

# **Evaluating Community Support for an Elementary School Education Garden**

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## **Abstract**

*This study surveyed 202 residents in the community of Winter Park in Wilmington, North Carolina to evaluate interest in the maintenance of a proposed education garden for Winter Park Elementary School (WPES). Results indicated strong community support for this garden. Additionally, four groups of variables (demographics, parenthood status, availability, and lifestyle preferences) were used to predict willingness to volunteer at the garden. Results showed that respondent age, number of children enrolled at WPES, driving distance between the household and WPES, and frequency of organic food purchases were the most consistent predictors of willingness to volunteer at the garden.*

**Keywords:** education garden, community support, volunteering, demographics, lifestyle

Immersion in nature enhances children's development, providing them with access to physical activity, improved psychological well-being, education, and an opportunity to develop social skills (Gundersen, Skår, O'Brien, Wold, & Follo, 2016). Pre-adolescent time spent in nature is also related to attentiveness to environmental concerns in adulthood (Wells & Lekies, 2006). The last decade has witnessed a significant decline in the time that children spend outside and in nature, attributable in part to increased technology (Holloway & Mahan, 2012). This reduction in time spent by children in nature is not unique to highly industrialized areas (Turner, Nakamura, & Dinetti, 2004), but is exacerbated by accelerated urbanization of natural spaces (Asah, Lenentine, & Blahna, 2014; Ghose & Pettygrove, 2014; Guitart, Pickering, & Byrne, 2012; Kareiva, 2008). Richard Louv labels the growing separation of children and nature as "nature-deficit disorder": a non-medical condition that describes the relationship between reduced experiences in nature and negative impacts on children's educational and personal development. Nature-deficit disorder is characterized by "diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses" (Louv, 2005, p. 34).

Education garden programs are one means of increasing time spent in the out-of-doors, especially in urban and suburban communities (Hilgers, Haynes, & Olson, 2008; Kareiva, 2008; Mabie & Baker, 1996; Rosol, 2011). Education gardens produce positive direct and indirect impacts, including improved concentration, opportunity for hands-on learning in a variety of subjects, appreciation of the environment, nutritional knowledge, access to fresh garden produce, understanding of environmental sustainability and stewardship, and building social relationships with peers and the greater community (Hilgers et al., 2008; Moore, Apicella, Marston, & Thompson, 2012).

Despite the numerous advantages, previous literature has indicated two principal barriers to success for garden programs: funds and labor (Asah et al., 2014). Both of these challenges can be ameliorated by a strong, reliable volunteer base for garden maintenance (e.g., Glen, Moore, Jayaratne, & Bradley, 2013). The current study investigated volunteer support for maintenance of an education garden at Winter Park Elementary School in Wilmington, North Carolina and identified predictors of that support.

## **Literature Review**

Education gardens provide an opportunity for students to participate in hands-on learning while expanding their understanding of food production, the lifecycles of plants, and the nutritional benefits of consuming garden-grown fruits and vegetables. Education gardens also facilitate the development of important life skills, including responsibility, respect for the environment, and maintenance of a healthy lifestyle (Hilgers et al., 2008). Support from volunteers is crucial for gardens to meet these goals (Glover, Parry, & Shiness, 2005). Volunteers are needed for a variety of tasks related to maintenance and educational use of garden spaces. Examples of volunteer contributions include soil conditioning, building garden beds, planting, fertilizing, weeding, watering, and harvesting (Armstrong, 2000; Asah et al., 2014). Volunteer support for educational aspects of garden

spaces is often geared toward reducing the potential burden of these programs on teachers. For example, a volunteer environmental educator may help integrate garden activities into lesson plans and manage community volunteer involvement (Sobel, 2005). In addition, a volunteer garden coordinator may assist with other logistic tasks such as coordinating garden activities (Armstrong, 2000) and acquiring funding for education garden programs (Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2012).

The primary interest of the current study was to compose a volunteer “profile”—that is, to identify factors that distinguish people willing to volunteer from those who are not. Past research indicated a variety of predictors related to garden volunteerism, including demographics, parenthood status, availability, and lifestyle. The majority of previous research has focused on community gardens rather than education gardens, *per se*. However, the findings from previous studies are relevant to the questions being asked in the present study.

## **Demographics**

### **Age**

In a study of applicants for urban allotment gardens in Portugal, 90 percent of applicants fell within the working adult age range of 25 to 64 years old (Martinho da Silva, Fernandes, Castiglione, & Costa, 2016). A French study reported similar findings—two-thirds of participants in community gardens were actively employed and one-third were retired, whereas in private gardens, two-thirds of owners were retired and only one-third were employed (Scheromm, 2015). By contrast, in New York City, older adults were the most active age group of volunteers involved in maintenance of community gardens, followed by working adults (Saldivar-Tanaka & Krasny, 2004). Similarly, a survey of over 1,000 Master Garden volunteers in Iowa found that more than 60 percent of them were 60 years of age or older (Takle, Haynes, and Schrock, 2016). However, a third study in the United States, conducted in Washington, found that Master Gardeners tended to be younger, with more college education, and employed (Chalker-Scott & Collman, 2006).

### **Gender**

The aforementioned Portuguese study found a relatively even gender distribution of applicants for urban allotment gardens (Martinho da Silva et al., 2016). An interview-based study of gender roles in community gardens in St. Louis, Missouri found that women occupied more leadership positions than men (Parry, Glover, & Shinew, 2005). Despite this, interviewees indicated that gender did not determine participation or garden roles. Instead, key factors in garden participation and activities included age, relevant experience, and interests.

### **Education**

Little research has examined how education level might relate to volunteer contributions to community or education gardens. One exception is Martinho da Silva and colleagues’ (2016) Portuguese study, which found that more than one-fifth of the urban allotment garden applicants had higher education or held professional positions, a greater percentage than in the county overall. This

suggests that highly educated and informed people are an important group of potential urban gardeners.

### **Income**

Community and household income have also been related to presence and success of garden programs. For example, Turner, Eliason, Sandoval, and Chaloupka (2016) found that while the number of education gardens at elementary schools in the U.S. increased in the last decade, education garden programs occurred less frequently at schools in communities of lower socioeconomic status. Researchers identified the reasons behind this as strain on school resources, reduced volunteer availability, and safety concerns.

This is not to say that there is no incentive for providing community or education gardens in disadvantaged communities. Garden programs provide access to outside spaces requiring significantly less individual monetary investment than private spaces (Ghose & Pettygrove, 2014; Rosol, 2011). They also improve access to fresh produce in a cost-effective manner for residents (Armstrong, 2000). Haynes-Maslow and colleagues (2015) found that community member interest in garden programs stemmed from the gardens' potential to provide convenient access to fresh produce at an affordable price; however, they also noted that community participation, organization, and safety served as significant considerations in garden planning. The effects of personal and household income on garden volunteer involvement have not received the same attention as community income. As an exception, Ozer (2007) found that lower household income correlated with reduced parent participation in activities at children's schools, suggesting that parents with lower income may need additional encouragement to become involved in education garden projects.

### **Parenthood Status**

Research studying the relationship between having children and interest in volunteering for education and community garden projects has also been limited. One study in California compared schools that applied for an Instructional School Garden Program with those that did not. Results showed that applicant schools more frequently had a committed parent and community volunteer base compared to non-applicant schools (Hazzard et al., 2012). Similarly, in a study of volunteer support for the Australia-based Stephanie Alexander Kitchen Garden Program, recruitment of children's parents and grandparents to volunteer was found to contribute to success of the program at different schools and provided an opportunity for community-building and participation in children's education (Block et al., 2012). Interestingly, while family members served an important role in this program, individuals from the surrounding community, not related to children at the Garden Program schools, also comprised a significant portion of the volunteer base. Likewise, examination of Gateway Greening community gardens in St. Louis, Missouri further showed that volunteers may be motivated to help with education gardens out of their general support for children's education and exposure to nature, beyond benefitting their own children (Glover et al., 2005).

**Volunteer Availability**

Several researchers have identified volunteers' time availability as a major factor in garden success (Asah et al., 2014; Glover et al., 2005; Hazzard et al., 2012; Sobel, 2005). In evaluating volunteer support for a "public garden" located at Iowa State University, results showed that for some volunteers, opportunities to contribute to the garden were limited by their working hours, despite their interest in participating (Haynes & Trexler, 2003). Ozer (2007) reviewed education garden surveys conducted in California and suggested that garden programs have a better chance to succeed if they can increase volunteer opportunities by accommodating the schedules of working parents and community members. Martinho da Silva and colleagues' (2016) Portuguese study indicated that leisure time was the second-most frequently mentioned motivation to apply for an urban allotment garden. Similar to time constraints, the distance volunteers have to travel to the garden may serve as a deterrent. This barrier may be offset when food production becomes an important motivation to participate in community gardens (Ilyniak & Khuns, 2013).

**Lifestyle**

Participation in education garden programs provides experiential learning opportunities for individuals from urban communities (Hilgers et al., 2008; Mabie & Baker, 1996). Children with gardening experiences also develop greater environmental awareness (Aguilar, Waliczek, & Zajicek, 2008) and consume more fruits and vegetables (Jones et al., 2012). Thus, personal gardening interest and experiences might predict support for public garden projects. In support of this, Haynes-Maslow and colleagues' (2015) interviews of 13 focus groups of low-income individuals found participation in fruit and vegetable programs to be related to specific interests and lifestyle choices, such as an interest in growing food. Focus groups with active community gardens in their neighborhoods had more positive feedback about the programs than those with inactive community gardens.

People who consume organic food also tend to be more conscious about nature and the environment (Paul & Rana, 2012). However, Scheromm's (2015) assessment of the relationship between food purchasing and garden involvement found a disconnect between gardening and organic food purchasing practices. Many gardeners bought food sourced from conventional industrialized agriculture, due to financial reasons or convenience. On the other hand, garden participants who purchased organic and local produce most frequently tended to be interested in implementing organic and environmentally sensitive practices in community gardens.

**Current Study**

The popularity of community and education garden projects necessitates research into the elements that produce successful programs, including understanding the predictors of volunteer interest. Previous research has suffered from two major limitations. First, most of the studies relied on community gardens rather than education-style gardens, despite the fact that education gardens are unique in that their primary aim is to provide education rather than crops. This critical difference may have important implications for volunteer support.

Second, previous research has tended to focus on single predictors (e.g., income or purchasing organic food). Few efforts have been made to test the integrative predictive power across a wide range of different types of predictors of volunteer interest. Thus, it remains unknown a) whether these variables make independent contributions to the prediction of volunteer interest and b) which variable might be the leading factor contributing to voluntary help for education gardens. For instance, it would be useful to know whether prior experience with growing food is important to garden volunteering regardless of education and income level.

The current study was designed to address these two limitations by conducting a survey regarding an elementary school education garden at Winter Park Elementary School (WPES) in Wilmington, North Carolina to examine four groups of predictors of volunteer interest in installing and maintaining an extensive garden plan developed by a research team in the Department of Environmental Sciences at the University of North Carolina Wilmington (Figure 1). The goals of this study were two-fold. First, the survey sought to assess the level of volunteer interest in the surrounding community of Winter Park for participation in the garden project. Second, this study sought to gain a better understanding of the characteristics predicting volunteer potential.

### **Figure 1. Proposed WPES education garden plot**



Source: Google Maps (2017)

## **Methods**

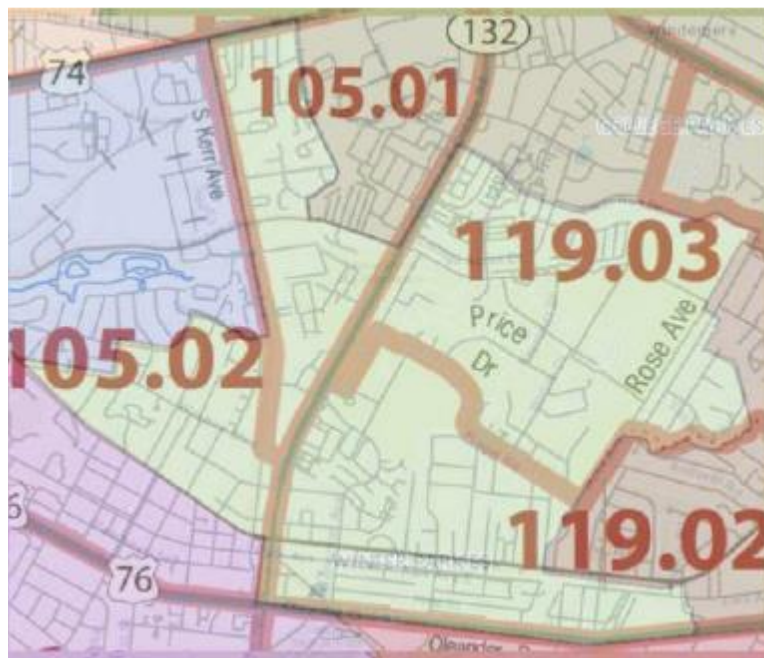
### **Participants**

Participants were randomly selected from the Winter Park Elementary School (WPES) district and neighboring areas. WPES is one of 30 elementary schools within the New Hanover County Public School System in North Carolina. The kindergarten through fifth grade school had a population of 366 students, with a student-to-

teacher ratio of 14:1, for the 2015-2016 school year (U.S. Department of Education, 2016). The education garden for WPES was proposed to be located within walking distance of the school on a small plot of land that is currently unused. The comprehensive garden plan includes volunteer requirements, designs for the physical space (i.e., planting beds, fencing, water source, walkways, and handicap accessibility), maintenance requirements (i.e., soil care, watering schedule, and pest control), lesson plans, planting and harvesting schedules, and necessary supplies.

The researchers stratified the households in the WPES district and neighboring areas by census tracts to ensure adequate representation of all parts of the area. The WPES district includes census tracts 105.01, 105.02, 119.02, and 119.03 (Figure 2), which we divided into sampling quadrants. The number of households within each of the quadrants was determined using census data to ensure proportional representation. The sampling frame included all households in the Winter Park community, rather than just households with children enrolled at WPES, in order to identify sources of support for the proposed garden project from the overall community.

**Figure 2. Winter Park sampling frame**



A total of 202 Winter Park community residents (106 males, 95 females, 1 did not report sex) participated in the education garden survey, with a response rate of 60.7 percent. Respondents ranged in age from 18 to 88 years old, (average 42.5, SD = 19.01). Education level had a relatively even distribution across the sample with the exception of the lowest (2 percent with some high school) and the highest education levels (2.5 percent with doctorate degrees): 10.9 percent with a high school degree, 26.2 percent with some college, 14.4 percent with an associate's degree, 28.2 percent with a bachelor's degree, and 15.3 percent with a master's

degree). A substantial number of respondents (40.6 percent) did not report household income due to either no knowledge (18.8 percent) or unwillingness (21.8 percent). The rest of the respondents reported an annual household pretax income relatively evenly distributed across the range: 9.9 percent earning \$25,000 or less; 18.8 percent earning \$25,001 to \$50,000; 12.9 percent earning \$50,001 to \$75,000; 9.4 percent earning \$75,001 to \$100,000; and 8.4 percent earning over \$100,000.

### **Procedure**

The survey instrument was refined using a pilot study involving both faculty and students. In January and February, pairs of trained University of North Carolina Wilmington undergraduate students administered a total of 202 paper surveys via in-person interviews (see complete survey protocol in Appendix A). Community residents were not notified about the study prior to survey implementation. Upon response of a household member, student surveyors introduced themselves and their affiliation, and gave a brief introduction to the purpose of the survey, but did not initially provide background information about the proposed education garden. Surveyors recorded willingness to participate in the survey, non-response, and refusal to participate. Surveyors ensured that all participants were age 18 or older and permanent residents of the household. In households with multiple adult residents, the adult who first responded to the request to participate completed the survey. To protect confidentiality, addresses of participants were logged separately from the surveys and catalogued using an assigned survey number. Addresses were collected to assess the relationship of residence inside and outside of the school district and distance from WPES on interest in the proposed garden project. Surveyors read each question/statement to participants and recorded, via written notation, dichotomous-choice selections, multiple-choice selections, Likert scale-based selections, verbatim responses to open-ended questions, and additional comments made by participants. Neither incentives nor rewards were offered for participation in the survey.

### **Measures**

The researchers developed the survey to obtain information about the Winter Park community, to understand existing attitudes toward gardening, and to evaluate interest in participating in an education garden. Although both quantitative and qualitative data were collected, only the quantitative part is reported in the current paper. We analyzed the data using SPSS, version 22. The quantitative measures assessed the key variable, volunteer support for the proposed education garden, as well as four groups of variables that were used to predict volunteer support: demographics, parenthood status, availability, and lifestyle preferences.

### **Demographic Variables**

The survey began with brief demographic background questions such as sex, age, ethnicity, religion, current occupation, highest education level, and annual household pretax income.

**Parenthood Status Variables**

Three variables were included that were related to children. First, each household was classified as either in the WPES school district or not by using the catalogued addresses and the WPES school district map. Second, participants provided the number of school-age children (defined as high school or below) that lived at the residence, and the ages of each of these children. Finally, respondents were asked to provide past, present, and future enrollment of the household's children at WPES. These responses were used to create a new variable representing the total number of children in each household ever enrolled at WPES based on summation of past, present, and future WPES attendance.

**Availability Variables**

Two questions were used to assess participants' potential availability for volunteering: driving distance from WPES and weekly paid working hours. Driving distance was determined with Google Maps. Participants reported their paid working hours per week in a free-listing format.

**Lifestyle Variables**

Two variables targeted lifestyle preferences: personal gardening interest and organic food purchasing behavior. Participants were asked whether they had ever grown food plants, whether they currently grew food plants, and whether they would like to grow food plants in the future if they had not done so. A dichotomous variable was created to represent interest in growing food by combining responses to ever, currently, and would like to grow food plants.

Organic food purchasing behavior was measured by one item asking participants to indicate how frequently they buy organic food, when available. A 5-point Likert scale was used to respond with options being never (0 percent of the time), rarely (up to one-third of the time), sometimes (up to two-thirds of the time), almost always (more than two-thirds of the time), and always (100 percent of the time).

**Volunteer Support**

Four separate questions were designed to measure volunteer support. First, participants reported their attitude about teaching students about gardening. Specifically, they responded to the statement, "It is important to teach elementary students about how food is grown" with a 5-point Likert scale ranging from *disagree strongly* to *agree strongly*. Next, two questions assessed participants' willingness to volunteer for the proposed education garden at WPES in a Yes/No format: (1) whether they would help maintain the garden, and (2) whether they would help organize maintenance activities at an education garden. Finally, if respondents indicated willingness to volunteer in any capacity, they were asked to provide the number of hours per month that they would be willing to contribute.

**Results****Volunteer Support for the Education Garden**

Participants had an almost unanimously favorable attitude towards teaching elementary school students about growing food; 92.6 percent of responses were

“strongly agree” and the rest (7.4 percent) selected “agree.” In terms of willingness to volunteer, 109 respondents (54 percent) indicated that they would be willing to help maintain an education garden at WPES if one was installed, and 79 participants (39.7 percent) were willing to help organize maintenance for the proposed garden space. However, for estimated monthly volunteer hours, 100 respondents (49.5 percent) reported zero hours and the rest ranged from 1 to 60 hours. The average of monthly volunteer hours for the whole sample was 4.92 ( $SD = 8.06$  hours). Among the 117 respondents who indicated willingness to volunteer in any capacity, 15 reported zero hours for monthly volunteer contribution. Thus, it appears that in principle, all participants agreed it is important to teach students about growing food. However, fewer participants expressed support by verbal consent and commitment to volunteer to help maintain the garden or organize maintenance.

### Variables Correlated with Volunteer Support

Pearson correlations were conducted between four groups of predictors (demographics, parenthood status, availability, and lifestyle) and the four indicators of volunteer support (attitude, willingness to maintain, willingness to organize maintenance, and volunteer hours). The correlations are presented in Table 1. It is clear that the attitudinal item of volunteer support only had statistically significant correlations with two out of 11 predictors: driving distance to WPES and frequency of purchasing organic food. This was likely due to the small variance of the attitudinal item. Therefore, the correlational results reported below focus on the other three variables of volunteer support.

**Table 1. Correlations of demographic, parenthood status, availability, and lifestyle variables with volunteer support variables**

	Attitude	Help maintenance	Help organize	Monthly volunteer hours
<i>Demographics</i>				
Age	-.02	-.30***	-.25***	-.24***
Sex	.08	.05	.01	-.05
Education	-.02	.08	-.05	-.08
Income	.06	.02	-.10	-.01
<i>Parenthood Status</i>				
In district	.02	-.05	-.16*	-.11
# of children	.07	.17*	.01	.05
# of children at WPES	.03	.18*	.19**	.17*
<i>Availability</i>				
Distance	-.18*	-.34***	-.18**	-.04
Working hours	.01	.21**	.12	-.01
<i>Lifestyle</i>				
Interest in growing food	-.10	.15*	.07	-.02
Purchases organic food	.22**	.21**	.20**	.14*

Notes: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , two-tailed  
N = 118 to 202

**Demographic Variables and Volunteer Support**

Out of the four demographic variables, only age had a significant, negative correlation with all three indicators of volunteer support, suggesting that younger respondents were more willing to volunteer with maintaining and organizing the garden, and were willing to contribute more hours per month. Sex, education, and income did not correlate with any of the volunteer support variables.

**Parenthood Status Variables and Volunteer Support**

Out of the 202 households, 157 (77.7 percent) were located within the WPES district, with the remaining 45 households (22.3 percent) in areas immediately surrounding the district. The majority of participants ( $n = 161$ , 79.7 percent) indicated that there were no school-age children living at the address. Of the 41 households with school-age children, the number of children ranged from one to five. Only 17 of the households with children (8.4 percent) indicated one or two children with either past, present, and/or future enrollment at WPES.

Overall, the three parenthood status variables were weakly correlated with volunteer support. Out of these three variables, number of children enrolled at WPES had the most consistent correlations with volunteer support; more children in the household enrolled at WPES correlated with more volunteer support that respondents were willing to provide in terms of maintaining the garden, organizing maintenance, and monthly volunteer hours. Whether the household resided in the school district had a weak negative association with willingness to organize garden maintenance. The total number of school-aged children had a weak positive association with willingness to maintain the garden. Overall, parenthood status variables did not appear to be strongly associated with volunteer support.

**Availability Variables and Volunteer Support**

Driving distance from the residence to WPES ranged from 0.06 to 3.40 miles, with an average of 1.57 miles ( $SD = .88$ ). Driving distance to WPES was found to have a significant negative correlation with willingness to help maintain and help organize maintenance but was not significantly correlated with monthly volunteer hours. This suggested that as the driving distance increased, respondents were increasingly reluctant to volunteer.

For weekly paid working hours, 75 respondents reported zero and the remaining 127 worked between three and 80 hours per week. The total sample had an average of 22.89 hours ( $SD = 20.81$ ). Weekly paid working hours was only significantly positively correlated with willingness to help maintain the garden space but not correlated with willingness to help organize maintenance or monthly volunteer hours. This indicated that the more people worked per week, the more they were willing to contribute to maintenance of the proposed education garden.

**Lifestyle and Volunteer Support**

The majority of survey participants ( $n = 156$ , 77.2 percent) indicated that they had personally grown food plants at some point in the past. Of the participants that had experience growing food plants, 54 grew food plants at the time of the survey. The

46 respondents who had never personally grown food plants or did not grow food plants at the time of the survey were asked if they would like to grow food plants; 22 indicated that they would like to. When a new variable was created to indicate an overall interest in growing food by the summation of positive responses to ever grown, currently grow, and would like to grow food plants, it was found that 178 respondents (88.1 percent) expressed some level of interest in growing food. This overall growing-food interest variable only had a significant positive correlation with willingness to maintain the school garden and did not significantly correlate with either willingness to help organize maintenance or estimated monthly volunteer hours.

For frequency of purchase of organic food, the responses were relatively evenly distributed across the provided Likert scale: never (10.4 percent), rarely (21.4 percent), sometimes (38.3 percent), almost always (21.9 percent), and always (7.9 percent). This frequency of organic food purchase was found to consistently have a significant positive correlation with all volunteer support variables, suggesting that the more frequently respondents purchased organic food, the more willing they were to help maintain the garden, help organize maintenance, and volunteer more time.

### **Independence of Variables Predicting Volunteer Support**

The correlational results suggested that the most promising variable from each group in terms of predicting volunteer support was age, number of children at WPES, distance, and frequency of purchasing organic food. To test whether they independently predicted volunteer support, the researchers conducted multiple regressions and these four variables were used to predict each of the volunteer support outcomes (i.e., willingness to help maintain the garden, willingness to help organize maintenance, and monthly volunteer hours). The attitudinal agreement about the importance of teaching elementary students about how food is grown was not included as a potential predictor because few variables showed a significant correlation with it, most likely because of the restricted range due to a high consensual agreement on this attitude. Logistic regressions were performed for willingness to help maintain the garden and willingness to help organize maintenance because these two variables were dichotomous (i.e., responses in the format of yes or no). Multiple linear regression was performed for monthly volunteer hours because this outcome was on a continuous scale.

### **Willingness to Help Maintain the Garden**

The logistic regression analysis showed that a test of the full model against a constant-only model was statistically significant, indicating that the four predictors as a set reliably distinguished between respondents willing and unwilling to help maintain the garden ( $\chi^2(4) = 219.27, p < .001$ ). Nagelkerke's  $R^2$  of .315 indicated a moderate relationship between prediction and grouping. Prediction success overall was 71.2 percent (61.8 percent for no and 78.9 percent for yes). The Wald criterion demonstrated that age (Exp (B) = .964,  $p < .001$ ), number of children at WPES (Exp (B) = 4.040,  $p = .033$ ), and distance (Exp (B) = .405,  $p < .001$ ) made a significant, independent contribution to prediction. Frequency of buying organic food was a marginally significant predictor (Exp (B) = 1.328,  $p = .068$ ). These

results suggest that a respondent was more willing to help maintain the garden when he or she was younger; had children enrolled at WPES in the past, present, or future; lived closer to WPES; and purchased organic food more frequently.

### **Willingness to Help Organize Maintenance**

Again, the logistic regression analysis showed that a test of the full model against a constant-only model was statistically significant, indicating that the four predictors as a set reliably distinguished between respondents willing and unwilling to help organize maintenance ( $\chi^2(4) = 233.19, p < .001$ ). Nagelkerke's  $R^2$  of .193 indicated a modest relationship between prediction and grouping. Prediction success overall was 72.8 percent (85.3 percent for unwilling and 54.4 percent for willing). The Wald criterion demonstrated that all four predictors made a significant, independent contribution to prediction: age (Exp (B) = .971,  $p = .001$ ), number of children at WPES (Exp (B) = 2.810,  $p = .030$ ), distance (Exp (B) = .659,  $p = .029$ ), and frequency of buying organic food (Exp (B) = 1.366,  $p = .039$ ). These results suggest that a respondent was more willing to help organize maintenance of the garden if he or she was younger; had children enrolled at WPES in the past, present, or future; lived closer to WPES; and purchased organic food more frequently.

### **Monthly Volunteer Hours**

The multiple regression analysis indicated that overall, the four predictors were able to account for a significant 7.6 percent of the variance in monthly volunteer hours ( $R^2 = .076, F(4, 193) = 5.055, p = .001$ ). Both age ( $Beta = -.223, p = .002$ ) and number of children at WPES ( $Beta = 2.249, p = .026$ ) significantly predicted monthly volunteer hours, suggesting that the younger the respondent was and the more children they had enrolled at WPES, the more volunteer hours the respondent was willing to contribute to the education garden. However, distance ( $Beta = -.009, p = .894$ ) and frequency of purchasing organic food ( $Beta = .094, p = .184$ ) were not significant predictors of monthly volunteer hours.

## **Discussion**

### **Community Support for Proposed Education Garden**

The results of this survey indicated a unanimous, high level of community support and significant community interest in participating in the proposed Winter Park Elementary School education garden. The strong support shown in the current study clearly indicated that the Winter Park community recognizes the importance of teaching elementary students about how food is grown, as well as the importance of education garden programs in incorporating food education into elementary school curricula. Open-ended responses indicating reasons for supporting the proposed education garden included "Helping kids take time away from technology"; "Teaching younger kids about food is important"; "Important for kids to learn about nature"; "Expose kids to where food comes from"; "Education to me as well," etc. These findings are highly consistent with recent literature that shows increasing popularity of education gardens due to growing awareness in the general public that garden programs provide an invaluable opportunity for students to participate in hands-on learning to expand their understanding of the lifecycles of

plants, to develop a better appreciation of the efforts involved in growing food, and to understand the nutritional benefits of consuming garden-grown fruits and vegetables. In addition, education gardens facilitate the development of important life skills, including responsibility, respect for the environment, and maintenance of a healthy lifestyle (e.g., Hilgers, Haynes, & Olson, 2008). They also provide technology-free activities that help narrow the growing rift between children and nature (Louv, 2005).

### **Volunteer Profile**

Attitude-behavior research has shown that moral support does not necessarily correspond to verbal commitment to actual support and even less to action commitment (see Bamberg & Moser, 2007). Thus, it is important to examine what differentiates those who are willing to volunteer to help with garden work. The current study found that four factors were consistently, significantly associated with willingness to volunteer for the proposed education garden: respondent age, number of children respondent had enrolled at WPES, driving distance between the household and WPES, and frequency of purchase of organic food. Regression results further indicated that these four factors made independent, statistically significant contributions to the prediction of willingness to volunteer to maintain the garden, as well as willingness to organize garden maintenance. For monthly volunteer hours, only age and number of children at WPES were significant predictors. Overall, these results suggested that respondents willing to help with the garden tended to be those who were younger, had children enrolled at WPES, lived closer to WPES, and purchased organic food more frequently.

These findings provide an interesting comparison to previous findings. Two U.S. studies showed that older adults tended to be the most active age group in community garden projects (Saldivar-Tanaka & Krasny, 2004; Takle et al., 2016). However, the findings of the current study appear to be more in line with two European studies that identified working adults as the most active age group in urban gardens (Martinho da Silva et al., 2016; Scheromm, 2015). Although not examined in the current study, we speculated that one reason that younger individuals were more willing to volunteer was because they find helping with an education garden more appealing than working in a community garden. If this was indeed the main reason, it would have important implications for management of public gardens—a garden volunteer program may wish to concentrate their recruitment efforts on select age groups. Given the current finding, it is conceivable that schools may have better success in efforts to raise awareness and recruit volunteers at special events targeting younger populations, such as state and county fairs and science fairs. Education gardens may also benefit from fostering connections with youth organizations (e.g., Boy Scouts and Girl Scouts) rather than individuals only.

Previous research regarding the relationship between having children, school enrollment, and interest in volunteering is also limited for education gardens. The present study directly assessed the relationship between having children and interest in volunteering for the education garden. Similar to Block et al. (2012) and Glover et al. (2005), the present study found a consistent positive correlation

between the overall number of children in the household enrolled at WPES and willingness to help maintain, help organize maintenance, and monthly volunteer hours. While this finding is unsurprising and encouraging, it raises the question of sustainable volunteer support. Currently it is unclear to what degree volunteers would continue their support after their children leave the school, what predicts recurring volunteering, and what efforts schools could make to retain current volunteers. A couple of studies, however, have recognized “positive feedback loops” between recurring volunteer contributions and positive impacts of community gardens including productivity of the spaces, education, community well-being, personal social-psychological benefits (e.g., personal growth), and environmental sustainability (Dennis & James, 2016; Guitart et al., 2012; Saldivar-Tanaka & Krasny, 2004).

Past research indicated that reduced volunteer time negatively impacted garden success (Asah et al., 2014; Hazzard et al., 2012). Both Ozer (2007) and Haynes and Trexler (2003) found that working adults, in particular, had limited availability to physically contribute to garden projects, despite their interest in participating. The present study found a significant positive correlation between weekly paid working hours and interest in helping to maintain the proposed WPES education garden. This indicated that the more hours per week that respondents worked, the more willing they were to contribute to physical maintenance of the garden space. These results indicated that working adults offered the most interest in volunteering in the WPES community, a trend similar to what Chalker-Scott and Collman (2006) found in Washington. This finding was particularly striking considering our other finding that driving distance to the school was negatively associated with willingness to volunteer for the garden. Taken together, it seems that as long as potential volunteers did not have to drive too far to get to the garden, weekly working hours did not hinder, but instead promoted, interest in volunteering. This is interesting in light of Ilyniak and Khuns’ (2013) finding that in community gardens, some participants were willing to walk long distances to help with the garden in order to produce affordable food, assuming they had the time. While there appears to be a discrepancy in these two findings with regard to the specific role of distance in garden volunteering, together they convey an important message: for the two common barriers to garden volunteering—work hours and required travel distance, each can be overcome by a strong motivation and dedication to participating in public gardens, whether education or community. Individuals’ willingness to help may be considerably reduced if impeded by both a busy work schedule and a long distance to travel.

Frequency of purchasing organic food showed stronger and more consistent associations with willingness to volunteer in the proposed WPES education garden than interest in growing food. This suggested that respondents who preferred the healthy lifestyle choice of buying organic tended to be more supportive of the education garden, whereas personal interest in growing food was less relevant. This finding was intriguing especially in conjunction with the finding that income did not significantly predict willingness to volunteer. Purchasing organic food is generally associated with higher incomes; the fact that only frequency of buying organic food, but not household income, predicted volunteer support for the WPES education

garden, indicated that one's ideology may be more influential than one's income or gardening experiences. Purchasing organic food can be driven by two distinct motives, however—a) a heightened awareness of the link between consuming organic food and personal health, and b) a strong concern about the negative impacts of conventional agriculture on the environment and a determination to fight against it. Unfortunately, our study was unable to differentiate which of these motives led to stronger willingness to volunteer.

All together, we believe that the current findings highlight the importance of examining volunteer support for education gardens compared to community gardens. These two types of gardens fulfill similar functions such as engaging in physical activity, expanding social connections, and giving back to the community; however, they serve fundamentally different purposes: the primary goals of education gardens are to teach children about plants and the process of growing food, whereas community gardens tend to focus on productivity and output (Dennis & James, 2016). Given this fundamental difference, it is reasonable that the profile of an active volunteer for an education garden, based on the current findings, consists of a relatively young, working parent with children enrolled in school, who is more likely to purchase organic food. It would be important for future research to further delineate the distinctive profiles for volunteers for education versus community gardens, for example, their personality traits and ideologies. Moreover, it would be fruitful to also examine the underlying motives that lead to differential support for these two types of gardens. Recent efforts in this area have been limited to community gardens and found that the most common motivations to volunteer include access to affordable, fresh food, social development, environmental stewardship, and education (Asah et al., 2014; Dennis & James, 2016; Guitart et al., 2012). Less attention has been given to identifying motivations to volunteer for education gardens.

### **Limitations and Future Directions**

While this study provided an important addition to the gardening-interest literature by reporting findings regarding willingness to volunteer for the proposed WPES education garden, there are some limitations. First, although respondents demonstrated a strong willingness to volunteer with three indicators (willingness to maintain the garden, willingness to organize maintenance, and monthly volunteer hours), this was completely based on self-reported willingness. It is entirely possible that expressing verbal support will not equate to action. It would be extremely valuable for future research to examine behavioral measures of volunteering support, such as school records of volunteering hours and activities. A follow-up study is currently in planning to be conducted every six months after the education garden plan is implemented. The follow-up study will involve a brief structured interview of the same community about their verbal support, actual volunteering efforts, and their volunteering experiences.

Second, while the Winter Park community showed strong support for the proposed education garden, and the present study was able to identify a number of qualities that characterize a potential volunteer, this community was unique in its suburban setting when compared to the communities in other studies. Existing education

garden research has generally focused more on funding for programs, the benefits of education in garden settings, and difficulties associated with establishing and maintaining education garden programs, rather than on understanding volunteer characteristics, recruitment, and retention (Ozer, 2006; Hazzard et al., 2012). Turner and colleagues' (2016) study assessed the presence of education garden programs in communities across the U.S. based on community and school demographics (e.g., locale, socioeconomic status, and race); however, they did not analyze these characteristics in relation with volunteer involvement. Given the overall scarcity of research on education garden support related to community volunteer involvement, future research will need to test to what extent the current findings will be replicated in varied communities.

The results of this survey will be an essential element in WPES' decision about whether to move forward with the current garden plan. Given the widespread strong support for the garden, the hope is that WPES will implement the garden in the near future, as planned. One of the benefits of this study was that it introduced community members to the concept of the garden project. It is conceivable that community support may increase as awareness increases. Should the WPES education garden plan move forward to the implementation phase, it will fulfill a unique suburban niche and serve as an important educational resource for WPES and the larger Winter Park community. Education gardens like this could expand to more communities to help prevent the further spread of "nature-deficit disorder" (Louv, 2005) and to help improve children's physical, social, academic, and psychological well-being.

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12. How many parents of these children live at this address? \_\_\_\_\_

13. Are you a parent of one of these children? Yes No

14. How many of these children currently attend WPES? \_\_\_\_\_

15. How many of these children will start at WPES in the future? \_\_\_\_\_

16. In the remaining children, how many of them attended WPES in the past? \_\_\_\_\_

17. Have you ever grown any food plants? Yes No (if no, skip to 21)

18. Do you currently grow any food plants? Yes No (if no, skip to 21)

19. What do you grow?

\_\_\_\_\_

20. Why do you grow food plants? (then skip to 23)

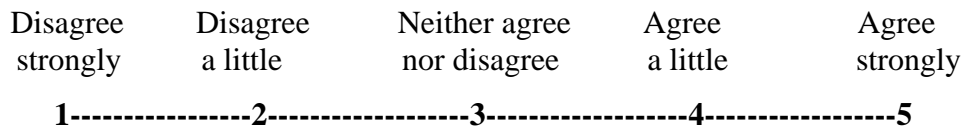
\_\_\_\_\_

21. Would you like to? Yes No (if no, skip to 23)

22. What prohibits you from doing so?

23. Please indicate whether you agree or disagree with the following statement using the following scale:

**“It is important to teach elementary students about how food is grown”**



24. If an education garden was installed at WPES, who should be responsible for maintaining it?

\_\_\_\_\_ (teachers, janitorial staff, parents, larger community, etc.)

25. If an education garden were installed at WPES, would you help maintain it? Yes No

26. Why or why not?

\_\_\_\_\_

27. Would you be willing to help organize maintenance activities at the garden? Yes No

28. Why or why not?

\_\_\_\_\_

**29. (Skip if no to both 25 & 27)**

***If you are willing to volunteer in any capacity, how many hours per month would you contribute? \_\_\_\_\_***

**30. Are you aware of current gardening efforts at WPES?** Yes No

**31. Are you interested in learning more about gardening efforts at WPES?** Yes No

**32. How often do you buy organic food, if available?**

- Never (0% of the time)
- Rarely (up to 1/3 of the time)
- Sometimes (up to 2/3 of the time)
- Almost always (more than 2/3 of the time)
- Always (100% of the time)

**33. Why do you choose to buy or not buy organic food?**

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***Thank you for your participation!!***