

## Defining Audience Segments for Extension Programming Using Reported Water Conservation Practices

### Abstract

A tool from social marketing can help Extension agents understand distinct audience segments among their constituents. Defining targeted audiences for Extension programming is a first step to influencing behavior change among the public. An online survey was conducted using an Extension email list for urban households receiving a monthly lawn and garden newsletter. The results describe particular constituent groups or segments, defined by their landscape conservation practices. Extension agents can use audience segmentation to design programming that targets the behaviors, expectations, and lifestyles of specific members of their community and identify emerging issues.

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## Introduction

The audience for Extension programming continues to change both demographically and culturally, prompting agents to seek new tools to adapt to community needs, priorities, and lifestyles (Hobbs, 2001; McDowell, 2004; Raison, 2010). Extension agents can improve program outcomes on public issues such as water conservation in the landscape or preserving natural resources by borrowing a tool from social marketing and strategically identifying audience segments for targeted programs. In these Extension fields, educational outcomes are often not enough to motivate behavior change, and agents need additional strategies. Social marketers focus on target audiences as corporations do with customers, profiling them through research and directly engaging them to actually change their behavior (Kotler, Roberto, & Lee, 2002).

Since the 1970s, the social marketing approach has proven effective in changing behavior in such areas as public health, driving safety, teen tobacco use, occupational safety, and natural resources

conservation (Kotler et al., 2002; McKenzie Mohr, Lee, Schultz & Kotler, 2012; Monaghan, Bryant, Baldwin, Zhu, Ibrahimou, Lind, Contreras, Tovar, & McDermott, 2008). Social marketing uses the tools and concepts of commercial marketers: audience segments are studied and then selected, new behaviors are considered a "product" that offers benefits that are desired by consumers, and the barriers to the adoption of new behaviors are deliberately lowered (Andreasen, 1995). The primary difference between commercial and social marketing is that for the latter, the ultimate beneficiary of changed behavior is the individual and the wider community and not a company (Weinrich, 2011). The "product" that social marketers promote is some change in behavior by the public that will ultimately benefit the environment, community health, quality of life, or the capacity of citizens.

Extension programming is often based on the premise that education with the latest information from the university can help citizens make better informed decisions and facilitate changes in their lives (Rogers, 1988; Molgaard, 1997; Goddard & Olsen, 2004). In Florida, the stated goal of the Cooperative Extension Service is also focused on providing communities with "Solutions For Your Life" (<http://solutionsforyourlife.ufl.edu/>). If adopted, these individual solutions often have wider societal impacts such as natural resource conservation and better public health. Extension programming is good at transferring information; there is ample evidence that programs lead to gains in knowledge, intention to change, and sometimes the adoption of new behaviors by the public (Jayaratne, Harrison, & Bales, 2009; Park-Brown, 2009). The study reported here was designed to use a social marketing technique called "audience segmentation" and provide instructions to Extension agents in how to modify urban landscape programming in Florida to make effective use of these distinct groups. The research sought to define different audiences for Extension programming regarding BMP adoption to conserve water in residential landscapes. Our survey revealed distinct segments of homeowners with different approaches to landscaping and with unique wants and needs that Extension can serve.

When it comes to conservation and sustainability programming, we suggest that Extension would be more effective if agents explicitly defined audiences based on their attitudes, demographics, lifestyles, and current behaviors. Extension agents already recognize that new behaviors are adopted by some audiences more easily than others (Loibl, Diekmann, & Batte, 2010). Target audiences could be those likely to act on the messages Extension promotes or those likely to have a large impact by changing their behavior. There are always risks involved for agents who select specific audiences; they may choose an audience that is small or reluctant to change. They may risk alienating other audience segments that are not the focus of their programming. We contend that with limited resources and limited chances to make an impact in their communities, Extension agents can benefit from this social marketing tool and improve their knowledge of their constituents and stakeholders. Agents should continue to provide educational programming to wider audiences (the "general public") at the same time they use audience segmentation to encourage behavior change from targeted groups.

## **A Case Study: Audience Segments for Urban Water Conservation Programs**

Many new homes built in the larger urban areas of Florida come with a yard planted primarily with St. Augustine turfgrass with an in-ground irrigation system controlled by a timer (Baum, Dukes, &

Miller, 2005). When the irrigation timer is set, these systems pump large amounts of water during a single irrigation cycle, sometimes thousands of gallons, and it is often more water than is needed for healthy turf grass (Haley, Dukes, & Miller, 2007). Setting the irrigation timers has been problematic for homeowners, and many prefer to leave them at one setting for long periods of time and not readjust them regardless of whether or not it has rained.

Florida's high per capita water use and rapidly urbanizing environment have contributed to the depletion of the state's groundwater resources (Marella, 2008). A large segment of Florida households typically use 50% or more of their total water consumption outdoors on their lawn and landscape (Haley et al., 2007). In response, the University of Florida has developed the Florida Friendly Landscaping program to encourage water conservation and reduce the environmental impact of landscaping practices (University of Florida IFAS Extension, 2009). The term Florida Friendly Landscaping (FFL) was trademarked by the University and has recently been recognized in legal statute (Senate Bill 2080):

The Legislature finds that the use of Florida-friendly landscaping and other water use and pollution prevention measures to conserve or protect the state's water resources serves a compelling public interest and that the participation of homeowners' associations and local governments is essential to the state's efforts in water conservation and water quality protection and restoration (Greene, 2010)

Florida lawmakers, municipal water managers, and citizens have all recognized the importance of changing residential landscaping behavior to reduce the impact of lawns on natural resources. At the local level, municipalities have instituted watering restrictions and public information campaigns to encourage conservation. Extension in Florida has also played a role by focusing education efforts on how to program the automatic irrigation timer to reduce the amount of water used. Those households that have automatic sprinkler systems in their yard constitute a large general audience for Extension conservation programming, but within that audience we identified distinct segments.

## Methods

A research team comprised of an urban horticulture Extension agent in Alachua County, Florida, a statewide Extension specialist in community-based social marketing (CBSM), and a student researcher developed a 26-item survey instrument using Survey Monkey. The survey was designed to collect information from Extension contacts about their adoption of the Florida Friendly Landscaping™ principles relating to water conservation behaviors. We also gathered demographic and lifestyle characteristics and assessed homeowners' landscaping issues and priorities. The goal of the survey was to gain insight into the impact of landscape water conservation programs in Alachua County and identify possible audience segments for future programming.

Among the demographic variables collected were age, income, education level, time in current home, and time living in Florida. Lifestyle questions included the presence of a home owners' association (HOA) and whether the respondent did their own landscaping. Landscaping practices included the following.

- Did the respondent do their own landscaping or hire a contractor?
- What percentage of their lawn was composed of turf grass?
- How did they set their irrigation timer?
- How frequently did they irrigate their lawn?
- What indoor and outdoor water conservation behaviors did they practice?

The survey also included three open-ended, qualitative questions including, "What do you like most about your landscaping design?" and, "If you could, what changes would you make to your home's landscape design and why?"

The survey was distributed through an email list developed by the urban horticulture agent to send out her monthly electronic newsletter on landscape issues. The participant list was generated by those who provided their email address at workshops and outreach programs produced by the county Extension office, including events where residents could purchase subsidized rain barrels and compost bins. While the email list was periodically maintained, an unknown number of emails were not delivered successfully; it is estimated that the response rate was approximately 36% (n= 545) of the approximately 1,500 email addresses on the agent's list at the time of distribution. The email included a letter from the agent with a personal appeal to fill out the survey and was sent out in 2010 with a follow-up email sent 4 weeks later.

Our sampling methods combined criterion-based sampling (as all participants were Extension constituents in Alachua County) and convenience sampling (as the survey was distributed electronically), a strategy that saved time and money compared to hard copy mail surveys. The audience that responded to the questionnaire was not randomly chosen from the county; the respondents to the survey were users of Extension services. All had some contact with Extension initially and were assumed to have maintained some interest in landscaping issues. While recognizing the limits of generalizing a nonrandom survey to a larger population, the reported behaviors regarding yard maintenance practices are instead useful for defining the lifestyles of a particular group of Extension clientele. These data help agents to think differently and strategically about how to design and deliver their programs.

The data were analyzed using SPSS. Chi Square tests of independence were run to determine whether participants' characteristics are related. Cramer's V and Phi are measures of association that help gauge the strength of the relationship between multiple variables. Phi ( $\phi$ ) is appropriate when examining variables with only two levels, while Cramer's V is appropriate when examining variables with more than two levels. The p-value or significance level is a measure of the probability of attaining, by chance, the level of relationship calculated. A p-value of less than .05 means that the calculated relationship is likely to be due to chance alone less than 5% of the time. This is a commonly accepted threshold for statistically significant relationships.

## **Results: Locating Market Segments in Survey Responses**

The survey results showed many ways to characterize different audience segments, providing Extension agents with different options for finding a suitable audience that will respond to their educational messages. This is the first step to using social marketing to promote behavior change. Some of the common approaches to defining audiences are demographic characteristics (age, income, education) or psychographic attributes (beliefs, attitudes). These demographic and psychographic descriptions provide a better understanding of how audience "lifestyle" may contribute to behavior change and acceptance of Extension messages. When these variables are compared with reported landscaping behaviors, we see that they show significant differences in what different audience segments are practicing.

## Segments Defined by Demographics and Lifestyle

The typical participant in the study was college educated (78%), reported an annual income greater than \$50,000 (62%), lived in Florida for 30 years, and in their current home for 11 years. The average age of respondents was 57. A majority (60%) did not live in a neighborhood governed by a homeowners association (HOA); however, both groups were represented.

Whether a respondent lived in a neighborhood with an HOA was an important lifestyle characteristic that also helped define his or her landscaping practices. Homeowner associations are common in new developments in Florida, and homebuyers sign a covenant and pay dues to the HOA as a condition of their home purchase. They are bound to the deed restrictions of the HOA, and this often includes landscaping design and regular maintenance. The homeowner-run boards of HOAs frequently maintain uniformity of landscaping aesthetics. Demographic comparisons of respondents based on HOA status revealed that those in an HOA were different than those not in an HOA (Table 1 and Table 2).

While respondents were generally from higher income households, membership in a neighborhood with an HOA was associated with slightly higher levels of annual income ( $\chi^2(4) = 41.26, p < .01$ ; Cramer's  $V = .31$ ). In addition, while education levels among respondents were also high, HOA residence was not clearly associated with higher education levels ( $\chi^2(4) = 8.98, p = .06$ ; Cramer's  $V = .13$ ) it did indicate a trend. Homes in HOA neighborhoods would tend to be more expensive and homeowners would likely be wealthier and better educated.

**Table 1.**

Values and Valid Percentages of Demographic Variables Compared by HOA Status

Demographic Variables		HOA Status			Chi square ( $\chi^2$ )	Significance Level (p-value)	Cramer's V
		HOA	Non	Total			
Annual Income	≤ \$30,000	10 6.3%	45 16.2%	55 12.6%	41.26	.00	.31
	\$30,000-	21	86	107			

	\$49,000	13.2%	31.0%	24.5%			
	\$50,000-\$74,000	<b>46</b> 28.9%	<b>66</b> 23.8%	<b>112</b> 25.7%			
	\$75,000-\$100,000	<b>32</b> 20.1%	<b>45</b> 16.2%	<b>77</b> 17.7%			
	≥ \$100,000	<b>50</b> 31.4%	<b>35</b> 12.6%	<b>85</b> 19.5%			
	<b>Total</b>	<b>159</b> 100%	<b>277</b> 100%	<b>436</b> 100%			
<b>Education</b>	<b>Some High School</b>	<b>2</b> 1.0%	<b>0</b> 0%	<b>2</b> 0.4%	<b>8.98</b>	<b>.06</b>	<b>.13</b>
	<b>High School</b>	<b>10</b> 5.1%	<b>19</b> 6.0%	<b>29</b> 5.7%			
	<b>Some College</b>	<b>22</b> 11.2%	<b>58</b> 18.4%	<b>80</b> 15.6%			
	<b>College Graduate</b>	<b>78</b> 39.6%	<b>124</b> 39.4%	<b>202</b> 39.5%			
	<b>Advanced Degree</b>	<b>85</b> 43.1%	<b>114</b> 36.2%	<b>199</b> 38.9%			
	<b>Total</b>	<b>197</b> 100%	<b>315</b> 100%	<b>512</b> 100%			

There was also a relationship between HOA residence, the age of respondents, and the number of years they had lived in Florida. Those residents who lived in an HOA were older than those respondents who did not live in an HOA ( $\chi^2(3) = 9.65, p < .05$ ; Cramer's  $V = .14$ ). There was also a statistically significant relationship between whether residents lived in an HOA and the number of

years they lived in Florida ( $\chi^2(3) = 17.26, p < .05$ ; Cramer's  $V = .18$ ). A larger proportion of HOA residents were among the newest to Florida (Table 2). The two types of respondents were very similar in all other length of residence categories but recent arrivals were more common in HOAs.

**Table 2.**

Values and Valid Percentages of More Demographic Variables by HOA Status

Demographic Variables		HOA Status			Chi square ( $\chi^2$ )	Significance Level (p-value)	Cramer's V
		HOA	Non	Total			
Age	18-24	0 0%	2 0.6%	2 0.4%	9.65	.02	.14
	25-44	27 14.5%	64 20.8%	91 18.4%			
	45-64	114 61.3%	197 64.0%	311 63.0%			
	≥ 65	45 24.2%	45 14.6%	90 18.2%			
	Total	186 100%	308 100%	494 100%			
Years in Florida	1-5	27 13.7%	14 4.5%	41 8.0%	17.26	.00	.18
	6-10	25 12.7%	28 8.9%	52 10.4%			
	11-20	27 13.7%	46 14.6%	73 14.3%			
	≥ 21	118 69.9%	226 72.0%	344 67.3%			

	<b>Total</b>	<b>197</b>	<b>314</b>	<b>511</b>			
		100%	100%	100%			

## Segments Defined by Reported Behaviors

Survey responses about landscaping behaviors also revealed that membership in an HOA helped better define different audience segments. Those households that belonged to an HOA were more likely to hire a landscape contractor to apply fertilizer, pesticides, and perform other landscaping services and thus less likely to do this work themselves. A significant relationship was found between HOA status and use of landscape contractors for yard maintenance ( $\chi^2 (1) = 69.03, p < .01, \phi = .36$ ).

**Table 3.**  
Use of Landscape Contractors for Yard Maintenance by HOA Status

Landscaping Services	HOA Status			Chi square ( $\chi^2$ )	Significance Level (p-value)	$\phi$
	HOA	Non	Total			
Hired Contractors	103 50.2%	52 16.3%	155 29.6%	69.03	.00	.36
Did Not Hire Contractors	102 49.8%	267 83.7%	369 70.4%			
<b>Total</b>	<b>205</b> 100%	<b>319</b> 100%	<b>524</b> 100%			

Residents who belonged to an HOA were more likely to have an in-ground irrigation system providing water to their yards (Table 4). A significant relationship was found between HOA status and ownership of in-ground irrigation systems ( $\chi^2 (2) = 118.1, p < .01, \phi = .47$ ).

**Table 4.**  
In-ground Irrigation System Ownership by HOA Status

In-Ground Irrigation System Ownership	HOA Status			Chi square ( $\chi^2$ )	Significance Level (p-value)	$\phi$
	HOA	Non	Total			
In-Ground System	149	81	230	114.85	.00	.47



	73.4%	25.6%	44.2%			
<b>No In-Ground System</b>	<b>54</b>	<b>236</b>	<b>290</b>			
	26.6%	74.4%	55.8%			
<b>Total</b>	<b>203</b>	<b>317</b>	<b>520</b>			
	100%	100%	100%			

We also investigated how respondents were using their irrigation systems to water their lawns to understand how that might affect adoption of conservation behaviors. Households that manually turn on their sprinklers as needed are more closely following Extension BMPs and may use less water than those who set the timer and let it run every week (set it and forget it). Some households reported they were adjusting the timer manually, while some never adjust it. There were also a significant number of respondents who reported they turned off their irrigation timer altogether, suggesting they had even gone beyond recommended practices in order to conserve water (Table 5). A significant relationship was found between HOA status and irrigation system scheduling ( $\chi^2 (4) = 15.23, p < .01, \text{Cramer's } V = .26$ ). Based on these data, those residents in an HOA were less likely to use the methods that Extension recommended for programming the system to conserve water.

**Table 5.**

Irrigation System Owner Irrigation Scheduling Behavior Organized by HOA Status

Irrigation Scheduling	HOA Status			Chi Square ( $\chi^2$ )	Significance Level (p-value)	Cramer's V
	HOA	Non	Total			
<b>Never Adjust</b>	<b>14</b>	<b>4</b>	<b>18</b>	<b>14.11</b>	<b>.01</b>	<b>.25</b>
	9.5%	4.9%	7.9%			
<b>Occasionally Adjust</b>	<b>34</b>	<b>12</b>	<b>46</b>			
	23.1%	14.8%	20.2%			
<b>Seasonally Adjust</b>	<b>47</b>	<b>21</b>	<b>68</b>			
	32.0%	25.9%	29.8%			
<b>Manually Turn On</b>	<b>41</b>	<b>25</b>	<b>66</b>			
	27.9%	30.9%	28.9%			

<b>Irrigation System Off</b>	<b>11</b> 7.5%	<b>19</b> 23.5%	<b>30</b> 13.2%			
<b>Total</b>	<b>147</b> 100%	<b>81</b> 100%	<b>228</b> 100%			

To summarize the findings of the survey, most respondents were generally well off, older, and highly educated. While 60% of respondents were not residing in neighborhoods that had HOA oversight, the remainder did (205 respondents). It is important to note that while there are many similarities between residents in HOAs and those not in HOAs, there are also distinct segments that exist with different lifestyles, needs, and constraints. They differed markedly in terms of their reported landscaping behaviors.

- HOAs had higher percentage 65 and older, and fewer in youngest age category
- HOAs had a higher percentage of new residents (less than 5 years in Florida)
- HOA residents were more likely to hire someone to do their landscaping for them
- HOA residents were more likely to have an in-ground irrigation system
- HOA residents were less likely to follow irrigation BMPs to conserve water

## **Discussion**

Survey results among Extension clientele in central Florida have identified distinct audience segments that should be approached with different programming. The HOA residents differed slightly from those not in an HOA in terms of demographic variables like age, income, and years having lived in Florida, but there were more important differences in terms of landscaping behaviors. Understanding these differences can help Extension agents create more relevant programming targeted for specific groups. For example, HOA residents were less involved with the management of their yards, preferring to hire a contractor. This could be due to not having the time or interest in hands-on landscaping practices while possessing the disposable income to hire a contractor. It could also be influenced by the rigorous specifications mandated by their HOA and neighborhood peer pressure. If an HOA has strict rules about cutting the grass for example, a "do-it-yourself" household would have to be diligent about mowing. One conclusion for Extension agents is that this audience segment would be less interested in science-based information about certain landscaping details such as mowing, fertilizing, and turf grass health.

The residents of HOAs in this sample were significantly more likely to have in-ground irrigation systems than non HOA residents, making them seem at first like a good target audience for information about scheduling irrigation systems. The data further supports this as HOA residents were significantly more likely to schedule their irrigation systems outside of Extension

recommendations (Table 5). Residents who have not adopted Extension recommendations on irrigation management and prefer to "set it and forget it" could be targeted with more information on how to program their system. However, the "set it and forget it" households, especially those that contract their landscaping, do not seem fully engaged in managing their landscape or conserving water. While this audience segment has a need for knowledge about irrigating, without a "teachable moment," Extension programming may not be effective for this group. Sometimes, it may be better to focus attention on audiences who may be more likely to change their behavior rather than those who use more resources.

In contrast, a significant number of respondents had already adopted some of the irrigation BMPs promoted by Extension. Those respondents who never use their in-ground irrigation system may be interested in learning strategies to improve their yards with xeriscaping principles or rainwater harvesting. Extension could acknowledge their success as water savers, seek ways to maintain this behavior, and leverage their influence on their neighbors and HOA boards. These innovators could be the ambassadors for promoting new landscaping practices in their neighborhoods (Rogers, 2003). They may look to Extension for help in making alternative landscapes more aesthetically pleasing and educating their neighbors about the environmental benefits of conserving water.

Another approach is to focus on the secondary audiences that influence these homeowner behaviors, such as their HOA management or their landscape contractors. Since the HOA plays such a dominant role in landscape practices for these neighborhoods, perhaps the governing boards and management companies might be better partners for Extension. This target group may help to promote new technological solutions such as automatic soil moisture sensors that reduce homeowner involvement in watering decisions. Extension agents can also partner with utilities or water managers who are targeting homeowners with new conservation policies or incentives.

Whatever methods are used to define a segment of the public, there are important questions to consider that help determine whether an audience should be targeted for programs:

- How large is this audience segment and what is their relative impact on the issues of conservation in the landscape?
- What are the secondary audiences that directly and indirectly influence their landscaping behaviors?
- What can we learn from the households that have begun to adopt some Extension recommendations that can be applied to others who have not yet begun making changes?
- How are they motivated by local issues surrounding water use and conservation?
- What skills and knowledge are most evident when they adopt these new behaviors?
- Are some solutions easier to adopt than others for a particular audience?

## **Conclusion**

As state and local governments tighten their budgets, Extension agents are asked to provide evidence that they are bringing about behavior change on issues of importance to local communities. In many communities in Florida, local governments and water managers must reduce public consumption of groundwater resources and they look to Extension for help in educating the public. Since most water waste occurs outdoors, a social marketing perspective helps Extension recognize the barriers homeowners face when adopting new landscape practices. Turfgrass landscapes predominate because they are favored by real estate markets, HOA codes, and homeowners who adopt the cultural norm of the green manicured lawn. A broadly defined audience of homeowners with a turfgrass landscape is actually composed of distinct and identifiable segments, some of which may be better targets for BMP programming.

Extension must recognize that adopting landscape BMPs, or any new behavior, is not easy or risk free and that some audiences may be more ready than others to adopt change. While recognizing the barriers to change, we have identified and described an audience segment that has already begun to modify irrigation behaviors and save water. This constitutes an audience segment that may actively be seeking information that Extension can provide. The behavior change exhibited by these homeowners can also serve as a model for understanding how to change the behaviors of a wider audience and eventually modify the norms of a neighborhood.

Encouraging the public to adopt behaviors to meet water conservation goals is a cost-effective service that can be provided by Extension. However Extension must begin to use approaches that go beyond knowledge transfer and deliberately motivate behavior change. Extension agents can improve program outcomes by borrowing a tool from social marketing and identifying the audience segments that are more likely to adopt new behaviors. We have shown how defining a target audience can be done using a variety of criteria, such as demographic characteristics (age, income, education) or psychographic attributes (lifestyles). Our survey also revealed that reported landscape conservation behaviors were a good way to characterize audience segments for Extension programming. By defining these segments and eventually targeting programs toward their needs and wants, Extension agents can improve the impact they have on public issues such as water conservation and sustainability. Documenting improved environmental outcomes will in turn increase public support for Extension services.

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