ENGAGING MILLENNIALS IN PUBLIC GARDENS THROUGH DIGITAL AND SOCIAL MEDIA STRATEGIES

by

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DEDICATION

This thesis is dedicated to my sister Emily, who was my statistics guru, editor, and cheerleader. Thank you for being one of the very best people I know.

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Thank you to my parents, Sue and Doug, for providing me with a life full of love, opportunities, and gardens. You have always made me feel as though I can accomplish anything.

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TABLE OF CONTENTS

Appendix

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Social media is an important element of modern nonprofit communication, and is widely accepted within the field of public horticulture. However, there is little data to support public garden social media professionals as they create social media engagement strategies. This research combines nonprofit best practices, current public garden social media strategies, and millennial preferences for public garden social media interaction to develop an understanding of effective social media strategies for millennial engagement with public gardens. Results show that millennials are excited about future involvement with public horticulture, and there are many possibilities to develop strong relationships between this generation and public gardens. Many current public gardens social media practices fit with millennial preferences, but there are areas for improvement and exploring new strategies. Opportunities revealed by this research include exploring new social media platforms, developing edutainment content, and soliciting donations through social media.

Chapter 1

LITERATURE REVIEW

1.1 Preface

Public gardens are wonderful because they offer beauty and peace in a frenetic modern world, provide a hub for environmental education and action, and offer a space for cross-generational interactions. Horticulture and gardens have always been a part of my life; I grew up with a horticulturist mother near a variety of world-class public gardens. Not all millennials are lucky enough to have this connection, but most do appreciate the value of public gardens and spending time outside. I conducted a completely unscientific poll of my friends to find out what is important to them about public gardens. My friends appreciate public gardens for: beauty, wildlife habitat value, space for exploration and discovery, and the potential for therapeutic respite. My friends and I are all millennials who care (at least a little and in some cases quite a lot) about public gardens. I am writing this thesis because I believe in the value of public horticulture, and I want public horticulture to be more accessible to my peers, to other millennials outside of my social circle. And when a millennial wants to reach beyond their existing social circle, they turn to social media where, with the right strategies, beliefs and information can be amplified.

1.2 Introduction

Public garden leaders believe there is value in both engaging millennials and in using social media; almost everyone in the public garden world who has discussed this research has been enthusiastic and interested in the results of this work. Their enthusiasm not only displays their willingness to learn, but also demonstrates the need for this research. There are many resources available for nonprofit social media strategies and millennial engagement. However, it can be difficult for nonprofit professionals to allocate their limited time to wading through these resources. Additionally, what works for a cause-based nonprofit like the American Red Cross (Briones, Kuch, Liu, & Jin, 2011) may not be as successful for cultural institutions like public gardens.

Leaders of public gardens and other types of cultural institutions both want and need to ensure steady membership, attendance, and donation rates in order to safeguard the future of their organizations. The millennial generation is currently aging into these roles. As public garden leaders search for methods to connect with this 'digitally native' generation, social media offers a viable option. This thesis brings together information from the organization side -- public gardens, and the client side -- millennials, with existing best practices to develop guidelines for public gardens to engage millennial audiences.

1.3 Literature Review

1.3.1 Public Gardens and Cultural Institutions

A museum, or cultural institution, is defined by the International Council of Museums as "a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment" (ICOM, 2015). According to the American Alliance of Museums the term comprises many distinct types of organizations including but not limited to historical museums, art galleries, *botanical gardens*, science centers, and zoos (AAM, 2014).

Public gardens are one specialized type of cultural institution. The American Public Gardens Association (APGA) defines a public garden as "an institution that maintains collections of plants for the purposes of public education and enjoyment as well as research, conservation, and higher learning" (American Public Gardens Association, 2015). This definition incorporates other garden terms such as "botanic garden" and "arboretum." There are many such institutions, small and large, throughout the world, the majority of which are nonprofit organizations.

Nonprofit cultural institutions, including public gardens, have an important role to play and can have a tangible effect on society. This significance can be viewed through many different lenses. The Netherlands Museum Association defines five different types of value: collection, connecting, educational, experience, and economic (DSP-groep, 2011). Gardens and natural history museums contribute to this value by preserving specimens used by scientists in many types of research (Godfrey, 2000). Economists have attempted to evaluate the economic value of services performed by

museums including: adding prestige to a city, providing educational opportunities, and preserving heritage for future generations (Martin, 1994).

Almost all nonprofit organizations have a mission statement, which is used as a statement of purpose, to guide decision making, and to represent the nonprofit to the public (Internal Revenue Service, 2016; Kirk & Nolan, 2010; Rakow & Lee, 2011). Cultural institution and public garden mission statements often include two key concepts: maintenance of collections and sharing those collections with the public. In service of the mission, it is important "that a transaction and a relationship with museum visitors, members and supporters has to reflect an exchange of benefits and costs, both for the public and for the museum" (Kotler & Kotler, 2000).

While museums can't be all things to all people (Kotler & Kotler, 2000), it is important to find a balance between appealing to a broad audience and creating a focus that is so narrow as to be isolating. There is evidence that nonprofits with broader constituency raise more money than those whose mission focuses on a more narrow audience (Kirk & Nolan, 2010). One characteristic of museum excellence in education and interpretation is that "the museum presents accurate and appropriate content for each of its audiences" (American Alliance of Museums, 2013). Audience analysis and segmentation can provide a balanced approach, because "all consumers are not created equal" (Hallberg, 1995). Audiences can be segmented by a wide variety of characteristics such as demographics, behaviors, interests, and preferences (Health Communication Capacity Collaborative, 2014). In applying this to museum audiences, one author suggests creating seven identity-based categories for evaluating visitors based on needs and desires: explorers, facilitators, professionals/hobbyists, experience seekers, rechargers, respectful pilgrims, and affinity seekers (Falk &

Dierking, 2012). There is value in crafting strategies that engage multiple segments of the audience and also on balancing attempts to engage a specific group.

Despite their documented value, cultural institutions cannot afford to operate as isolated entities; they need the input and interaction of their community to stay relevant to their audience and donors. A desire to remain relevant drives the creation of industry publications like TrendsWatch, a report published each year, beginning in 2012, by the Center for the Future of Museums to monitor and predict museum trends (American Alliance of Museums, 2017). In the six years since its creation, TrendsWatch has discussed sixteen trends related to digital engagement, social media use, edutainment, and millennial engagement (Figure 1.1). These themes include 'New Educational Era', which discusses a shift from formal education to non-traditional education strategies; 'The Sharing Economy', which links shifts in millennial purchasing trends to the social media platforms they use for sharing; and 'Agile Design', which focuses on quick changes based on audience response. Also referred to as 'failing forward,' the flexibility inherent in agile design is an important element of social media strategy (Berthon, Pitt, Plangger, & Shapiro, 2012; Johnston, 2015; Kanter & Fine, 2010).

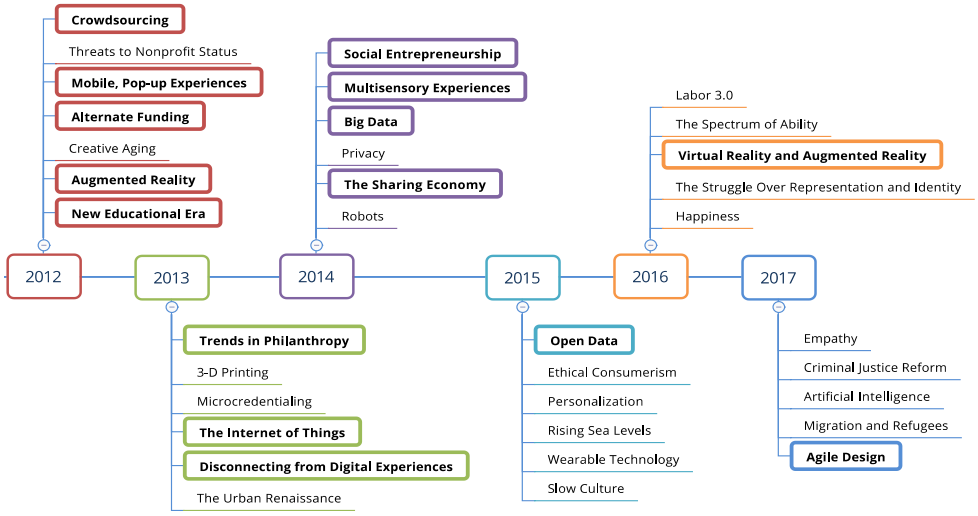


Figure 1.1: Timeline of themes covered by TrendsWatch from 2012 to 2017, issues pertinent to this research on digital media promotion strategies, social media, edutainment, and millennial engagement are shown in bold (American Alliance of Museums, 2017)

As cultural institutions plan for the future, they consider both the donors of today, and how those donors compare with donors of tomorrow. Within high net worth individuals, the highest average charitable giving amount comes from donors retiring within the next 5 years (Bank of America & Indiana University, 2012). As this cohort of donors ages out, new and younger groups will become the largest sources of charitable giving. According to current trends in philanthropy, millennials are likely to dominate future giving. Millennials express more interest in outcome-oriented philanthropy, where organizations demonstrate accountability, metrics, and return on investment (ROI) (Merritt & Katz, 2013). Institutions need to demonstrate engagement levels in application for various sources of funding, which is crucial to maintaining nonprofit status (Martin, 1994). In contrast, there is a rise in charitable donation through social media, where donors appear driven by attention-getting

projects, social pressures, and the convenience of casual, impulse donating (Saxton & Wang, 2014).

1.3.2 The Millennial Generation

This research focuses on one segment, millennials, with the hope that some strategies can be extrapolated and modified for use with a variety of audience groups. It is important to consider the role of millennials "because they will soon dominate our companies, organizations, and communities" (Feldmann, Hosea, Ponce, Wall, & Banker, 2015). Millennials will be characterized in more detail in Chapter 3. Some basic generational framework is provided here to provide background for those millennials characteristics. Millennials, sometimes referred to as Generation Y, are individuals born between 1982 and 2000, and represent more than one quarter of the total population of the United States of America (The Council of Economic Advisers, 2014). This group has faced different cultural and economic conditions than the baby boomers and Generation X, and thus they view the world differently. Millennials' formative years were shaped by historical events such as the September 11 terrorist attacks, Hurricane Katrina, wars in Iraq and Afghanistan, and corporate scandals such as Enron (Saratovsky & Feldman, 2013). Many millennials entered the workforce during the Great Recession and have continued to be affected by lingering unemployment (The Council of Economic Advisers, 2014). Millennials were also the first generation raised with digital technology, considered digital natives (Prensky, 2001). As millennials grew up, computers, cell phones, and the Internet all became ubiquitous, and the technology adoption rate is increasing over time (Felton, 2008).

An article in *The New York Times* from March 2014 explains the changes museums and other cultural institutions are likely to face as millennials become their

primary visiting and supporting audience; millennials tend to support social causes over the arts, are more interested in the direct effects of their gifts, and are more likely to move around instead of becoming solidly established within one community (Gelles, 2014). An important way that cultural institutions engage audiences, especially younger audiences, is by being open to change and staying aware of trends. At the Art Museum Marketing Association meeting in 2013, Purcell suggested using social media to facilitate observation of and conversation about these trends (Purcell, 2013).

1.3.3 Digital and Social Media

Digital media and social media play an ever-increasing role in our daily lives, entertainment, and education. Digital media is audio, video, and photo content that has been digitally compressed and converted for easy transmission over computer networks (Microsoft, 2010). Social media are "websites and applications that enable users to create and share content or to participate in social networking" (OED Online, n.d.). In 2015, 85% of the adult American population used the Internet and of those, 76% used social media (Perrin, 2015). Social media is integral to modern society and communication, especially in terms of developing and maintaining relationships (Kanter & Fine, 2010). Additionally society is becoming more mobile: 68% of U.S. adults owned a mobile phone in 2015 and 45% owned a tablet (Anderson, 2015), and this increase in mobility has allowed more frequent access to digital and social media. Facebook is the most commonly used social media platform followed by YouTube, Instagram, and then Twitter (American Press Institute, 2015). As seen in Figure 1.2,

Facebook is also the most frequently used social media platform with 76% of users logging in daily (Greenwood, Perrin, & Duggan, 2016).

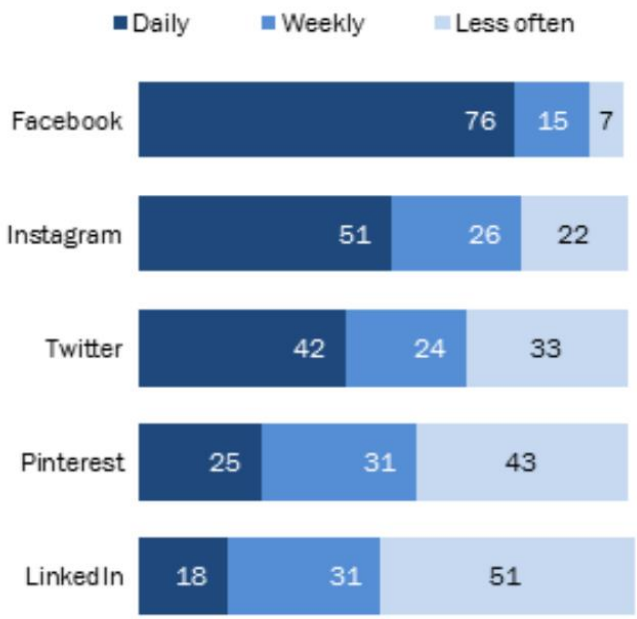


Figure 1.2: Frequency of social media use by platform for American adults in 2016 showing percentage of daily, weekly, and less often use (Greenwood et al., 2016)

Digital and social media have specific value as integral elements of nonprofit marketing strategies (Kanter & Fine, 2010; Rakow & Lee, 2011). The top three social media sites for nonprofits are Facebook, Twitter, and YouTube, respectively, and Instagram shows the greatest growth in importance to nonprofit communications (Figure 1.3). Organizations use social media to foster relationships, engage their stakeholders, and increase both the size and diversity of their audience (Waters, Burnett, Lamm, & Lucas, 2009). However, there is evidence that nonprofits are not

using social and digital media to its full potential; this is particularly noted in terms of sharing organizational successes, soliciting donations, and increasing community involvement (Hou & Lampe, 2015; Waters et al., 2009). For example, nonprofit organizational websites tend to focus on one-way broadcasting instead of two-way communication and cater to highly interested audiences instead of working to engage new people (Sommerfeldt, Kent, & Taylor, 2012).

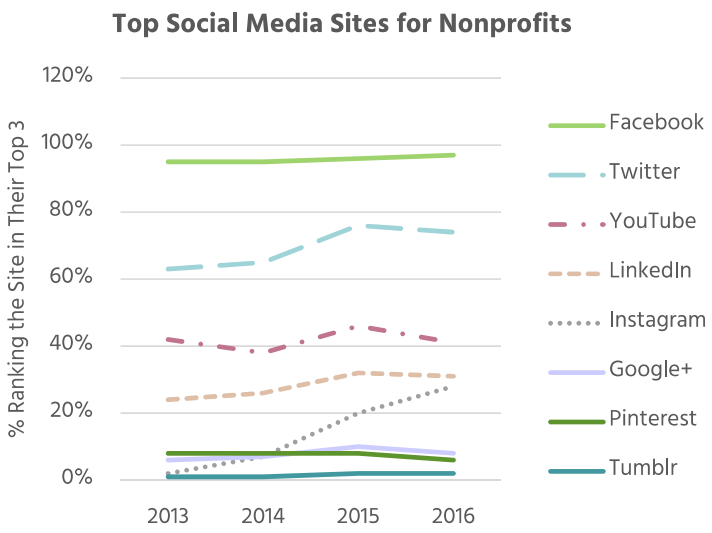


Figure 1.3: The top social media sites used by nonprofit organizations (Facebook, Twitter, YouTube, LinkedIn, Instagram, Google+, Pinterest, and Tumblr) and their use trends between 2012 and 2016 (Nonprofit Marketing Guide, 2016)

1.3.4 Thesis Plan

Social media use is still a relatively new frontier for nonprofit organizations and especially for public gardens. In order to continue fulfilling their missions, public

gardens must stay relevant to their audiences and adapt to changes in user preferences. In today's technology-saturated world, that often means finding a way to bridge the gap between public gardens and their tech-savvy audiences, especially millennials. The research goal is to provide supported strategies for public gardens to bridge this gap. An examination of public garden social media strategy will be conducted from two perspectives: organizational efforts and millennial desires. This chapter has introduced the foundational concepts of the research: the value of public gardens, the millennial generation, and the role of digital and social media for nonprofit organizations. Chapter 2 will examine current social media use at public gardens, and Chapter 3 focuses on millennials and ways in which they are interested in interacting with public gardens. Chapter 4 combines the results of Chapters 2 and 3 to develop and present guidelines for public gardens and millennial engagement.

Chapter 2

ORGANIZATION RESEARCH: GARDEN MATRIX AND SOCIAL MEDIA MANAGER INTERVIEWS

2.1 Introduction

In this chapter, researchers investigate current public garden social media and millennial engagement strategies. Because nonprofit organizations, such as public gardens, typically adapt more slowly to market forces and new technologies than the for-profit community (Bush, 1992), the first step was to review current public garden efforts on social media and millennial engagement. The social media activities of 100 public gardens were evaluated, using Google and social media platform searches. The next step was to investigate nine of these organizations in more detail through interviews with the person who controls the organization's social media accounts. These interviews gave context, detail, and narrative about social media activities at public gardens; they also provided insight into millennial engagement strategies. Both research techniques explored and ways in which public gardens are using social media to capitalize on their limited time and resources. While public gardens share common strengths, such as engaging visuals, they also share common weaknesses on which they can improve.

2.2 Literature Review

Social media is an integral part of modern marketing in both the for-profit and nonprofit sectors (Kanter & Fine, 2010; Safko, 2012). Organizations use social media

to foster relationships, engage their stakeholders, and increase both the size and diversity of their audience (Waters et al., 2009). Social media is especially important for nonprofit marketing both because of often-limited resources (time, staff, money, skills) and a desire to build relationships (Kanter & Fine, 2010). Because of these constraints, nonprofits have varying degrees of success on social media. They are often constrained by "ineffective measurement of social media performance, deficient organizational resources, and lack of control over work" (Hou & Lampe, 2015). To maximize efficient use of limited resources, experts suggest creating a social media strategy.

2.2.1 Elements of Social Media for Nonprofits

Nonprofits use social media strategies to increase brand awareness, engage community, acquire and retain donors, and participate as thought leaders (Nonprofit Marketing Guide, 2016). A social media plan begins with an assessment of current social media activities. Once the baseline is set, the organization can proceed: setting clear goals, developing metrics to monitor goal progress, examining their audience or community, and assessing internal capacity. Finally, information learned in preceding steps can be combined and used to guide selection of platforms, creation of a content strategy, and development of a brand or voice (Lasica, 2012; Safko, 2012).

Measurable objectives

Nonprofit social media goals are varied; they depend on both the nature and mission of the organization. Some general examples include: increasing awareness and engagement, building community, and sharing mission-based information (Lua, 2017; WiredImpact, 2017). Developing strategies to quantify these goals can help social

media professionals (SMPs) use analytics to evaluate and report on their social media strategies. Analytics is "the discovery, interpretation, and communication of meaningful patterns in data" (Wikipedia Contributors, 2017). On social media, these data commonly include audience demographics, the reach of individual posts, and metrics about the page's performance; the data can often be found embedded within the platform such as on Facebook's Insights page (Facebook Business, 2014). To make the best use of this information, data should be evaluated quickly and distilled into actionable items (He, Tian, Chen, & Chong, 2016).

Fundraising is an example of a measurable nonprofit social media objective. Fundraising occurs on social media but it takes a different form than traditional fundraising and is often informed by a different set of factors (Saxton & Wang, 2014). For example, in conventional off-line fundraising organizational efficiency and financial capacity are often important contributors to a donor's decision-making process. In social media-based giving, traditional drivers are replaced by attention-getting projects, social pressures, and the convenience of casual, impulse donating (Saxton & Wang, 2014). It is also important to note that the majority of social media donations are from small-gift donors (Saxton & Wang, 2014). In *The Networked Nonprofit*, the authors recommend using a multi-platform fundraising strategy and using storytelling to make fundraising a personal experience (Kanter & Fine, 2010).

Target Audience

A better understanding of social media analytics, especially user-focused data, can guide nonprofits in their decision-making by providing information about the identity and desires of the audience or community. Nonprofits can use demographic

data to craft directed engagement strategies, such as a millennial engagement strategy. A director of content marketing for a nonprofit-focused digital agency justified targeted communications by saying that even though many nonprofits consider their audience to be the general public, “if you think you’re speaking to the general public, you’re probably speaking to nobody” (Johnston, 2015).

It is crucial for organizations to both listen to and interact with their social media followers to transform audience into community (Brogan, 2009). Listening and observing existing interactions allow an organization to learn the audience’s interests, concerns, and viewpoints. The next step is to engage the audience, encourage them to participate, and build up the organization’s social community (Kanter & Fine, 2010). Social media has allowed nonprofits to move from customer relationship management, where the organization takes action, to customer-managed relationships, which allow customers (or community members) to take action (Law, Lau, & Wong, 2003). Community members might take action by sharing information, creating their own content, or asking questions (Saratovsky & Feldman, 2013); two-way communication allows the community to take ownership and contribute to the activities of the nonprofit. For a public garden, social media community includes a wide variety of participants defined by visitation, geography, and desire. For example, the social media community contains both frequent visitors and those who have only visited once. The community contains people living within several miles of the garden and those on the other side of the globe; it contains people who want to remember previous visits and those who hope to visit the garden in the future (J. Fazekas & N. D’Addezzio, personal communication, July 19, 2016).

Internal Capacity

In a survey of nonprofit communications professionals, limited budget and staff time were two of the most commonly mentioned restrictions (Nonprofit Marketing Guide, 2017). Social media is often described as a lower cost alternative to traditional marketing. However, it is important to take staff time into account; many nonprofit staffers are concerned about the extra time required by social media responsibilities (Kanter & Fine, 2010). For public gardens, total marketing spending makes up an average of only 5% of expenses (American Public Gardens Association, 2016). A 2016 public gardens benchmarking study did not give statistics for number of marketing employees. Instead, marketing and public relations employees were grouped with membership, development, gift shop, special events, and volunteer coordination to make up 12% of public garden employee allocation (American Public Gardens Association, 2016). These numbers indicate that in public gardens, as in most nonprofit organizations, both staff time and money are significantly limited. Nonprofit organizations often face an additional limitation on social media success -- a lack of professional communications training or experience (Durham, 2013). Prioritizing and assigning responsibilities is a crucial part of a successful nonprofit social media strategy, which can help alleviate some of these limitations (Lanoue, 2017).

Platform Selection, Content Strategy, and Branding

Selecting platforms "that fit your style and interests, and resonate more with your network" is important for time management and social media success (Kanter & Fine, 2010). Social media goals, community activity, and content format all contribute to platform selection. For example, Facebook focuses on both visual content and

articles from around the web, is most used by those between 45 and 54, and has a ‘donate now’ button for fundraising. On the other hand, Instagram is a mostly visual platform, attracts people under 35, and is does not contain embedded infrastructure for soliciting donations (Meyer Foundation, 2016). Post formats include pictures, graphics, short videos, and text; variety is valuable and “visual content can often reach emotional triggers in a way words alone cannot” (Johnston, 2015). Hashtags, and potential hashtag strategies, may help define which platforms are best suited for the organizational goals. A hashtag is a word or phrase preceded by the pound symbol (#), and hashtags function differently on different platforms. For example, hashtags on Twitter are most frequently used to follow a larger conversation while hashtags on Instagram are generally more thematic. Some examples include #publicgardens, #beauty, and #letsmove. Hashtags can be used to brand content, create or join a larger conversation, indicate a theme, or promote an event (Bruns & Burgess, 2011; Saxton, Niyirora, Guo, & Waters, 2015).

In order to both make the best use of limited time and keep the organization’s social media presence refreshed, experts suggest creating a social media content calendar (Johnston, 2015). These calendars can include platform usage, post formats, content creators, events, campaigns, and themes (Sailer, 2017).

Social media users “consume content for information and entertainment, participate for social interaction and community development, and produce their own content for self-expression and self-actualization” (Shao, 2009). Nonprofit organizations can consider these user motivations as they develop a content strategy for use on social media. Social media content can be developed around types of *content*. One example of this is the EIEIO digital marketing strategy. EIEIO stands

for: engaging, informative, entertaining, interesting, and opinionated; the goal is to include a mixture of different types of content (Ziemelis, 2013). Social media content can also be developed around types of *content consumers*. Content consumers can range from low levels of engagement (‘happy bystanders,’ who listen the organization’s message, or ‘spreaders,’ who share content with their networks) to high levels of engagement (‘donors,’ who support the organization financially, or ‘instigators,’ who participate as content creators) (Kanter & Fine, 2010).

Purpose, the reason for posting to social media, guides the informational content included in posts. The informational content may be mission based, as when gardens seek to inform their audience about horticultural facts. It may also be revenue driven, as when organizations promote events, post opening hours, or give institutional updates. Public gardens on average get 49% of their revenue as earned revenue; the remainder comes from private revenue, public revenue, investments, interests, and dividends (American Public Gardens Association, 2016). Understanding the sources of earned revenue for public gardens, such as 23% from admissions and 15% membership, is important for content creation (Figure 2.1).

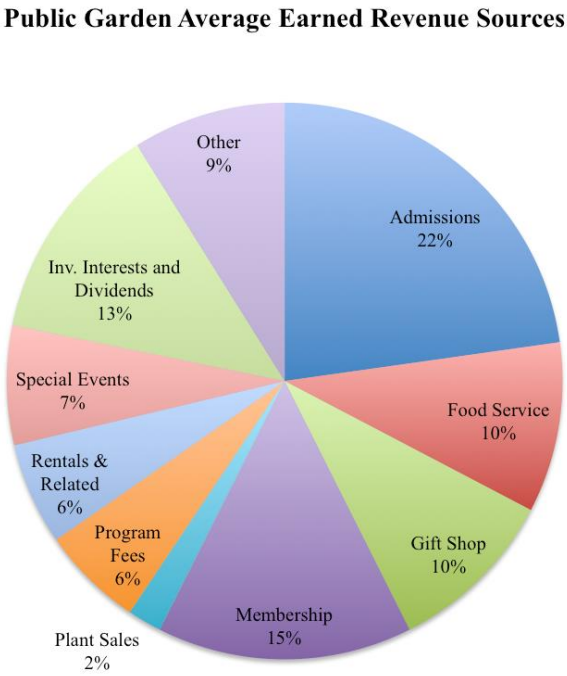


Figure 2.1: Average percentages of earned revenue sources at public gardens, other includes: consulting, parking, and publication (American Public Gardens Association, 2016)

A nonprofit's brand is a "clear, cohesive organizational identity and communications system" to support the nonprofit's goals and mission; brand shapes perception (Durham, 2013). Brand may include a name, logo, style guidelines, and organizational voice. Many nonprofits developed brands organically as the organization grew; these may need reevaluation, consolidation, or updating (Durham, 2013). Brand voice is expressed through character/persona, tone, language choice, and purpose (Schwab, 2011).

Edutainment

Edutainment is a portmanteau of education and entertainment. The term is used to describe a phenomenon of sector convergence between education and entertainment (Addis, 2005). This phenomenon is growing in museums and nonprofits as visitors find museums unwelcoming and seek a more interactive, user-friendly experience (Ballofet, Courvoisier, & Lagier, 2014). Some examples of edutainment content include: podcasts such as *Freakonomics* (Dubner & Levitt, n.d.), video series such as *The Brain Scoop* from The Chicago Field Museum (Grasslie, n.d.), games such as *Odell Down Under* (MECC, 1995), and virtual reality experiences such as those at the Franklin Institute (The Franklin Institute, 2017). Edutainment offers the opportunity to combine different social media post types, informative and entertaining, into one piece of content.

2.2.2 Chapter Plan

There are common themes in the literature for nonprofit social media factors and strategies such as: limited resources, engaging content, and listening to the audience. But these themes have not been applied to or investigated for public gardens. As such, the research goals hope to address:

1. How do public gardens currently use social media?
2. Do gardens have strategies designed to specifically engage a millennial audience?
3. Can current public garden resources support edutainment as a community engagement strategy?

2.3 Materials and Methods

2.3.1 Garden Matrix Data Collection Procedures

For the first part of this research a matrix was created to examine how public gardens are currently using social media in terms of platform selection, posting frequency, and levels of community engagement. The garden matrix provides a broad view of existing trends within the online world of public horticulture. To create the matrix, a list of all organizations (n=573) that were members of the American Public Gardens Association (APGA) as of April 2016 was used and filtered to include only organizations (n=367) with either the word garden or arboretum in their title. An additional 14 organizations determined to be for-profit or non-garden focused organizations were removed. Finally, a random group of 100 were selected from the updated list of 353 gardens to comprise the garden matrix. See Appendix B for a list of all organizations from the APGA list and their status in this research.

A consistent search strategy was enacted, first on Google and subsequently on specific platforms, for each of the 100 organizations within a two-week window (5/16/2016 to 5/25/2016) to minimize differences based on posting during the study period. All searches were originally made with the name exactly as it appeared on the APGA website followed by a modified name from the Google (Google Inc., Mountain View, CA) search results if necessary. Platforms searched were: Facebook (Facebook, Inc., Menlo Park, CA), Instagram (Facebook, Inc., Menlo Park, CA), Twitter (Twitter Inc., San Francisco, CA), Pinterest (Pinterest, Inc., San Francisco, CA), Tumblr (Tumblr, New York City, NY), YouTube (YouTube LLC, San Bruno, CA), and Snapchat (Snap Inc., Venice, CA). YouTube results were included only if the organization had an account, not if the organization was mentioned. On Snapchat both

the organization name and Twitter/Instagram handles were searched. The searches were supported by looking for logos or mentions on the organization's homepage. Blogs were found by entering the organization name in a Google search plus the word "blog." Challenges or surprises discovered during the search were recorded.

For three of the most common platforms (Instagram, Twitter, and Facebook) additional information was collected and a social media activity ranking was calculated (See Table 2.1). On Instagram, the number of posts, number of followers, number following, date of the first post, and date of the most recent post were recorded. Instagram activity was calculated as the number of posts per active week (active weeks is number of days between the first post and the most recent post divided by 7) of the organization's Instagram account. An organization was classified as high activity on Instagram if there were 7 or more posts per active week, medium activity if there were between 1 and 7 posts per active week, low activity if there was less than 1 post per active week, and inactive if there were no postings within the six months prior to matrix sampling.

On Twitter, the number of tweets, number of followers, number following, number of likes, joining date, and date of the most recent post was recorded. Twitter activity was recorded as the number of tweets per active week of the organization's Twitter account. An organization was classified as high activity on Twitter if there were 5 or more posts per active week, medium activity if there were between 1 and 5 posts per active week, low activity if there was less than 1 post per active week, and inactive if there were no postings within the six months prior to matrix sampling.

On Facebook, the organization's Facebook category (park, museum, charity organization, public places, etc.), number of page likes, date of the first post, and date

of the most recent post were recorded. The number of page likes was used as a substitute for number of posts because number of posts is not available data on an organization's Facebook page. Facebook activity was calculated as the number of likes per active weeks of the organization's Facebook account. An organization was classified as high activity on Facebook if there were 70 or more likes per active week, medium activity if there were between 7 and 70 likes per active week, low activity if there were less than 7 likes per active week, and inactive if there were no postings within the six months prior to matrix sampling.

Table 2.1: Equations for social media activity (SMA), and ranking categories

Social Media Activity (SMA)	Low	Medium	High
$Instagram\ activity = \frac{number\ of\ posts}{active\ weeks}$	$SMA \leq 1$	$1 < SMA > 7$	$SMA \geq 7$
$Twitter\ activity = \frac{number\ of\ tweets}{active\ weeks}$	$SMA \leq 1$	$1 < SMA > 5$	$SMA \geq 5$
$Facebook\ activity = \frac{number\ of\ likes}{active\ weeks}$	$SMA \leq 7$	$7 < SMA > 70$	$SMA \geq 70$

An aggregate organizational social media activity (OSMA) score was created by assigning points to the social media activity rankings: high = 4 points, medium = 3 points, low = 2 points, inactive = 1 point, no account = 0 points. Social media activity ranking points for Facebook, Instagram, and Twitter, were added, which created OSMAs between 0 and 12. An OSMA of 1 to 4 is considered low, 5 to 8 is considered medium, and 9 to 12 is considered high. An OSMA score of 0 indicates that the organization has no discernable account on Instagram, Twitter, or Facebook.

2.3.2 Interview Data Collection Procedures

In the second part of this research interviews were conducted to learn about the experiences of public garden social media professionals (SMPs). The interviews provided depth, details, and narrative, supporting the broader information gathered in the garden matrix. These interviews were crucial in providing firsthand stories to understand the inherent complexity found in an individual's experience (Weiss, 1994); the interviews also offered an organizational and professional perspective on digital and social media strategies at public gardens. Nine public gardens in three defined category levels from the garden matrix were randomly selected to represent a range of OSMAs, three high activity, three medium activity, and three low activity. Including SMPs from organizations at all activity levels allowed integration of a variety of perspectives into an understanding of social media activities. The interviewed organizations included 2 university-affiliated gardens, 1 municipality-affiliated garden, and 6 independent nonprofit organizations (Table 2.2). Contact with interviewees was made using a form email, and each signed a consent form before the interview (Appendix C). Semi-structured interviews (Lindlof & Taylor, 2011) were conducted and recorded by phone, asking about the social media strategies in use at their organizations. This project was submitted to the University of Delaware Institutional Review Board (IRB) and granted "Exempt" status before interviews began (Appendix A).

A list of questions, the research instrument (Appendix C), was designed to guide each of the interviews. Conducting qualitative interviews is a process of learning through trial and error (Weiss, 1994). As the PI, my (the first author's) opinions, experiences, and biases were present in the interviews. Throughout the process, I learned to put less of myself into the interviews and allow more space for the

interviewee, but my biases are present in these results. Where possible in the results, I reference spontaneous mentions when something came up before I prompted with a question. Conversely, I try to indicate where responses were given in answer to specific questions from me. While this presents a limitation for interpretation, the results provide a depth of information and perspective that would have been unavailable from Internet research alone.

Interview analysis was conducted in 3 stages. In stage 1, interviews were transcribed and studied to develop a holistic understanding of interview content. In stage 2, constant comparative open coding (Glaser, 1965) guided by research questions of interest and interview foci was conducted. Every mention of a specific social media platform was recorded. After coding all interviews, there was a review and combination of codes that identified analogous constructs. Finally in stage 3, twelve codes (one with two sub-codes) were conceptually grouped into four themes; one code, edutainment, is considered an individual theme.

Table 2.2: Names of social media professionals, organizations, and their OSMA rankings, *UCF Arboretum was classified as low OSMA in the matrix but was discovered in the interview to have a high OSMA

Organization	**Affiliation**	**Social Media Professional**	**Position**	**OSMA**	**Interview length mins: secs**
Tyler Arboretum	Independent	G. Bloomer (GB)	Communications Manager	High (h)	48:39
University of Delaware Botanic Garden	University	R. Lyons (RL)	Board Chair (Volunteer)	Low (l)	17:30
Streissguth Gardens	Independent	B. Streissguth (BS)	Director	Low (l)	15:05
Botanical Gardens at Heritage Park	Municipal	B. Burns (BB)	Social Media Coordinator	Medium (m)	22:51

San Luis Obispo Botanical Garden	Independent	L. Collinsworth (LC)	Education Director	Medium (m)	23:54
University of Central Florida Arboretum	University	J. Werleigh (JW)	Program Assistant	High* (h)	45:39
Woodlands Garden	Independent	K. Baltzell (KB)	Director	High (h)	33:47
Myriad Gardens	Independent	L. Spears (LS)	Director of Marketing and Public Relations	High (h)	46:20
Mounts Botanical Garden	Independent	T. Neil (TN)	Membership and Marketing Director	Medium (m)	N/A

2.4 Results

2.4.1 Garden Matrix Results

Of the 100 organizations represented in the matrix, the majority (86 organizations) had some presence on one of three major social media platforms (Facebook, Instagram, and Twitter); only 14 organizations had no discernable social media accounts. Of those organizations with a social media presence, 76 organizations (88%) had official Facebook pages, 58 (67%) organizations had Instagram accounts, and 51 (59%) organizations had Twitter accounts (Table 2.3). At the time of sampling, a total of 11 accounts from 9 organizations across the three main platforms were recorded as inactive because they had not posted within the previous 6 months (Table 2.3). Other social media platforms (Figure 2.2) used by the selected organizations included: Pinterest (39 organizations), Tumblr (10), Snapchat (5), Periscope (4), YouTube (29), and blogs (34). Facebook pages include space for an organizational designation; at the time of sampling, public garden was not an option. Some of the most commonly used designations were Park, Tourist Attraction, and Event Venue.

Since the creation of the garden matrix, Facebook has added ‘Public Garden’ as a possible designation.

The 29 organizations with YouTube accounts used those accounts with different frequencies; some organizations posted only 1 video while one organization posted over 100 videos. Seven organizations posted only 1 video, 7 organizations posted between 2 and 10 videos, 16 organizations posted between 10 and 50 videos, and 1 organization posted more than 100 videos.

Figure 2.2 displays the organizational social media activity (OSMA) scores for the 100 examined organizations. In summary, fourteen organizations had no accounts (OSMA = 0), 31 organizations had a low OSMA score (OSMA = 1 to 4), 22 organizations had a medium OSMA score (OSMA = 5 to 8), and 33 organizations had a high OSMA score (OSMA = 9 to 11).

Table 2.3: Social media activity rankings of the selected organizations (n=100) from the three most common platforms

	No Account (0)	**Inactive (1)**	**Low (2)**	**Medium (3)**	**High (4)**
Facebook	24	2	25	41	8
Instagram	41	7	15	30	7
Twitter	43	2	7	27	21

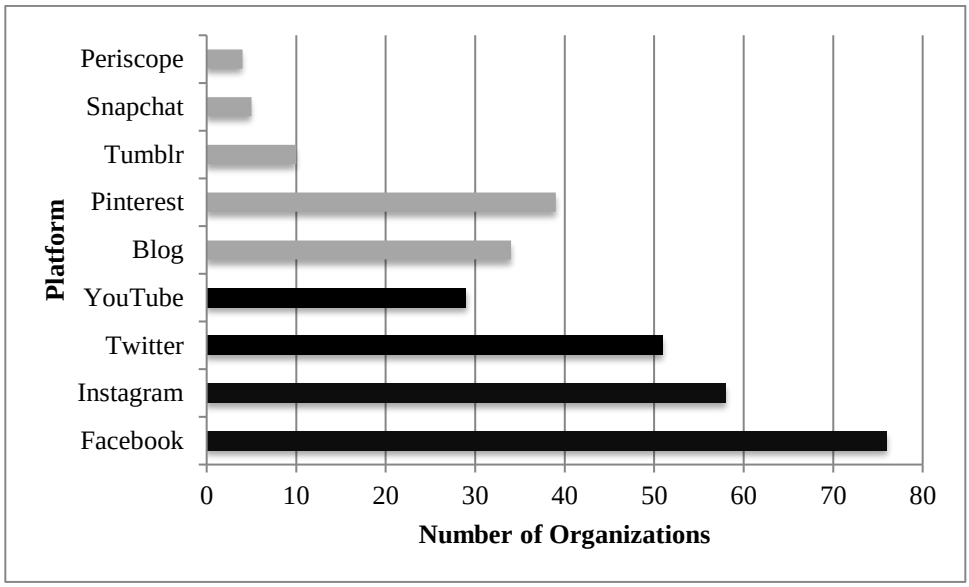


Figure 2.2: Number of organizations using nine common social media platforms. The four platforms represented in black are be discussed in greater detail

There were several challenges in filling out the garden matrix, which were incorporated as part of the results. (1) Several organizations use names different from those with which they registered for the APGA (Table 2.4). (2) Eighteen organizations have unofficial Facebook pages, which were not included in the analysis. These seem to have been created by fans rather than employees of the gardens. (3) Some organizations are listed either on APGA or on online platforms as “Friends” groups. (4) When the registered garden is an element of a larger organization, their social media or online presence is sometimes nested under another site. The most prevalent examples of this within the selected organizations were university and municipal gardens.

Table 2.4: Examples of differences between garden names online and names used to register as a member of the APGA

APGA Name	Platform	Name Found
Cal Poly Arboretum & Gardens	Facebook	Leaning Pine Arboretum – Cal Poly
State Arboretum of Virginia, Orland E. White Arboretum	Google Search	Blandy Experimental Farm
Henry P. Leu Gardens	Instagram	leugardens
Red Butte Garden & Arboretum	Snapchat	OfficialRBG

2.4.2 Social Media Professional Interview Results

The nine interviews ranged in length from 15:05 (Ben Streissguth, Stresissguth Gardens) to 48:39 (Gary Bloomer, Tyler Arboretum) with an average of 31:44. Recording failed on one interview (Terri Neil, Mounts Botanical Garden). As a result, I used notes taken during the interview in the analysis but did not include direct quotes in the text. One organization, University of Central Florida Arboretum, was classified as low in the matrix but, during the interview, I subsequently identified it as actually having a high OSMA score; the organization is referred to as highly active in the interview analysis. This is an example of matrix challenge four described above, nested social media accounts. Eight of the interviews were conducted with paid employees. A volunteer manages one social media page; Robert Lyons is the chair of the University of Delaware Botanic Garden board (Table 2.2). Social media professionals (SMPs) will be referred to by their initials with a subscript to indicate the OSMA score of their organization. For example, Gary Bloomer from Tyler Arboretum (high activity level) is referred to as GB_H.

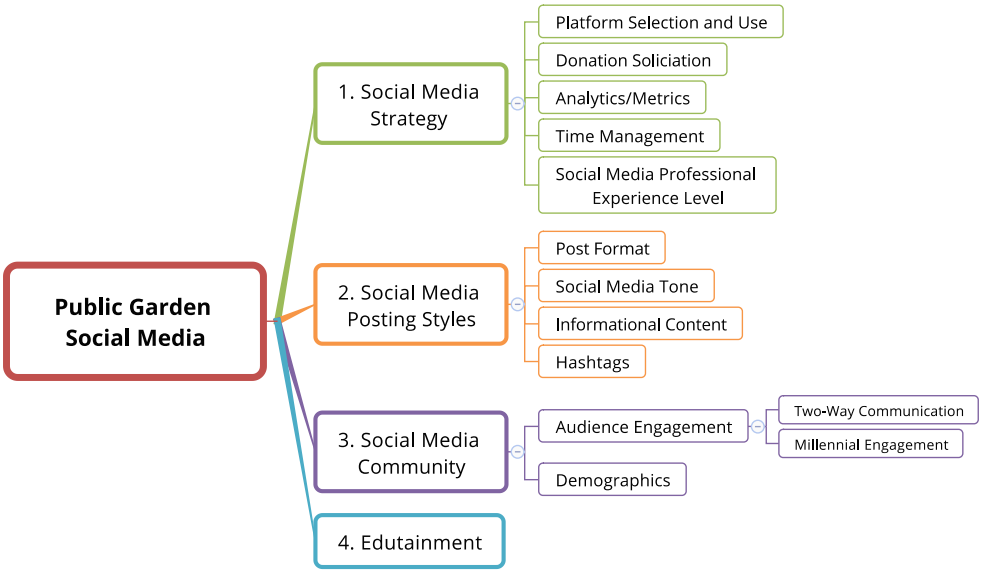


Figure 2.3: This logic chart displays sub codes and themes identified during the social media professional interviews.

Four major themes in the interviews: (1) social media management, (2) social media posting styles, and (3) social media community, and (4) edutainment (Figure 2.3). The first two themes, social media management tactics and social media posting styles, reflect the synthesis of organizational goals, individual SMP preferences, and specific approaches used to create and maintain the organization's social media presence. The third theme, social media community, reflects audience engagement and development of a community relationship. Millennial-specific engagement strategies are included as a sub-code within the third theme. The fourth theme, edutainment, is a

reflection of a research question rather than a spontaneously developed topic. Each of the four themes is presented below. Then differing approaches to Pokémon Go are examined as an example of social media strategies.

Social Media Strategy

Organizational social media strategies are composed of many different elements, defined by the needs of the organization and preferences of the SMP. Social media strategies are also influenced and constrained by budget and time restrictions. Platform selection and use is one important element of social media strategy. In addition, SMPs discussed three strategies in response to direct interview protocol questions, solicitation of donations, analytics, and time management. SMPs spontaneously discussed two additional concepts during the interviews, success metrics and SMP experience level.

Platform Selection and Use

Six social media platforms were discussed by multiple SMPs (Table 2.5). Facebook was the most commonly used platform and it was mentioned most often during the interviews; all nine SMPs discussed using Facebook, and it was mentioned an average of seven times during each interview. Instagram and Twitter were the next most common platforms. Snapchat, and YouTube were discussed less frequently. For six of the platforms, the total number of times the platform was mentioned in the interviews was positively correlated with the number of organizations who mentioned the platform. Snapchat is the exception to this trend; two SMPs from gardens with

high OSMA scores discussed Snapchat usage in detail, especially as a method of engaging younger audiences.

Table 2.5: Number of organizations (n=9) that mentioned each of six platforms and the total number of times each of those platforms were mentioned throughout the interviews

Platform	Number of Organizations	Total number of mentions
Facebook	9	49
Instagram	8	27
Twitter	7	19
Snapchat	4	11
YouTube	5	7
Pinterest	4	5

Solicitation of Donations

Five of the nine interviewed SMPs solicited donations through social media, and each of these SMPs represented an independent organization, as opposed to a garden that is part of a larger organization. Two of those five solicited donations as part of a larger national campaign such as Giving Tuesday, "a global day of giving fueled by the power of social media and collaborations" (Belfer Center for Innovation and Social Impact, 2017). The other three created solicitations specific to their organizational or mission needs: a capital campaign, a boost to the annual fundraising appeal, or funding a specific project. Most SMPs consider their social media-based donation efforts to be minimally successful. For example, when asked about soliciting charitable donations, LC_M (San Luis Obispo Botanical Gardens) said, "I think that it was slightly effective. I mean it was probably more so than not asking." While KB_H (Woodlands Garden) said, "We probably have [solicited donations] but we probably

haven't been very successful at it." Two SMPs, GB_H and TN_M, specifically mentioned spending money on social media advertising. GB_H said, "A small amount of money, maybe a hundred to a hundred and fifty dollars, would be allocated to Facebook advertising. But that's pretty much it." Three organizations stated they have no budget for social media marketing.

Analytics/Metrics

Six SMPs mentioned the use of analytics embedded in social media platforms. LS_H (Myriad Gardens) was particularly interested in analytics saying, "I love analytics. More than anything I love it [for]…boasting internally, to our board." Other SMPs looked at embedded analytics occasionally but did not incorporate them into strategizing or decision-making. RL_L (University of Delaware Botanic Garden) said, "I don't actively seek them out, but Facebook gives me reminders that they are available…But I must say that it's not something that guides me yet." Only one SMP, BB_M (Botanical Gardens at Heritage Park), discussed the use of analytics to guide strategy decisions, saying that he was "using it primarily so [he] can decide how to move forward and if [he] could be more successful or not." Two SMPs discussed a desire to find or make better use of metrics to establish successful social media strategies. When discussing hashtags, KB_H said, "I don't really know if it's effective…but I do it because I hope that it's helpful," indicating a lack of analytic data use for evaluation of hashtag effectiveness.

Posting Schedule / Time Management

Time management was an important element of the interviews. Seven of the nine SMPs felt that their social media strategies were constrained by a lack of sufficient staff time. BB_M said:

> No (laughs) I don't have enough time to do anything that I want to do. I'm actually a part-time worker for the city so I currently work 30 hours weekly, and like I said I'm promoting everything under Parks and Recreation and also Keep Grapevine Beautiful, which is a separate social media identity. So it is quite a lot, and I'm sure that eventually, hopefully, the gardens and the other entities will have their separate social media accounts.

Other SMPs work full-time for their organizations but often have other significant responsibilities and perceive social media postings as something to be done in extra time. LC_M said:

> It's one of those things that is not quite an afterthought but an 'Ooh I've got an extra five minutes I'm going to post something real quick.' So it's not something that I spend my whole day on and I'm just not able to take that kind of time away from other stuff that I'm doing.

This time constraint is mitigated by the fact that they see large rewards for relatively low inputs. KB_H describes social media as "low effort and low cost," saying that it is "really huge for us to be able to reach that many people and not have a humongous advertising budget."

As an element of time management, SMPs described different levels of schedule ranging from having no schedule at all to creating schedules months in advance, which other organization staff members could use. One SMP, RL_L, created no schedule and described his social media strategy as, "very much a random response to things that are happening… What's important to me is refreshing and keeping things active and current on that page as best as I can." Six SMPs created a schedule for some things but not all. TN_M (Mounts Botanical Garden) created a weekly

schedule to avoid oversaturation when multiple people were posting. LS_H scheduled posts for courses and events saying, “I do plan posts that are geared towards trying to sell classes or trying to sell events that need registration.” Several of these SMPs expressed a desire for scheduling more in advance. For example, KB_H said, “I would love to have things scheduled much further out in advance so we're not running behind the eight ball to post stuff.” The final two SMPs, GB_H and JW_H (University of Central Florida Arboretum), created significant schedules in advance. JW_H uses his schedule to focus on connecting to other campus organizations at the university. “We'll be posting in a couple of groups, organizations, like student organizations that have interacted with us that we think might be interested [in specific programming].” GB_H used his advance schedule to allow other staff members to participate in topics on social media, providing content in areas such as “importance of building a community” and “what goes on in the world of horticulture.” All of the SMPs allowed space within their social media strategy for spontaneous posting. LC_M said, “Where as Instagram it might be ‘Oh I saw this lizard just now’ … [because] Instagram is more of the day-to-day kind of random cool things that I see or think about.”

Experience Level of Social Media Professionals

Four interviewed SMPs expressed a lack of social media marketing experience or confidence in the effectiveness of their strategies, three from gardens with high organizational activity rankings and one from a garden with a low organizational activity ranking. KB_H described, “So it’s good to know that we might be doing some things right. But it just sort of feels like a lot of times it’s a little haphazard.” Another

participant from a highly active organization, JW_H said, “None of us are experts at marketing” and “I'm always learning different things from different people.”

Social Media Posting Styles

Social media posting style is operationalized as an organization’s brand or voice. An organization’s social media posting style is determined by their post format, tone, language, and content. Hashtags (#) are also included as an element of posting style, as they represent a way to express tone, include content, and contribute to the format of a post.

Social Media Post Format

Photos were the most commonly mentioned format across all nine of the interviews. SMPs assumed people want to see garden photos as LC_M describes, “because we're a botanic garden it’s like ‘Oh people want to see the pictures.’" BB_M said:

> Whenever we are promoting the gardens through the use of photography or just general promotion that is, “Oh look how pretty the garden is, come visit,” that sort of, general non-sales type advertisement of the garden seems to really resonate with our audience.

RL_L “…virtually never post[s] without an image.” Videos were the next most popular format, mentioned by five of the SMPs. GB_H developed a different theme for each day of the week and created “Video Tuesdays” to share “two or three videos throughout the course of the day.” Most SMPs mentioned the visual nature of public garden promotion. Alternatively, they generally described text in terms of keeping postings

short, with SMPs saying they use a “small amount of text” (LC_M) and they try “to give information in bite size chunks that’s easy to understand” (GB_H).

Social Media Tone

Social media professionals most commonly used *friendly*, *light*, and *casual* to describe social media tone, and all nine touched on a variant of this when describing their social media presences. Of interaction with the social media audience, LS_H said, “Oh, I just feel like they're a part of the family,” and KB_H said, “I feel like I try to make things sound personal. I don't want our posts to seem corporate.” Second to this friendly or approachable tone, SMPs were also likely to describe their tone as factual, educational, and informational. RL_L said, “I always try and keep it factual, light, when I'm talking. I don't make jokes or anything, but I do have a very appreciative tone.” LC_M said:

> You know I try to keep it light and educational but with a little bit of humor. And not making it super super science-y. I will throw in, every once in a while I'll link to a master gardeners post or what’s going on at another botanic garden around the country.

Informational Content

Social media professionals spontaneously described social media content around three themes: horticulture/nature, organization/event updates, and content from outside organizations.

Eight of the nine SMPs touched on horticulture or nature content. Many gardens have appreciation of natural beauty and/or learning about plants as part of their organizational missions. For example, the mission of Tyler Arboretum is “To preserve, enhance, and share our heritage, collections, and landscapes, to create and

inspire stewards of the natural world" (Tyler Arboretum, n.d.). JW_H uses Snapchat videos to encourage students to volunteer doing horticultural tasks, describing, "We'll show a quick little snippet on double digging or seeding." Posts focused on horticulture often provide an educational opportunity. BS_L (Streissguth Gardens) said, "My entire Instagram feed is pretty much devoted to basically just trying to get people to learn the name of plants in the garden. So I'll take a picture of a flower and then I'll put the name up." Similarly, KB_H said, "Any time I mention a plant, I'll try to say the genus and species just to stay…botanically correct."

Eight SMPs spoke about logistic posts during their interviews. These concentrated on topics such as event promotion or changes to hours/accessibility of the site. In speaking about the success of event promotion on social media for Woodlands Garden KB_H said:

> I'd say the big thing for us is just really marketing events kind of at the last minute. Like we have this whole plant sale that's going on right now that's been hugely successful over the last couple months. And I think the ability to quickly and consistently update the availability and take pictures and share with individuals that have joined in on our social media to be able to see that. You can see the effects of that pretty quickly. You know I can't say that 100% of those sales are coming because of our communication on social media. But I think adding that to our communications effort makes a big difference.

In particular, SMPs use Facebook as a social media outlet for event promotion, describing specific features such as, "… the ability to publish and send at a different date" (LC_M). Typically, the organizations' Facebook accounts have large followings, allowing SMPs to reach a sizable audience. BB_M described focusing posting efforts on Facebook, "I tried to promote especially on Facebook with our largest audience posting," and JW_H explained that by creating events on Facebook they are "…trying to reach out to a lot more people."

Only three SMPs share content created by other organizations, striving to spread information and share a greater message via social media. KB_H said, “I'd like to be spreading more information about things that are directly related to our mission that may not be produced by the garden.” LC_M mentioned outreach to organizational partners, “connecting with some of our city partners, sharing their message.” GB_H felt that sharing content from outside the organization was crucial and said, “My gut feeling is that social media messages shouldn't be all about the person or the organization posting.” Sharing content from other organizations can contribute to a strong and functional social media community; it can increase the reach of an organization’s message and add valuable variety to the social media feed (Kanter & Fine, 2010).

Use of Hashtags

Interviewed SMPs described using two different types of hashtags: organization-specific hashtags (used to brand content, promote events, or for fundraising campaigns) and larger message hashtags (used to indicate a theme or join a broader conversation). LS_H described using an organization-specific hashtag (#PumpkinvilleOKC) for a specific event to amass over 700 photos on the organization’s Instagram account for a pumpkin festival at the gardens: “I think more than anything I do want to be a part of the conversation. But I also, especially with Pumpkinville, I want to see other people's photos.” At the Tyler Arboretum, GB_H uses #TylerEveryday because, “There’s an emphasis on there being something different to see at Tyler each day of the week. As the seasons change, as the weather changes, as foliage changes there is something different every day.”

SMPs use larger message hashtags to capitalize on the familiarity of the hashtag to attract attention for their individual organization. By using larger message hashtags, SMPs are able to drive traffic to their own sites. KB_H said, “I use them because I want people to just sort of fall onto our profiles if they're searching for plant sale or whatever it might be.” LC_M said, “So I'll do like Throwback Thursday [#tbt] and Wellness Wednesday [#wellnesswednesday]. And all of these California or San Luis Obispo [hashtags], just so when people are looking for those things, maybe we pop up.” Larger message hashtags are also used to solicit donations as mentioned for #GivingTuesday, a national campaign donation to charitable causes after Thanksgiving each year.

Social Media Community

The social media community of a public garden is comprised of the community members with whom the organization is connected on social media platforms and the larger network including outside organizations with similar geographies, missions, or members. Social media success is defined by success in both building and maintaining an active community. These individuals choose to “follow” organizational accounts on Facebook, Twitter, and Instagram and can be categorized by demographic descriptors or their activity on social media. The strategies and responses of SMPs possibly influence not only the information made available to those followers but also the individuals prompted to become followers. A truly *social* media community is formed through two-way communication and the strategies used to foster this interaction demonstrate organizational goals (Kanter & Fine, 2010).

Several SMPs mentioned strategies for marketing to increase the size of their social media community. JW_H discussed building a social media presence and community at the University of Central Florida Arboretum from the ground up.

> Yeah so like I said in the beginning we had to go down to their level… So we have the Facebook and then went to the Instagram, then Twitter and Snapchat because that is what the kids are using…they're walking throughout campus with it. (JW_H).

He includes social media handles (e.g. Instagram and Snapchat) on publications and brings laptops to campus events in order to encourage students to follow the arboretum. KB_H also discussed using one social media platform to promote another. "I feel like our strategy is really kind of cross pollinating between the different platforms. And remembering to tell people that I have these other ways they can communicate."

Two-Way Communication

Many SMPs appreciated the chance to engage with their social media audience through listening and responding to comments. Several of the SMPs spontaneously used the word listening to describe interactions with their social media community. For example, GB_H said, "I think it's absolutely essential to spend more time listening," and LS_H explained, "We love listening to complaints, too. And acting upon them." All six SMPs who spoke about responding to comments said that the majority of comments they received were positive. JW_H described the comments of the UCF Botanic Garden social media community as, "… a lot of positive comments. And they're neutral in the sense that people will have those questions, or people will post the name of their friend or something because they think their friend might be interested in the event." SMPs who discussed comments also spoke about the

importance of responding in a timely manner. RL_L only remembered one negative comment.

> A reader didn't like the plant that we were using. And they posted on [the picture] and they just said something negative about it and I put a response in there telling them why we chose it. But I don't intend to keep an ongoing discussion about things like that because that's not the forum of this page at all.

This response is indicative of the way several SMPs chose to respond to negative comments. GB_H discussed responding to complaints, "I've taken the approach of being the informative friend, giving as much information as possible, always being respectful, always being aware that I'm not just communicating with one person, I'm communicating with everyone else that that person knows." One SMP (TN_M) discussed deleting negative comments and responding to the poster in a private comment.

Demographics

The SMPs were asked about general demographics of their social media community and, specifically, the percentage of millennial visitors or social media followers. Four SMPs (LS_H, KB_H, GB_H, and BB_M) specifically use embedded analytics to evaluate demographics of their social media audience. All four organizations have a predominantly female audience but the primary age ranges by garden (Table 2.6). Three SMPs (JW_H, LC_M, and TN_M) spoke about their social media audience in more general terms. JW_H described the dual audience of the University of Central Florida Arboretum.

> …our main focus is the college age population. So those are who we actively engage… But the arboretum, the UCF Arboretum, has such a history here in Orlando that I continuously meet people…[from older

> generations where] I'm the age of their grandkids or something like that.

LC_M described the social media audience of Myriad Gardens in terms of both age and geographic distribution.

> I would assume kind of the older crowd is more engaged with the Facebook and probably more local also. And then with the Instagram I kind of have people from all over the place and I think maybe a little younger.

TN_M described the social media audience of Mounts Botanical Garden as avid gardeners in their fifties and sixties, young families with adults in their thirties and forties, and very few people under thirty. The final two SMPs (BS_L, RL_L) were not able to provide on-the-spot demographic descriptions of their audiences.

Table 2.6: Descriptive quotes of audience demographics from SMPs using embedded platform analytics for social media audience evaluation.

Organization	**OSMA Score Ranking**	**Description of Audience**
Myriad Gardens	High	"*83 percent are women, 17* [percent] *men and then our biggest chunk is 29 percent 25 to 34* [years old]. *Then our next biggest is 35 to 44* [year old] *women*."
Woodlands Garden	High	"*Facebook is more common at least in terms of who I'm seeing like our posts and things.* [The audience on] *Facebook is more likely to be in their forties and fifties*"

Tyler Arboretum	High	"*First of all 80 percent of our Facebook fans categorize themselves as female and 19 percent categorize themselves as male… of the 80 percent who are female, 15 percent are ages 25 to 34. And the largest group with 34 percent of that 80 percent female group are between the ages of 35 and 44. And then 16 percent of those 80 percent female are between the ages of 45 and 54…only 2 percent of our 80 percent female community is between the ages of 18 and 24.*"
Botanical Gardens at Heritage Park	Medium	"*Women in their thirties is our primary audience that is on Facebook and we don't have a huge following of millennials.*"

Millennial Engagement

Within the theme of social media community, audience engagement is evaluated through two lenses: engagement strategies specific to millennials and through two-way communication.

Millennial engagement, specifically targeted by five SMPs, was either part of a conscious strategy or a result of broader engagement strategies. Two SMPs used Snapchat as a strategy to engage a millennial audience. BB_M said, "We've done things such as Snapchat filters for larger events that might have more of an audience in a millennial age range such as our summer concert series that's held in the gardens." At the UCF Arboretum, JW_H also successfully promoted events to the millennial audience through Snapchat.

> We would have an event and I was like, 'Hey, how have you heard about this?' and somebody would go 'Snapchat, you know, yeah I learned through Snapchat' … we've had people come to our events because that's how they found out about it.

LC_M created a class series --"California ethnobotany but more hands on" -- intended to appeal to the local millennial audience, specifically "… a lot of the homestead-y type

younger families and college students that want to come out and learn that stuff." At Woodlands Garden, KB_H successfully involved millennial volunteers in assisting with Facebook and Instagram.

Four SMPs did not have clear plans or strategies for engaging millennials. LS_H believed her success with millennials was an advantage of offering interesting programming such as salsa nights and a seasonal ice rink. "We also give them such a great variety of events. But it's not specially targeted to millennials. But [what] we've come up with, millennials are loving." One SMP (GB_H) chose not to target specific segments of the population, such as millennials, preferring instead to create appealing and valuable content.

> It's not that I have a specific strategy for targeting a specific demographic. I think it's best to think of, rather than to think of putting people into categories, I think the whole notion of, and this is no reflection on your research, this is a personal opinion based on 25 plus years in the world of nonprofits. So I think the whole notion of trying to engage any group is, I think it's fundamentally flawed… I think that it's much better to be willing and to be able to inspire people to be anthemic. And to tell stories, to be yourself, to be authentic. And to think of building equity with people's imaginations. So to spend time to focus on creating a relationship to build a connection (GB_H).

One SMP (RL_L) began informal conversations about increasing millennial engagement but had not put any strategies into place. Finally, BS_L had made no effort to specifically involve millennials and did not intend to initiate any.

Edutainment

Analysis of edutainment is somewhat limited, as a majority of the SMPs did not have prior experience with the concept of edutainment. Edutainment is specifically educational entertainment content, such as podcasts or videos. Given this definition,

SMP familiarity and use of edutainment can be divided into three categories: currently involved in producing edutainment, previously involved in producing edutainment, or never involved edutainment. Four SMPs (KB_H, JW_H, LC_M, TN_M) are currently involved in creating edutainment content and one created edutainment in the past (GB_H). Four had no involvement with edutainment (LS_H, BB_M, BS_L, RL_L).

For those who are currently involved with edutainment, they produced low input edutainment content. KB_H implemented a cell phone walking tour of Woodlands Garden. The other three SMPs involved in current edutainment projects described short video content available on YouTube or through Snapchat.

> We'll do short 30 second videos with the garden founder… little plant profiles, or how to prune things, or how to take care of your garden in the summer. And so trying to keep those [to] 30 seconds to a minute I guess (LC_M).

JW_H made a video from a recent event and made this available to the greater community via social media. "We did our first salve making workshop a couple weeks ago and that was filmed. And how to make salve was put into a two-minute video. And so…I will have more of those videos and stuff out there." This example demonstrates a low investment way to increase the reach of existing activities.

Pokémon Go – A Case Study

One example of an engaging, if not highly educational, game that successfully engaged millennials is Pokémon Go, a location-based augmented reality mobile phone game released in the summer of 2016 (Niantic, Inc.). Pokémon Go promotion, or lack thereof, provides a window into public gardens' social media strategies and a way to compare these strategies to larger trends in social media use. The location-based game can be used to illustrate the concepts and strategies discussed in the interviews.

The success of Pokémon Go relied heavily on social media promotion and was released about three months before the SMP interviews . Seven of the nine organizations actively promoted Pokémon Go in their gardens via social media platforms, focusing on Facebook. Of these seven, two were active at a very high level (LS_H, JW_H) and felt that this promotion was successful based on social media and visitation responses. To be highly active these SMPs posted more than 5 times, provided resources to encourage players, hosted or promoted Pokémon Go events, and continued to promote Pokémon Go over several months. LS_H described her experience with Pokémon Go at Myriad Gardens in downtown Oklahoma City positively.

> We had fun with the Pokémon Go craze…we'll catch things inside of our Crystal Bridge like Rattata [a specific Pokémon]. We have 13 Pokémon stops in our garden. So we were taken over in the summer time. It was fun.

Similarly, JW_H of the University of Central Florida Arboretum spoke positively about Pokémon Go, describing several social media-promoted events focused on Pokémon Go during the summer and fall of 2016.

> We'll do a plant give away for example and we'll put the table right next to the PokéStop so things [Pokémon] were just being picked up with ease. And we did a movie in the park event where we showed Pokémon: The First Movie. We had lures happening all day for that as well… And that was the most successful movie we've shown…so that was a great, to us all, success of combining social media usage and that marketing promotion to really bring folks out to us. Because the hype was happening, and honestly if I waited until the fall…it wouldn't have been that successful.

Other organizations promoted Pokémon Go but were less active (KB_H, GB_H, TN_M, BB_M, RL_L) with only several posts encouraging the social media community to visit and catch Pokémon. SMPs described the low investment of participation saying; “I don't know that we got a whole lot of feedback or interest from it. But I mean I'm all

for it as long as it's a positive thing" (KB_H) and "it was a very low investment…and you know, nothing ventured nothing gained" (RL_L).

SMPs mentioned increased and diversified visitation as positive effects of Pokémon Go in their gardens along with some limited negative effects like inappropriate access (e.g. off limits locations and outside of operating hours) and some negative reactions on social media. GB_H said, "we used it [Pokémon Go] to our advantage and…for a couple of weeks we saw upticks in admissions" and mentioned the potential to attract a different kind of visitor saying, "There's a scope here to attract a non-garden, non-arboretum, non-walking-in-the woods kind of visitor." JW_H described a similar trend saying, "it definitely brought a lot more folks out to us." While this trend did seem especially appealing to millennial audiences, LS_H describes Pokémon Go visitors at the garden by saying, "I've seen all ages playing it too. I mean I had some women, probably in their forties, maybe fifties, and they were…going 'Oh I got it! I got it!'" Some SMPs relayed negative reactions but these were minimal compared to positive reactions they received. "We got a few complaints but we can't please everyone. But generally the response was fairly positive" (GB_H).

Millennial garden staff or garden staff's millennial family members often played a role in alerting other staff to the trend of Pokémon Go and explaining the game. LS_H described the value of both her millennial colleague and a quick response to the trend saying:

> So I had to get a quick education. And fortunately I do work with some very smart millennials. And…she just brought me up to speed on it all. She said 'I'm finally getting my boyfriend out to the gardens more.' And so we're like 'We've got to jump in on it.'

From the University of Delaware Botanic Garden, RL_L drew on the social media savvy of a millennial to take advantage of Pokémon Go. "We let another staff person's

daughter do it… [she] said ‘Why don't we do this?’ and I said ‘Hey, if you want to do it go right ahead’ and she did it.”

The release of Pokémon Go presented a different opportunity and challenge for public gardens, especially for the people involved in the organization’s social media message. The interviewed SMPs each approached decision making for the Pokémon Go trend in a different way, often without knowing how their community would perceive the game. RL_L described decision making by saying, “There was an argument ‘You got ‘em in the garden but what did that accomplish?’ Did they learn anything else besides the Pokémon game?” RL_L and his organization decided that promoting Pokémon Go was low effort enough that educational value was not as important. One SMP spoke about using the demonstrable popularity of the game to convince his supervisor that promotion was a worthwhile investment saying, “it’s the top selling app on both apple, at the apple store, and Google, and if you want to capture numbers we need to capitalize on it” (JW_H).

The release of Pokémon Go presented an interesting opportunity for SMPs looking to increase and diversify their typical audience, such as by engaging millennials. Reaction to Pokémon Go demonstrated a variety of digital and social media strategies in use at public gardens.

2.5 Discussion and Conclusions

The garden matrix was the first stage of research completed and it provided a snapshot of current practices in social media use by public horticulture organizations. The majority of observed organizations are employing some social media but there are distinct levels of activity on these platforms. Researchers believed these activity levels would be defined by several limiting factors common to nonprofit organizations:

number of staff, available time, budget, and low social media expertise (Durham, 2013; Hou & Lampe, 2015; Kanter & Fine, 2010), but this explanation was only partially supported by the interviews conducted with social media managers from selected organizations. High activity organizations spoke about more types of platforms and mentioned those platforms more frequently. High activity organizations also referenced more specific management strategies, especially analytics; these organizations were more likely to mention 'engagement' and discuss two-way communication. Low and medium activity level organizations spoke about the same topics but generally mentioned them less frequently. However, low and medium activity organizations were no more likely to discuss lack of time, resources, or social media savvy than their higher activity counterparts.

An important theme that emerged from the garden matrix research is the value of a consistent brand (Durham, 2013). While most organizations have clearly identifiable and consistent brands, it was sometimes challenging to learn about a specific organization's social media accounts because the organization used different names and imagery in different places.

Selecting one or more social media platforms is also an important step in creating an effective social media strategy (Johnston, 2015). Audience demographics, posting formats, and activity levels all contribute to platform selection. For nonprofit organizations generally, the top three platforms are Facebook, Twitter, and YouTube (Nonprofit Marketing Guide, 2016). For public gardens the top three platforms are Facebook, Instagram, and Twitter; YouTube is the sixth most used platform. Public gardens may be less interested in adopting video as a main form of communication because quality video requires a significant resource outlay. However, as effective

YouTube videos are often user-generated and lower quality (Burgess & Green, 2009; Shao, 2009), public garden leaders may not feel this style would be a good representation of their organizations.

For those public gardens that do use YouTube, there is a wide variety in frequency of use, with few organizations posting videos on a regular basis. Instagram use shows the most growth in nonprofit communications over the last five years but is already well established within the public garden community. Prevalence of Instagram may be because public gardens are aware of the strength of their visual content, and Instagram is a platform that relies almost completely on imagery. In the interviews with social media professionals (SMPs), Facebook, Instagram, and Twitter were the three most commonly mentioned platforms.

Platform selection is one important step in creating a strong social media strategy, but there are many other important elements. As the authors point out in The Networked Nonprofit, “tools will come and go but strategy sustains organizations” (Kanter & Fine, 2010). Social media management was an important theme from the SMP interviews. From this theme two unifying concepts were identified: (1) time management and motivation, and (2) trial and error. While the SMPs felt time management and scheduling were important issues, social media usage was truly defined by personal and organizational motivation. Only two of the SMPs interviewed were employed as full time communications professionals. They were all finding a balance between engaging in social media activities and tending to other responsibilities. Communication professionals in other nonprofit organizations express similar pressures and strategies (Nonprofit Marketing Guide, 2016).

For many interviewed SMPs, trial and error was an integral part of their social media management. Lack of success metrics and low understanding of social media analytics contributes to their reliance on trial and error. Many SMPs, even those from organizations with high OSMA scores felt they lacked social media savvy and were simply testing strategies hoping one would be successful; they seemed unsure of how to quantify that potential success. However, trial and error is actually an accepted and valuable part of social media strategy. Providing concrete success metrics, such as number of people reached or attendance for a post promoted only on social media, may give SMPs the support required to explain their needs and request additional support (Hou & Lampe, 2015; Kanter & Delahaye Paine, 2012), especially as many public garden SMPs do not have formal training in communications. These concepts were emphasized by SMPs' approaches to soliciting donations, using hashtags, and promoting Pokémon Go.

The second interview theme was social media posting styles. When considering the codes and interview responses from this theme, the results coalesce into the concept of a successful public garden social media voice, the 'knowledgeable friend'. This is in alignment with best practices from other nonprofits where experts describe the value of "a personable brand voice that helps supporters feel connected" (Johnston, 2015). The knowledgeable friend voice is defined by social media tone, post formats, informational content, and two-way communication. Public gardens want to be entities that add something to the conversation, posting about their missions and values, without appearing overbearing or losing the interest of their audience. In their interviews SMPs described social media tones that support the knowledgeable friend voice: personable, light, factual, and educational.

When considering posting style, public garden SMPs have to find a balance between mission-focused and revenue-generating posting. For a nonprofit, all generation of revenue ultimately contributes to advancing the organizational mission, but there is a distinction between posts that simply share mission-oriented organization, like an article about the benefits of using native plants from a native plant arboretum, and posts that are intended to generate revenue, like promotion of an upcoming event. The balance between mission-focused and revenue-generating posts can be examined in several ways. One method is to consider Shao's user motivations of consumption, participation, and content production (Shao, 2009). Another strategy is to evaluate audience engagement levels from happy bystanders, to spreaders, donors, evangelists, and eventually to instigators (Kanter & Fine, 2010). As users move along this engagement ladder, the SMP can rely more on their active engagement and contributions. Most interviewed SMPs appear to be finding this balance without formal evaluation of motivations or engagement levels. However, introducing more structure and scheduling of posts could decrease creative workload on the SMPs.

Two-way communication contributes significantly to the knowledgeable friend voice. This type of engagement is emphasized repeatedly in nonprofit social media literature along with the concept of 'listening' (Johnston, 2015; Kanter & Fine, 2010; Kaplan & Haenlein, 2010; Waters et al., 2009). Most public garden SMPs seem to be in alignment with nonprofit best practices of listening to their social media audience and responding quickly, both to positive comments and to concerns/complaints. However, SMPs are not yet moving their community farther up the engagement ladder. There is significant opportunity to increase community participation through

interactive posts and solicited user-generated content (Kanter & Fine, 2010; Saratovsky & Feldman, 2013).

Edutainment, where educational content is presented in an entertaining way, corresponds to the knowledgeable friend voice and may even offer deeper content experiences (Addis, 2005), but most SMPs were either completely uninvolved or only minimally involved with edutainment content at their organizations. This could be due to concerns about dilution of high culture by popular culture, or the idea that an emphasis on showy presentation will overshadow important content. These concerns have been documented among museum professionals who were hesitant about embracing edutainment and the increased role of technology at their institutions (Ballofet et al., 2014). Many visitors to public gardens value interaction with nature and a respite from technology, which may be disrupted by virtual or augmented reality experiences. SMPs expressed a similar concern during discussions about Pokémon Go promotion. Pokémon Go does not purport to be edutainment, though the company does discuss gamification of physical activity and exploring the world around us, but SMPs are unsure of what value Pokémon Go has for their visitors. As public gardens consider adopting edutainment it may be important to demonstrate the deeper educational values inherent in true edutainment content, and consider ways to offer edutainment experiences without disrupting the overall experience of visiting a garden.

Understanding the social media community through demographics, engagement, and communication is an important step in creating, modifying, or maintaining a successful social media strategy (Hou & Lampe, 2015; Johnston, 2015; Kanter & Fine, 2010). Because the majority of SMPs have not yet embraced the role

of analytics in their strategies, they are often unsure about current demographics and do not have methods of evaluation for tactics designed to engage a particular segment of the population, illustrated by a lack of millennial engagement strategies. Because millennials are highly visual (Matulich, Papp, & Haytko, 2008), they are predisposed to react well to the many images used by public garden SMPs but public gardens are not going further to build positive reaction into engagement. Increased in-person visitation appears to be an implicit goal of growing the social media community; however, there is as yet little data to support this strategy, offering a valuable opportunity for future investigation.

This research shows that many public garden SMPs are following general best practice guidelines established for nonprofit social media use such as, platform selection, posting frequency, post formats, social media voice, and two-way communication. However, their lack of measurement strategy limits their ability to appraise the success of individual tactics; SMPs can potentially increase efficiency and efficacy with greater evaluation of their social media efforts. The next chapter investigates millennials, the way they have previously interacted with public gardens, and how they want to interact with public gardens in the future.

Chapter 3

USER RESEARCH: SURVEY OF MILLENNIALS

3.1 Introduction

This chapter investigates millennials and their interactions with public gardens. Between a pilot study and the finalized survey, the researchers surveyed almost 1,000 millennials. They used research about millennial preferences for cultural institutions, desired communication strategies, and marketing theory to guide creation of a survey, "Millennials Connecting to Public Gardens". Millennials reported their past interactions with public gardens and how they would like to interact with public gardens in the future, both on social media and through edutainment content. They also responded to questions with the level of importance (e.g., importance of social media content format) and strength of agreement questions (e.g., positive agreement with online interaction) to help public gardens' marketing staff prioritize their social media tactics. Millenials overwhelmingly expressed interest in public gardens and showed significant potential for future interaction, both online and in person. Millennials are particularly interested in public gardens for the chance to spend time in nature, take photos, and attend special events.

3.2 Literature Review

3.2.1 Defining Millennials

Millennials (also referred to as Gen Y) are most often defined as those born between 1982 and 2000. This generation is educated and diverse but came of age in a particularly challenging economic time, which has impacted job availability and attitudes about saving money (Howe & Strauss, 2000; The Council of Economic Advisers, 2014). With roughly 75.4 million individuals, millennials are the largest living generation in the United States and are expected to expand with an influx of young immigrants (Fry, 2016). Immigration contributes to the racial diversity of millennials, who are 44.2% non-white. This is 5.7% more diverse than those aged 35 to 54 (38.5% non-white) and 19.2% more diverse than those aged 55 and over (25.0% non-white) (Frey, 2016). Millennials are the first digitally native generation; they grew up with computers in the home, ubiquitous cell phones, and experienced the rise of the smartphone (Prensky, 2001). Members of the millennial generation value community both online and in the physical world, a characteristic exemplified by close relationships with their parents (The Council of Economic Advisers, 2014). Millennials are less likely to have children when compared with previous generations at the same age, perhaps because 47% are still living with their parents or other family members (Taylor & Keeter, 2010). Millennials are socially conscious and more likely to search for and be satisfied by work they consider meaningful (DeVaney, 2015). Millennials are charitable; they give of both their time and money, but their donation actions are often defined by a spirit of impulsivity, focused on social pressures and convenience (Saratovsky & Feldman, 2013).

In spite of these research findings and discussion referring to the millennial generation, only 40% of millennials identify with this label (Doherty, Kiley, & Jameson, 2015). A poll conducted on abc.com in 1997 found that millennial was the most popular name to describe the generation; however, the second most popular choice was to have no generation label at all (Howe & Strauss, 2000). This attitude may be attributable to the wide range of people and ages included within the millennial generation, or to the pejorative use of the term "millennials" in the media (Stein, 2013). The youngest millennials are in high school while older millennials have established families. Researchers evaluate not only the ways millennials differ from other generations, but also the ways millennials themselves are varied (Taylor & Keeter, 2010). As such, it is important to consider this within-generation diversity when designing a program intended to reach millenials.

3.2.2 Perceptions of Millennials

When one crafts a strategy designed to engage a segment of the population, perceptions of that segment may have as much influence on the design as the statistics and facts described above. The media often presents negative images of millennials, especially in headlines, even if the articles go on to temper that negativity (Hansen & Spaeth, 2013; Lyshon, 2016; Stein, 2013). An article from Time Magazine, "The ME ME ME Generation" exemplifies this phenomenon. The author begins by presenting negative stereotypes about millennials reinforced by data including: narcissism, stunted development, laziness, and technology addiction (Stein, 2013). However, every generation sees negative qualities in the following generation, qualities that can often be linked to consistent characteristics of youth instead of generational differences (Reeve, 2013). In his article, Stein goes on not only to offer alternative

interpretations of his original facts but also to include positive attributes particular to millennials. He describes people who value experiences over material goods, are accepting of differences, maintain optimism through challenges, and are financially responsible (Stein, 2013). For this reason, it is critical to look deeper than stereotypical preconceptions of any population subset, in this case the millennial generation, when considering them as a target audience, consumer, or learner.

3.2.3 Digitally Native Generation

Technology changes the way *everyone* engages with the world; millennials simply demonstrate this change at higher rates and in more extreme ways. Millennials are digital natives, that is, "native speakers of the digital language of computers, video games and the Internet" (Prensky, 2001). When asked what makes their generation unique, millennials primarily identified 'technology use', and a majority, 74%, feel technology makes their lives easier rather than more complicated (Taylor & Keeter, 2010). In 2015, 86% of 18 to 29 year olds owned smart phones, compared to 68% of the average adult population (Anderson, 2015).

Not only do millennials own devices at a higher rate, they are also more likely to spend significant time connected to the Internet on those devices. As seen in Figure 3.1, 51% of millennials say they are either 'almost always' or 'mostly' online and connected, while only 10% say they are 'almost always' or 'mostly' offline (American Press Institute, 2015). Additionally, 51% of millennials spend 'nearly all' or 'most' of their online time using a smartphone (Fluent, 2016). Technology stakeholders (e.g. media researchers, tech CEOs, and communications experts) are essentially evenly split about whether millennials' constant connections will eventually be net positive (wide information availability, multi-tasking, nimble problem-solving) or net negative

(short attention spans, lack of face-to-face social skills, and internet dependency) (Anderson & Raine, 2012). Three smartphone features more popular with millennials than with older users include, "social networking, watching video, and listening to music or podcasts" (Smith & Page, 2015). As they are engaging with more smartphone features, rates of wireless Internet connection reflect millennials behavior. Considering all millennials, 62% of millennials connected to the internet wirelessly when away from home or work in 2010 (Taylor & Keeter, 2010). Further, some millennials, 15%, are completely dependent on smartphones for their Internet connections. Smartphone dependence is even more evident in ethnic minority groups with 12% of African American and 13% of Latinx (Padilla, 2016) relying on their smartphone for Internet connectivity, as compared to white (4%) (Smith & Page, 2015).

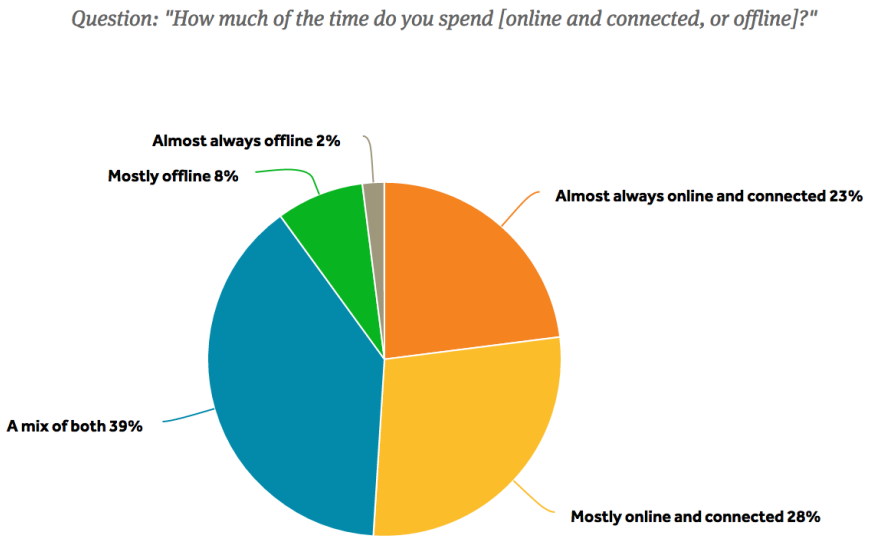


Figure 3.1: Percent of time spent online by millennials (American Press Institute, 2015)

3.2.4 Social Media Use by Millennials

The millennial generation truly does everything online; the generation "actively contributes, shares, searches for and consumes content – plus works and plays – on social media platforms" (Bolton et al., 2013). In 2008, 75% of millennials were using social media and that number has only continued to grow (Taylor & Keeter, 2010). In 2016, 88% of online adults aged 18 to 29 were using Facebook, 59% using Instagram, and 36% using Twitter (Greenwood et al., 2016). Among millennials, social media is the most common source for lifestyle information such as health and fitness, entertainment, and arts and culture (American Press Institute, 2015). Of average adults only 7% have posted a video of themselves online, but for millennials, this number is much higher at 20% (Taylor & Keeter, 2010). In fact, social media use among millennials has become so ubiquitous and frequent that researchers are exploring social media addiction and social media-linked depression within this population (Bright, Grau, & Kleiser, 2013; Steers, Wickham, & Acitelli, 2014).

Facebook is still millennials' most commonly used platform; 41% say they use Facebook everyday. But, other social media platforms are closing the gap. Percent of millennials using other platforms everyday are as follows: YouTube (35%), Instagram (29%), Snapchat (25%), Pinterest (17%), Twitter (17%), LinkedIn (13%) (Fluent, 2016). Millennial social media platform does vary by age group. As shown in Figure 3.2, the youngest millennials use every platform most frequently except Facebook, which is most often used by the oldest millennials (Fluent, 2016). Millennials are the most active demographic on YouTube, a site known for its participatory culture where users both make and consume content (Burgess & Green, 2009); 35% of millennials

say they use YouTube every day; and 12% of millennials say it is their most commonly used social media network (Fluent, 2016).

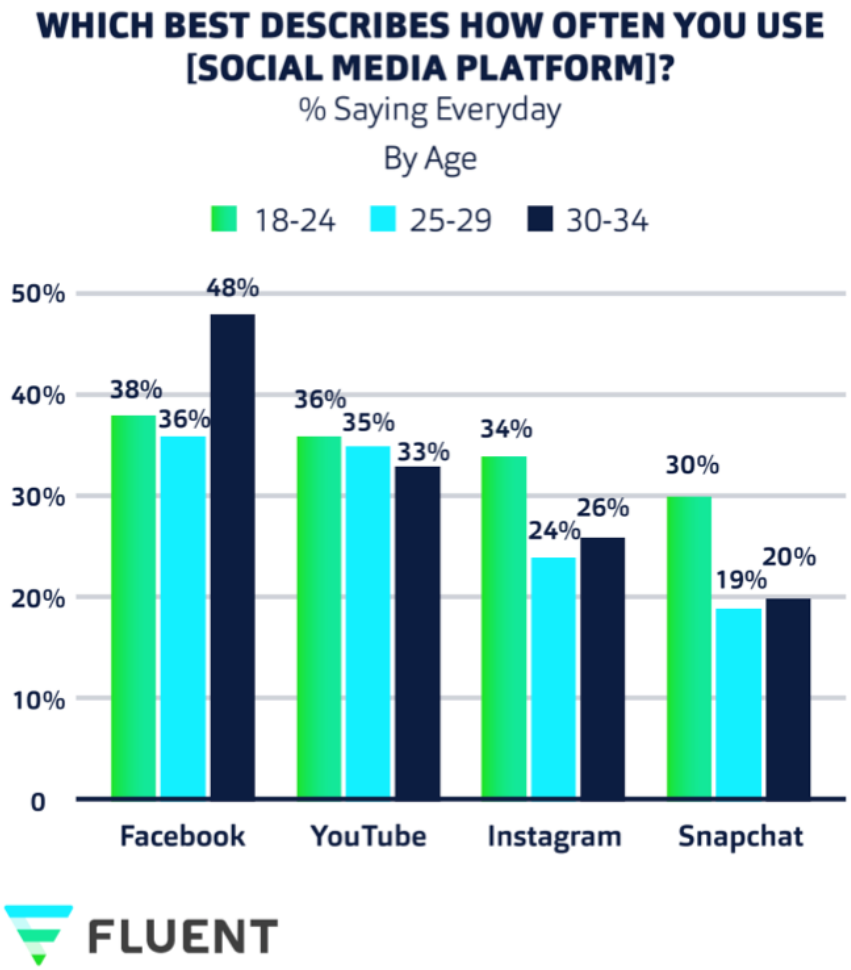


Figure 3.2: Percent of millennials who use Facebook, YouTube, Instagram, and Snapchat everyday, shown by age (Fluent, 2016)

3.2.5 Millennials and Edutainment

Millennials almost exclusively get news and entertainment from digital sources, and many get news from social media (Mitchell & Dana, 2015). Over the

course of millennials' lives, the costs of producing, distributing, and consuming digital content have fallen considerably (The Council of Economic Advisers, 2014). Most millennials, 87%, pay for at least one online subscription; 55% of millennials pay for digital video content like Netflix, 48% pay for music like Spotify, and 19% pay for audiobook subscriptions like Audible (American Press Institute, 2015).

Edutainment is particularly suited to millennial consumption due to the combination of digital availability, potential for mobility, and entertainment value. Approximately 50% of podcast listeners are in the millennial generation; 64% of the podcast audience listen on some type of portable media device; and 93% have a social media presence according to a 2015 survey (Edison Research, 2015).

Location-based games, augmented reality, and virtual reality comprise the newest sector of edutainment, blurring the lines between the physical world and game activities along a continuum between reality and virtuality (Milgram & Kishino, 1994). Location-based games, such as Pokémon Go, combine physical world locations with mobile game actions, and game dynamics can be defined for educational goals (Ahlqvist, 2017; Buchtova & Simkova, 2014). In augmented reality, computer graphics overlay the physical world, enhancing the game and education experience (Billinghurst, 2002). In virtual reality, users enter an artificial 3D environment created by computer stimuli. In-game activities are at least partially controlled by users physical world actions (Merriam-Webster, n.d.). Games and experiences at all points along the reality-virtuality continuum can have educational intent (Billinghurst, 2002; Buchtova & Simkova, 2014; Zyda, 2005). These experiences seem well suited to the digitally native generation, providing an interesting avenue for future research.

3.2.6 Chapter Plan

Previous research has evaluated millennial preferences for entertainment, news, shopping, dining, and communication. Millennial preferences for public gardens or public garden social media are unknown, a gap this research begins to fill. Because it is a new area of investigation, this research seeks to answer broad and open-ended questions about the connections between millennials and public gardens. As such, the researchers answer the following questions:

1. To what extent are millennials currently interacting with public gardens?
2. How do millennials want to interact with public gardens in the future?
3. How do millennials want to interact with public gardens on social media?
4. How do millennials want to consume public garden edutainment content?

3.3 Materials and Methods

To better understand millennial interactions with public gardens both in-person and through social media, researchers developed and distributed a web-based survey. They administered an initial pilot survey to 479 respondents through the first author's social media network and several professors at the University of Delaware. They revised the final survey based on the pilot administration by clarifying question wording, including additional response options, and asking more questions about social media preferences.

This study covers the outcome of the second survey administration, completed by approximately 500 millennials unconnected to the first author or to the University of Delaware. Researchers designed the survey in Qualtrics, and Lightspeed GMI, a digital data collection company, distributed it to participants. Participants received a

point-based incentive for completing the survey (22 market points based on the average survey completion time of 13 minutes).

The first five questions in the survey were screener questions to (1) ensure only millennials were taking the survey, and (2) balance the remaining participants across demographic categories consistent with national averages. Millennials are defined as people born between 1982 and 2000, who were between 16 and 34 at the time of this research. The sample includes people born between 1982 and 1998 to avoid including any participants under the age of 18. In addition to age, demographic screeners were: gender, region of the United States, yearly household income, and race/ethnicity. Survey respondents were deleted either if they completed the survey in less than 4 minutes (counts as a speed run) or if they responded to text entry questions with invalid responses such as "*vkljdlnaj*." The survey was available from September 14, 2016 to November 9, 2016.

The survey included multiple choice, check-all-that-apply, rating scales, built in logic questions, and open ended text entry to survey participants about their experiences and desires from public gardens and public garden social media. Full text of the survey can be found in Appendix D. The survey was organized into four blocks of questions. The first block, "Your Experience with Public Gardens," encompassed questions about past interactions with public gardens focusing on awareness and visitation. The first block also included a definition of public gardens and a link where participants could look up public gardens in their area. The second block, "Public Gardens Want to Connect with You!," asked about methods public gardens previously used to connect with millennials and how millennials might want to hear from public gardens in the future. The third block, "Public Gardens and Social Media," focused on

public garden social media use and which strategies on social media are most appealing to millennials. The final block, “Millennial Entertainment and Education Preferences,” surveyed millennials about their edutainment preferences pertaining to public gardens. Researchers categorized and coded all open-ended responses. The University of Delaware Human Subjects Institutional Review Board (IRB) was granted the survey “Exempt” status (see Appendix A).

Researchers used Stata 14.2 for statistical analyses including multiple linear and logistic regression, dependent sample *t* tests, and chi-square goodness of fit tests. With multiple linear regression, researchers estimated probabilities of outcomes when compared to reference groups. With multiple logistic regression, researchers estimated odds ratios of outcomes when compared to reference groups. An odds ratio (OR) is “the probability of an outcome occurring divided by the probability of the outcome not occurring” and is unbounded, that is not limited to between 0 and 1 (Liberman, 2005). It is important to note the difference between probability and odds ratios for interpreting effect size as odds ratio does not describe the change in probabilities, rather it describes the relationship between probability pairs (Liberman, 2005) With dependent samples *t* tests (or paired t-tests), researchers evaluate the differences between the means of dependent observations (UCLA IDRE, 2017). With chi-square goodness of fit tests, researchers determined whether sample data distributions were consistent with distributions predicted by the model.

3.4 Results

3.4.1 Sample Demographics

Using demographic screening questions, the survey software filtered respondents such that they were proportionally representative of the United States population. However, millennial demographics are not completely aligned with those norms. Table 3.1 presents the sample demographic characteristics with chi-square goodness of fit tests to illustrate similarities and differences between sample and national demographic proportions for millennials (Flemming, 2016; Pew Research Center, 2015).

Of the 495 respondents, there were significantly more respondents in the older age brackets [23-27 years (38.4%) and 28-32 years (36.4%)] than the youngest bracket [18-22 years (25.3%)] and significantly more women (55.8%) than men (44.2%). The majority of sample millennials reported an annual household income of $40,000 to $74,999, which includes the national mean for millennials of $61,000 (Pew Research Center, 2015). The sample percentage of white respondents (56.4%) is very similar to the national millennial average (57.0%), but, overall, the ethnicity distribution in the sample is significantly different from the national millennial distribution. It seems the sample might be slightly over representative of other/multiple ethnicities and slightly under representative of Latinx. Sample millennials are also significantly more highly educated than the national millennial averages. However, this is likely explained by the lack of millennials between 16 -18 in the sample due to consent restrictions. Similarly, there is a higher percentage of unemployed millennials in the sample, as opposed to students, which might also be explained by the age restriction that

eliminated two years in which millennials are highly likely to be students. Finally, the sample is representative of the national percentage of millennials with children.

Table 3.1: Sample demographics of respondents to millennial survey

Characteristic	**N**	**M (SD)**	***Freq.***	**%**	**Goodness of Fit** Exp. %[a]	χ^2 (df)	***p***
Age	495	25.42 (6.20)					
18-22 years			125	25.25	33.3		
23-27 years			190	38.38	33.3	14.85(2)	.001
28-32 years			180	36.36	33.3		
Gender	495						
Female			276	55.76	50.0	6.56(1)	.010
Male			219	44.24	50.0		
Annual Household Income	493						
Less than $20,000			82	16.63	25.0		
$20,000 to $39,999			116	23.53	25.0	24.46(3)	<.001
$40,000 to $74,999			154	31.24	25.0		
More than $75,000			141	28.60	25.0		
Ethnicity	495						
White			279	56.36	57.0		
Hispanic or Latinx			69	14.14	21.0		
Black or African Am.			56	11.31	13.0	61.30(3)	<.001
Other[b]			36	7.27	9.0		
Multiple			55	11.11			
Education	482						
Some HS/HS graduate			119	24.69	40.0		
Some college			114	23.65	35.5	192.43(2)	<.001
College degree +			168	34.85	24.5		
Graduate degree			81	16.80			
Have Children	480						
No			273	56.88	60.0	1.95(1)	.162
Yes			207	43.12	40.0		
Employment Status	482						
Employed			309	64.11	66.5		
Unemployed			92	19.09	7.0	118.11(2)	<.001
Student			81	16.80	26.5		

[a] Expected percentage based on millennials demographic composition. Age, gender, and income are assumed to equally distributed due to lack of accurate national statistics

[b] Other ethnicities include: Asian, American Indian, Alaska Native, Middle Eastern, North

African, Native Hawaiian, and Pacific Islander

3.4.2 Research Question 1: To what extent are millennials currently interacting with public gardens?

Not only did the majority of millennial respondents indicate they previously visited and interacted with public gardens to varying degrees, they also showed an affinity for activities available at public gardens. As shown in Table 3.2, there were significant differences in whether or not millennials previously visited a public garden, with just over half of millennials definitely remembering a previous visit (53.4%), just over one-third never having visited (34.8%), and the remaining millennials unsure (12.8%). Appendix Table D.1 presents these percentages by demographic subgroup.

One demographic subgroup (millennials with vs. without children) significantly predicted the likelihood of having visited a garden at the .001 level (Table D.2, see Appendix D for all regression tables). Holding all other subgroups equal, the odds of millennials having visited a garden were over twice as large for respondents who have children as for those who do not have children [β*(SE)* = 0.77(0.24), p = .001, Odds Ratio (OR) = 2.15].

Table 3.2: Variable Descriptives for RQ1: To what extent are millennials aware of and interacting with public gardens?

Variable	***N***	***M(SD)***	***Freq.***	***%***	χ^2 ***(df)***[a]	***p***
Visited a public garden?	494					
No			172	34.82		
Yes			259	52.43	117.14 (2)	<.001
Maybe			63	12.75		
If no, interested in visiting?	172					
No			30	17.44	72.93 (1)	<.001
Yes			142	82.56		

Freq. of public garden visits						
If visited = yes, no, maybe	496	1.32 (1.50)				
If visited = yes	259	2.53 (1.11)				
Desired activities	496					
Taking pictures			343	69.29		
Time with nature			331	66.87		
Children's/family events			210	42.42		
Seasonal exhibits			207	42.82		
Plant-based exhibits			199	40.20		
Performing arts events			175	35.35		
Taking a class			128	25.86		
Total Number of Activities		2.54 (1.53)				
Contacted by Public Garden	494	0.26 (0.44)				
No			365	73.94	112.74 (1)	<.001
Yes			129	26.06		
Contact Method	129					
Email (Yes)			78	60.47	233.06 (1)	<.001
Social Media (Yes)			85	65.89	214.27 (1)	<.001

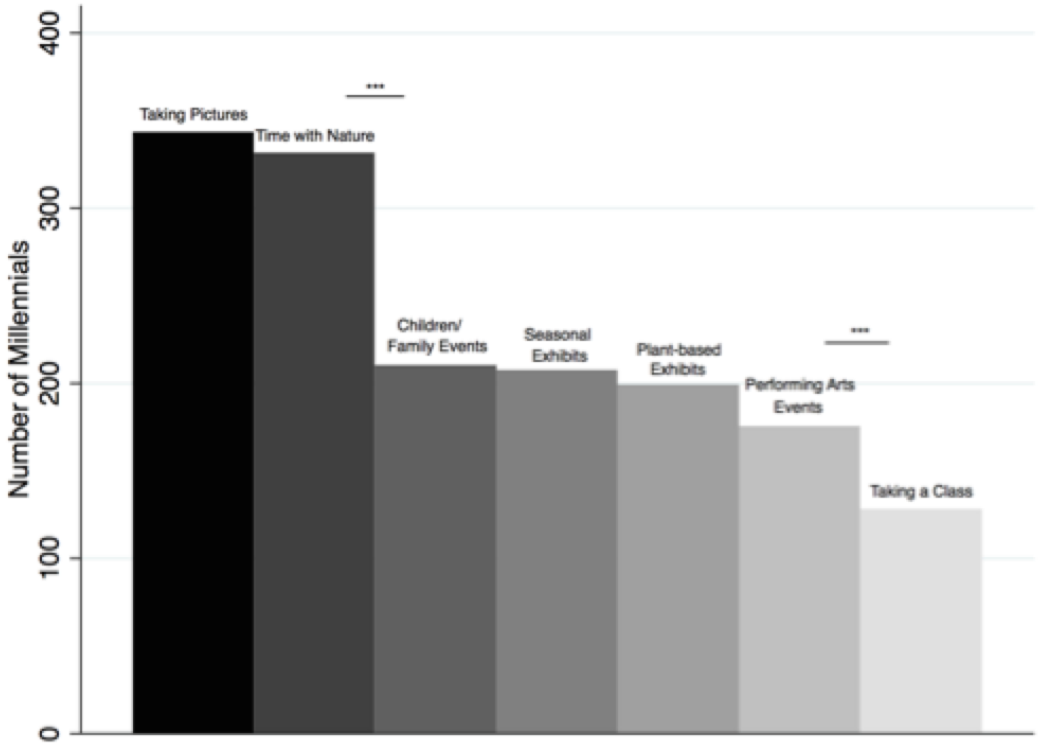
[a] Chi-square goodness of fit test

Of those who had not previously visited a public garden, significantly more millennials were interested in visiting in the future (82.5%) than not (See Table 3.2) Having children was significantly predictive of interest in future public garden visitation at the .01 level (Table D.2). Holding all other demographic subgroups constant, the odds of millennials being interested in visiting a garden were almost seven times as large for respondents who have children as for respondents without children [β*(SE)* = 1.90(0.61), p = .002, OR = 6.67].

Considering all respondents, millennials visit public gardens approximately less than once a year [*M(SD)* = 1.32 (1.50); 1 = *Less than once a year*]. However, considering only those respondents who had reported visiting a public garden at least once (*n* = 259), they visit public gardens approximately one to three times annually [*M(SD)* = 2.53 (1.11); 2 = *Once a year*, 3 = *2-3 times a year*].

Several demographic characteristics (gender, millennial with vs. without children, and income) were significantly predictive of the frequency with which millennials visit public gardens (Table D.3). Holding all other demographic variables equal, male millennials visited public garden significantly more often, almost one third more frequently, than female millennials [β *(SE)* = 0.29 (0.13), p = .032]. Millennials with children visited public gardens significantly more often, more than two thirds more frequently, than millennials without children [β *(SE)* = 0.63 (0.15), p <.001]. Millennials with an annual income over $75,000 visited public gardens significantly more often, almost two thirds more frequently, than millennials with an annual income less than $20,000 [$\beta$ *(SE)* = 0.60 (0.21), p = .004].

A majority of respondents found currently available public garden activities appealing (see Figure 3.3); 93.9% expressed interest in at least one suggested public garden activity, and 47.6% were interested in three or more activities. Respondents were interested in an average of 2.54 activities (*SD* = 1.53). Taking pictures (69.3%) or spending time with nature (66.9%) were the two most commonly selected activities, and taking a class (25.9%) was the least commonly selected option.



Note. *** $p < .001$

Figure 3.3: Responses to "Which specific public garden activities interest you or might interest you? (Select all that apply)"

Despite the fact that a majority of millennials previously visited public gardens (Table 3.2), significantly fewer were contacted by a public garden (26.1%). For those millennials (n = 129), social media (65.9%) and email (60.5%) were the most frequently reported contact methods.

3.4.3 Research Question 2: How do millennials want to interact with public gardens in the future?

Most millennials (83.9%) showed interest in hearing more about public gardens in their area (Table 3.3). Considering just those millennials who are interested

in hearing more, they would like to hear about public gardens approximately once a month [*M(SD)* = 3.90 (1.41); 4 = *Once every other week*]. However, this mean is a reflection of a bimodal distribution, and the two primary responses were *once per week* (3) and *once per month (5)*. This, along with the large standard deviation, suggests there is significant variation in the frequency with which millennials would like to hear from public gardens.

Table 3.3: Variable Descriptives for RQ2: How might millennials want to interact with public gardens in the future?

Variable	***N***	***M(SD)***	***Freq.***	**%**
Interested in Learning More	492			
No			79	16.06
Yes			413	83.94
Frequency of Desired Information				
If interested = yes or no	496	3.25 (1.95)		
If interested = yes	413	3.90 (1.41)		
Desired Information Methods	413			
Social media			256	61.99
Email			221	53.51
Television Advertisements			187	45.28
Online advertisements			171	41.40
Print			122	29.54
Radio Advertisements			104	25.18
Types of Desired Information	413			
Special Event			276	66.83
“What’s in Bloom?”			227	54.96
Home Gardening Tips			216	52.06
Promotional			215	52.57
Upcoming Classes and Workshops			189	45.76
Behind the Scenes Stories			143	34.62
Sustainability/Conversation			139	33.66
Why Not Interested in Information	78			
Too Busy			41	53.56
Uninterested in Public Gardens			13	16.67
Other			14	17.95
Both busy and uninterested			10	12.82

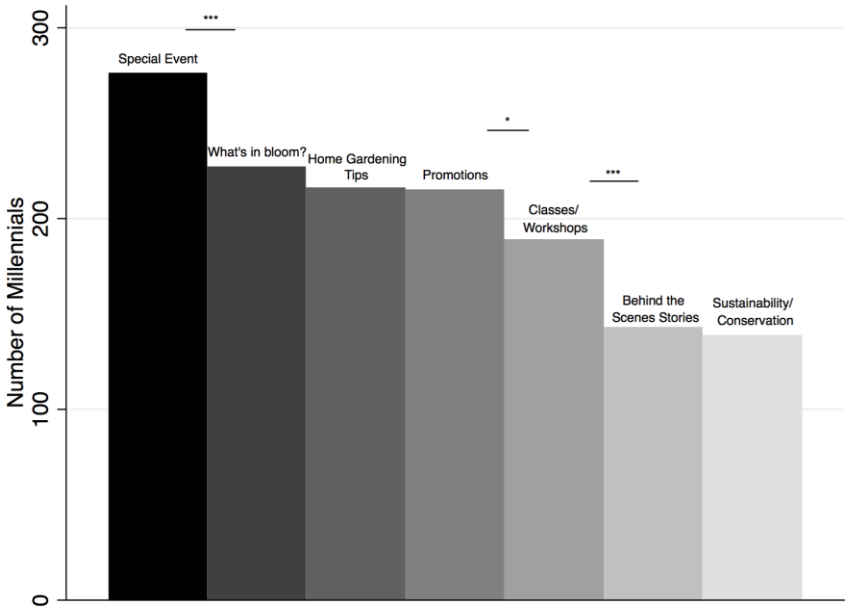
One demographic subgroup (millennials with vs. without children) significantly predicted the odds of being interested in learning more about public gardens at the .001 level (Table D.4). Holding all other subgroups equal, the odds of millennials being interested in learning more about a garden are almost three times as large for respondents with children as for respondents without children [β *(SE)* = 1.01 (0.31), p = .001, OR = 2.75].

Several demographic characteristics (gender, millennials with vs. without children, race/ethnicity) significantly predicted the frequency with which millennials want to hear from local public gardens (Table D.5). Holding all other demographic variables equal, male millennials as compared to female millennials [β *(SE)* = 0.77 (0.17), $p < .001$] and millennials with children as compared to those without [β *(SE)* = 0.85 (0.18), $p < .001$] desire significantly more frequent contact from public gardens.

The primary modes by which millennials would like to hear about public gardens were social media (62.0%) and email (53.5%), digital modes they are likely to use daily (Table 3.3). Demographic subgroups did not predict a preference for either of these information delivery modes (Table D.4). For millennials who were not interested in learning more about public gardens (n = 79), the most commonly cited reason was that they are too busy (53.6%).

Respondents selected all public garden information they would be interested in from a list of seven options (Table 3.3, Figure 3.4). Millennials showed substantial interest in the offered topics, with at least one third of millennial respondents expressing interest in each topic. The most popular topic, special event information, interested 66.8% of millennials, and the least popular topic, sustainability/conservation interested 33.7% of millennials. In answer to the open ended question, “What could a

local public garden do to encourage you to visit?" millennials most commonly said 'more events/exhibits,' 'increased advertisement,' and 'offer discounts' (Figure 3.5).



Note. *** $p < .001$ * $p < .05$

Figure 3.4: Number of millennial respondents interested in each of seven different types of public garden information (n = 413)

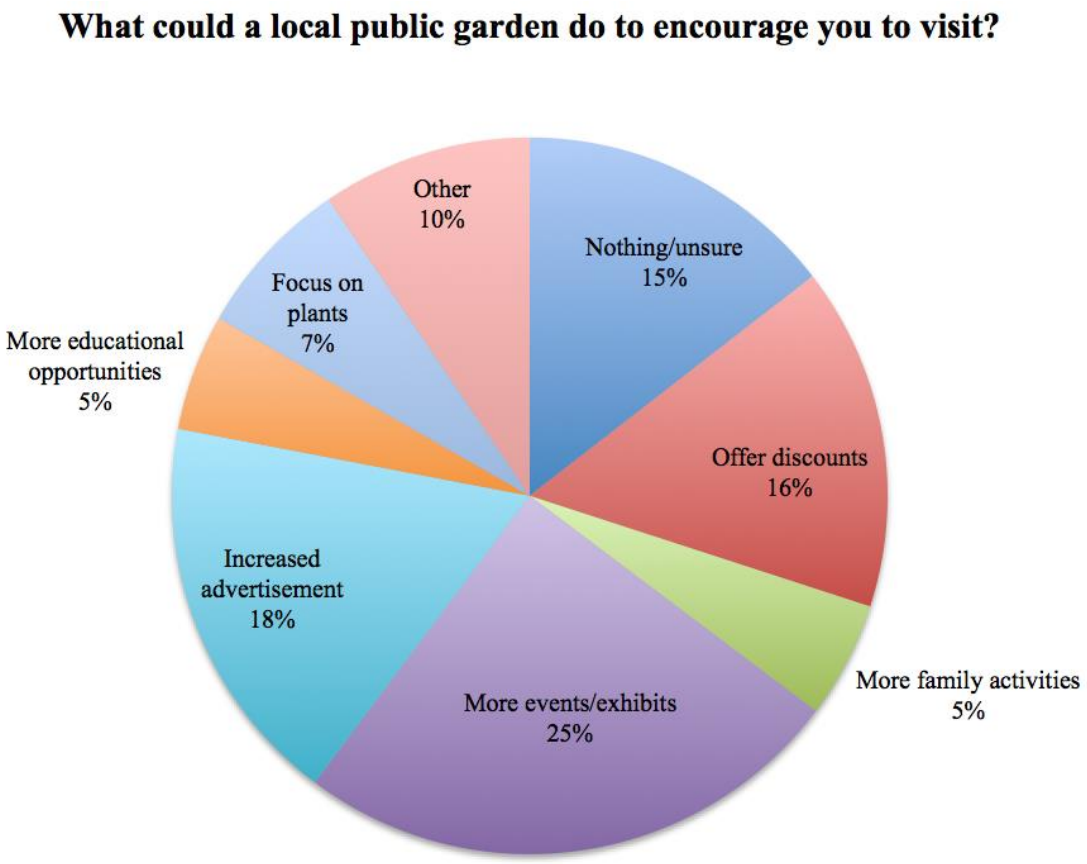


Figure 3.5: Strategies suggested by millennial respondents to increase visitation at public gardens (n = 390)

3.4.4 Research Question 3: How do millennials want to interact with public gardens on social media?

As discussed above, the largest percentage of millennials selected social media as a preferred mode for learning more about public gardens, and respondents expressed strong interest in social media. Assuming public gardens were using social media, the largest number of millennials identified Facebook as a preferred platform, (77.0%), followed by YouTube (51.6%), Instagram (49.6%), and Twitter (36.7%) (Respondents could choose all platforms that appealed; See Table 3.4). Figure 3.6

illustrates the progression of platforms, and that significantly more millennials identified Facebook as appealing than YouTube, the next most popular platform.

Table 3.4: Variable Descriptives RQ3: How do millennials want to interact specifically on social media?

Variable	***N***	***F***	**%**
Most Appealing Platforms	496		
Facebook		382	77.02
YouTube		256	51.61
Instagram		246	49.60
Twitter		182	36.69
Snapchat		136	27.42
Pinterest		130	26.21
Periscope		33	6.65
GrowIt		29	5.85
Posting Format	496		
Images		378	76.21
Video		268	54.03
Articles		222	44.76
Interactive Content		158	31.85
Infographics		134	27.02
Contests		130	26.21
List Posts		111	22.38
Personal Narratives		109	21.98
Social Media Tone	496		
Instructional		298	60.08
Thoughtful/Inspirational		257	51.81
Funny		230	46.37
Promotional		185	37.30
Conversational		165	33.27
Social media influence visitation?	484		
No		294	60.74
Yes		142	29.33
Maybe		48	9.92

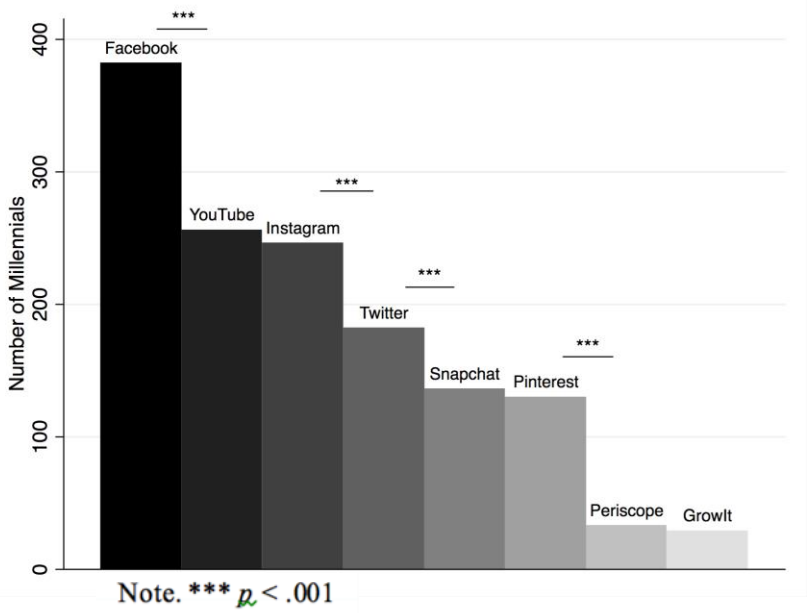


Figure 3.6: Number of millennials who find each social media platform appealing for use by public gardens

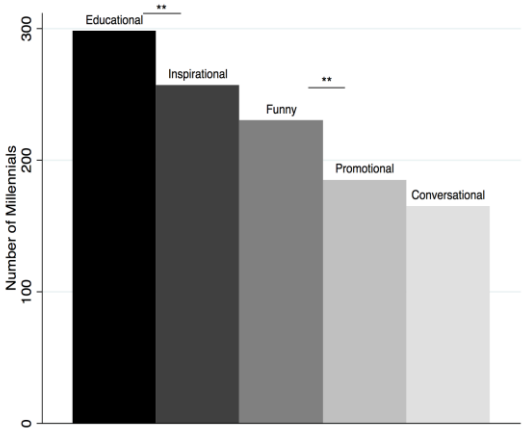
Several demographic subgroups significantly predicted the odds of millennials selecting Facebook (millennials with vs. without children, race/ethnicity, gender) or Twitter (gender) as an appealing platform at the .05 level (Table D.6). Holding all other subgroups equal, the odds of millennials finding Facebook appealing for public garden social media activity were more than twice as large for respondents with children as for respondents without children [β *(SE)* = 0.80 (0.26), p = .002, OR = 2.23], approximately twice as large for white respondents as for black/African American respondents [β *(SE)* = 0.73 (0.36), p = .039, OR = 2.06], and more than one and a half times as large for female respondents as for male respondents [β *(SE)* = 0.48 (0.23), p = .037, OR = 1.63]. The odds of millennials finding Twitter appealing for public garden social media activity were just over twice as large for male respondents as for female respondents [β *(SE)* = 0.74 (0.20), p < .001, OR = 2.08].

Two demographic subgroups (age and race/ethnicity) also significantly predicted the odds of finding Instagram appealing for public garden social media at the .05 level (Table D.7). Holding all other subgroups equal, the odds of millennials finding Instagram appealing for public garden social media activity were almost twice as large for respondents between 18 and 22 years old as for respondents between 23 and 27 years old [β *(SE)* = 0.55 (0.25), p = .028, OR = 1.73] and respondents between 28 and 32 years old [β *(SE)* = 0.53 (0.26), p = .040, OR = 1.70]. The odds of millennials finding Instagram appealing for public garden social media activity were about three times as large for white respondents as for respondents who identify as 'other race/ethnicity' [β *(SE)* = 1.11 (0.41), p = .006, OR = 3.05].

A number of demographic subgroups (gender, age, race/ethnicity, millennials with vs. without children) significantly predicted the odds of finding YouTube appealing for public garden social media at the .05 level (Table D.7). The odds of millennials finding YouTube appealing were almost three times as large for male respondents as for female respondents [β *(SE)* = 1.02 (0.20), p < .001, OR = 2.78] and were almost twice as large for respondents between 18 to 22 years old as for respondents between 23 to 27 years old [β *(SE)* = 0.63 (0.25), p = .013, OR = 1.87]. The odds of millennials finding YouTube appealing were more than twice as large for Hispanic/Latinx respondents [β *(SE)* = 0.87 (0.31), p = .006, OR = 2.38] and for respondents who identify with multiple ethnicities [β *(SE)* = 0.75 (0.32), p = .019, OR = 2.11] than for white respondents. The odds of millennials finding YouTube appealing were also more than twice as large for respondents with children as for respondents without children [β *(SE)* = 0.76 (0.21), p < .001, OR = 2.14].

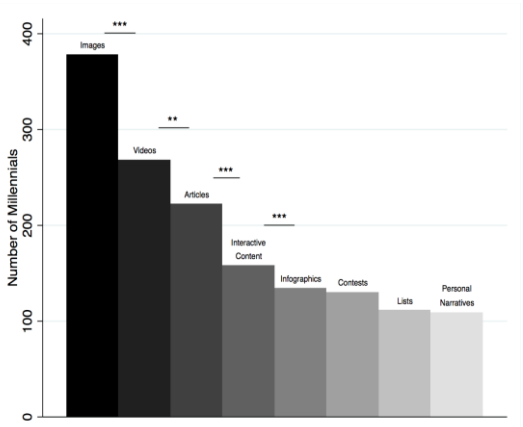
As shown in Figure 3.7 (A), the largest number of millennials were interested in either educational (60.1%) or inspirational (51.8%) social media tones. However, all social media tone options were selected by at least one third of respondents (Table 3.4). As shown in Figure 3.7 (B), there were significant differences in interest level for the five most popular post formats. Millennials were most interested in image posts (76.2%), followed by videos (54.0%), articles (44.8%), interactive content (31.2%), and infographics (27%).

(A) Social Media Tone



Note. ** $p < .01$

(B) Post Format



Note. *** $p < .001$ ** $p < .01$

Figure 3.7: Social media tones and (B) post formats in which millennial respondents are interested

Millennials consider social media tone and post format to be equally important. Both had average ratings between moderately and very important [tone: M(*SD*) = 3.85 (1.01); format: M(*SD*) = 3.71 (1.10); 3 =*moderately important*, 4 =*very important*]. There is a statistically significant difference suggesting millennials value tone over form of social media posts (*t(df)*= -4.00, *p* <.001), but the means are qualitatively very

similar (3.85 vs. 3.71 out of 5). The importance of social media tone and post format are also significantly positively associated. Holding all demographic subgroups equal and controlling for appeal of the four most appealing platforms, for every 1 standard deviation increase in importance of tone, importance of format increased 0.68 standard deviations, and for every 1 standard deviation increase in importance of format, importance of tone increased .70 standard deviations (Table D.8)

Table 3.5: Importance of or level of agreement with specific factors regarding millennials and public garden social media

Variable	***N***	***M(SD)***
Scale: 1 (not at all important) to 5 (extremely important)		
Posting Format	488	3.71 (1.10)
Social media tone	492	3.85 (1.01)
Special Discount	486	3.67 (1.17)
Previous Garden Visits	487	3.28 (1.32)
Planned Future Visit	487	3.78 (1.09)
Friends Following	487	2.93 (1.44)
Specific Platform	487	3.86 (1.17)
Desire to Find Out More	487	2.14 (1.09)
Scale: 1 (strongly disagree) to 7 (strongly agree)		
Desire Online Audience Interactions	487	
Yes		5.37 (1.32)
No		3.94 (1.92)
Desire Hashtags	487	
Yes		4.53 (1.73)
No		4.86 (1.61)
Desired Frequency of Social Media Activity	486	
Once a Day		4.65 (1.73)
Throughout the Year		5.44 (1.39)
Unfollow if Too Many Posts		4.59 (1.86)
Unfollow if Too Few Posts		4.01 (1.84)
Scale: 1 (definitely not) to 5 (definitely yes)		
Likelihood of donation	486	3.6 (1.08)

Holding all else equal (importance of post format, other platform appeal, and demographic subgroups), millennials who find Instagram appealing for public garden social media use perceive social media tone to be .13 standard deviations more important than those who do not. Millennials who find YouTube appealing perceive social media tone to be .12 standard deviations more important than those who do not, and millennials with children perceive social media tone to be .12 standard deviations more important than those without children (Table D.8).

Holding all else equal (importance of social media tone, other platform appeal, and demographic subgroups), millennials who find Twitter appealing for public garden social media activity perceive post format to be .21 standard deviations more important than those who do not and millennials who find YouTube appealing perceive post format to be .18 standard deviations more important than those who do not (Table D.8).

Given the choice between nonresponse and interaction from public gardens (e.g., commenting on a tagged post), millennials significantly prefer public gardens to interact with them via social media (Table 3.6). While there was a significant difference suggesting millennials prefer posts without hashtags to posts with hashtags, the response means are qualitatively similar (4.86 vs. 4.53 out of 7) such that the difference may not be substantively meaningful (Table 3.5).

Table 3.6: T-test comparing the means of interaction vs. nonresponse and having hashtags vs. not having hashtags

Variables	*t (df)*	*p*
Interact vs. Nonresponse	14.08 (486)	<.001
Yes hashtags vs. No hashtags	-3.04 (486)	.003

In answer to the open ended question, “How can public gardens encourage their social media followers to visit or attend an event at their site?” almost a quarter of respondents suggested public gardens should ‘offer promotions/prizes’ (Figure 3.8). Specific suggestions included: “post about free admission days,” “give discounts to followers,” and “have special events with prizes.” The second most common response category was ‘increased advertisement,’ followed by suggesting a change to the garden or garden events.

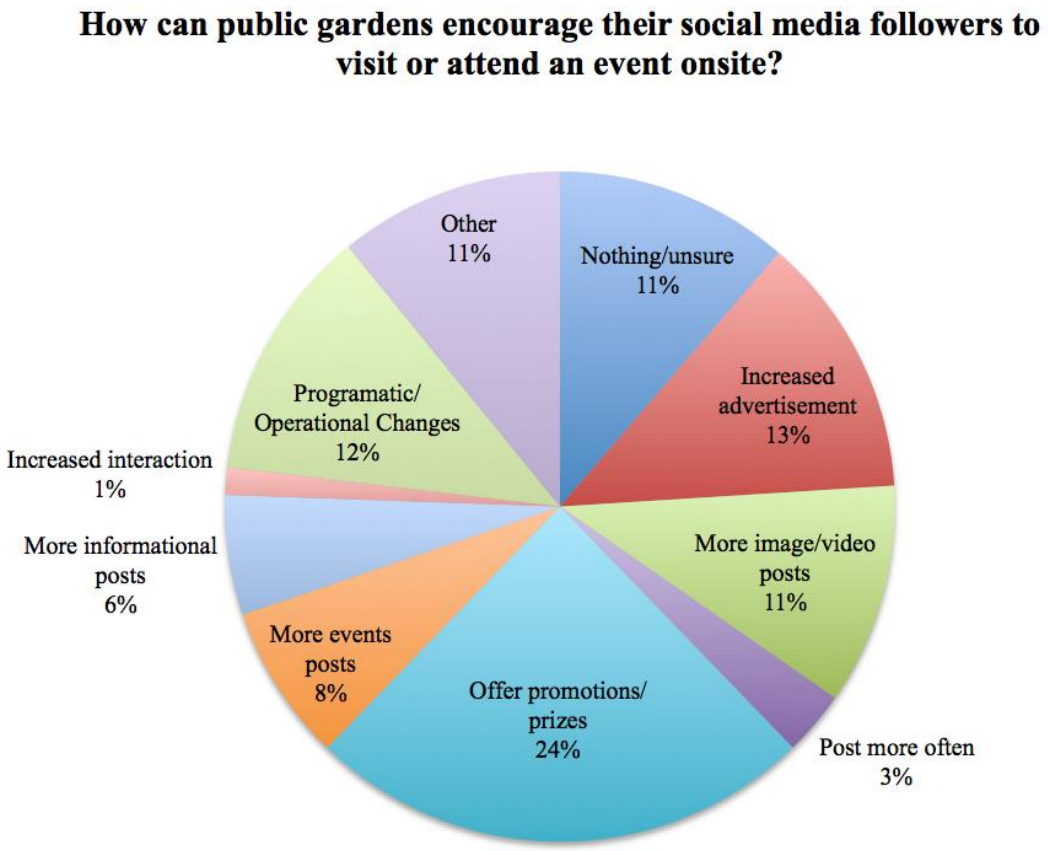


Figure 3.8: Strategies suggested by millennial respondents to encourage social media followers to visit or attend an event at the garden site (n = 490)

A majority of millennials would ‘probably’ or ‘definitely’ be willing to donate to a public garden through a social media campaign (55.5%). Almost a third are undecided about possibly donating (30.7%), and only 13.8% say they ‘probably’ or ‘definitely’ would not be willing to donate. Several demographic subgroups significantly predicted the odds of donation at the .05 level (Table D.9). Holding all other subgroups equal, including income brackets, the likelihood of the youngest millennials, between 18 and 22 years old, donating to a public garden due to a social

media campaign was .26 standard deviations higher than for millennials between 23 and 27 years old The likelihood of male millennials donating to a social media campaign was .31 standard deviations higher than that of females donating and the likelihood of millennials with children donating was .52 standard deviations higher than that of millennials without children. The likelihoods of millennials with a income levels of $40,000 to $74,999 and more than $75,000 were respectively .35 and .55 standard deviations higher than of millennials with an income level of less than $20,000.

3.4.5 Research Question 4: How might millennials want to consume public garden edutainment content?

A majority of millennials are interested in edutainment content from public gardens (86.7%) (Table 3.7). As shown in Figure 3.9, there were significant differences in interest level of different forms of edutainment. Millennials were most interested in YouTube edutainment (61.3%), followed by blogs (33.1%), location-based games (30.0%), augmented/virtual reality experiences (29.8%), and podcasts (19.0%).

Table 3.7: Variable Descriptives RQ4: How do millennials want to consume public garden edutainment content?

Variable	***N***	***Freq.***	***%***
Form of edutainment content	496		
YouTube Channel		304	61.29
Blog		164	33.06
Location Based Games		149	30.04
Augmented/Virtual Reality		148	29.84
Podcast		94	18.95
Other		10	2.02
Not Interested		66	13.31
Edutainment Topics	496		

Urban gardening	239	48.19
Gardens after dark	238	47.98
Activities for children	218	43.95
Farm to table movement	194	39.11
Sustainability/conservation	177	35.69
Other	6	1.21

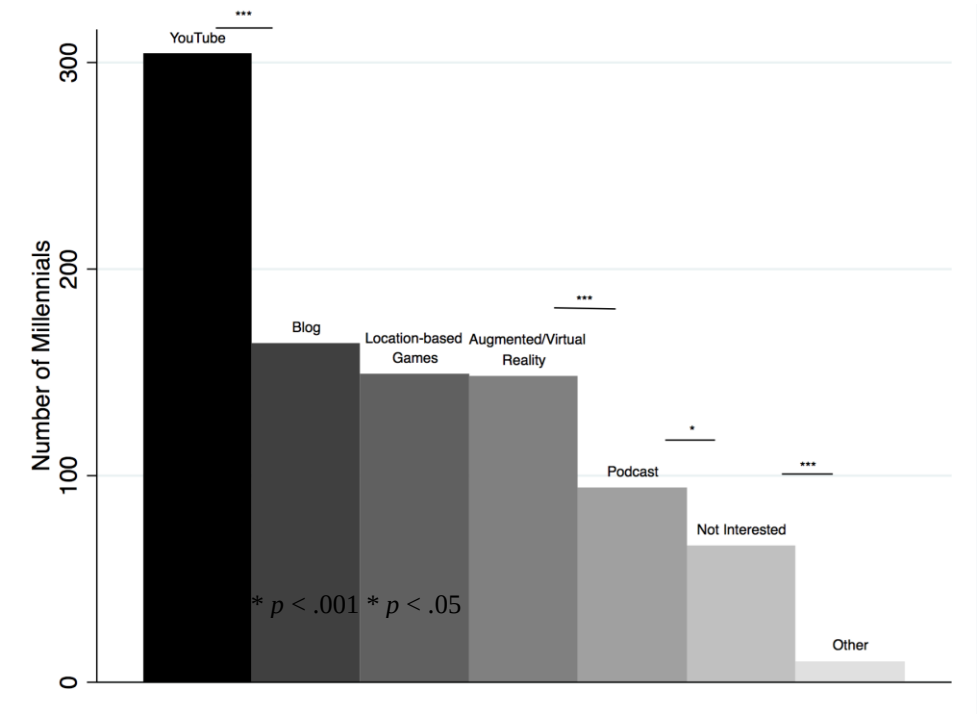


Figure 3.9: Millennial preferences for types of edutainment.

Millennials showed substantial interest in the suggested edutainment topics, with at least one third of millennial respondents expressing interest in each topic (Figure 3.10). The most popular topics were ‘urban gardening/community greening’ (48.2%) and ‘gardens after dark’ (48.0%).

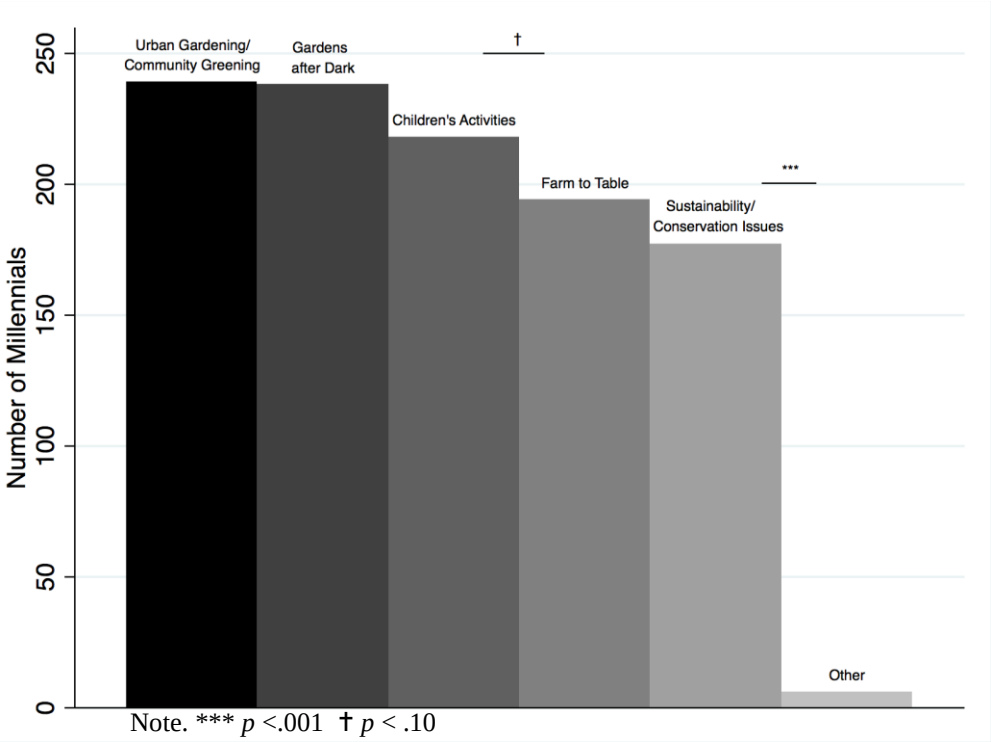


Figure 3.10: Millennial preferences for potential edutainment content.

A number of demographic subgroups (race/ethnicity, millennials with vs. without children, gender) significantly predicted interest levels in YouTube videos, blogs, and podcasts for public garden edutainment at the .05 level (Table D.10). Holding all other subgroups equal, the odds of millennials finding YouTube interesting for public garden edutainment were more than twice as large for male respondents as for female respondents [β *(SE)* = 0.87 (0.21), p < .001, OR = 2.39], more than twice as large for Hispanic/Latinx respondents as for white respondents [β *(SE)* = 0.73 (0.33), p = .024, OR = 2.08], and almost twice as large for respondents with children as for respondents without children [β *(SE)* = 0.59 (0.21), p = .005, OR = 1.80]. The odds of millennials finding blogs appealing for public garden edutainment

were more than one and a half times as large for respondents with children as for respondents without children [β *(SE)* = 0.46 (0.21), p = .028, OR = 1.59]. The odds of millennials finding podcasts appealing were approximately one and two thirds as large for male respondents as for female respondents [β *(SE)* = 0.50 (0.24), p = .037, OR = 1.64].

Demographic subgroups (age and millennials with vs. without children) also significantly predicted interest levels in location-based games and augmented/virtual reality at the .05 significance level (Table D.11). Holding all other subgroups equal, the odds of millennials finding location-based games interesting for public garden edutainment were almost twice as large for respondents between 23 and 27 years old as for respondents between 18 and 22 years old [β *(SE)* = 0.73 (0.33), p = .024, OR = 1.87]. The odds of millennials finding augmented/virtual reality experiences interesting were more than one and a half times as large for respondents with children as for respondents without children [β *(SE)* = 0.55 (0.21), p = .010, OR = 1.74], and for male respondents as for female respondents [β *(SE)* = 0.46 (0.21), p = .026, OR = 1.58].

3.5 Discussion and Conclusions

Throughout this analysis one demographic subgroup, millennials with children, stood out as a consistently significant predictor of millennial public garden interaction. Millennials with children were more likely to have previously interacted with gardens, showed greater interest in future interaction, and desired more frequent interaction than millennials without children. This effect was visible in every section of the survey from previous visitation, to social media preferences, and to edutainment; it should be considered as a valuable predictor and factor to interpretation throughout

these results. Another interesting result is that male millennials were more likely to have visited public gardens than female millennials and desired more frequent contact from public gardens. This contradicts both public garden social media analytics and commonly held wisdom about public garden visitor demographics (Table 2.6).

Additional demographic predictors were statistically significant for individual questions. he youngest millennials (between 18 and 22 years old) were more likely to donate money and preferred both Instagram and YouTube when compared to their older counterparts. Female millennials were more likely to select Facebook for public garden social media than male millennials. White millennials were more likely to select Facebook when compared to black/African American millennials and more likely to select Instagram when compared to millennials who identify with 'Other' ethnicities. Both Latinx millennials and millennials who identify with multiple ethnicities were more likely to select YouTube when compared to white millennials. The highest income millennials (> $75,000/year) visited more frequently and were more likely to donate when compared to the lowest income millennials (< $20,000/year). At the same time, it is important to note that there were no consistent racial or age-based trends from which broader conclusions can be drawn.

Most millennials had visited a public garden, and if they had not yet visited they were overwhelmingly interested in future visitation. It is interesting to note that millennial public garden visitation was more than an occasional visit with family every few years; millennials who had visited a garden visited between one and three times per year (Table D.1). Some public garden stakeholders have expressed concern that they will need to make programmatic changes in order to engage younger audiences. However, millennials showed interest in many activities public gardens

already offer, and most were interested in multiple activities (Figure 3.3). While millennials were interested in activities inherent to gardens such as spending time with nature and taking pictures, they were also interested in activities available at other cultural institutions, such as exhibits and events for children. It may be possible for public garden marketing strategies to capitalize on the inherent, unique elements of public gardens, such as horticultural features, to enhance visitation and event attendance.

A large majority of millennials are interested in learning more about their local public gardens (Table D.3), which suggests that desire, a crucial step of increasing millennial engagement, is already in place. Despite these high levels of interest, most millennials had not previously been contacted by a public garden, and they cited increased awareness as a primary driver of their potential future visitation (Figure 3.5). Millennial respondents showed the most interest in hearing from public gardens through social media and email. Both social media and email are opt-in forms of digital communication, where users can control their feeds or inboxes. This finding is supported by previous research showing millennial preferences for digital information sources (American Press Institute, 2015; Mitchell & Dana, 2015). Millennials showed less certainty in how often they want to hear from local public gardens. The two most common responses were "*once per week*" and "*once per month*." This bimodality may have arisen from a poorly worded question. There is a difference between the passive act of viewing public garden posts on social media and actually receiving email or other direct contact, which was not clearly delineated in the survey question.

These results illustrate the strong potential for public gardens to engage millennials through social media and provide information on how millennials want to

interact with public gardens through digital platforms. Each social media platform has its own style, audience, strengths and weaknesses. Millennials expressed the most interest in four platforms for public garden social media use: Facebook, YouTube, Instagram and Twitter (Table 3.4, Figure 3.6). These results are mostly in alignment with current rates of millennial platform use (Figure 3.2), which show that the most commonly used platforms are Facebook, YouTube, Instagram, and Snapchat. In both cases, Facebook is consistently the most commonly used platform. Interestingly, millennials expressed a preference for Twitter over Snapchat for public garden social media use. This discrepancy may be explained by Snapchat's popularity for personal communication with "close friends and family" as opposed to than communication with outside organizations (Piwek & Joinson, 2016).

Millennials showed the most interest in images, videos, and articles from public gardens. It is unsurprising that millennials showed a strong interest in images and videos; not only do millennials prefer visual representations (Matulich et al., 2008), but also gardens have many natural displays that are well-suited to visual depiction. Millennial interest in articles may offer an interesting opportunity to provide educational content outside of formal classes. Likely, millennials do not prioritize social media tone over format or vice versa. They found both to be important elements of public garden social media, and their importance was positively correlated such that an increase in perceived important of one predicts an increased in perceived importance of the other (Figure 3.7, Table 3.8).

Public garden marketing teams are interested in the conversion from social media follower to site visitation, event attendance, and membership (J. Fazekas & N. D'Addezzio, personal communication, July 19, 2016). Two open-ended questions

specifically addressed this issue. The first, “What could a local public garden do to encourage you to visit?” captured visitation drivers and deterrents for millennials. The top three response categories were: offer discounts, increase advertisement/awareness, and hold more events; both discounts and awareness can be addressed through social media. The second question, “How can public gardens encourage their social media followers to visit or attend an event at their site?” directly addresses the idea of conversion from follower to visitation. Again, millennial responses focused on discounts and advertisement, though there was less focus on events. The focus on advertisement and awareness may indicate that while millennials are interested in public gardens, they feel uninformed about the offerings of public gardens in their area. Social media strategies might offer an avenue by which to close this awareness gap.

Millennial respondents expressed a willingness to donate to public gardens through social media campaigns. This confirms results of previous research showing potential for millennial giving on social media (Saxton & Wang, 2014) and offers opportunities for public garden fundraisers. The demographic subgroup predictors of potential for public garden donation were especially interesting. The youngest millennials showed the greatest interest in donating and higher income level was only a little over a third to two thirds more likely to predict interest in donation (Table 3.10), perhaps indicating that giving potential may be more about levels of interest and connection than financial capacity (Saxton & Wang, 2014).

Throughout the survey responses, millennials expressed a desire for educational opportunities (Figure 3.5) but not necessarily for taking a class (Table D.1). Edutainment provides a balance of learning and entertainment, without the

formal structure of classes or coursework. Therefore, it is unsurprising that millennials showed a high level of interest in a variety of forms of edutainment (Figure 3.9). YouTube was their most preferred type of edutainment, which is reflected by millennial social media platform preferences. The second most popular form, blogs, is something already used by public gardens (Figure 2.2). Millennials also expressed interest in more emerging technologies including location-based games, augmented reality, and virtual reality. This suggests that for public gardens to capitalize on millennial edutainment, they need to remain open to new options and stay flexible, while balancing the onsite experience with the role of technology in the garden. Each public garden will have to make organizational decisions considering their goals pertaining to millennial engagement, visitor experience, available infrastructure, and internal capacity.

While these findings indicate potential for millennials to positively interact with and support public gardens, the lack of millennial awareness currently limits their interaction. In the next chapter, survey results are combined with nonprofit best practices and current public gardens social media strategies to suggest best practices for public gardens on social media.

Chapter 4

CONCLUSIONS AND BEST PRACTICES

4.1 Conclusions

This research combines nonprofit best practices, current public garden social media strategies, and millennial preferences for public garden social media interaction to develop an understanding of effective social media strategies for millennial engagement in public horticulture. Results show that millennials are interested in interacting with public gardens on social media, and that many current public garden social media practices fit with millennial interests. But there are areas for improvement and exploration of new strategies, particularly by developing clear social media management practices. There are also a variety of potential new tactics that public garden social media professionals (SMPs) can explore, such as fundraising on social media, incorporation of user-generated content, and edutainment for millennial engagement.

Throughout this analysis one demographic subgroup, millennials with children, stood out as a consistently significant predictor of millennial public garden interaction. Public garden SMPs should consider developing millennial engagement strategies centered on family and children's programming. Moreover, millennial men were more likely to have visited public gardens than millennial women and desired more frequent contact from public gardens, which is surprising considering current public garden social media demographics (Table 2.6). Additional demographic predictors, such as race/ethnicity and age, were only statistically significant for individual questions.

Given that there were no consistent racial or age-based trends from which broader conclusions can be drawn, SMPs should only focus on tailoring their engagement strategies in highly specific social media contexts.

Millennials, social media experts, and public garden social media professionals all agree that interaction is an important element of a successful social media strategy. Public garden SMPs are currently involved as listeners, and they regularly respond to direct questions or complaints. However, there is an opportunity to increase community interaction and participation; 31% of millennials are interested in interactive content on public garden social media. Interactive posts and user-generated content are two effective strategies to move social media followers along an engagement scale (Kanter & Fine, 2010; Saratovsky & Feldman, 2013). Using these tactics, public garden SMPs could move casual followers to content creators, mission spreaders, volunteers, and donors.

As SMPs consider different tactics to increase millennial engagement, it is important that they also consider their goals for millennial engagement. The SMPs interviewed for this research did not significantly discuss social media goals and did not seem to have any specific goals pertaining to millennial engagement. It is important to set millennial-specific goals and create evaluation metrics for social media strategies (Lua, 2017; WiredImpact, 2017). Goal setting and evaluation can help prioritize strategies when time and resources are limited.

Millennials expressed the most interest in four platforms: Facebook, YouTube, Instagram and Twitter. Millennial preferences for public garden social media platforms (Figure 3.6) mirror those most commonly used within the nonprofit community (Figure 1.3), particularly in terms of the overwhelming popularity of

Facebook. However, millennials selected YouTube as their second most desired platform, and only 30% of public gardens are using YouTube as part of their social media strategy (Figure 2.2). One potential explanation for this disconnect is that public garden leaders and marketers are concerned about the resources needed to produce video content, though YouTube is dominated by low-input user-generated content (Burgess & Green, 2009; Shao, 2009). It may also be that public garden social media professionals are concerned about the quality of user-generated materials and the potential for brand dilution, though user-generated content also has the power to strengthen a brand and help keep it relevant (Gensler, Völckner, Liu-Thompkins, & Wiertz, 2013).

Millennials showed the most interest in images, videos, and articles from public gardens. Public garden social media professionals discussed images and videos as the two most commonly used forms along with short, explanatory texts (Chapter 2, pg. 35), but did not discuss articles as a primary post format. It is important to understand that articles are a valued way for millennials to engage with public garden informational content, and this may be a particularly effective way to share mission-based educational content. Articles are also well suited to blog posts, the second most popular form of public garden edutainment for millennials.

This research presents compelling evidence for the value of social media fundraising, especially for millennial communities. Most millennials are open to donating money to a public garden through a social media campaign. Public garden SMPs have not yet focused on donation as a major element of their strategies, but giving infrastructure is in place on some social media platforms, like Facebook and YouTube. Within the nonprofit community, social media giving is an accepted and

valued technique. Social media fundraising offers the opportunity to share compelling stories and engage millennials (Kanter & Fine, 2010), giving them the chance to support the garden with small dollar donations. Because likelihood to give online is defined attention-getting projects, social pressures, and the convenience of casual, impulse donating, small organizations with engaged communities have a good chance of success (Saxton & Wang, 2014). And impulsively charitable millennials are well suited to giving under these conditions, particularly when they feel a connection to the cause or mission.

This work has also provided the groundwork for growth in public garden edutainment. As yet, there is little edutainment content being created by public gardens, but some SMPs expressed interest in exploring the possibilities. Millennials expressed a desire for educational opportunities but not necessarily for taking a class. Edutainment provides a balance of learning and entertainment, without the formal structure of classes or coursework. Millennials responded well to the idea of public garden edutainment, both in established forms like videos or podcasts and in emerging forms like augmented or virtual reality experiences. This suggests that for public gardens to capitalize on millennial edutainment, they need to remain open to new options and stay flexible, while balancing the onsite experience with the role of technology in the garden. Each public garden will have to make organizational decisions considering their goals pertaining to millennial engagement, visitor experience, available infrastructure, and internal capacity. When implemented thoughtfully, edutainment provides a valuable opportunity for public gardens to share mission based, educational content with digitally native millennials.

4.2 Social Media for Public Gardens Engaging Millennials

All the elements of this research including the literature review, garden matrix, public garden social media professional interviews, and millennials survey responses have been combined to develop some best practices for social media strategies to engage millennials in public gardens. As you develop your social media strategy and policy, write down as much as you can. A formalized plan will save you time and effort in the long run. This guide cannot possibly cover all the best practices but it will get you moving in the right direction. Good luck!

1. Set goals for millennial engagement
2. Know your audience – and help them become a community
3. Define and maintain a consistent brand
4. Carefully consider platform selection
5. Turn followers into visitors
6. Cultivate social media donors
7. Prioritize your efforts
8. Seek additional resources

Additional Info:

Consider subscribing to a social media management systems such as Hootsuite, Spout Social or Buffer. These programs can help with every aspect of social media use, from schedules and content guides to analytics and engagement. Management systems require a paid subscription but will likely help you save significantly in staff time.

4.2.1 Set goals for millennial engagement

Consider this: Why do you want to increase millennial engagement on social media? What goals will best support the community you described in step one? There are a lot of valid answers to this question but they may not be the same for all organizations. Carefully considering your organizational goals is an important first step to designing a successful millennial engagement strategy. It is also important to decide how you are going to quantify success so that you can evaluate your new strategies. Start with 'why' and move towards 'how.' Goals can be combined and customized to meet your organization's need. Examples of goals (and some measurement strategies) include (Kanter & Delahaye Paine, 2012; Lua, 2017; WiredImpact, 2017):

- Increase awareness of your garden among millennials
    - More millennial followers
    - Wider reach of social media posts
    - Increased numbers of mentions
- Increase engagement with your garden on social media
    - Increased shares
    - More likes and comments
- Build a strong millennial community
    - Increased communication between followers
    - More millennials volunteers
    - More millennial donors
- Engage your social media audience with the organization's mission
    - More likes, comments, and shares of mission-based posts
    - More millennial volunteers

- More millennial donors

Is one of your end goals to increase the number of millennial visitors, volunteers, and donors? Don't assume that more millennial social media followers means more millennial visitation at your garden. But the farther your millennial community moves along the engagement scale, there will be increases in awareness, interaction, and loyalty. Increased millennial visitation may be an important, stated goal of your social media plan, but increased visitation often occurs as a byproduct of the increased awareness and strengthened community (more on moving from followers to visitors later).

4.2.2 Know your audience – and help them become a community

Who is your millennial audience?

Get to know your existing millennial audience! Start by looking at the demographics of your social media audience. For some platforms, this information should be available through the platform's dashboard, such as Facebook's Insight page. Are millennials already engaging with your garden? Why? If they are not involved, ask them why not! Don't worry if you don't have the budget to conduct market research. You can reach out to other organizations in your area to ask about their experiences with millennials, or perhaps send out a survey. You can combine this with what we know about millennials and public gardens. Research suggests that there are some common barriers to millennial engagement with public gardens including price and awareness (Figures 3.5 and 3.8). Put together information gained during these steps to identify the different levels of opportunity for millennial engagement.

How do millennials want to engage with you on social media?

You can listen to and interact with your social media followers to help transform your millennial followers from an audience into a community (Brogan, 2009). Consider this ladder of engagement where your audience moves from happy bystanders all the way to instigators. Happy bystanders follow your garden on social media and like your posts, spreaders share your content via their networks, donors support your garden by giving time or money, evangelists spread the word and convince other to get involved, and instigators create their own content or initiate projects (Kanter & Fine, 2010). Where are your followers now? Where would you like them to be?

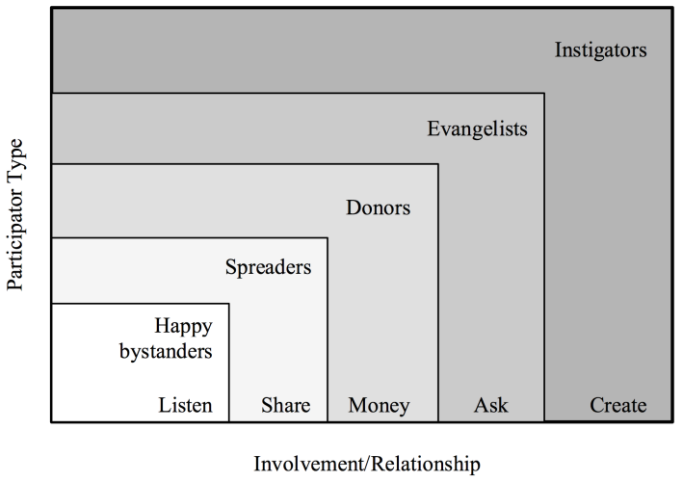


Figure 4.1: The Ladder of Engagement from *The Networked Nonprofit*, Copyright © 2010 by Beth Kanter. All rights reserved. (Kanter & Fine, 2010)

As you transition your followers along the engagement scale, it is important to listen to your audience. You should start to listen by observing the activity on your

social media pages. When you're ready to learn more, try asking your followers a question or posting a survey on your page. What elements of your garden are they most interested in? What would they like to learn more about? There are a lot of perceptions and assumptions about millennials – they may or may not be true for your community. Research has shown that millennials are particularly interested in learning about public garden events (Figure 3.4), but they are also interested in most of the topics public gardens already post about! Allowing millennials to participate in your garden's social media community, as content creators, will move them along the engagement scale.

What do millennials have to say about your organization?

You will likely receive some (but not much!) negative feedback. Before you find yourself in this situation, think through the eventualities and be prepared with creating a formalized moderation policy. This will help you respond to difficult situations and standardize interactions, which is particularly helpful if you have more than one person posting to social media. The moderation strategy should include types of comments you respond to, types of comments you do not respond to, time limits for responding, and procedures for deleting spam posts. A word of caution – delete comments with care; if you remove comments without just cause, you may create more problems than you solve (Britton, 2016).

So to recap:

1. Get to know your millennials
2. Listen to them and ask them questions
3. Solicit and encourage millennial interaction

4. Create and adhere to a moderation strategy

4.2.3 Define and maintain a consistent brand

Your garden should be easily identifiable on social media and should be represented by a consistent brand, consider unified brand elements and social media strategy (Durham, 2013). Start by evaluating your existing brand. Does it serve both the mission of your garden and the goals laid out by your social media strategy? If you determine that the brand should be updated:

1. It is important to unify under one name so your garden is easily searchable.
2. It is valuable to include social media icons on the garden's web page and have social media platforms linked together.
3. Using consistent logos, imagery, and voice across all platforms can contribute to brand recognition and strengthen your connections.

If your brand is in good shape, consider any further strategy development. For example, does your organization use hashtags? And if so, how are they used? Creating clear and consistent hashtags may encourage visitors to tag you in their posted content, increasing your potential audience.

Finally, record as much of this information as possible in written communication policies. For example, what tone do you take when engaging with or reacting to the social media audience?

4.2.4 Carefully consider platform selection

You don't need to create a presence on each new social media platform as it surfaces. There are several important questions to consider as you select your platforms. How many platforms can you consistently maintain an active presence on? What platforms does your target audience prefer? As of 2016, millennials prefer Facebook, YouTube, and Instagram for public garden social media, in that order (Figure 3.6). For each of the common platforms we will consider some of the top functions of the platform and suggested posting frequency.

Best practices for posting frequency vary widely based on industry, audience size, and social media goals. The frequencies posted here are a good starting point but should be adjusted based on your experiences. Remember, if you are posting interesting, high quality content, it is hard too post too often! In that case, let your posting frequency be guided by your garden's internal capacity (Campbell, 2016; Milligan, 2016).

Facebook: (Post 2 times per day, especially popular with millennial women and millennials with children)

Facebook is still by far the most popular platform for millennials (Figures 3.2 and 3.6), nonprofit organizations (Figure 1.3), and public gardens (Figure 2.2). If you only have the resources for one platform, Facebook is probably your best bet.

You should make use of Facebook's new page category: Public Garden. You can choose two additional categories to help define your organization, if desired. Don't underestimate the sway Facebook events, promotion, and sharing popularity have on millennial actions. Millennials are particularly interested in learning about public garden special events (Figure 3.4), so make use of the Facebook event pages!

Bonus Tip: If you are interested in video as a way to engage millennials, consider Facebook Live (https://live.fb.com/). Live streaming is easy, does not require intensive resources, and provides powerful connection opportunities.

YouTube: (Varied and based on goals, but be as consistent as possible, especially popular with millennial men and millennials with children)

Millennials chose YouTube as the second most popular platform for public garden social media use, and the platform provides an interesting option for public gardens looking to move users along the engagement scale from passive followers to more active content creators. However, it may require more resources to maintain control over an organizational brand when integrating user-generated content. There are two ways for millennials to interact with your organization on YouTube.

1. Users can watch content generated by the garden. In this case, millennials prefer added value content such as behind the scenes information and how-to videos.
2. Users can share their content they created. The garden could ask users to submit thirty-second videos talking about their favorite garden moment from the previous year and feature several of the videos on their YouTube channel.

Bonus Tip: Some of the most effective YouTube channels are centered on a dynamic spokesperson with a strong personality to represent the organization (Dearolph, 2014).

Public gardens can achieve this end by finding an engaging staff member or partnering with outside content creators.

Instagram: (Most days post once, sometimes post twice)

This is an easy one for public gardens! Gardens have lots of beautiful images they can post, and millennials connect well to the visual style of Instagram. Instagram is particularly useful for on the go posting from mobile devices and allows for spontaneous content. Hashtag use on Instagram offers the opportunity for millennials to share their own photos of events at public gardens.

For Example: Myriad Botanical Gardens uses event hashtags, like #PumpkinvilleOKC, to aggregate user photos taken at the garden.

Other Platforms

There are other social media platforms that may be suited to your garden's social media goals or to the millennials in your community. Here are a few possible other platforms and their most common uses:

- *Twitter: (12 or more tweets per day, especially popular with millennial men)* Twitter has a strong role in active events and is potentially useful for live-tweeting symposia or workshops.
- *Snapchat: (Varied and based on goals)* Snapchat is very popular with a younger audience, however, Snapchat is more suited to one-on-one communication with friends than the one-to-many communication

needed to communicate with a large community. Public gardens can make use of Snapchat through location or event specific filters.

- *Pinterest: (5 pins spread throughout the day)* Pinterest is particularly common in the bridal/wedding planning community. If your garden hosts a lot of weddings, this is a good platform to consider, but remember that users expect fresh content on a regular basis.

For Example: In some special situations, such as at a university garden with a mostly millennial audience, Snapchat can be effective for advertising events, recruiting volunteers, and sharing garden updates. At the UCF Arboretum, Snapchat is an integral part of their social media strategy for millennial engagement.

4.2.5 Turn followers into visitors

At this point in the process, you've learned about your audience, set some goals, evaluated your brand, and selected platforms. If one of your goals is to get millennials more actively engaged at your garden, you probably need to think about how to move your community from social media to in-person interactions.

Followers to Visitors:

1. Let the wonderful programming already available at your organization take the lead!
2. Play up aspects of that programming that appeal to a millennial audience such as children's events and photo opportunities.
3. Create a sense of urgency by focusing on limited-time activities like a particular blooming plant or a special exhibit.

4. Offer promotions for social media followers and contributors. For example, give people garden shop discounts if they follow the garden on Facebook and share a post with three people. Or offer future free admission to users who post videos to the garden's YouTube page.

Bonus Tip: Consider reaching out to popular local bloggers (Goddard, 2017). They may be willing to share a post from your garden or you can sponsor a post to promote an event, this will encourage visitors from your area to visit your garden!

4.2.6 Cultivate social media donors

Fundraising on social media is on the rise, and 86% of millennials would consider donating to a public garden through a social media campaign. Social media fundraising works for millennials because they tend to be both socially conscious and impulsive. To capitalize on millennial social consciousness you should make your appeal specific and include images, which evoke a more emotional reaction. To capitalize on millennial impulsivity, you need to make donating as easy as possible. Both Facebook and YouTube have charitable infrastructure available for registered nonprofit organizations in the form of 'Donate' buttons and overlays. As a potential first step, consider joining a national campaign for charitable giving, such as #GivingTuesday (Belfer Center for Innovation and Social Impact, 2017).

Even if your millennial audience is not ready to contribute financially to your organization, they may be able to give in other ways. For example, they can give of their time or expertise.

For Example: Mounts Botanic Garden offers the opportunity for followers to sponsor a foster child to attend a garden event.

4.2.7 Prioritize your efforts

This guide includes a framework of recommendations, designed to apply to a wide variety of public gardens and even other cultural institutions. As you're considering the limited resources you have available, here are some ways you can prioritize your efforts and choose which strategies you should focus on. Ask yourself some questions:

1. How many resources will this take? Is this the best way to accomplish my garden's goals or support my garden's mission? Not all strategies are right for all organizations. Evaluate your resources, consider your audience, and prioritize!
2. Do you have to do it now? Sometimes, it can be better to wait until a platform, tactic, or strategy has been better tested before investing your resources.
3. Is this something your community is asking for? Now that you have spent some time listening to your community, consider their needs and desires.
4. It is okay to try something, fail, and move on! Trial and error, failing forward, or agile design (Merritt, 2017) are all perfectly valid elements of a social media strategy. When you implement a new tactic, set a date to evaluate your success. If the tactic is not helping you achieve your stated goals, it is okay to move on to something new.

4.2.8 Seek additional resources

The world of social and digital media is large and constantly evolving. If this guide has not answered your questions, you may want to review some additional resources. There are many fantastic blogs and books to help answer every type of question!

- *The Networked Nonprofit* (Kanter & Fine, 2010), *Measuring the Networked Nonprofit* (Kanter & Delahaye Paine, 2012), and Beth Kanter's Blog (http://www.bethkanter.org/)
- *Cause for Change: The Why and How of Nonprofit Millennial Engagement* (Saratovsky & Feldman, 2013)
- *Brandraising* (Durham, 2013)

4.3 Limitations and future research

There are several limitations to interpreting the results of this study. Both examined populations, public gardens and millennials, are diverse and highly varied. Public gardens vary by size, visitation, budget, mission, goals, and much more. Researchers investigated only a small portion of public gardens, 100 for the matrix and 9 in surveys, and used that portion to extrapolate public garden social media activities. The millennial population was well represented by the survey sample, but online survey responses have inherent limitations. For example, online surveys do not capture responses from members of the population without Internet access (Ilieva, Baron, & Healey, 2002). Survey results are also limited by social desirability and acquiescence response biases (Lavrakas, 2008; Lewis-Beck, Bryman, & Futing Liao, 2004). Additionally, little research has been conducted on public gardens. As such, researchers were limited to broader evaluations of research questions instead of

specific hypothesis testing. Future research could focus on the demographic complexity of millennials, perhaps with studies designed to examine gender and race differences in public garden engagement.

There are several additional exciting opportunities for future research suggested by this project. First, future studies should further evaluate the conversion process from social media follower to visitation of a public garden, perhaps examining strategies to increase millennial awareness of local public gardens. One possibility would be to use the results of this research to develop hypothetical strategies for millennial social media outreach, then conduct experimental studies to test if the hypotheses are supported by millennial responses. Another option is to evaluate millennial edutainment and social media fundraising strategies. Researchers could examine edutainment that has been successful in other cultural nonprofits and apply those lessons to develop millennial edutainment content. As an element of edutainment strategies, research could investigate the use of YouTube videos for millennial engagement in public horticulture. Researchers could also conduct a survey to explore factors determining the likelihood of millennials donating to public gardens through a social media campaign, and use the results of that survey to create several pilot programs for public garden social media fundraising.

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Appendix A

IRB DOCUMENTATION

This research was granted “Exempt” status by the University of Delaware Institutional Review Board (IRB). This appendix contains the original project exemption letter and two approvals for updates to the project.

A.1 Initial project exemption letter

DATE:	February 22, 2016
TO:	Elizabeth Barton, MS
FROM:	University of Delaware IRB
STUDY TITLE:	[872733-1] Millennials Connecting to Public Gardens
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	February 22, 2016
REVIEW CATEGORY:	Exemption category # *(2)*

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.

A.2 First project modification letter - exempt

DATE:	June 16, 2016
TO:	Elizabeth Barton, MS
FROM:	University of Delaware IRB
STUDY TITLE:	[872733-2] Millennials Connecting to Public Gardens
SUBMISSION TYPE:	Amendment/Modification
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	June 16, 2016
REVIEW CATEGORY:	Exemption category # *(2)*

Thank you for your submission of Amendment/Modification materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.

A.3 Second project modification letter - exempt

DATE:	October 17, 2016
TO:	Elizabeth Barton, MS
FROM:	University of Delaware IRB
STUDY TITLE:	[872733-3] Millennials Connecting to Public Gardens
SUBMISSION TYPE:	Amendment/Modification
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	October 17, 2016
REVIEW CATEGORY:	Exemption category # *(2)*

Thank you for your submission of Amendment/Modification materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.

Appendix B

GARDEN MATRIX DETAILS

This appendix contains two sections of the garden matrix. The first table gives the number of organizations using each platform. The second table shows platform activity on the top three platforms and includes the organizational social media activity (OSMA) score

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B.1 Garden Matrix Part 1

Table B1: Number of public gardens (N = 100) using each of nine common social media platforms

Organization	Facebook	Instagram	Twitter	YouTube		Blog	Pinterest	Tumblr	Snapchat	Periscope
Adkins Arboretum	X	X	X	X		X	X		X	
Alaska Botanical Garden	X	X	X			X				
Aldridge Gardens	X	X	X				X			
Annmarie Sculpture Garden & Arts Center	X	X								
Arboretum At Flagstaff	X	X	X			X				
Bailey Arboretum	X	X				X				
Baker Arboretum	X	X								
Bayard Cutting Arboretum	X		X							
Bellevue Botanical Garden			X							
Bernheim Arboretum & Research Forest	X	X	X	X		X				X
Birmingham Botanical Gardens	X	X	X			X	X			
Blithewold Mansion, Gardens & Arboretum	X	X	X			X	X			
Botanic Garden At Historic Barns Park	X									
Botanical Gardens at Heritage Park*									X	
Boxerwood Nature Center & Woodland Garden	X					X				
Cal Poly Arboretum & Gardens	X									
Carefree Desert Gardens										
Chase Garden	X	X	X							
Chihuly Garden and Glass		X	X			X				
Conservation Garden Park	X	X	X			X	X			X
Descanso Gardens	X	X	X				X			X
Dow Gardens	X	X	X			X	X			
Durango Botanic Gardens		X				X	X			

Dyck Arboretum of the Plains	X					X	X			
Elisabeth C. Miller Botanical Garden										
Fell Arboretum at IL State Univ.										
Fort Myers-Lee County Garden Council						X				
Friends of Laurelwood Arboretum	X									
Gardens at Gantz Farm										
Gardens At Matter Park	X					X				
Gardens of the Big Bend at Univ. of FL	X									
Gardens On Spring Creek	X						X			
Garvan Woodland Gardens	X	X	X			X	X			
Harry P. Leu Gardens	X	X	X				X			
Henry Schmieder Arboretum	X									
Heronswood Garden										
Hidden Lake Gardens	X	X	X							
Highline Sea Tac Botanical Garden	X									
Historic London Town and Gardens	X	X		X			X			
Holden Arboretum			X	X		X	X	X		
Humboldt Botanical Garden	X	X	X	X						
Idaho Botanical Garden	X	X								
Iowa Arboretum	X	X	X	X		X	X			
Ithaca Children's Garden	X	X	X	X			X			
Jensen-Olson Arboretum	X									
Kansas State University Gardens	X									
Key West Botanical Garden Society		X								
Ladew Topiary Gardens	X	X		X						
Lasdon Park And Arboretum	X	X								
Leach Botanical Garden	X	X								
Lockerly Arboretum	X	X					X			
Longue Vue House and Gardens	X	X	X	X						
LA County Arboretum Foundation	X	X				X		X		
Missouri Botanical Garden	X	X	X	X		X	X	X	?	
Mizzou Botanic Garden	X	X	X				X			
Morton Arboretum	X	X	X	X		X	X		X	
Mounts Botanical Garden		X	X	X			X			

Myriad Gardens Foundation	X	X	X	X			X		?	X
Northern Plains Botanic Garden Society	X									
Old Westbury Gardens	X	X	X			X	X			
Oregon Garden Foundation	X	X	X	X			X	X		
Pinecrest Gardens	X	X	X	X		X	X			
Prairie Garden Trust										
Rancho Santa Ana Botanic Garden	X	X	X			X	X			
Red Butte Garden & Arboretum		X	X	X		X	X		X	
Regional Parks Botanic Garden	X	X	X	X			X	X		
Reiman Gardens, Iowa State University	X	X	X	X		X	X			
Rutgers Gardens	X	X	X							
Salisbury University Arboretum										
San Luis Obispo Botanical Garden	X		X	X			X		?	
Sandhills Horticultural Gardens	X									
Santa Barbara Botanic Garden	X	X	X	X		X	X	X	?	
Santa Fe Botanical Garden	X	X	X	X			X			
Sarah P. Duke Gardens	X	X	X	X		X	X			
Sawtooth Botanical Garden	X			X						
Shofuso Japanese House and Garden	X	X	X	X		X	X			
Smith-Gilbert Gardens	X	X	X			X	X	X		
State Arboretum Of Virginia	X	X								
Stonecrop Gardens	X									
Streissguth Gardens	X	X								
Taltree Arboretum & Gardens	X	X	X	X			X			
Tanger Family Bicentennial Garden	X		X	X						
Texas Discovery Gardens	X	X	X				X		?	
Thanksgiving Point Garden			X			X			X	
Toledo Botanical Garden	X	X	X							
Tower Hill Botanic Garden	X	X	X	X		X	X	X		
Tudor Place Historic House & Garden	X	X	X	X		X	X			
Tyler Arboretum	X	X	X	X		X		X		
Unbelievable Acres Botanic Gardens, Inc.										
University Of CA Santa Cruz Arboretum			X							
University of Central Florida Arboretum			X					X		

University of Delaware Botanic Gardens	X									
University Of Hawaii Urban Garden Center										
University Of Miami - Gifford Arboretum										
University of NE Lincoln Botanical Garden										
Vander Veer Botanical Gardens										
Ventura Botanical Gardens	X	X								
Water Conservation Garden	X									
Western Kentucky Botanical Garden	X									
Total	76	58	51	29		34	39	10	5	4

B.2 Garden Matrix Part 2

Table B.2: Activity scores for each organization (N=100) on the three most common platforms (Facebook, Instagram, and Twitter), see Chapter 2.3.1 for platform activity score and organization social media activity (OSMA) calculations

Organization	**Facebook**	**Instagram**	**Twitter**	**OSMA**
Adkins Arboretum	2	2	3	7
Alaska Botanical Garden	3	3	3	9
Aldridge Gardens	3	3	3	9
Annmarie Sculpture Garden & Arts Center	3	3	4	10
Arboretum At Flagstaff	3	3	3	9
Bailey Arboretum	2	1	0	3
Baker Arboretum	2	2	0	4
Bayard Cutting Arboretum	3	0	1	4
Bellevue Botanical Garden	0	0	3	3
Bernheim Arboretum & Research Forest	3	3	4	10

Birmingham Botanical Gardens	4	4	4	12
Blithewold Mansion, Gardens & Arboretum	3	3	3	9
Botanic Garden At Historic Barns Park	3	0	0	3
Botanical Gardens at Heritage Park*	0	0	0	0
Boxerwood Nature Center & Woodland Garden	2	0	0	2
Cal Poly Arboretum & Gardens	1	0	0	1
Carefree Desert Gardens	0	0	0	0
Chase Garden	2	2	2	6
Chihuly Garden and Glass	0	3	4	7
Conservation Garden Park	3	2	3	8
Descanso Gardens	4	3	4	11
Dow Gardens	3	1	4	8
Durango Botanic Gardens	0	3	0	3
Dyck Arboretum of the Plains	3	0	0	3
Elisabeth C. Miller Botanical Garden	0	0	0	0
Fell Arboretum at Illinois State University	0	0	0	0
Fort Myers-Lee County Garden Council	0	0	0	0
Friends of Laurelwood Arboretum	2	0	0	2
Gardens at Gantz Farm	0	0	0	0
Gardens At Matter Park	3	0	0	3
Gardens of the Big Bend at University of Florida	2	0	0	2
Gardens On Spring Creek	3	0	0	3
Garvan Woodland Gardens	4	3	3	10
Harry P. Leu Gardens	4	4	2	10
Henry Schmieder Arboretum	2	0	0	2
Heronswood Garden	0	0	0	0
Hidden Lake Gardens	3	1	2	6
Highline Sea Tac Botanical Garden	1	0	0	1
Historic London Town and Gardens	3	3	0	6
Holden Arboretum	0	0	3	3
Humboldt Botanical Garden	2	1	1	4
Idaho Botanical Garden	4	2	4	10
Iowa Arboretum	2	2	2	6
Ithaca Children's Garden	3	3	3	9

Jensen-Olson Arboretum	2	0	0	2
Kansas State University Gardens	2	0	0	2
Key West Botanical Garden Society	0	1	0	1
Ladew Topiary Gardens	3	2	0	5
Lasdon Park And Arboretum	2	1	0	3
Leach Botanical Garden	3	2	0	5
Lockerly Arboretum	3	3	0	6
Longue Vue House and Gardens	3	4	3	10
Los Angeles County Arboretum Foundation	3	3	0	6
Missouri Botanical Garden	4	3	4	11
Mizzou Botanic Garden	2	2	3	7
Morton Arboretum	4	3	4	11
Mounts Botanical Garden	0	3	4	7
Myriad Gardens Foundation	4	4	4	12
Northern Plains Botanic Garden Society	2	0	0	2
Old Westbury Gardens	3	2	2	7
Oregon Garden Foundation	2	3	4	9
Pinecrest Gardens	3	3	3	9
Prairie Garden Trust	0	0	0	0
Rancho Santa Ana Botanic Garden	3	4	4	11
Red Butte Garden & Arboretum	0	3	3	6
Regional Parks Botanic Garden	2	3	4	9
Reiman Gardens, Iowa State University	3	3	3	9
Rutgers Gardens	3	3	3	9
Salisbury University Arboretum	0	0	0	0
San Luis Obispo Botanical Garden	2	0	3	5
Sandhills Horticultural Gardens	2	0	0	2
Santa Barbara Botanic Garden	3	3	3	9
Santa Fe Botanical Garden	3	2	3	8
Sarah P. Duke Gardens	3	4	3	10
Sawtooth Botanical Garden	2	0	0	2
Shofuso Japanese House and Garden	3	3	4	10
Smith-Gilbert Gardens	3	3	3	9
State Arboretum Of Virginia	3	1	0	4

Stonecrop Gardens	2	0	0	2
Streissguth Gardens	2	3	0	5
Taltree Arboretum & Gardens	3	2	4	9
Tanger Family Bicentennial Garden	2	0	3	5
Texas Discovery Gardens	3	3	4	10
Thanksgiving Point Garden	0	0	3	3
Toledo Botanical Garden	3	3	3	9
Tower Hill Botanic Garden	3	4	4	11
Tudor Place Historic House & Garden	2	3	4	9
Tyler Arboretum	3	2	4	9
Unbelievable Acres Botanic Gardens, Inc.	0	0	0	0
University Of California Santa Cruz Arboretum	0	0	3	3
University of Central Florida Arboretum	0	0	3	3
University of Delaware Botanic Gardens	3	0	0	3
University Of Hawaii CTAHR Urban Garden Center	0	0	0	0
University Of Miami - Gifford Arboretum	0	0	0	0
University of NE Lincoln Botanical Garden & Arboretum	0	0	0	0
Vander Veer Botanical Gardens	0	0	0	0
Ventura Botanical Gardens	3	2	2	7
Water Conservation Garden	2	0	3	5
Western Kentucky Botanical Garden	3	0	2	5
Woodlands Garden	3	2	4	9

Appendix C

SOCIAL MEDIA PROFESSIONAL (SMP) INTERVIEW DOCUMENTS

C.1 Email template for first contact with public garden SMPs:

Dear *Person*,

I hope your week is going well. My name is Elizabeth Barton, and I am a Longwood Graduate Fellow working on my thesis project, Digital and Social Media Strategies for Engaging Millennials in Public Horticulture. For my project, I'm interviewing public garden employees about their social media strategies, particularly those related to Millennial engagement.

I identified *Your Organization* for an interview because of *this specific reason*. To learn more about your strategy, I would like to set up a phone interview with you sometime in the next two weeks. Or, if you are not the best person at *Your Organization* to discuss this with, can you please direct me to the correct person?

I look forward to hearing from you!

Best,
Elizabeth Barton

C.2 Informed consent document for SMPs

INFORMED CONSENT TO PARTICIPATE IN RESEARCH

Title of Project: Millennials Connecting to Public Gardens

Principal Investigator(s): *Elizabeth Barton and Barbara Ley*

You are being invited to participate in a research study. This consent form tells you about the study including its purpose, what you will be asked to do if you decide to take part, and the risks and benefits of being in the study. Please read the information below and ask us any questions you may have before you decide whether or not you agree to participate.

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this study is to learn about the ways in which public horticulture institutions are engaging with a Millennial audience. Public gardens and other types of cultural institutions want to ensure steady membership, attendance, and donation rates in order to safeguard the future of their organizations. The Millennial generation is currently aging into these roles. Public gardens are searching for methods to connect with this digitally native generation. The results of these interviews will be combined with information about Millennial habits and preferences to develop a best practices guide for the use of digital and new media in public horticulture. These results will be published as part of a Master's thesis.

You will be one of approximately 10 participants in this study. You are being asked to participate because you have been identified as the person with the most control of the digital and social media presence at your organization.

WHAT WILL YOU BE ASKED TO DO?

As part of this study you will be asked to participate in a guided interview with the researcher. Before the interview you will receive a short list of questions. These questions are intended to guide the interview and to allow you time to find any relevant information. The interview will be conducted over the phone and should take between 30 minutes and 1 hour. It will be recorded and then transcribed for later analysis.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

The research team does not expect your participation in this study will expose you to any risks different from those you would encounter in daily life.

WHAT ARE THE POTENTIAL BENEFITS?

You will not benefit directly from taking part in this research. However, knowledge gained from this study may contribute to our understanding of the most effective ways to increase Millennial engagement with public horticulture.

Participant's Initials _____

HOW WILL CONFIDENTIALITY BE MAINTAINED? WHO MAY KNOW THAT YOU PARTICIPATED IN THIS RESEARCH?

Identification of participants is crucial to an understanding of the context. Names and institutions will be attributed to information collected during this research.

USE OF DATA COLLECTED FROM YOU IN FUTURE RESEARCH:

The research data we will be collecting from you during your participation in this study may be useful in other research studies in the future. Your choice about future use of your data will have no impact on your participation in this research study. Do we have your permission to use in future studies data collected from you? Please write your initials next to your preferred choice.

_____ YES **_____ NO**

WILL THERE BE ANY COSTS TO YOU FOR PARTICIPATING IN THIS RESEARCH?

There are no costs to you for participating in this research.

DO YOU HAVE TO TAKE PART IN THIS STUDY?

Taking part in this research study is entirely voluntary. You do not have to participate in this research. If you choose to take part, you have the right to stop at any time. If you decide not to participate or if you decide to stop taking part in the research at a later date, there will be no penalty or loss of benefits to which you are otherwise entitled. Your decision to stop participation, or not to participate, will not influence current or future relationships with the University of Delaware or Longwood Gardens.

If, at any time, you decide to end your participation in this research study, please inform the principal investigators by email (ebarton@udel.edu)

WHO SHOULD YOU CALL IF YOU HAVE QUESTIONS OR CONCERNS?

If you have any questions about this study, please contact the Principal Investigator, Elizabeth Barton at (302) 463-6541 or ebarton@udel.edu. The academic supervisor, Barbara Ley, can be reached by email (bley@udel.edu).

If you have any questions or concerns about your rights as a research participant, you may contact the University of Delaware Institutional Review Board at hsrb-research@udel.edu or (302) 831-2137.

Participant's Initials _____

Your signature on this form means that: 1) you are at least 18 years old; 2) you have read and understand the information given in this form; 3) you have asked any questions you have about the research and the questions have been answered to your satisfaction; and 4) you accept the terms in the form and volunteer to participate in the study. You will be given a copy of this form to keep.

_____	_____	_____
Printed Name of Participant	Signature of Participant	Date
_____	_____	_____
Person Obtaining Consent (PRINTED NAME)	Person Obtaining Consent (SIGNATURE)	Date

---

<u>OPTIONAL</u> CONSENT TO BE CONTACTED FOR FUTURE STUDIES:

Do we have your permission to contact you regarding participation in future studies? Please write your initials next to your preferred choice.

_____ YES _____ NO

Participant's Initials _____

C.3 Semi-structured interview questions

Millennial Engagement

1. Do you know what percentage of your visitors fall into the millennial generation? (1982-2000) Can you describe your audience?

Social Media

1. How is your garden currently using social media?
2. What platforms are you using?
3. What population (generation) is most engaged with your garden's online presence?
4. Do you have the human capital necessary to use social media (at all or more than you do currently depending on the garden)?
5. Do you budget for adwords/analytics?
6. How many staff members are involved with your social media message? How many volunteers?
7. What *formats* of social media content do you use?
8. What *tone* of social media content do you use?
9. Do you use hash tags? Why?
10. Do you engage in two-way communication? How? Why? Positive or negative experiences?
11. How often do you post throughout the day/week/month? Do you create a schedule in advance?
12. Have you ever solicited donations through social media?

General Educational/Entertainment Materials

1. What if any education/entertainment materials do you produce every year? How much do you spend?
2. What type of materials do you produce? Are those materials targets to specific groups of people? If so, what groups?
3. Are there any materials you produce that are particularly successful with a millennial audience?

Location-based games

1. What is your organization's stance on location based games?
2. Is that reflective of the organization's attitude toward digital innovation and technology?

Wrap-Up

1. Can you talk about any particular social media successes? Failures? (not already mentioned)

Appendix D

ADDITIONAL SURVEY DOCUMENTATION

D.1 Survey

Introduction

Hi! My name is Elizabeth Barton and I'm conducting this survey as a part of my thesis research in the Longwood Graduate Program at the University of Delaware. My goal is to understand Millennials' relationship with public gardens. We are defining Millennials as people born between 1982 and 2000. All responses will be anonymous and confidential. Please answer as many questions as you would like. Thank you for taking the time to complete this survey!

Please contact me with any questions by email (ebarton@udel.edu) or on Twitter (@ElizabethTau).

By clicking on the button below I affirm that I am 18 years of age or older and that I am willing to participate in this research. I understand that I am under no obligation to participate in this research if I do not want to, and that I can quit the research at any time.

This survey will take approximately 10-15 minutes to complete.

These page timer metrics will not be displayed to the recipient.

First Click: *0 seconds*

Last Click: *0 seconds*

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Click Count: *0 clicks*

Screener

How old are you?

- Less than 18 years old
- 18 to 22 years old
- 23 to 27 years old
- 28 to 32 years old
- More than 32 years old

Are you...

- Female
- Male
- Other

In which region of the United States do you live?

- West
- Midwest
- South
- Northwest/Northeast

What is your yearly household income?

- Less than $20,000
- $20,000 to $39,999
- $40,000 to $74,999
- More than $75,000

Please check all categories that describe you.

- White
- Hispanic or Latino
- Black or African American
- Asian
- American Indian or Alaska Native
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- Some other race, ethnicity, or origin

Your Experience with Public Gardens

According to the American Public Gardens Association (APGA), a **public garden** is defined as "an institution that maintains collections of plants for the purposes of public education and enjoyment as well as research, conservation, and higher learning. It must be open to the public and resources and accommodations must be made to all visitors."

We want to know about your relationship with public gardens and other similar institutions.

Check out this map of public gardens near you if you're still unsure about what a public garden is.
http://www.nationalpublicgardensday.org/

Have you ever been to a public garden?

- Yes (If you'd like, please list the gardens you have visited)
- No
- Unsure

How often do you visit public gardens?

- ○ Less than Once a Year
- ○ Once a Year
- ○ 2-3 Times a Year
- ○ More than 3 Times a Year

What are three words you would use to describe your experiences at public gardens?

Word 1 [ ]

Word 2 [ ]

Word 3 [ ]

Were you aware of public gardens before taking this survey?

- ○ Yes
- ○ No

Are you interested in visiting a public garden someday?

- ○ Yes
- ○ No

Which specific public garden activities interest you or might interest you? (Select all that apply)

- ☐ Experiencing plant based exhibits
- ☐ Attend a specific seasonal exhibit
- ☐ Attending a performing arts event
- ☐ Spending time with nature
- ☐ Taking pictures
- ☐ Children or family themed events
- ☐ Taking a class
- ☐ Other [ ]

What could a local public garden do to encourage you to visit?

[ ]

Public Gardens Want to Connect with You!

Have you ever received information from or been contacted by a public garden?

- ○ Yes
- ○ No

How have you received information from or been contacted by a public garden? (Select all that apply)

- ☐ Print
- ☐ Social Media
- ☐ Email
- ☐ Online Advertisements
- ☐ TV Advertisements
- ☐ Radio Advertisements
- ☐ Other

Would you be interested in hearing more about public gardens near you?

- ○ Yes
- ○ No

How would you like to learn more about local public gardens? (Select all that apply)

- ☐ Online Advertisements
- ☐ TV Advertisements
- ☐ Email
- ☐ Print
- ☐ Radio Advertisements
- ☐ Social Media
- ☐ Other

How often would you like to hear from local public gardens?

- ○ More than once per week
- ○ Once per week
- ○ Once every other week
- ○ Once per month
- ○ Every 2-3 months
- ○ Once or twice per year

What type of information would be most interesting to you? (Select at that apply)

- ☐ What's in bloom
- ☐ Special event information
- ☐ Sustainability or conservation information
- ☐ Promotions (such as memberships, discounts, etc.)
- ☐ Behind the scenes stories
- ☐ Home gardening tips and trends
- ☐ Upcoming classes and workshops
- ☐ Other

Why would you prefer not to hear more about local public gardens? (Select all that apply)

- ☐ Uninterested in public gardens
- ☐ Too busy
- ☐ Other

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Public Gardens and Social Media

If public gardens were using social media, what platforms would be most appealing to you? (Select all that apply)

- ☐ GrowIt
- ☐ YouTube
- ☐ Facebook
- ☐ Snapchat
- ☐ Periscope
- ☐ Pinterest
- ☐ Instagram
- ☐ Twitter
- ☐ Other

Have you ever heard of or used the garden socially app GrowIt?

- ○ I use the app.
- ○ I have heard of the app but do not use it.
- ○ I have not heard of the app.

How often do you use GrowIt?

What features of GrowIt are most important to you?

What **format** of social media content are you interested in from a public garden? (Select all that apply)

- ☐ Video
- ☐ Contests
- ☐ Articles
- ☐ Personal narratives
- ☐ Infographics
- ☐ Interactive content
- ☐ List posts
- ☐ Images
- ☐ Other

How important is the **format** of social media content from a public garden?

- ○ Extremely important
- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

What **tone** of social media content from a public garden interests you? (Select all that apply)

- ☐ Educational content
- ☐ Funny or clever content
- ☐ Thoughtful or inspirational content
- ☐ Conversational content
- ☐ Promotional content

How important is the **tone** of social media content from a public garden?

- ○ Extremely important
- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

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Please indicate how important each of these factors would be when deciding whether or not to follow a garden on social media.

	Extremely important	Very important	Moderately important	Slightly important	Not at all important
I want to find out more about the garden.	○	○	○	○	○
I plan to visit the garden in the future.	○	○	○	○	○
My friends follow the garden on social media.	○	○	○	○	○
I have visited the garden before.	○	○	○	○	○
The garden posts to a social media platform I already use.	○	○	○	○	○
The garden offers special discounts or deals.	○	○	○	○	○

Please indicate how strongly you agree or disagree with the following statements about public gardens and social media interaction.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I like it when posts include hashtags.	○	○	○	○	○	○	○
I prefer posts without hashtags.	○	○	○	○	○	○	○
The garden should not respond to online commenters.	○	○	○	○	○	○	○
I want the garden to interact with their online audience.	○	○	○	○	○	○	○

Please indicate how strongly you agree or disagree with the following statements about the timing or frequency of public garden social media posts.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
It is important for the garden to post consistently throughout the year.	○	○	○	○	○	○	○
It is important for the garden to post at least once per day.	○	○	○	○	○	○	○
I will unfollow a garden if there are too few posts.	○	○	○	○	○	○	○
I will unfollow a garden if there are too many posts.	○	○	○	○	○	○	○

How can public gardens encourage their social media followers to visit or attend an event at their site?

Has social media ever influenced your decision to visit a public garden? Please explain your answer.

- ○ Yes
- ○ Maybe
- ○ No

Most public gardens are non-profit organizations. Would you be willing to donate to a public garden through a social media campaign?

- ○ Definitely yes
- ○ Probably yes
- ○ Might or might not
- ○ Probably not
- ○ Definitely not

Millennial Entertainment and Education Preferences

Some public gardens are interested in offering more exciting public programs to reach new audiences. One way they could do this is through "edu-tainment," that is, entertaining educational content.

What form of public garden edu-tainment is most interesting to you? (Select all that apply)

- ☐ Podcast
- ☐ Location Based Games (for example, Pokemon Go)
- ☐ Augmented/Virtual Reality
- ☐ Blog
- ☐ YouTube Channel
- ☐ Other
- ☐ I am not interested in public horticulture edu-tainment

Some potential topics for public horticulture edu-tainment are listed below. Select all that interest you.

- ☐ Farm to table movement
- ☐ Sustainability or conservation issues
- ☐ Urban gardening or community greening
- ☐ Garden activities for children
- ☐ Happenings in gardens after dark
- ☐ Other

Location-based or location-enabled games, where gameplay occurs based on the players geographic location, have come into the spotlight with the rise of Pokémon Go. How strongly do you agree or disagree with the following statements about location-based games.

		Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Promotion of these games would encourage me to spend time in a public garden		○	○	○	○	○	○	○
Promotion of these games would discourage me from spending time in a public garden		○	○	○	○	○	○	○

Please explain your answers to the above question about location-based games.

Demographics

Thank you so much for taking the time to complete this survey. We would like to get to know you a little more. The answers to these questions will not be used to identify you. In what year were you born?

Are you...

- Female
- Male
- Other

Please check all categories that describe you.

- White
- Hispanic or Latino
- Black or African American
- Asian
- American Indian or Alaska Native
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- Some other race, ethnicity, or origin

What is the highest level of education you have completed?

- Some High School
- High School Graduate
- Some College
- Associate/Bachelors Degree
- Some Graduate School
- Graduate Degree

What is your marital status?

- Single
- Married or Domestic Partnership
- Widowed
- Separated or Divorced

Do you have children?

- ○ Yes
- ○ No

What is your employment status? Please check all that apply.

- ☐ Employed
- ☐ Out of Work
- ☐ Homemaker
- ☐ Student
- ☐ Military
- ☐ Retired
- ☐ Unable to Work

In what field are you employed or do you study?

D.2 Expanded survey results tables

Table D.1: Percentages of millennials who have visited a public garden or showed interest in visiting a public garden, presented by demographic subgroup

	Visited Garden			**Interested in Visiting**	
Subgroups	Yes *Freq.* (%)	No *Freq.* (%)	Maybe *Freq.* (%)	Yes *Freq.* (%)	No *Freq.* (%)
Age					
18-22 years	54 (43.2)	50 (40.0)	21 (16.8)	42 (84.0)	8 (16.0)
23-27 years	97 (51.3)	76 (40.2)	16 (8.5)	64 (84.2)	12 (15.8)
28-32 years	108 (60.0)	46 (25.6)	26 (14.4)	36 (78.3)	10 (21.7)
Gender					
Female	129 (46.9)	109 (39.6)	37 (13.5)	51 (81.0)	12 (19.1)
Male	130 (59.4)	63 (28.8)	26 (11.9)	91 (83.5)	18 (16.5)
Annual Household Income					
< $20,000	28 (34.6)	37 (45.7)	16 (19.8)	29 (78.4)	8 (21.6)
$20,000 - $39,999	49 (42.2)	49 (42.2)	18 (15.5)	40 (81.6)	9 (18.4)
$40,000 - $74,999	81 (52.6)	53 (34.4)	20 (13.0)	44 (83.0)	9 (17.0)
> $75,000	99 (70.21)	33 (23.4)	9 (6.4)	29 (87.9)	4 (12.1)
Ethnicity					
White	152 (54.5)	87 (31.2)	40 (14.3)	72 (82.8)	15 (17.2)
Hispanic/ Latinx	41 (59.4)	22 (31.9)	6 (8.7)	18 (81.8)	4 (18.2)
Black/African American	22 (40.0)	28 (50.9)	5 (9.09)	18 (64.3)	10 (35.7)
Other[a]	18 (40.0)	13 (36.11)	5 (13.89)	12 (92.3)	1 (7.7)
Multiple	26 (47.3)	22 (40.0)	7 (12.73)	22 (100.0)	0 (0.0)
Highest Education					
Some HS/HS grad	46 (38.7)	55 (46.2)	18 (15.1)	46 (83.6)	9 (16.4)
Some college	54 (47.4)	45 (39.5)	15 (13.2)	36 (80.0)	9 (20.0)
Bachelor's +	98 (58.3)	51 (30.4)	19 (11.3)	45 (88.2)	6 (11.8)
Graduate degree	57 (70.4)	16 (19.8)	8 (9.9)	12 (75.0)	4 (25.0)
Have Children					
No	116 (42.5)	113 (41.4)	44 (16.1)	90 (79.7)	23 (20.3)
Yes	138 (66.7)	54 (26.1)	15 (7.3)	49 (90.7)	5 (9.3)
Employment Status					
Employed	181 (58.6)	92 (29.7)	36 (11.7)	76 (82.6)	16 (17.4)
Unemployed	36 (39.1)	43 (46.7)	13 (14.1)	33 (76.7)	10 (23.3)
Student	38 (46.9)	32 (39.5)	11 (13.6)	30 (93.8)	2 (6.25)

[a] Other ethnicities include: Asian, American Indian, Alaska Native, Middle Eastern, North African, Native Hawaiian, and Pacific Islander

Table D.2: Multiple linear regression predicting public garden visitation or interest in visiting public gardens.

	Public Garden			
	4.3.1.1.1 Visitation		**If Never Visited, – Interest in Visitation**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*
N	417			
Age (18-22 years)				
23-27 years	-0.12 (0.31)	.691	0.15 (0.59)	.794
28-32 years	0.17 (0.33)	.609	-0.70 (0.73)	.337
Gender (Male)				
Female	-0.41 (0.23)	.078	-0.04 (0.49)	.930
Income (<$20,000)				
$20,000 - $39,999	-0.01 (0.36)	.969	-0.64 (0.73)	.379
$40,000 - $74,999	0.11 (0.36)	.747	-0.51 (0.76)	.502
> $75,000	0.62 (0.38)	.101	0.07 (0.83)	.928
Ethnicity (White) [a]				
Hispanic/ Latinx	0.09 (0.32)	.783	-0.01 (0.67)	.992
Black/African American	-0.51 (0.34)	.130	-0.51 (0.67)	.446
Other	-0.28 (0.45)	.538	0.71 (1.19)	.551
Multiple	-0.08 (0.38)	.826	Omitted*	
Highest Education Level (College degree)				
Some HS/HS grad	-0.59 (0.31)	.058	-0.38 (0.78)	.626
Some college	-0.35 (0.30)	.237	-1.3 (0.66)	.048
Master's	0.23 (0.37)	.541	-1.87 (0.98)	.058
Have Children (No)				
Yes	0.77 (0.24)	.001	1.90 (0.61)	.002
Employment (Employed)				
Unemployed	-0.47 (0.31)	.129	-0.31 (0.62)	.611
Student	0.09 (0.35)	.803	1.71 (0.79)	.031
Intercept	0.45 (0.47)	.336	2.09 (1.05)	.047
R^2	0.10		0.15	

[a] For Interest in Visitation, the 'multiple ethnicities' category perfectly predicts interest in visiting a public garden and was dropped from the model due to lack of variance

Table D.3: Multiple linear regression predicting frequency of public garden visitation

	Frequency of Visitation	
Subgroups	β (SE β)	*p*
N	476	
Age (18-22 years)		
23-27 years	0.05 (0.18)	.786
28-32 years	0.14 (0.20)	.461
Gender (Male)		
Female	-0.29 (0.13)	.032
Income (<$20,000)		
$20,000 - $39,999	0.02 (0.19)	.926
$40,000 - $74,999	0.21 (0.20)	.289
> $75,000	0.60 (0.21)	.004
Ethnicity (White)		
Hispanic/ Latinx	0.36 (0.20)	.073
Black/African American	0.10 (0.21)	.635
Other	0.05 (0.27)	.866
Multiple	0.15 (0.23)	.519
Highest Education Level (College degree)		
Some HS/HS grad	-0.39 (0.19)	.037
Some college	-0.21 (0.19)	.255
Master's	0.20 (0.22)	.346
Have Children (No)		
Yes	0.63 (0.15)	<.001
Employment (Employed)		
Unemployed	-0.26 (0.17)	.142
Student	0.13 (0.21)	.531
Intercept	0.96 (0.25)	<.001
R^2	.17	

Table D.4: Multiple logistic regression predicting interest in learning about public gardens, email contact, and social media contact

	Interest in Learning about Public Gardens		**Interest in Learning via Email**		**Interest in Learning via Social Media**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*	β (SE β)	*p*
N	478		405		405	
Age (18-22 years)						
23-27 years	-0.05 (0.31)	.853	0.36 (0.27)	.172	-0.39 (0.28)	.153
28-32 years	0.02 (0.34)	.963	0.30 (0.28)	.287	-0.27 (0.29)	.354
Gender (Male)						
Female	-0.48 (0.28)	.080	0.08 (0.21)	.701	0.26 (0.21)	.223
Ethnicity (White)						
Hispanic/ Latinx	0.23 (0.42)	.591	-0.41 (0.30)	.172	0.16 (0.31)	.600
Black/Af. Am.	-0.19 (0.41)	.633	-0.50 (0.35)	.149	-0.05 (0.35)	.882
Other	-0.30 (0.48)	.538	0.12 (0.42)	.774	-0.30 (0.41)	.461
Multiple	0.13 (0.44)	.767	0.09 (0.34)	.783	0.21 (0.35)	.547
Have Children (No)						
Yes	1.01 (0.31)	.001	0.16 (0.22)	.462	0.05 (0.22)	.834
Intercept	1.68 (0.32)	<.001	-0.13 (0.25)	.612	0.56 (0.27)	.037
R^2	0.05		0.01		0.01	

Table D.5: Multiple linear regression predicting frequency of desired contact from public gardens

	Frequency of Desired Contact	
Subgroups	β (SE β)	*p*
N	480	
Age (18-22 years)		
23-27 years	0.07 (0.23)	.755
28-32 years	-0.06 (0.23)	.781
Gender (Male)		
Female	-0.77 (0.17)	<.001
Ethnicity (White)		
Hispanic/ Latinx	0.42 (0.24)	.080
Black/African American	0.07 (0.32)	.836
Other	-0.35 (0.33)	.284
Multiple	0.19 (0.29)	.512
Have Children (No)		
Yes	0.85 (0.18)	<.001
Intercept	3.30 (0.22)	<.001
R^2	0.10	

Table D.6: Multiple logistic regression predicting interest in Facebook and Twitter for public garden social media

	Facebook		**Twitter**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*
N	480		480	
Age (18-22 years)				
23-27 years	0.27 (0.27)	.319	-0.25 (0.25)	.331
28-32 years	0.44 (0.30)	.149	-0.16 (0.26)	.535
Gender (Male)				
Female	0.49 (0.23)	.037	-0.74 (0.20)	<.001
Ethnicity (White)				
Hispanic/ Latinx	-0.41 (0.33)	.204	0.12 (0.29)	.692
Black/African American	-0.73 (0.36)	.039	0.03 (0.32)	.925
Other	-0.12 (0.43)	.775	-0.70 (0.43)	.099
Multiple	-0.08 (0.39)	.843	0.24 (0.31)	.434
Have Children (No)				
Yes	0.80 (0.26)	.002	0.14 (0.20)	.501
Intercept	0.61 (0.25)	.015	-0.01 (0.23)	.969
R^2	0.05		0.03	

Table D.7: Multiple logistic regression predicting interest in Instagram and YouTube for public garden social media

	Instagram		**YouTube**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*
N	480		480	
Age (18-22 years)				
23-27 years	-0.55 (0.25)	.028	-0.63 (0.25)	.013
28-32 years	-0.53 (0.26)	.040	-0.44 (0.26)	.095
Gender (Male)				
Female	0.05 (0.19)	.791	-1.02 (0.20)	<.001
Ethnicity (White)				
Hispanic/ Latinx	0.39 (0.29)	.167	0.87 (0.31)	.006
Black/African American	-0.50 (0.31)	.106	0.60 (0.33)	.074
Other	-1.11 (0.41)	.006	0.57 (0.40)	.158
Multiple	-0.01 (0.31)	.975	0.75 (0.32)	.019
Have Children (No)				
Yes	0.28 (0.20)	.171	0.76 (0.21)	<.001
Intercept	0.34 (0.23)	.142	0.44 (0.24)	.068
R^2	0.03		0.08	

Table D.8: Multiple linear regression predicting the importance of tone and format

	Importance of Tone		**Importance of Format**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*
N	480		476	
Importance of:	Form		Tone	
	0.70 (0.05)	<.001	0.67 (0.04)	<.001
Platforms (No)				
Facebook (Yes)	0.08 (0.08)	.344	0.10 (0.08)	.224
Twitter (Yes)	-0.06 (0.06)	.378	0.21 (0.06)	.001
Instagram (Yes)	0.13 (0.07)	.048	0.09 (0.07)	.173
YouTube (Yes)	0.12 (0.07)	.066	0.18 (0.07)	.012
Age (18-22)				
23-27 years	0.05 (0.08)	.534	-0.04 (0.08)	.600
28-32 years	0.05 (0.08)	.549	-0.03 (0.07)	.648
Gender (Male)				
Female	0.01 (0.06)	.841	-0.02 (0.06)	.710
Ethnicity (White)				
Hispanic/ Latinx	0.09 (0.08)	.257	< -0.01 (0.08)	.961
Black/African American	-0.03 (0.10)	.746	0.11 (0.09)	.235
Other	-0.25 (0.13)	.054	0.16 (0.13)	.206
Multiple	-0.01 (0.10)	.914	-0.02 (0.10)	.812
Have Children (No)				
Yes	0.12 (0.07)	.088	0.09 (0.07)	.178
Intercept	-0.26 (0.11)	.022	-0.30 (0.12)	.011
R^2	0.58		0.59	

Table D.9: Multiple linear regression predicting the likelihood of millennial donation to public gardens

	Likelihood of Donation	
Subgroups	β (SE β)	*p*
N	477	
Age (18-22 years)		
23-27 years	-0.26 (0.12)	.025
28-32 years	-0.18 (0.12)	.133
Gender (Male)		
Female	-0.31 (0.09)	.001
Ethnicity (White)		
Hispanic/ Latinx	0.21 (0.11)	.057
Black/African American	0.13 (0.17)	.428
Other	-0.09 (0.13)	.496
Multiple	0.18 (0.16)	.242
Have Children (No)		
Yes	0.52 (0.09)	<.001
Income (<$20,000)		
$20,000 to $39,999	0.08 (0.14)	.578
$40,000 to $74,999	0.35 (0.14)	.012
< $75,000	0.55 (0.14)	<.001
Intercept	-0.24 (0.15)	<.001
R^2	0.17	

Table D.10: Multiple logistic regression predicting interest in forms of public garden edutainment (YouTube videos, blogs, podcasts)

	YouTube Videos		**Blogs**		**Podcasts**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*	β (SE β)	*p*
N	480		480		480	
Age (18-22 years)						
23-27 years	-0.34 (0.25)	.173	0.21 (0.26)	.428	-0.21 (0.32)	.522
28-32 years	-0.16 (0.27)	.551	-0.04 (0.27)	.893	0.35 (0.33)	.276
Gender (Male)						
Female	-0.87 (0.21)	<.001	-0.30 (0.20)	.136	-0.50 (0.24)	.037
Ethnicity (White)						
Hispanic/ Latinx	0.73 (0.33)	.024	-0.10 (0.30)	.737	-0.04 (0.33)	.916
Black/African American	0.30 (0.33)	.374	-0.44 (0.35)	.212	-0.07 (0.40)	.854
Other	0.37 (0.41)	.364	0.25 (0.37)	.505	-0.79 (0.56)	.162
Multiple	0.37 (0.33)	.263	-0.14 (0.33)	.666	-0.24 (0.40)	.546
Have Children (No)						
Yes	0.59 (0.21)	.005	0.46 (0.21)	.028	0.19 (0.25)	.456
Intercept	0.80 (0.24)	.001	-0.73 (0.24)	.002	-1.22 (0.28)	<.001
R^2	0.06		0.02		0.03	

Table D.11: Multiple logistic regression predicting interest in forms of public garden edutainment (location-based games, augmented/virtual reality experiences)

	Location-based Games		**Augmented/Virtual Reality Experiences**	
Subgroups	β (SE β)	*p*	β (SE β)	*p*
N	480		480	
Age (18-22 years)				
23-27 years	0.63 (0.27)	.018	-0.36 (0.27)	.178
28-32 years	-0.21 (0.29)	.467	-0.06 (0.27)	.839
Gender (Male)				
Female	-0.18 (0.21)	.384	-0.46 (0.21)	.026
Ethnicity (White)				
Hispanic/ Latinx	-0.31 (0.31)	.323	-0.06 (0.30)	.830
Black/African American	0.15 (0.33)	.643	-0.45 (0.35)	.207
Other	-0.45 (0.43)	.293	-0.69 (0.45)	.127
Multiple	-0.11 (0.34)	.743	-0.15 (0.34)	.656
Have Children (No)				
Yes	0.42 (0.22)	.056	0.55 (0.21)	.010
Intercept	-1.00 (0.25)	<.001	-0.56 (0.24)	.022
R^2	0.04		0.03	