of volunteer support, which encompasses the degree to which volunteers are supported and acknowledged by staff. The Green Scheme demonstrated the ways in which they supported and acknowledged the tree planting events by providing the supplies the volunteers needed to accomplish the task of planting trees. Perhaps more importantly, the party-like atmosphere they created with food and music may have celebrated the volunteers' efforts in a way that made the volunteers feel acknowledged by the Green Scheme. The Green Scheme's narratives provided context-specific details about their celebration that may inspire other practitioners to celebrate their volunteers in a manner that is appropriate for the context in which they work.

Future Research

I see two areas of future research on community engagement in urban environmental stewardship emerging from this dissertation. The first area is to further test the ecological model of street tree watering. Future research can examine

interactions between factors in the ecological model of street tree watering. Quantitative research designs, such as experimental or quasi-experimental designs will be most appropriate for research in this area. Applying and testing the ecological model of behavior to urban forest stewardship may pave the way for the application of the ecological model of behavior to other types of urban environmental stewardship activities (e.g. other forms of tree maintenance, the installation and use of rain barrels).

A second area of future research entails further exploring the community engagement practices of urban environmental stewardship organizations, including their volunteer management practices for engaging volunteers in an organizational context (versus residents who may not be participants of such groups). Qualitative methodology, such as narrative inquiry, can capture practitioners' interpretations of the lived experiences involving residents and volunteers in stewardship, as well as how their experiences are shaped by the complex "ecology" of individual, social and environmental factors and processes in the settings where they work. Findings from this qualitative area of research can help inform the operationalization of "concrete, vivid and situation-specific," independent variables that may affect stewardship behaviors in the first area of research (Kuo 2002), and may also produce practical knowledge about effective practices for community engagement in urban environmental stewardship.

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