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EC-814-W

EXPERT REVIEWED

Personal Gardens: Who is growing their own in the U.S.?

And, an example of who is growing their own on Purdue University's campus

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Introduction

For multiple reasons, including food safety and transparency of production practices, conversations about food production increasingly include the role of the home garden. From an academic perspective, studies have found that, especially for young children, gardening can boost important skills, such as math, communicating knowledge, making decisions, and conveying emotions that aid in success not only in school but life in general (Miller, 2007; Robinson, 2005). Beyond the classroom, participation in community gardens increases fruit and vegetable consumption overall, resulting in positive dietary habits (Draper, 2010). The American Heart Association promotes gardening in any capacity to help promote fruit and vegetable intake among children, and it also notes gardening's positive impacts on learning (AHA, 2017). Gardening has many benefits for children, and more information regarding those who garden can help organizations target those who may benefit from more information on gardening, and increase involvement, too.

This paper will explore the demographics of groups who are gardening in the United States, as well as share a case study of a practical application to creating a gardening opportunity (involving children) on a university campus.

Identifying Gardening Participation in a Sample of 825 U.S. Households

Survey instrument and data collection

An online survey tool, Qualtrics, was used to gather information in November 2014 from 825 U.S. respondents who were contacted through an online panel maintained by Lightspeed GMI. Basic demographic information was collected, and questions were asked about lifestyle, such as outdoor activity participation and gardening habits. The composition of the sample was targeted to match the U.S population in terms of gender, age, income, education, and geographical region of residence (U.S. Census Bureau, 2014). Respondents were required to be 18 years of age or older to participate in the survey (managed using quotas in Qualtrics). The Purdue University's institutional review board (IRB) approved the survey (IRB Protocol Number 1410015306).

Responses to demographic questions were summarized by calculating frequencies for categorical variables and are reported in Table 1.

Additionally, to better understand who participates in gardening activities, cross tabulations were calculated for both demographics and gardening habits, as well as lifestyle questions and gardening habits. Cross tabulations employ chi-squared statistical testing to determine if the percentage of respondents is statistically different. Gardening habits were defined in two ways: (1) growing produce of any kind in a personal garden at home, and (2)

Table 1. Demographic Results n=825

Demographic Variable	*Percentage of Respondents*
Gender	
Male	49%
Age	
18 to 24 years	14%
25 to 44 years	34%
45 to 64 years	34%
65 years and over	18%
Households with at least 1 child	30%
Region	
Midwest	27%
South	33%
West	23%
Northeast	17%
Income	
Less than $20,000	19%
$20,000 - $39,999	29%
$40,000-$59,999	23%
$60,000-$79,999	12%
$80,000-$99,999	7%
$100,000-$119,999	3%
$120,000 or more	7%
Gardening Participation	
Growing produce of any kind in a personal garden AT HOME	35%
Growing produce of any kind in a personal garden NOT AT HOME (in a garden plot or community garden)	5%

growing produce of any kind in a personal garden not at home — in a garden plot or community garden, for example.

Insights into Gardening Participation by Respondent Demographics

Of respondents who indicated they grew produce of any kind in a personal garden at home, a higher percentage of women (40.1%) than men (30.3%) selected yes (Table 2). A higher percentage (43.3%) of respondents from the Northeast indicated they grew produce in a personal garden than did respondents from the Midwest (33%). Of respondents who reported an income of less than $20,000, a lower percentage (20.8%) reported growing produce at home when compared to other income levels. In comparison, 34.7% for those with incomes of $20,000-$39,999; 40.9% for those with incomes of $40,000-$59,999; 41.7% for incomes of $60,000-$79,999; 45.9% for incomes of $80,000-$99,999; and 46.2% for those who said they earned from $100,000 to $119,999 reported growing produce at home. As for ethnicity, American Indians (50%), White/Caucasian (38.4%), and Mexican/Latino (32.4%) had a higher percentage of respondents who said they grew produce at home when compared to the percentage of Black/African American respondents (14.7%).

A higher percentage of men (6.4%) than women (3.3%) reported growing produce of any kind in a personal garden not at home (Table 2). The age range with the highest participation was 18-24 (12.7%). Participation for the other groups was lower: 6.0% for ages 25-44, and 2.1% for ages 45-64. As for income levels, 3.7% of respondents who reported an income of $20,000-$39,999 said they grew produce in a personal garden not at home; which is lower than the percentage (9.8) of those reporting an income of $80,000-$99,999.

Households with children are more likely to participate in gardening, either at home or away: 41.6% of respondents who said they have children grow produce in a personal garden at home; fewer (8.2%) participate in gardening

Table 2. Cross tabulations of respondent demographics and gardening habits

	Growing Produce of any kind in a personal garden AT HOME		Growing produce of any kind in a personal garden NOT AT HOME (in a garden plot or community garden)	
Demographic	***Does Not Participate***	***Participates***	***Does Not Participate***	***Participates***
Gender				
Male	69.7%a	30.3%a	93.6%a	6.4%a
Female	59.9%b	40.1%b	96.7%b	3.3%b
Age				
18 to 24 years	68.2%a	31.8%a	87.3%a	12.7%a
25 to 44 years	64.9%a	35.1%a	94.0%b	6.0%b
45 to 64 years	64.2%a	35.8%a	97.9%c	2.1%c
65 years and over	62.9%a	37.1%a	98.0%b, c	2.0%b, c
Region				
Midwest	67%a	33%a	95.9%a	4.1%a
South	65.3%a, b	34.7%a, b	93.8%a	6.2%a
West	67.2%a, b	32.8%a, b	95.3%a	4.7%a
Northeast	56.7%b	43.3%b	96.5%a	3.5%a
Income				
Less than $20,000	79.2%a	20.8%a	96.2%a, b	3.8%a, b
$20,000 - $39,999	65.3%b	34.7%b	96.3%b	3.7%b
$40,000-$59,999	59.1%b	40.9%b	94.6%a,b	5.4%a,b
$60,000-$79,999	58.3%b	41.7%b	94.2%a, b	5.8%a, b
$80,000-$99,999	54.1%b	45.9%b	90.2%a	9.8%a
$100,000-$119,999	53.8%b	46.2%b	96.2%a,b	3.8%a,b
$120,000 or more	68.8%a, b	31.3%a, b	95.8%a, b	4.2%a, b
Children in Household				
No	67.4%a	32.6%a	96.6%a	3.4%a
Yes	58.4%b	41.6%b	91.8%b	8.2%b
Ethnicity				
White, Caucasian	61.6%a	38.4%a	96.0%a	4.0%a
Black, African American	85.3%b	14.7%b	96%a, b	4.0%a, b
Asian, Pacific Islander	72.3%a, b	27.7%a, b	87.2%b	12.8%b
Mexican, Latino	67.6%a	32.4%a	86.5%b	13.5%b
American Indian	50%a	50%a	100%a, b	0.0%a, b
Other	72.7%a, b	27.3%a, b	100%a, b	0.0%a, b

Each subscript letter denotes a gardening habit where the demographic does not differ significantly at the .05 level using a chi-squared test. For example, the a and b subscripts on male (30.3%) and female (40.1%) indicate that those values statistically differ from one another with regard to participation in at-home gardening by men versus women; in contrast, the matching subscripts for all age categories of at-home gardening indicate no statistical differences in participation by age.

away from home. For households without children, those participation levels were 32.6% and 3.4%, respectively. As for participation levels and ethnicity, 4.0% of White/ Caucasians had a personal garden away from home. A higher percentage of Asian/Pacific Islanders (12.8%) and Mexican/Latino (13.5%) had a personal garden away from home.

If the idea of transparency in food procurement is driving, at least in part, some people to participate in gardening produce at home, then one may consider whether other personal participation in food procurement may be related to gardening. With this in mind, an interesting association between hunting or fishing and gardening was identified. A higher percentage of respondents who indicated they fished (51.8%) also reported growing produce in a personal garden at home when compared to the percentage of respondents who indicated they did not fish (30.1%) (Table 3). In addition, a higher percentage of respondents who hunted (57.l %) indicted they grew produce in a personal garden at home than did those who reported not hunting

Table 3. Cross tabulations of respondent lifestyle and gardening habits

	Growing Produce of any kind in a personal garden AT HOME		Growing produce of any kind in a personal garden NOT AT HOME (in a garden plot or community garden)	
Demographic	***Does Not Participate***	***Participates***	***Does Not Participate***	***Participates***
Fishing				
No	69.9%a	30.1%a	97.6%a	87.3%a
Yes	48.2%b	51.8%b	2.4%b	12.7%b
Hunting				
No	67.2%a	32.8%a	96.9%a	79.8%a
Yes	42.9%b	57.1%b	3.1%b	20.2%b
Other Outdoor Activities				
No	72.1%a	27.9%a	95.8%a	4.2%a
Yes	51.5%b	48.5%b	93.9%a	6.1%a
Vegetarian				
No	64.9%a	61.7%a	91.3%a	98.6%a
Yes	61.7%a	38.3%a	8.7%b	1.4%b
Vegetarian in Household				
No	66.1%a	33.9%a	95.9%a	4.1%a
Yes	40.9%b	59.1%b	83.0%b	17.0%b
Vegan				
No	64.9%a	35.1%a	89.4%a	96.6%a
Yes	60.0%a	40.0%a	10.6%b	3.4%b
Vegan in Household				
No	65.5%a	65.5%a	95.8%a	4.3%a
Yes	34.5%b	52.9%b	76.0%b	24.0%b

Each subscript letter denotes a gardening habit where the demographic does not differ significantly at the .05 level. For example, the a and b subscripts on no they don't fish (69.9%) and yes they do fish (48.2%) indicate that those values statistically differ from one another with regard to participation in at-home gardening by respondents who fish and those who do not; in contrast, the matching subscripts for vegetarians (yes and no) in the at-home gardening column indicate no statistical differences in participation by vegetarians and non-vegetarians.

(32.8%). Less related to food procurement, but related to the act of gardening itself, a higher percentage of respondents who reported participating in other (besides hunting or fishing) outdoor activities (48.5%) also grew produce in a personal garden at home, compared to those who did not participate in outdoor activities.

A higher percentage of respondents who reported having a vegetarian in the household (59.1%) or a vegan in the household (52.9%) also reported growing produce at home when compared to the percentage of respondents who did not report having a vegetarian in the household (33.9%) or a vegan in the household (65.5%).

The role of gardening plays an important role in the development and understanding of our world and community (Miller, 2007; Robinson, 2005). Increasing interest (and research) on early childhood setting and the benefits of introducing and participating in gardening at a young age has been seen recently. In addition, as demonstrated by the higher percentage of people with children who had a garden at home and the higher percentage of people with children who participated in a community garden, people with children perceive some benefit to (or at least interest in) gardening. A reality of our culture is the family structure often cannot meet childcare needs with immediate family members in the home and often rely on out-of-home care in licensed childcare centers, and non-family home care providers. The implications of gardening in childcare settings adds another level of implications for the benefits of gardening and how gardening is implemented. "Childcare providers are an important target group to focus on when advocating for the use of instructional gardens with young children" (Davis & Brann, 2017).

In Practice: Cultivating Gardens with and for Children at Purdue University

The importance of gardening and the benefits of gardening have also been incorporated into the field of early childhood education. Early childhood programs that incorporate gardening into a daily routine help to build and develop an understanding of the cycle of planting and the community implications for diversity. Author Carolyn Tomlin, in an article titled *How does your garden grow?*, writes, "Through the studies of plants, children become aware of how people depend on plant life as the source of food, clothing, and shelter, as well as the aesthetic beauty inherent in both indoor and outdoor surroundings." (Tomlin, 2008). Early childhood programs that work with young children develop curriculum and opportunities to participate in gardening. One such example was demonstrated at a laboratory school at Purdue University.

The Ben and Maxine Miller Child Development Laboratory School (MCDLS) housed in the Department of Human Development and Family Studies in the College of Health and Human Sciences at Purdue University has a gardening collaboration with the Department of Hospitality, Tourism and Management (HTM). The laboratory school is a licensed childcare center with children from ages 6 weeks to 5 years of age enrolled in seven classrooms. Breakfast, lunch and snacks are served to the 96 children enrolled in the full-day program. Lunches are catered by HTM through a partnership with Ambarish Lulay, the Clinical Chef Instructor, and the kitchen staff. The collaboration between the two programs requires an annual review of the budget and menus. Marriott Hall, which houses kitchens, classrooms, and laboratory space for students enrolled in HTM, is a short walking distance from the laboratory school. A garden spot with 10 raised beds—in memory of Arnold Cohen, a late local businessman—is maintained behind the Marriot building by Lulay and his students. The gardens inspired an opportunity to extend the relationship with HTM and MCDLS in working together to maintain the garden plots. Cohen was the founder of Arni's, a regional pizza chain with a long history of boosting community projects.

The project began in spring 2014 and enjoyed wide support. Children from the laboratory school walked to the gardens, where they assisted in preparing the soil, weeded, planted, watered and harvested the vegetables. Jody Tishmack of Soilmaker provided soil, and Bennett's Greenhouse, Dr. Steve Hallett and Purdue Student Farms provided seedlings. The children had hands-on experience

with maintaining a garden space for a period of time and were allowed to use the harvest in their snacks and meals. The children taste-tested different varieties of tomatoes, and made pizza and zucchini bread. Several of the preschool age classrooms participated in a demonstration kitchen with HTM students who taught the children how to make gazpacho using tomatoes and cucumbers from the garden. The children measured the height of the plants from week to week to record their growth. They learned about the growing and production cycle of plants—and that some of the items that were planted were enjoyed by the local rabbits before they could be harvested. The classroom teachers discovered that the children were more apt to eat the vegetables they had harvested when they appeared on their lunch or snack plate. The first year of the gardening project included three of the older classrooms; the following year, the entire center participated in the gardening project. Parents often accompany the children to participate with their child in gardening. The location is ideal because many parents work on campus and can walk to the garden and share in the learning activity.

The gardens are also used for HTM's hospitality students to better understand where food comes from. This gardening project catches HTM's undergraduate students at a critical time to plant a seed of creativity (from a hospitality standpoint) much earlier than might otherwise occur in their careers. Specifically, when the HTM students see the activities of the MCDLS laboratory school children in the

garden, it can contribute to spurring ideas for hospitality concepts that involve guest participation at a much more fundamental level. For example, decorating outdoor areas of a restaurant with herbs that are used in the restaurant, using a more seasonal menu, and/or indicating the source of the ingredients used in prepared meals. Understanding this connection, and the associated growing and production cycle of plants, may contribute to an improved perspective on working in the food-service industry and the knowledge base to facilitate better purchasing decisions.

The motivation and connection for creating such a project helped to build on the value of having children in the laboratory school learn about the cycle of planting and how it relates to their daily eating. Gardening builds upon community relationships and developing an understanding culture (Nimmo & Hallett, 2008). The laboratory school is housed within a university community with a diverse population, and gardening serves as a universal language, or bridge of sorts, which brings everyone together. According to those involved, the gardening project has been rewarding for the children involved as well as the faculty and staff who participate in supporting the project.

Broad Implications

As laboratory schools, both HTM and MCLS strive to create opportunities for Purdue students to research and learn. The gardening project is just one example of a project that created an environment for research and learning to occur within an early childhood population. Further development of this project and other similar projects could become widespread. A few examples could be: expanding to (or forming linkages with existing programs in) family education or creating a curriculum that spans the seasonal cycle with gardening and planting including the winter months.

Additional research is needed to continue to gain understanding on whether, and to what degree, gardening impacts the eating or learning behavior of the children directly involved in gardening programs, as well as the effect of such a program on the quality and impact of the education HTM students received. Other garden-school interfaces exist around the state and country, although almost certainly with some degree of variation in terms of scale and intensity of gardening involvement. With the evolving interest in studying school and childcare involvement with gardens and food production, focusing on the impacts of the degree of integration of the garden into educational endeavors, may prove particularly fruitful in providing insights to those wishing to develop their own programs.

References

American Heart Association (AHA) (2017). Why we garden. http://www.heart.org/HEARTORG/HealthyLiving/HealthyKids/TeachingGardens/Why-We-Garden_UCM_436620_SubHomePage.jsp

Davis, K. L., & Brann, L. (2017). Examining the Benefits and Barriers of Instructional Gardening Programs to Increase Fruit and Vegetable Intake among Preschool-Age Children. *Journal of Environmental and Public Health*, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5457770/

Draper, C., & Freedman, D. (2010). Review and analysis of the benefits, purposes, and motivations associated with community gardening in the United States. *Journal of Community Practice*, 18(4), 458-492

Miller, D. L. (2007). The seeds of learning: Young children develop important skills through their gardening activities at a Midwestern early education program. *Applied Environmental Education and Communication*, 6(1), 49-66.

Nimmo, J., & Hallett, B. (2008) Childhood in the Garden, A place to encounter natural and social diversity. Beyond the Journal Young Children on the web, https://www.naeyc.org/files/yc/file/200801/BTJNatureNimmo.pdf

Robinson, C. W., & Zajicek, J. M. (2005). Growing minds: The effects of a one-year school garden program on six constructs of life skills of elementary school children. *HortTechnology*, 15(3), 453-457.

Tomlin, C. (2008). How does your garden grow? http://www.earlychildhoodnews.com/earlychildhood/article_view.aspx?ArticleID=583

U.S. Census Bureau, 2014. State and Country Quick Facts. Available online: https://www.census.gov/quickfacts/fact/table/US/PST045216

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About the photos

Children and teachers from the Ben and Maxine Miller Laboratory School at Purdue University participate in gardening activities, including watering, pulling weeds, and tending to the vegetable plants. (Photos used with permission)

Dec. 2018