Research Article

Awareness and Usage of Extension and Outreach Programs

Julian M. Worley[a], William B. Banks[a], William Secor[a], Benjamin L. Campbell[a]
[a]*University of Georgia*

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Abstract
Extension takes many forms, with a common thread to provide scientific information to a diverse audience on a variety of topics. This research examines awareness and use of Extension-related information from different entities (e.g., state Departments of Agriculture, private businesses, and other public entities), overall experience with Extension output from different entities, and use of different types of Cooperative Extension programming (e.g., youth development, food safety, and animal production). Using data from a 2021 survey of around 4,000 U.S. residents, most respondents were aware of or used information from a variety of sources and were not limited to their own state Extension and outreach sources. Depending on the program area, around 30–40 percent of respondents were interested but not using or attending Extension or outreach programming. Several demographic factors were associated with higher or lower awareness and use including age, race, gender, political affiliation, urbanicity, and connection to agriculture. Respondents found information and Extension agents to be somewhat reliable to extremely reliable. Finding ways to motivate

1 Introduction

Cooperative Extension (Extension) and other university outreach programs have had a long history of bringing academic research to the local communities they serve. Extension began with a focus on agriculture and rural communities in 1914. When Extension was founded, more than 60 percent of the population in the United States lived in rural areas, and 40 percent were engaged in some form of agriculture (Lusk 2016). In the first 5 years after its formal founding, Extension helped the U.S. war effort during World War I. During this time, Extension supported shifts in acreage, encouraged food preservation and processing, and helped farmers at home address labor shortages due to the draft (U.S. Department of Agriculture, National Institute of Food and Agriculture 2014). Today, Extension serves both rural and urban communities, as only about 2 percent of the population is actively involved in farming today (U.S. Department of Agriculture, Economic Research Service 2021), and approximately 85 percent of the population lives in urban areas (Dobis et al. 2021). Extension offers programs on childhood development; gardening; 4-H; science, technology, engineering, and math (STEM); and much more, in addition to the traditional agriculture Extension services.

With the shift from a traditionally rural audience to an audience across the entire urban-rural spectrum, there may be opportunities for increased awareness of and impact from Extension programming. This study investigates respondent awareness and use of Extension programs and other outreach services. In particular, how aware are people of Extension and other Extension information providers (e.g., state Departments of Agriculture, private businesses, etc.), how many have used Extension or other outreach services, or attended Extension or other outreach programs, and what are the potential factors that drive this awareness and use? A nationwide survey was conducted that assessed general residents' awareness and use of Extension and outreach services through various providers (e.g., in-state universities, out-of-state Departments of Agriculture, and industry associations) and across different topic areas (e.g., crop production, animal production, youth development, etc.).

A multinomial logit (MNL) regression is used to assess the importance of different sociodemographic drivers of awareness and use. The results suggest several sociodemographic factors are important in assessing awareness and use of different entities' Extension and other outreach efforts that include age, race, political affiliation, education, and income. The impacts are relatively consistent (i.e., have the same sign) across different entities. By program area, awareness, interest, and use are affected by location within the United States, age, gender, education, household income, and other factors. Again, the results are relatively consistent across program areas. These results suggest that there are different segments of the public that Extension and other information providers can target to reach a broader audience. For instance, rural respondents, younger (Millennial and younger), and households with higher incomes are more likely not to be aware of Cooperative Extension in their state (or more likely to be aware and use). Given this, opportunities exist to increase awareness to these groups as they have a higher probability of using Cooperative Extension if they are aware.

2 Background

The Morrill Act of 1862 enabled the establishment of a group of postsecondary institutions focusing on the education of the public in the "agriculture and mechanical arts" (Croft 2019). It was followed by a second act, the Morrill Act of 1890, that further secured financial support for these institutions, as well as creating 19 historically black college and university land-grant institutions. More than 100 years later, the Equity in Educational Land Grant Status Act of 1994 rounded out the legislation concerning land-grant universities by bringing 36 tribal colleges and universities into the land-grant system. These groups are often referred to as 1862, 1890, and 1994 institutions, respectively. All three waves of land-grant institutions are tied to the three-fold land-grant mission: teaching of students within the university, research to further our collective understanding, especially in the realms of agriculture and engineering, and outreach to the general public to bring the knowledge gained in research out for use by the public (Croft 2019).

While the land-grant acts of 1862, 1890, and 1994 established a place for education of students and research, there was a need for more research dissemination among the general population, especially those involved with agriculture. Thus, the Hatch Act of 1887 established the funding and organization of agricultural experiment stations, with the main directive to help diffuse new research findings to the public and look into areas of research relevant to the general agriculture community (Croft 2019). These agricultural research stations prompted a wave of legislation in regard to the organization of land-grant institutions. The Smith and Lever Act of 1914 further ensured the mission of extension of research to the general public in the land-grant mission through a combination of federal, state, and local funding and formally established the Extension system currently used today. It should be noted that the two above acts excluded 1890 and 1994 institutions from funding. This was remedied by the Evans-Allen Act in 1997, which established funding for the 1890 schools, and the Agricultural Research Extension, and Education Reform Act (AREERA) of 1998, which provided funding for 1994 institutions (Croft 2019).

Several studies have attempted to determine the impact of Extension, but passing of program informational content to nonparticipants via word of mouth or other unobserved means makes it difficult to fully quantify the impacts (see Israel 1992 for sampling methods). Studies often focused on only one part of the Extension service such as the impact of youth programs (Edwin, McKinley, and Talbert 2010), the impact of Extension on lifelong learning (Van Tilburg 1989), or one specific area, such as social impacts (Borron et al. 2019).

Warner et al. (1996) provides some insight into public perception of Extension and its programs. The authors conducted a telephone survey in 1982 and 1995 asking potential Extension users their awareness and use of Extension programs, in an attempt to track the impact of Extension more fully. The combined awareness of Extension overall decreased by 2 percent between 1982 and 1995, with the

largest area of decreased awareness in community development and 4-H, both an 8 percent decrease over the study time periods. Twenty-six percent of the sample in both 1982 and 1995 indicated that they had used Extension services at some point. However, the percentage who used Extension programs dropped by a third, from 12 to 8 percent, between 1982 and 1995. The greatest geographical area of usage was the Midwest and Southern regions, while demographically those living on farms and those with higher incomes and educational levels used Extension programming more often. The lowest level of usage demographically were people living in cities, young people, and those with lower incomes and educational levels. These usage trends carried over between both rounds of the survey.

Warner et al. (1996) also asked about current funding levels for different programs (i.e., 4-H/youth development, family development/management, natural resources/environment, community economic development, nutrition/health, agriculture production/marketing, and leadership/volunteer development) in 1995. Across all programs, a majority of respondents in their survey indicated that funding should be kept the same or increased. Areas including 4-H/youth development, family development and management, and natural resources and the environment were areas in which more than half of respondents said to increase spending. Around half of respondents said that spending on the agriculture production and marketing area should remain the same. These funding preferences varied across different sociodemographic factors such as race, gender, age, and income.

Yang et al. (2009) surveyed Adams County, Colorado, residents about the importance of thirty-seven issues. Using principal component analysis, the authors identified six principal issue areas (i.e., helping vulnerable children/youth, agricultural education and sustainability, strengthening families, chronic diseases, and environmental threats). The residents identified helping vulnerable children and youth as the most important, and agricultural education and sustainability as the least important. Yang et al. (2009) found that several demographic factors affect the relative importance of these different principal issue areas, including gender, age, and household size. Moreover, the authors found that 71 percent of the survey respondents were unaware of Extension. Twenty percent were aware but did not have any contact with Extension. Last, 9 percent had interacted with Extension within the last 3 years.

More recently, Narine, Ali, and Hill (2020) surveyed Utah residents about thirty-two issues and how much effort Extension should place on each issue. The authors narrowed these issues into four priority issue areas using principal component analysis. The most important priority issue area according to Utah residents was environmental quality, followed by conservation capacity, community development, and agriculture and food safety. Individual issues that received higher effort ratings centered on the environment and food health and safety.

These studies suggest that there may be differences in awareness, interest, and use across different program areas. Additionally, these studies suggest that sociodemographic factors may be important considerations affecting awareness, interest, and use. Our study builds on past studies by examining awareness of not only traditional Cooperative Extension, but also Extension information coming from entities outside Cooperative Extension. Further, our study examines overall experience with Cooperative Extension as well as use and interest in different types of Extension programming.

3 Data

During January 2021, an online survey was implemented to obtain a representative sample of the U.S. population. The purpose of the survey was to better understand perceptions of agriculture within the United States, specifically preferences and perceptions about production practices in the greenhouse industry. Furthermore, the survey examined awareness, experience with, program use, and investment levels in Extension and other outreach services.

Respondents were recruited from the online panel of Toluna, Inc. A random set of panelists were emailed by Toluna, Inc., asking if they would like to participate in the survey. (Toluna is from Wilton, CT, and maintains a panel database and utilizes various data quality checks, including eliminating duplicate

responses, speed-checks, etc.). Panelists agreeing to participate were directed to the survey where they were presented with the Institutional Review Board consent form. After consenting to take the survey, respondents completed the survey. The only requirement to participate was that a respondent be 18 years of age or older. A total of 3,931 respondents completed the survey questions of interest to this paper.

The sample is relatively representative of the U.S. population with respect to age, race, region of residence, and household income. Table 1 presents descriptive statistics and a comparison to U.S. Census Bureau estimates as appropriate. The estimated median U.S. age is 38 years while the sample median age is 42 (U.S. Census Bureau 2019a). The sample age is higher given the U.S. Census estimates include persons under 18 years of age—our sample only included respondents 18 years of age or older. U.S. Census estimates the race makeup of the U.S. population as 76 percent Caucasian, 13 percent African American, and 11 percent another race (U.S. Census Bureau 2019b). In comparison, the sample is 82 percent Caucasian, 9 percent African American, and 9 percent other. The U.S. Census estimate of median household income is $62,843 (U.S. Census Bureau 2019b), which is similar to the sample median household income of $62,501. Regions are defined using criteria defined by the Bureau of Economic Analysis, with each region being represented in a similar manner as the population. The Mideast and Far West are slightly different from U.S. Census estimates. The sample is disproportionately women compared to men (62 percent female compared to 51 percent male estimated by the U.S. Census), which could impact the results. Results are generalizable to the overall U.S. population to the extent the sample is representative of the population as a whole.

Prior to answering the Extension-related questions, respondents were told that "Extension is providing formal and informal education to clients." The questions of interest for this paper are:

1) How aware are you of the Extension efforts provided by the following entities ...? (See Table 2 for different providers of Extension information.) The choices included: Not aware, Have heard of but not used, Have used information but not attended an in-person/online event, Have attended an in-person/online event, and Have used information and attended an in-person/online event.
2) Overall, what has been your experience with the following entities (listed in Table 2) with respect to providing education programming, information, workshops, etc.? (0–100 scale, 0 = Extremely Negative, 50 = Neither Negative/Positive, and 100 = Extremely Positive)
3) What types of information commonly provided by your state's Cooperative Extension have you used or would use to better your life/business? (See Table 3 for program areas.) The choices included: Have used, Have attended an in-person/online event, Have attended an in-person/online event and used information, Not used but interested in accessing information, Not used but interested in attending an in-person/online event, Not used but interested in attending an in-person/online event and accessing information, and Not interested.)
4) How reliable do you perceive the information that you have seen from your state's Cooperative Extension? (0–100 scale, 0 = Not reliable, 50 = Somewhat reliable, and 100 = Extremely reliable)

Table 1: Descriptive Statistics of Demographics and Other Variables of Interest

Variable[a]	Mean	Census Estimates
Region[b]		
Far West	14%	17%
Rocky Mountains	3%	4%
Southwest	11%	13%
Plains	5%	7%
Great Lakes	14%	14%
Mideast	19%	15%
New England	5%	5%
Southeast	28%	26%
Age (median years)	42	38
Age: Generation[c]		
Millennial and younger	41%	
Generation X	29%	
Baby Boomers and older	30%	
Race		
White/Caucasian	82%	76%
African American	9%	13%
Other	9%	10%
Gender: Male	38%	49%
Political Affiliation		
Democrat	43%	
Republican	29%	
Independent	23%	
Other	6%	
Education		
High School or Less	15%	38%
Some College or Associate's Degree	32%	28%
Bachelor's Degree	31%	22%
Higher than Bachelor's Degree	22%	13%
Urbanicity		
Metropolitan	25%	
Suburban	53%	
Rural	22%	
No. Children in Household	0.8	
No. Adults in Household	2.2	
Household Income (median $)	$62,501	$62,843
Primary Food Buyer in Household	94%	
Primary Plant Buyer in Household	86%	
Connection to Agriculture, Personal or Parental[d]	35%	
No. Observations	3,931	

[a] Reference categories for categorical variables are as follows: Region = Southeast, Generation = Baby Boomers and older, Race = White/Caucasian, Gender = Female, Political Affiliation = Democrat, Education = Bachelor's Degree, Urbanicity = Metropolitan, Primary ___ Buyer in Household = Not the primary ___ buyer.
[b] States are divided into regions using definitions from the Bureau of Economic Analysis (Abadi 2018).
[c] Baby Boomers—born 1964 or prior, Generation X—born between 1965 and 1984, Millennial—born in 1985 or after
[d] A respondent has a connection to agriculture if the respondent or their parents have either grown up on a farm or have worked on a farm, or the respondent has worked or are working another non-farm agricultural job.

Table 2: Entities Evaluated for Awareness and Use/Attendance of Extension (or Extension-Like) Programming
Entities
Your state's Department of Agriculture
Your state's Cooperative Extension
Your state's universities
Departments of Agriculture in other states
Cooperative Extension in other states
Universities in other states
Private businesses
Other public entities in your state
Other public entities in other states

Table 3: Program Areas Evaluated for Attendance and Use/Attendance
Program Areas
Animal production (for food)
Animal production (non-food)
Crop/plant production (for food)
Crop/plant production (non-food)
Environment and natural resources
Youth development (e.g., 4-H)
Money, family, and home
Food safety and health
Timely and trendy topics
Other

4 Empirical Model

Questions 1 and 3 are of main interest for this paper. With respect to Question 1, the choices are divided into three categories: (i) Not aware of, (ii) Have heard of but not used, and (iii) Used or attended, or both, in order to better understand awareness and use. Given the categorical nature of the data, a MNL model is utilized to examine sociodemographic factors impacting responses that provides Extension information (Table 2). The model is specified as (Greene 2012):

$$P(R_i = j) = \frac{e^{\boldsymbol{\beta}_j' \boldsymbol{x}_i}}{\sum_{v=0}^{2} e^{\boldsymbol{\beta}_v' \boldsymbol{x}_i}} \text{ where j = 0, 1, 2} \quad (1)$$

where the $P(R_i = j)$ is the probability that the ith respondent (R_i) chose the jth option; $\boldsymbol{x}$ is a set of respondent characteristics (Table 1); and $\boldsymbol{\beta}$ is a vector of parameters. These respondent demographics are selected to provide a breadth of demographics (e.g., age and race), psychographics (e.g., political affiliation), and behaviors (e.g., primary food or plant buyer) that may be associated with a person's awareness or use of Extension or outreach programming. Others in the literature have also used these variables when asking similar questions. For example, Yang et al. (2009) compared respondent program priorities across gender, age, urbanicity, education, income, household size, and other demographic variables. Marginal effects are estimated because they are more readily interpretable than the MNL coefficient parameters using log-odds. The marginal effect for a continuous variable represents the increase/decrease in probability of being in a category given a one-unit change in the explanatory

variable. Categorical variable marginal effects represent the change in probability given a change from the explanatory variable's base category. Standard errors of the marginal effects are estimated using the delta method (Stata n.d.).

With respect to Question 3, respondent choices are aggregated into three categories: (i) Not interested, (ii) Not used but interested, and (iii) Used or attended. A MNL model is analyzed for each Extension program area described in Table 3. The structure of the MNL model is similar to Equation 1, except that the options are now not interested, not used but interested, and used or attended for a particular program area. Average marginal effects are calculated in the same way as with respect to Question 1. The average marginal effect for a continuous variable estimates the change in probability of being in a response option given a one-unit change in the independent variable. Categorical variable average marginal effects are estimated as the change in probability of being in a category given a change in the categorical variable from a base category. As before, the standard errors of these marginal effects are estimated using the delta method.

5 Results

Due to the large number of programs considered in this paper, the results start with an overview of awareness of outreach programs as a whole. Then the results of the estimated MNL models are presented. Next is a more detailed look at respondents who stated they are aware of outreach programs and the results from the second series of MNL models (for survey Question 3 of interest) regarding interest and use of various Extension programs. Full estimation results are available as a downloadable supplementary appendix accompanying this paper.

5.1 Entity Awareness and Use

Figure 1 presents the results of awareness and use by potential outreach providers. In all but one case, a plurality of respondents to the survey are aware of outreach programs by different entities. However, use tended to be at around 30 percent across all entities. Approximately, 65 percent of respondents are aware that a university in their own state offers Extension programming, while around 60 percent are aware of Extension programming at universities in other states. Extension has around 30 percent use, with around another 25 percent hearing about programming from Extension.

These results are somewhat similar to Warner et al. (1996); however, direct comparison is difficult because of differences in terminology. Awareness may have increased since 1995 when Warner et al. (1996) found that around 45 percent of respondents were aware of the Cooperative Extension Service by name. In the current study, around 55 percent of people are aware of or use Cooperative Extension. Warner et al. (1996) found that around 26 percent of respondents had ever used Extension programming. These results suggest use has increased since 1995.

Around 23 percent of respondents have heard of, but have not used, their state's or another state's Extension or services provided by other public entities. In contrast, around 27 to 29 percent of respondents are aware of, but have not used, Extension services of universities and state Departments of Agriculture. Thirty-seven percent of respondents are both aware of and use or attend Extension or other outreach programs provided by the land-grant university in their state, and 32 percent are aware of and use Extension or other outreach programs provided by other states' land-grant universities. Thirty-two percent of respondents use or attend their own state's Extension and outreach information or programs, but only 28 percent do the same for Extension and outreach in another state.

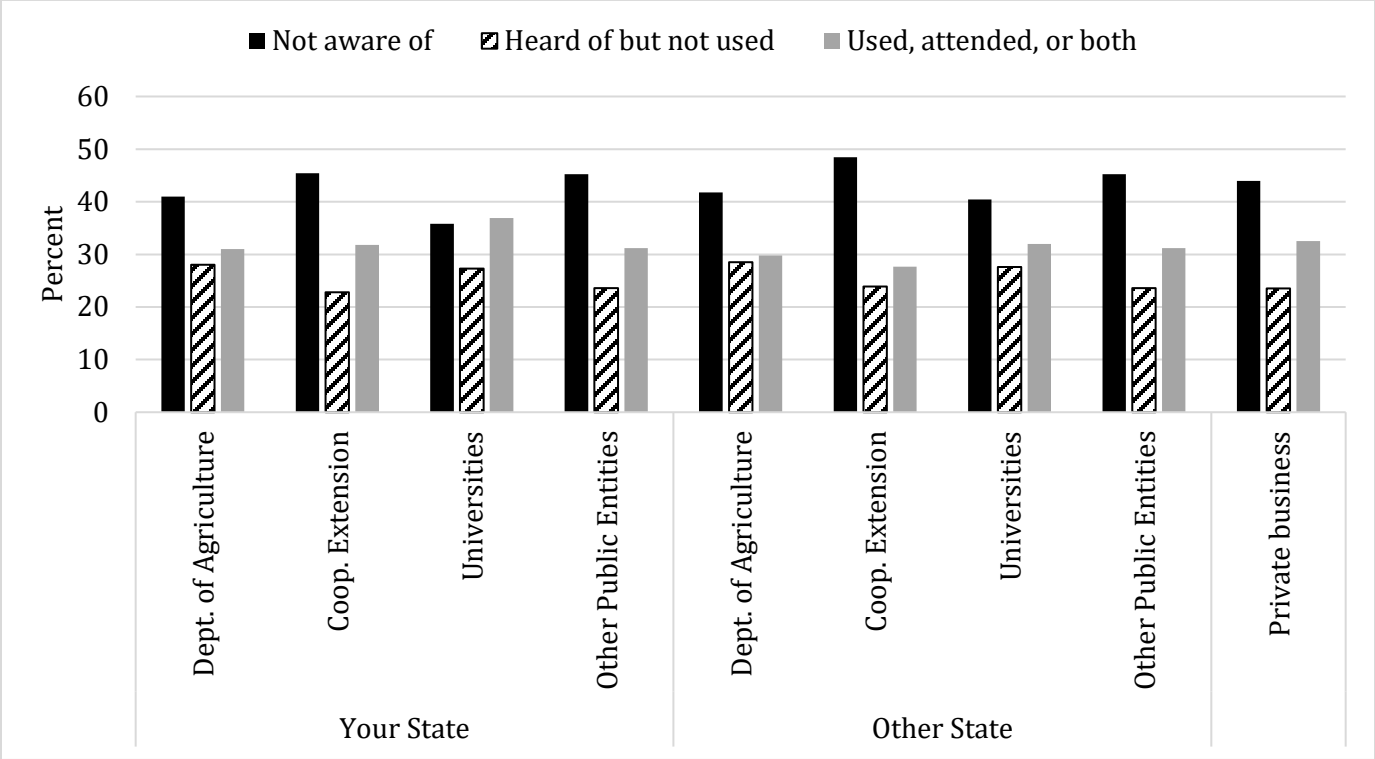

Figure 1: Respondent Awareness by Entity and Level of Awareness

MNL models examining factors influencing awareness and use of programs or services for different entities (providers) separated by the providing entity result in several interesting findings. The range of marginal effects for each explanatory variable across entities and the direction of any significant marginal effects are presented in Table 4. Marginal effects for all entities are available from the authors upon request. Generation X and younger are more likely to be aware of and use Extension programs in comparison to older generations (e.g., Baby Boomer and older). From Table 4, Generation X is between 4.1 and 15.7 percent more likely to have used, attended a program, or done both, compared to the Baby Boomer and older generation. This points to a potential generational break in awareness of Extension and other outreach entities.

African American respondents are more likely to use/attend Extension information across different entities compared to Caucasian respondents. Male respondents are also more likely to be aware of and use Extension and outreach programs. This has one of the largest impacts on the probability of awareness or use. Respondents who identify as Republican are more likely to be aware of Extension and other outreach programs, but are less likely to use them as compared to Democrats. Education also plays an important role in awareness and use of Extension and outreach programs. Respondents with an education level below a bachelor's degree are more likely to be unaware of Extension and outreach programs. This may be due to many of the Extension programs running out of universities, where college students have a higher chance of exposure to Extension and other programs and services. Respondents with education levels above a bachelor's degree are more likely to be both aware of and use Extension programs and services. This again may be due to an increase in the possibility of exposure to outreach programs and services while pursuing multiple degrees.

Households with more adults and those with more children are more likely to be aware of and use Extension services, as are households with higher incomes. Suburban respondents are more likely to be unaware of and therefore less likely to use Extension programming, whereas rural respondents are more likely to be aware of Extension, compared to urban respondents. This may be due to availability and ease of participation in programs in rural and suburban areas. In terms of the impact of having a

Table 4: Multinomial Logit Regression Marginal Effects of Entity Awareness, Range across Different Entities, and Significance Direction (if significant)[a]

Variable	Not aware of			Heard of but not used			Used, attended, or both		
	Low	High	Significant Direction[b]	Low	High	Significant Direction	Low	High	Significant Direction
Region									
Far West	-0.005	0.065	+	-0.058	0.006	-	-0.028	0.018	
Rocky Mountains	0.034	0.121	+	-0.055	0.046		-0.097	-0.014	-
Southwest	-0.004	0.036		-0.054	0.005	-	-0.020	0.026	
Plains	-0.022	0.048		-0.046	0.039		-0.030	0.031	
Great Lakes	-0.010	0.020		-0.020	0.034		-0.024	0.017	
Mideast	-0.020	0.014		-0.047	0.002	-	-0.012	0.036	+
New England	0.040	0.102	+	-0.097	-0.022	-	-0.049	0.030	
Generation									
Young	-0.102	0.056	+/-	-0.137	-0.078	-	0.054	0.180	+
Generation X	-0.084	0.015	-	-0.110	-0.056	-	0.041	0.157	+
Race									
African American	-0.041	0.003		-0.055	0.001	-	0.002	0.072	+
Other	-0.029	0.012		-0.033	0.050	+	-0.021	0.035	
Gender: Male	-0.187	-0.143	-	-0.002	0.030	+	0.136	0.176	+
Political Affiliation									
Republican	-0.016	0.002		0.010	0.055	+	-0.045	-0.008	-
Independent	0.007	0.048	+	0.022	0.053	+	-0.084	-0.052	-
Other	0.031	0.114	+	-0.058	0.022	-	-0.067	-0.038	-
Education									
High School or Less	0.046	0.118	+	-0.024	0.007		-0.119	-0.026	-
Some College	0.052	0.080	+	-0.036	0.017	-	-0.089	-0.026	-
Higher than Bachelor's Degree	-0.086	-0.060	-	-0.024	0.023		0.052	0.101	+
Urbanicity									
Suburban	0.019	0.036	+	0.001	0.029		-0.061	-0.037	-
Rural	-0.041	0.036	-	0.025	0.074	+	-0.079	-0.019	-
No. Children in Household	-0.048	-0.027	-	-0.013	0.006	-	0.033	0.046	+
No. Adults in Household	-0.025	-0.007	-	-0.008	0.011		0.007	0.019	+
Household Income[c]	-0.009	-0.003	-	-0.007	0.001	-	0.007	0.010	+
Primary Food Buyer in Household	0.016	0.078	+	-0.023	0.026		-0.056	-0.017	

Table 4 continued.

Variable	Not aware of			Heard of but not used			Used, attended, or both		
	Low	High	Significant Direction[b]	Low	High	Significant Direction	Low	High	Significant Direction
Primary Plant Buyer in Household	-0.123	-0.083	-	-0.023	0.046	+	0.062	0.109	+
Connection to Agriculture	-0.207	-0.155	-	-0.014	0.038	+	0.158	0.196	+

Note: Significance is at the 10% level. Full marginal effect and coefficient results are available from the authors in a supplemental appendix.
[a] Entities include: Your state's Department of Agriculture, your state's Cooperative Extension, Your state's universities, Department of Agriculture in other states, Cooperative Extension in other states, Universities in other states, private businesses, other public entities in your state, and other public entities in other states.
[b] Significant direction looks across all entities and assesses whether the sign direction is positive or negative for any significant variables. For instance, if all significant marginal effects were all positive for a variable, then the significant direction column would have a "+", if the significant marginal effects were all negative for a variable, then the significant direction column would have a "-", and if there were positive and negative effects then the significant direction column would have a "+/-". Exact marginal effects are available from the authors upon request.
[c] The marginal effect for household represents a change in the probability given a $10,000 increase in income.

connection to agriculture, an increased connection to agriculture leads to increased likelihood of awareness and use of Extension.

Some of these results match with previous literature, while others are different. The findings regarding education, income, and connection to agriculture are directionally similar to Warner et al.'s (1996) findings. However, our results on age, race, and rurality differ. Warner et al. (1996) found that whites made more use of Extension programming. However, we find that African Americans are more likely to use or attend Extension or outreach programs. Similarly, Warner et al. (1996) showed that those in cities and those that are younger have lower use rates. Our results are in direct contrast to this.

Figure 2 contains the experience ratings of each entity by respondents who indicate they have used information from that entity or have attended an event put on by the entity, or both. Average experience ratings are relatively close to one another, ranging from 68.5 to 72.7 on a 100-point scale (0 = Extremely Negative, 50 = Neither Negative/Positive, and 100 = Extremely Positive). The respondents' own state Departments of Agriculture, Extension, and universities received the highest ratings, while private businesses and other public entities received the lowest ratings. These results suggest that residents have a positive experience with the entities in their state that are traditionally associated with providing outreach and less so with other states' providers and private businesses. Table 5 contains the reliability of Extension information and personnel. These reliability scores are given on a 0–100 scale with 0 being not reliable, 50 being somewhat reliable, and 100 being extremely reliable. These are similar to each other at approximately 74. This suggests that users find the information from Extension reliable. Additionally, respondents find that the people they interact within Extension are reliable.

Table 5: Perceived Reliability of Cooperative Extension Information and Personnel, 0–100 scale[a]

Reliability of Element Evaluated	Obs.	Mean	Std dev.
Information	1,298	73.8	21.6
Extension agents or other personnel you get information from	1,289	74.1	21.2

[a] 0 = Not reliable, 50 = Somewhat reliable, and 100 = Extremely reliable
Note: This sample is limited to those respondents that indicated they used information from their state's Extension, attended an online or in-person event by their state's Extension, or did both of those things.

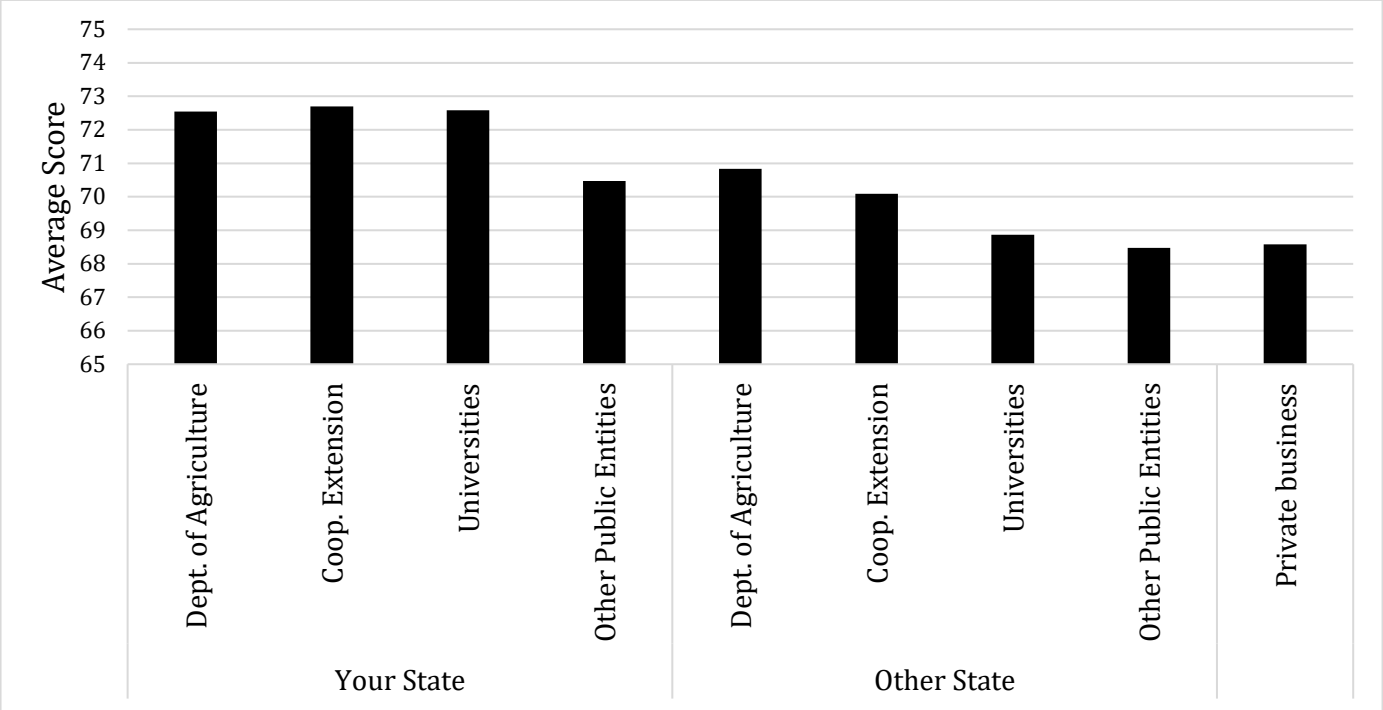

Figure 2: Average Respondent Experience by Entity, 0–100 Scale

5.2 Program Area Awareness and Use

Breaking down the utilization of outreach programs and services by program area separate from the entity providers can give a better picture of which programs respondents are not interested in compared to those they are interested in, compared to those they have actually used. These percentages are presented in Figure 3. Most program areas have about 30 percent of respondents utilizing them, with the food safety programs having the highest percentage of usage at approximately 33 percent and "other" programs having the lowest at around 24 percent.

The percentage of respondents who are interested in using but not currently using or attending programs is larger than the percentage of users across all program areas. This indicates there is a large portion of current non-users who would like to be users but are currently not reached by Extension programs either via lack of knowledge in how to participate or a lack of means to participate. The percentage of interested non-users is highest for environmental (42 percent) and food safety programs (41 percent). These results are somewhat similar to the results by Yang et al. (2009), who found that helping families, children, and the environment are important areas of interest. However, our findings suggest environmental issues may be more interesting with youth development being less interesting to respondents today compared to 2009. These are also similar to those found by Narine, Ali, and Hill (2020), who found that environmental issues were important areas of focus. However, direct comparison is difficult because the program areas are not identical.

The percentage of respondents who are aware of various programs but not interested ranges from 26 percent to 44 percent, with the lowest level of disinterest in food safety programs and the highest for the other category. The high level of disinterest in the "other" category may be due to consumers preferring to participate in outreach programs for particular subjects.

Another series of MNL regressions are used to examine the impact of various demographic variables on use and interest by program area. The range of marginal effects for each variable across program areas and the directions of significant marginal effects are presented in Table 6. Marginal effects for all program areas are available from the authors upon request. Region plays a larger role in interest and participation; all regions are more likely to be uninterested or neutral, and less likely to use

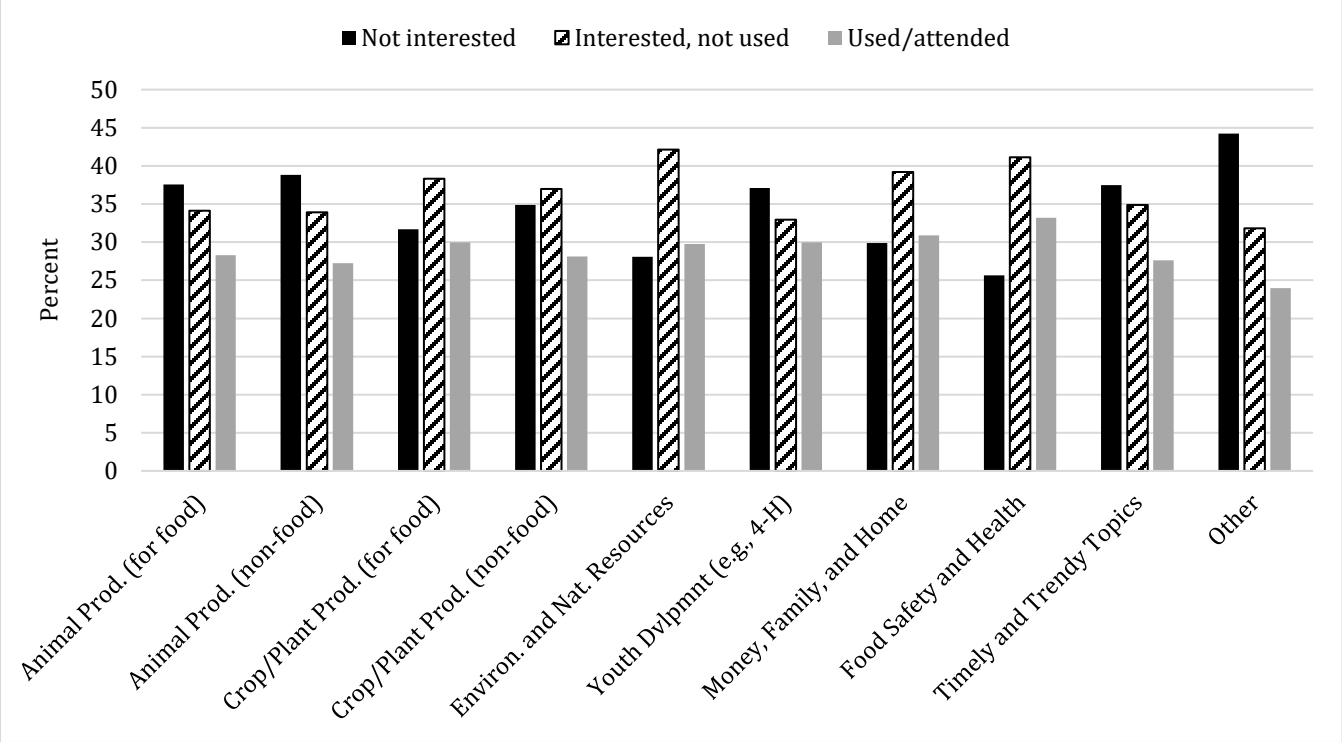

Figure 3: Respondent Use by Program Area

and attend relative to the Southeast (the reference region). Generation X and younger, and male respondents are more likely to be interested and use outreach programs as compared to older generations. Young generations are more likely to be interested in and have attend programs and are less likely to be uninterested when compared to older generations. However, different generations seem equally likely to be interested, but are not using programs as older generations. This breakdown is program dependent and may be the result of accessibility, timing, alternative information sources, or cost of programs. For example, younger generations have a higher likelihood to use information about animal production than to use information about food safety and health. Non-white respondents are not only more likely to be interested in but also more likely not to use programs. This may be due to accessibility issues

Male respondents are more likely to be interested in and use outreach programs as compared to their female counterparts. These results are fairly consistent at around a 10 percent higher probability of using an outreach program compared to females. They are equally likely to be interested in, but not use Extension programs, based on the program. All other individual demographics except for education are more likely to be uninterested, and more likely not to have used Extension programs, compared to their base categories. Respondents with educational levels lower than bachelor's degree are more likely to be either uninterested or interested but are non-users as compared to the base category of those with a bachelor's degree. Specific areas of disinterest includes environmental topics, timely and trendy topics, and food safety. This again may be due to a lack of knowledge on how to participate in programs or a lack of means to do so. Warner et al. (1996) found an association between lower education levels and lower use. Respondents with higher than a bachelor's degree education are more likely to be both interested in and use programs. Their higher use is significant across all program areas. Households with more adults and households with more children are more likely to be interested and use programs, as are households with higher incomes. Those households with more children have a relatively consistent higher likelihood of currently using or attending programs across all areas. However, interest (without use) is less widespread. Those with more children are more likely to be interested but are not currently using youth development programs, animal production programs, timely and trendy topics,

Table 6: Multinomial Logit Regression Marginal Effects of Program Area Use, Range across Program Areas, and Significance Direction (if significant)

Variable	Uninterested			Interested but Not Using			Interested and Using		
	Low	High	Significant Direction[a]	Low	High	Significant Direction	Low	High	Significant Direction
Region									
Far West	0.007	0.043	+	-0.029	0.011		-0.028	0.008	
Rocky Mountains	0.075	0.136	+	-0.085	-0.003	-	-0.075	-0.028	-
Southwest	0.000	0.038		-0.058	0.005	-	-0.018	0.024	
Plains	0.059	0.100	+	-0.062	-0.004		-0.074	-0.013	-
Great Lakes	-0.001	0.033		-0.048	0.013	-	-0.028	0.017	
Mideast	-0.030	0.012		-0.007	0.045	+	-0.038	0.002	-
New England	0.001	0.061	+	0.011	0.053		-0.088	-0.031	-
Generation									
Young	-0.158	-0.015	-	-0.051	0.036	+/-	0.065	0.163	+
Generation X	-0.134	-0.036	-	-0.017	0.049	+	0.046	0.127	+
Race									
African American	-0.113	-0.043	-	0.003	0.086	+	0.000	0.061	+
Other	-0.090	-0.046	-	0.027	0.099	+	-0.032	0.033	
Gender: Male	-0.134	-0.054	-	-0.046	0.044	+/-	0.087	0.127	+
Political Affiliation									
Republican	0.033	0.098	+	-0.052	-0.002	-	-0.047	-0.008	-
Independent	0.034	0.082	+	-0.039	0.019	-	-0.063	-0.013	-
Other	0.105	0.153	+	-0.110	-0.043	-	-0.074	-0.025	-
Education									
High School or Less	-0.007	0.073	+	-0.026	0.044	+	-0.069	-0.011	-
Some College	-0.004	0.030	+	-0.017	0.042	+	-0.046	-0.010	-
Higher than Bachelor's Degree	-0.079	-0.047	-	-0.017	0.013		0.051	0.087	+
Urbanicity									
Suburban	0.015	0.052	+	0.024	0.063	+	-0.082	-0.054	-
Rural	0.029	0.098	+	-0.028	0.026		-0.070	-0.027	-
No. Children in Household	-0.077	-0.033	-	-0.005	0.033	+	0.031	0.048	+
No. Adults in Household	-0.021	-0.012	-	-0.006	0.012		0.008	0.022	+
Household Income[b]	-0.009	-0.001	-	-0.009	0.000		0.007	0.010	+
Primary Food Buyer in Household	-0.070	-0.001	-	-0.002	0.077	+	-0.054	0.028	

Table 6 continued.

Variable	Uninterested			Interested but Not Using			Interested and Using		
	Low	High	Significant Direction[a]	Low	High	Significant Direction	Low	High	Significant Direction
Primary Plant Buyer in Household	-0.138	-0.090	-	0.037	0.066	+	0.037	0.079	+
Connection to Agriculture	-0.184	-0.144	-	0.019	0.075	+	0.088	0.135	+

Note: Significance is at the 10% level. Full marginal effect and coefficient results are available from the authors in a supplemental appendix.
[a] Significant direction looks across all entities and assesses whether the sign direction is positive or negative for any significant variables. For instance, if all significant marginal effects were all positive for a variable, then the significant direction column would have a "+", if the significant marginal effects were all negative for a variable, then the significant direction column would have a "-", and if there were positive and negative effects then the significant direction column would have a "+/-". Exact marginal effects are available from the authors upon request.
[b] The marginal effect for household represents a change in the probability given a $10,000 increase in income.

and other areas. Suburban and rural respondents are more likely to be uninterested and less likely to utilize outreach programs.

For particular program areas, participants with a connection to agriculture are significantly more likely to have used or attended programs for all program areas than their non-agriculture counterparts. Those with a connection to agriculture are also less likely to be uninterested in any program area and more likely to be interested but have not used the program for all areas but youth programs, as compared to those without a connection.

6 Conclusions

Extension and other outreach programs are currently at a crossroads of growth. The push for virtual programs and databases has allowed new users to fully access outreach programs they would not normally have access to or awareness of. With food safety and other programs also coming into the public eye more than before, outreach programs could see a swell of interest and growth of users. Knowing how to engage these potential new users and maintain the current ones is extremely important to fully capturing this peak in interest. Using survey responses and MNL regressions, insight has been gained into which consumers are already aware of outreach programs, which consumers are actually using the programs, and what are their perceptions about their experiences. With these insights, Extension and other entities can better increase their name recognition, program recognition, and the number of users by engaging in programing that is of interest to current non-users. For instance, rural consumers are more likely to be aware of but not use Extension programming; thereby, increasing programming in rural areas could lead to increased use in these areas. For rural residents, this awareness cuts across all public entities. However, they are less likely to be of interest across program areas compared to those living in metropolitan areas. Therefore, alternative programming and different messaging may be needed to garner interest in Extension and outreach programs in these areas.

There is room to market and expand usage, especially to urban and suburban users, users with lower incomes, women, and users with lower education levels. These users may not be aware that Extension and outreach programs apply to more than agricultural programs, especially those who live in urban areas. For example, more programing in urban school systems could improve name recognition as well as improve usage across demographics since schools are not exclusive to one specific demographic. This could also help reach those at any education level, not just those with a college education. To attract those with lower income levels, providing no-cost or low-cost programming would seem to be essential. Other program delivery modes may also be warranted due to additional constraints (e.g., internet access or time of program delivery). As noted by Rader (2011), people are not keen to find Extension

information online, which motivates the notion that other alternative methods of program delivery are warranted.

Programs can also be developed or marketed to those who are interested in the area but have not attended a program or used information. Specifically, Generation X and African American respondents are interested in but not using the money, family, and home Extension programs. Finding ways to move these groups from interested non-users to users could benefit those groups. On a more general level, African Americans, households with children, households in suburban areas, those with lower incomes, and primary buyers (of foods or plants) are more likely to have an interest or use Extension programming (Table 6). Combined with the awareness results, program timing and location of delivery appear to be important themes. This speaks to potential accessibility issues. People in these segments of interest may be more time-constrained (e.g., lower incomes) or live in areas that were not a focus of traditional Extension outreach (e.g., suburban). Moreover, a lack of awareness may drive the lack of attendance. An example of how to increase access is to be cognizant of public transit lines and their proximity to program areas if the program is in person, or the timing and asynchronous availability of online programs so as not to exclude users who may be more time-constrained. The usage of online recordings of programs and databases as well as greater visibility of available programs and services can help reach this audience.

The difference in both program use and awareness between respondents with a connection to agriculture and those without a connection is potentially due to the extensive use of Extension programs and services in the wider agricultural industry. This leads people with any connection to the industry to be at a minimum aware of the existence of Extension and other university outreach programs, even if they have not made use of them. Therefore, if Extension or other outreach programs are looking to expand their user base, focusing information campaigns and advertisements in non-agriculture sectors would be more successful at bringing in new users.

Extension, as well as other outreach programs, are designed to help bring new insights and knowledge to the general public. This mission requires outreach services to continue to grow and change with the needs and composition of the general public. If outreach services cannot be accessed by all who wish to use them, be it due to a lack of means or a lack of awareness, then Extension and similar programs are not fully completing their goals. This look into where those awareness and access weaknesses currently are can help close the gap between where Extension and outreach programs are and where they could be, notably with respect to engaging interested persons that are not taking advantage of Extension programming.

There are several limitations to this study. First, the results are only generalizable to the overall population if the survey sample is representative of the overall population's preference and usage of Extension resources. There is no way to know if the survey sample's preference and usage mirrors that of the overall population. However, by mirroring demographics and socioeconomic characteristics of the survey sample to that of the overall sample, we can have some confidence that the survey results are generalizable to a larger group. Second, we provided a general definition of Extension to respondents. The survey results are robust if respondents utilized the definition provided and did not utilize a preconceived notion of what they viewed Extension as.

About the Author: Julian M. Worley is a Former Graduate Research Assistant with the Department of Agricultural and Applied Economics at University of Georgia. William B. Banks is a Former Graduate Research Assistant with the Department of Agricultural and Applied Economics at the University of Georgia. William Secor is an Assistant Professor with the Department of Agricultural and Applied Economics at the University of Georgia. Benjamin L. Campbell is an Associate Professor with the Department of Agricultural and Applied Economics at the University of Georgia (bencamp@uga.edu)

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