

# Homeowners' Prioritization of Landscape Features Regarding Aesthetic, Environmental, Financial, and Psychological Benefits

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**ABSTRACT.** Maintaining and caring for residential landscapes is a crucial aspect of homeownership in the United States. For homeowners in the United States, residential lawns represent a significant economic investment, signal their social commitments, and reflect their personal characters. To investigate the differences in Florida homeowners' priorities regarding residential landscape features, an online survey of 1220 homeowners was conducted. Four different groups of homeowners were identified based on their perceived importance of the four landscape features, namely, environmental, financial, aesthetic, and psychological benefits. Factors such as environmental and financial attitudes and social norms influencing homeowners' decision-making were examined. The findings revealed that homeowners' knowledge of landscaping practices and environmental attitudes impact their prioritization regarding landscape features.

Landscapes and private gardens are a major component of United States residential landscapes. They not only enhance the aesthetic appeal of a property but also offer several social and environmental benefits such as providing space for outdoor activities, absorbing heat, increasing property value, and contributing to the overall health and well-being of residents. One major component of landscapes is turfgrass lawns. However, traditional turfgrass lawns are not without drawbacks. To maintain a lush green appearance, many residents excessively irrigate and fertilize, which may increase the potential for groundwater pollution caused by nutrient leaching. To combat these potential consequences, environmentally

friendly landscape (EFL) alternatives attracted local and state stakeholders' interest. EFLs are designed to incorporate a combination of turfgrass and nonturfgrass plantable areas of native plants, mulch, and other low-maintenance landscape components that require less irrigation water and fertilizer than traditional, predominantly turfgrass lawns. By reducing the use of irrigation water and fertilizers, EFLs have the potential to protect the environment while preserving aesthetic, environmental, economic, and psychological benefits to homeowners.

Homeowners may have various motivations for their involvement in landscape maintenance and related activities. Although some homeowners enjoy gardening and landscaping as a hobby, others appreciate landscapes as a way to increase their property value. For example, a recent study by Knuth et al. (2019) found that there were two landscape user types: active and obligate users. Active users were greatly involved and experienced in landscape activities and wanted to participate in environmental activities such as conserving water. These homeowners may be more receptive to adopting EFLs. However, obligate users were less involved in gardening activities and were less interested in environmental perceptions and may not have the same level of experience with or interest in landscaping activities. These homeowners may be less receptive to adopting EFLs.

Despite these fundamental differences in terms of motivation and level of involvement, it is still unknown whether the way homeowners perceive these outdoor spaces substantially influences how they manage the spaces. Therefore, during this analysis we sought to understand the perceptual differences between Florida homeowners in terms of their knowledge of landscaping practices and acceptance of aesthetic, environmental, financial, and psychological benefits.

A review of relevant literature indicated that the desire to conform to prevailing social and cultural norms is very strongly tied to landscape management decisions (Kurz and Baudains 2012; Marco et al. 2010; Nassauer et al. 2009). Grove et al. (2006) suggested that household landscape management behavior is a plausible predictor of vegetative cover for the household. This means landscape management decisions are largely influenced by the homeowner's desire to assert their membership in a lifestyle group and uphold prestige within the neighborhood (Behe et al. 2018; Grove et al. 2006). In fact, the presence of a shared social ideal [sometimes in the form of homeowners associations (HOAs)] can result in spatial autocorrelation of gardening practices, creating a homogenous neighborhood through similar designs and plant selections, in suburban neighborhoods (Hunter and Brown 2012; Warren et al. 2008; Zmyslony and Gagnon 1998). This can influence households to the point that their preferences may be different from their landscape behaviors (Larsen and Harlan 2006). Front gardens are present for "public show" governed by social norms, whereas back gardens are private and a more direct expression of personal preferences (Goddard et al. 2013; Larsen and Harlan 2006).

Homeowner attitudes, along with social and cultural norms, toward environmental concerns can play a significant role in landscape management decisions. However, the social influence of landscape maintenance can clash with EFL adoption, as noted by Hayden et al. (2015) and Kendal et al. (2012), who found that consumers were less likely to engage in environmental behaviors if they cared greatly about what their neighbors thought of their landscapes or if they felt they had a neighborhood standard to uphold.

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Nevertheless, Khachatryan et al. (2020) found that homeowners in Florida with greater knowledge of EFLs preferred designs that were more visually appealing and required less maintenance than homeowners who had less knowledge. Heterogenous landscapes, which tend to feature greater plant diversity, were also preferred over homogenous designs. Greater plant diversity has also been linked with greater environmental adaptability. The relationship between EFLs and enhanced environmental benefits for urban areas have been supported by previous studies (Gobster et al. 2007; Hostetler and McIntyre 2001; Jorgensen and Tylecote 2007; Khachatryan et al. 2017; Nasar 1983; Uren et al. 2015). Encouraging the installation of landscapes that require fewer inputs, such as adoption of the Florida Friendly Landscaping (FFL) practices, can help reduce the negative environmental outcomes from irrigation, fertilizer, and maintenance (Khachatryan et al. 2019; Yue et al. 2012; 2017). This type of program may be of interest to some consumer segments who hold environmental concerns in high regard. These types of consumers have indicated their willingness to pay price premiums for environmentally friendly goods and services (Engel and Pötschke 1998; Hall and Dickson 2011; Khachatryan et al. 2014; Knuth et al. 2018a, 2018b; Straughan and Roberts 1999; Tully and Winer 2014; Zhang and Khachatryan 2021).

Goddard et al. (2013) indicated that the aesthetic appearance of the garden was a top priority for homeowners because it provides a relaxing and visually pleasing environment. The authors found that homeowners were greatly influenced by their friends' and neighbors' opinions of their landscapes. Given the strong influence of aesthetics and curb appeal, homeowners are more likely to invest in plants and maintain their landscape to keep up with these social influences, as noted by Behe et al. (2018) and Knuth et al. (2018a, 2018b, 2020). Additionally, research by (Larsen and Harlan 2006) found that wealthier neighborhoods tend to have greater vegetation cover and higher plant diversity, indicating socioeconomic status can influence landscape preferences as well as management practices. Thus, one can conclude that the aesthetic appeal of residential landscapes

plays a significant role in shaping homeowner preferences and subsequent behaviors.

Moreover, homeowners may view the time, money, and effort expended on yard care as a worthwhile investment to improve property values (Blaine et al. 2012; Clayton 2007; Nassauer et al. 2009). Taking care of a lawn is partially an investment of capital and financial resources because the home presentation represents the homeowners' largest financial assets (Robbins et al. 2001). As such, there is a great incentive to invest time and money into landscape upkeep (Robbins et al. 2001). In fact, Blaine et al. (2012) found that 41% of subjects reported maintaining their landscapes for financial reasons compared with 61% who wanted their landscape to "fit into" the neighborhood and 53% who indicated ease of care. These findings support the concept of financial obligations significantly influencing individual landscape maintenance behavior.

In addition to financial considerations, mental health benefits of plants have become increasingly important attributes that consumers and horticultural industry stakeholders consider (Hall and Knuth 2019). Exposure to plants in one's everyday indoor and outdoor environments has been shown to lead to reduced anxiety and stress, lower levels of depression, greater happiness and life satisfaction, enhanced memory retention, and increased creativity (Hall and Knuth 2019). However, although the benefits of landscaping practices to well-being are widely recognized, there is a gap in the literature regarding the prioritization of landscaping for psychological benefits compared to other motivations. The meaningful interactions between people and wildlife that take place in gardens demonstrate emotional engagement and are essential for encouraging long-term pro-environmental behavior (Maiteny 2002).

Previous research has demonstrated that knowledge plays a critical role in shaping consumer preferences for different landscapes and influences the adoption of environmentally friendly landscapes. Uren et al. (2015) found that factors such as knowledge, functionality, and social norms were instrumental in homeowners' decisions to convert to more ecologically sensitive landscapes that incorporate native plants. Although participants expressed concerns regarding the environment,

they admitted to selecting native plants primarily based on their attractive aesthetic qualities such as colorful flowers and bright green foliage. Nevertheless, conformity to cultural norms that promoted environmentally responsible behavior emerged as the primary motivation for embracing a "wild" style.

Maintenance requirement is a deterrent for homeowners when considering remodeling their yard with less turf (Shaw 2005). Homeowners often view mowing turfgrass as less labor-intensive and time-intensive than pulling weeds or pruning shrubs (Clem et al. 2021). In Florida, the practices of the FFL program have been used to promote sustainable landscape design and maintenance practices that protect the environment while reducing homeowners' labor, energy, and monetary inputs (University of Florida Institute of Food and Agricultural Sciences 2022). FFL principles-based landscapes often incorporate more ornamental plants than a typical Florida landscape and require different maintenance know-how and practices. This could lead to the perception that maintaining an FFL program-based landscape is more time-consuming than a typical Florida landscape, potentially deterring homeowners from FFL installation (Hansen et al. 2018).

During this analysis, we compared four different motivations, aesthetic, environmental, financial, and psychological, for adopting FFL practices of Florida homeowners according to the landscape benefit. There were four hypotheses: knowledge and perceptions of landscape care and related ordinances will predict the curb appeal motivation; landscape attitude and environmental concern will predict the environmental motivation; price discounts and financial savings will predict the financial motivation; and wildlife and pollinator-friendly practices will predict psychological motivation.

## Materials and methods

**PROTOCOL AND SURVEY SECTIONS.** This sample of Floridian homeowners was collected through a survey with approval from the university committee (UF-IRB201600776 approved Oct 2016) involving research with human participants. The online survey administered through an online survey platform (Qualtrics, Provo, UT, USA) with sections focusing on sales information,

factors that encourage Florida residents to install FFLs, environmental concerns, knowledge about and familiarity with environmental factors, and general household information. The survey was distributed in Nov 2016 using the Qualtrics subject panel. These data were collected before the coronavirus disease 2019 (COVID-19) pandemic and may reflect results that are in line with behaviors before the COVID-19 pandemic because shutdowns might have influenced gardening practices.

Florida homeowners (1220 participants; single-family dwellings only) provided complete responses. Two quality assurance questions were used to ensure complete, valid responses. Factors that encourage Florida residents to adopt FFLs were generated for the purposes of this experiment and included the following: “How effective would the following factors be in encouraging you to install a Florida Friendly Landscape?”, “More practical information on the benefits associated with Florida Friendly Landscapes”, “More information on the financial benefits of Florida Friendly Landscapes”, and “Landscape ordinances limiting irrigation water use.” The Environmental Concern scale was adopted from Weigel and Weigel (1978). Sales information source-related questions were adopted from Rihn et al. (2018).

Participants of the survey were asked to select from the following the landscape features which was most important to them: curb appeal, environmental benefits, financial benefits, and psychological benefits (Table 1). Participants were placed in subsequent groups based on the feature they felt was most important, resulting in four groups of participants.

#### DEMOGRAPHIC CHARACTERISTICS.

A summary of the demographic characteristics is shown in Table 2. The mean age of the sample was 50.08 years, whereas the mean age of the population

**Table 1. Types of Florida homeowners (*N* = 1220) and their prioritized landscape feature.**

Category	<i>N</i>	Sample (%)
Environmental	228	19
Financial	229	19
Curb appeal	598	49
Psychological effect	165	14
Total	1,220	100

**Table 2. Demographic characteristics of the sample (*N* = 1220) compared with those of the Florida population (US Census Bureau 2017). Demographic characteristics include age, sex, income, race, location within Florida, and lot size of a single-family home.**

Demographic characteristic	Sample	Population
	Mean	
Age (years)	50.08	41.1
Male (%)	59	49
White (%)	83	54.9
Black (%)	6.48	16.9
Latino (%)	4.76	26.4
Asian (%)	3.12	3.0
Native American (%)	0.82	0.5
Pacific Islander (%)	0.08	0.01
Education: bachelor’s degree or higher (%)	52.55	45
Full-time employment (%)	43.40	53.6
Retired (%)	28.69	19.7
Income (%)		
<\$20,000	3.04	18.6
\$20,000–\$39,999	16.82	39.4
\$40,000–\$79,999	41.83	
\$80,000–\$99,999	12.31	42
>\$100,000	26.02	
Florida region (%)		
Northwest	7.21	
Northeast	6.80	
Central	21.31	
Central-west	14.92	
Central-east	7.30	
Southwest	14.01	
Southeast	28.44	
Lot size (%)		
Less than one-half acre (0.20 ha)	60.49	
One-half acre	25.66	
More than one-half acre	13.85	

of Florida was 41.1 years old (US Census Bureau 2017). The sample had slightly more males than the general population (59% vs. 49%) and consisted of more white individuals (83% vs. 55%), less Latino/Hispanic individuals (4.76% vs. 26.4%), and slightly more educated individuals (53% vs. 45%). Forty-three percent of the sample was employed full-time, and 29% of the sample was retired. The sample included more individuals with moderate household income levels of \$40,000 to \$79,000 (41.83%) compared to the Florida population (39.4%) and less with higher levels of income than the Florida population. Approximately one-quarter of the sample resided in either the southeast or central areas of the state. Sixty percent of the sample resided on a lot size less than one-half of an acre (0.20 ha), 25% resided on one-half of an acre, and 14% resided on a

property more than one-half of an acre.

**BINARY LOGIT MODEL.** Because participants were given four landscape features and asked to select the most important one, the dependent variable (chosen landscape feature) was categorical, and the four categories were mutually exclusive. A binary logit model was considered for each category of the four landscape features. Because one of the landscape features was environmental benefits, the binary dependent variable *y* had a value of one (1) if the respondent perceived environmental benefits as the most important landscape feature and a value zero (0) otherwise. Therefore, a series of binary outcomes were generated.

The conditional probability of choosing environmental benefits given a set of covariates *X* can be presented as:

$$P(y = 1|X) = \frac{\exp(X\beta)}{1 + \exp(X\beta)}, \quad [1]$$

where the set of variables in the  $X$  vector ( $1 \times K$ ) includes homeowner perceptions of the effectiveness of information, financial benefits, and local ordinances promoting FFLs. Homeowners' general concerns about the environment and sales and prices of landscape-related products were included. Additionally, homeowners' attitudes toward landscapes, whether they have heard of FFL, their knowledge about the FFL principles, general turfgrass care requirements, soil care and soil type, knowledge about local residential landscape regulations, water conservation practices, as well as knowledge about wildlife- and pollinator-friendly landscapes were also included. More details regarding these explanatory variables are provided in Table 3. A list of individual demographic characteristics such as age, sex, ethnicity, educational levels, household size, and income levels were included to control for differences across homeowners. To

further control for variations across different regions and population areas, regional dummies and population density dummies were also included.  $\beta$  was the vector of parameters to be estimated.

The general log likelihood function for an individual  $i$  with a sample size  $n$  is:

$$\ell(\beta) = \sum_{i=1}^n (1 - y_i) \log \left( 1 - \frac{\exp(X_i\beta)}{1 + \exp(X_i\beta)} \right) + y_i \log \left( \frac{\exp(X_i\beta)}{1 + \exp(X_i\beta)} \right), \quad [2]$$

which can be rewritten as:

$$\ell(\beta) = \sum_{i=1}^n [y_i X_i \beta - \log(1 + \exp(X_i\beta))]. \quad [3]$$

The estimated  $\beta$  coefficients in Eq. [2] do not directly represent the marginal effects of the independent variables on the probability. Postestimation commands were used to estimate and report marginal effects. In the case of a continuous variable, the marginal effect of  $x_j$  (e.g., the  $j^{\text{th}}$  variable is age) on the probability is given by:

$$\frac{\partial P(X)}{\partial x_j} = \beta_j \frac{\exp(X_i\beta)}{[1 + \exp(X_i\beta)]^2}. \quad [4]$$

For a binary variable  $x_k$  that has the values of 1 and 0 (e.g., the  $k^{\text{th}}$  variable was whether participants had heard of FFL), the marginal effect is calculated as:

$$\frac{\partial P(X)}{\partial x_k} = P(x_1, \dots, x_{k-1}, 1, x_{k+1}, \dots, x_K) - P(x_1, \dots, x_{k-1}, 0, x_{k+1}, \dots, x_K) \quad [5]$$

where  $K$  is the total number of variables in the  $X$  vector.

## Results and discussion

As summarized in Table 1, approximately one-half of the participants (598 participants) indicated that curb appeal was the most important landscape feature to them, followed by financial benefits (19%) and environmental benefits (19%). Fourteen percent (165 participants) indicated that psychological benefits were most important to them.

**Table 3. Relevant information, knowledge, and socio-demographic explanatory variables used within the logit model and separated into four categories of Florida homeowners' landscape feature priorities (curb appeal, environmental, financial, and psychological).**

Explanatory variable	Variable scale points	Curb appeal	Environmental	Financial	Psychological
		Mean			
Encouraging factors: information	1 = not effective 7 = very effective	5.19	5.62	5.04	5.40
Encouraging factors: financial	1 = not effective 7 = very effective	5.45	5.70	5.53	5.46
Encouraging factors: ordinance	1 = not effective 7 = very effective	4.55	5.00	4.67	4.85
Environmental concerns	1 = strongly disagree 5 = strongly agree	3.49	3.58	3.45	3.43
Sales and price concerns	1 = extremely uncharacteristic 7 = extremely characteristic	6.24	6.10	6.41	6.19
Landscape attitude	1 = strongly disagree 5 = strongly agree	3.17	3.22	3.24	3.17
Knowledge of Florida Friendly Landscapes principles	1 = not knowledgeable at all 7 = very knowledgeable	3.95	4.91	3.99	4.49
Knowledge of turfgrass care and requirements	1 = not knowledgeable at all 7 = very knowledgeable	4.23	4.54	4.19	4.44
Knowledge of soil care and type	1 = not knowledgeable at all 7 = very knowledgeable	3.56	4.28	3.71	4.12
Knowledge of residential landscape local regulations	1 = not knowledgeable at all 7 = very knowledgeable	4.09	4.77	4.31	4.42
Knowledge of water conservation practices	1 = not knowledgeable at all 7 = very knowledgeable	4.60	5.26	4.79	4.75
Knowledge of wildlife- and pollinator-friendly landscapes and gardening	1 = not knowledgeable at all 7 = very knowledgeable	3.74	4.81	3.88	4.45
Have you heard of Florida Friendly Landscapes?	1 = yes 0 = no	0.51	0.69	0.52	0.62

The marginal effects of factors on homeowners' prioritization of landscape features from the binary logit models are shown in Table 4. The estimated coefficients associated with these marginal effects can be found in Supplemental Table 1. Overall, our analysis revealed several factors. For example, encouraging FFL installation factors, environmental concerns, sales and price concerns, overall attitudes toward landscaping, and knowledge of FFL principles played distinct roles in shaping homeowners' prioritization of landscape features (Table 4). Consistent with our expectations, the provision of more practical information about FFL principles (e.g., plant selection, environmental impact) was positively associated with homeowners'

prioritization of the environmental benefits feature. Conversely, financial information about FFL such sales and price concerns, was positively associated with prioritizing features concerning financial benefits. In the subsequent sections, we delve into detail of each hypothesis about homeowner types, beginning with the hypothesis 1: curb appeal motivation.

Hypothesis 1 (knowledge and perceptions about landscape care and related ordinances will predict the curb appeal motivation) was partially supported. Nearly one-half of the participants selected curb appeal as their top priority feature, as expected. However, landscape attitude had no effect on predicting curb appeal. These homeowners may maintain their landscape primarily

because of social obligations or because social values are important to them. Therefore, they are participating in the maintenance of their landscape to gain approval from their neighbors, not because they enjoy it. Another reason is that environmental concerns or psychological values are important to them (Knuth et al. 2019).

Knowledge of turfgrass care and requirements seems to exert a stronger influence (Table 4) on homeowners' decision-making than any factors promoting environmentally friendly landscapes. Knowledge of turfgrass care and requirements did have a positive effect, with a marginal effect of 4.47%, indicating the greater the knowledge of care and requirements, the more likely they would be to prioritize curb

**Table 4. Binary logit model-based marginal effects (ME) and standard errors (SE) of relevant information, knowledge, and socio-demographic explanatory variables on Florida homeowners' landscape feature priorities.**

Explanatory variable	Curb appeal		Environmental		Financial		Psychological	
	ME	SE	ME	SE	ME	SE	ME	SE
Encouraging factors: information	0.0119	0.02	<b>0.0321<sup>i</sup></b>	<b>0.01</b>	<b>-0.0545</b>	<b>0.01</b>	0.0208	0.01
Encouraging factors: financial	-0.0126	0.02	-0.0075	0.01	<b>0.0392</b>	<b>0.01</b>	<b>-0.0248</b>	<b>0.01</b>
Encouraging factors: ordinance	-0.0197	0.01	-0.0002	0.01	0.0131	0.01	0.0034	0.01
Environmental concerns	0.0180	0.04	0.0079	0.03	-0.0475	0.03	0.0170	0.02
Sales and price concerns	0.0234	0.02	<b>-0.0360</b>	<b>0.01</b>	<b>0.0265</b>	<b>0.01</b>	-0.0079	0.01
Landscape attitudes	-0.0491	0.03	<b>0.0393</b>	<b>0.02</b>	0.0268	0.02	-0.0174	0.02
Knowledge of Florida Friendly Landscapes principles	-0.0184	0.01	<b>0.0267</b>	<b>0.01</b>	-0.0143	0.01	0.0056	0.01
Knowledge of turfgrass care and requirements	<b>0.0447</b>	<b>0.01</b>	<b>-0.0268</b>	<b>0.01</b>	-0.0064	0.01	-0.0051	0.01
Knowledge of soil care and type	-0.0064	0.01	-0.0019	0.01	-0.0002	0.01	0.0103	0.01
Knowledge of residential landscape local regulations	-0.0163	0.01	0.0036	0.01	0.0095	0.01	-0.0002	0.01
Knowledge of water conservation practices	-0.0051	0.01	0.0091	0.01	0.0175	0.01	<b>-0.0235</b>	<b>0.01</b>
Knowledge of wildlife and pollinator friendly landscapes and gardening	-0.0361	0.014	0.0257	0.01	-0.0076	0.01	0.0131	0.01
Have you heard of Florida Friendly Landscapes?	<b>-0.0625</b>	<b>0.03</b>	0.0436	0.02	-0.0024	0.02	0.0192	0.02
<b>Demographics</b>								
Male	0.0408	0.03	0.0165	0.02	-0.0358	0.02	-0.0183	0.02
Age	<b>0.0029</b>	<b>0.00</b>	0.0003	0.00	-0.0014	0.00	-0.0014	0.00
White	0.0355	0.04	-0.0032	0.03	<b>-0.0888</b>	<b>0.03</b>	<b>0.0762</b>	<b>0.03</b>
Education: bachelor's degree or higher	0.0005	0.01	-0.0057	0.00	-0.0079	0.00	<b>0.0121</b>	<b>0.00</b>
Full-time employment	0.0337	0.03	-0.0242	0.03	0.0085	0.03	-0.0159	0.02
Retired	-0.0044	0.04	-0.0084	0.03	0.0003	0.04	0.0168	0.03
Children in household	-0.0045	0.02	-0.0019	0.01	-0.0025	0.01	0.0114	0.01
Adults in household	<b>0.0504</b>	<b>0.02</b>	<b>-0.0274</b>	<b>0.01</b>	-0.0059	0.01	-0.0110	0.01
Income	<b>0.0290</b>	<b>0.01</b>	-0.0097	0.01	-0.0093	0.01	-0.0075	0.00
<b>Florida region</b>								
Northwest	-0.0337	0.07	-0.0429	0.05	0.0074	0.05	0.0562	0.04
Northeast	0.0411	0.07	-0.0615	0.05	0.0322	0.05	-0.0111	0.04
Central	0.0340	0.05	-0.0260	0.03	-0.0067	0.04	0.0103	0.03
Central-east	0.0589	0.07	0.0040	0.04	0.0020	0.05	-0.0532	0.04
Southwest	-0.0246	0.06	-0.0630	0.04	0.0633	0.04	0.0193	0.03
Southeast	0.0516	0.05	-0.0379	0.03	0.0050	0.04	-0.0108	0.03
<b>Population density</b>								
City	0.0071	0.07	-0.0291	0.04	0.0172	0.05	0.0183	0.04
Suburb	0.0266	0.06	-0.0252	0.04	0.0255	0.04	-0.0052	0.04
Small town	0.0399	0.07	<b>-0.1214</b>	<b>0.05</b>	0.0273	0.05	0.0521	0.04

<sup>i</sup>Significance according to the 95% confidence interval is indicated in bold.

appeal of their landscape. Additionally, there was a negative effect of knowledge of FFLs, with the marginal effect of  $-6.25\%$ . This indicated that the more information and knowledge they had about FFLs, the less likely they were to rank curb appeal as the most important beneficial feature of their landscape. This result is not surprising because those who prioritize curb appeal tend to have a greater understanding of how to make their landscape look visually appealing, but they may not be as concerned with the impact of their behavior on the environment. Because they are not necessarily concerned about the environment, they are less likely to know how their behavior affects wildlife and to be concerned with programs such as the FFL program.

The results show that some of the demographic variables played a role predicting the curb appeal landscape motivation. Specifically, older individuals with slightly more adults in the household and a greater annual household income were more likely to prioritize curb appeal over other landscape features. This result combined with the result of a negative influence of FFL knowledge on curb appeal motivation suggested that consumers who may be more influenced by their neighbors' landscapes and social nuances choose landscapes features that are not always aligned with environmental practices. They do so to appeal to the social influences on them. These findings are similar to those of Hayden et al. (2015) and Kendal et al. (2012), who found that social influences clash with environmentally friendly landscapes.

Hypothesis 2 (landscape attitude and environmental concern will predict the environmental motivation) was supported. Higher levels of knowledge about the FFL principles and favorable attitudes toward landscapes were more likely to predict motivation for environmental features of landscapes. Knowledge of FFL principles and landscape attitude had a positive influence on the prioritization of the environmental factors of the landscape (with marginal effects of  $2.67\%$  and  $3.93\%$ , respectively). However, homeowners' sales and price concerns negatively influenced the prioritization of the environmental benefit feature ( $-3.63\%$ ). The greater the sales and price concerns regarding a

landscape, the less likely they were to prioritize the environmental factors of their landscape. In previous literature, medium-income households preferred turfgrass-orientated landscapes over environmental-orientated landscapes (Zhang and Khachatryan 2020). Low-income and high-income households preferred environmental-orientated landscapes over turfgrass-orientated when combined with financial rebate incentives. The percentage of medium-income households sampled for this study may explain the negative relationship between financial incentives and environmental benefit.

Additionally, too much financial incentive had a lesser effect on environmental behavior adoption. Participants with low incentive requirements were willing to pay more for environmentally friendly attributes than their counterparts in the medium and high incentive requirement groups (Zhang and Khachatryan 2020). The results and combined literature indicated that financial incentives do not influence all participants equally, and, in fact, that rebate incentives seemed not to influence participants' environmental adoption intentions at all.

The more knowledge of turfgrass care and requirements, the less likely the homeowners are to consider the environmental features of their landscape as most important (with a marginal effect of  $-2.68\%$ ). This is in line with the results reported by Zhang and Khachatryan (2021), who found that consumers are knowledgeable about environmental impacts and the principles of engaging in environmentally friendly practices but are less familiar with "standard" lawn and turf care practices. Knowledge did play a part in the intention to adopt environmentally friendly landscapes, similar to the results reported by Uren et al. (2015).

Several sociodemographic variables have significant impacts on landscape feature optimization. Large households with more adult family members are less likely to prioritize environmental features of their landscape as most important. However, the negative result associated with residency in small town is consistent with the findings of Engel and Pötschke (1998), Hall and Dickson (2011), Khachatryan et al. (2014), Straughan

and Roberts (1999), and Tully and Winer (2014), who suggested that being from a small town led to a lesser likelihood that the homeowner prioritized environmental features of their landscape as most important. However, being from a small town led to a lesser likelihood that the homeowner would prioritize environmental features of their landscape as most important.

Hypothesis 3 (price discounts and financial savings will predict the financial motivation) was supported. Although homeowners who prioritized financial benefits were negatively influenced by encouraging information about FFLs in terms of the environment, they were receptive to encouraging information about FFL in terms of finances (marginal effect of  $3.92\%$ ); additionally, they were concerned about sales and price information and prioritized the financial features of their landscape (marginal effect of  $2.65\%$ ). This result may be attributable to the large amount of individuals with medium household incomes who were not being as environmentally motivated as those with low-income and high-income households (Zhang and Khachatryan 2020). These results are consistent with the findings of Blaine et al. (2012), who reported that they solely prioritized the financial gains of an improved landscape and least costly options for maintaining the landscape. They may view the time, money, and effects spent on yard care as an investment and a way to improve the property value (Blaine et al. 2012; Clayton 2007; Nassauer et al. 2009). However, none of the knowledge about FFLs or care for the landscape in any capacity played a part in the homeowners' prioritization of the financial features of their landscape. Being white negatively influenced the financial motivation. This may be because much of Florida's high-earning population is white and may not respond as well to discounts and monetary savings because these reasons are not as salient as other motivations (All4HealthFL 2023).

Hypothesis 4 (wildlife-friendly and pollinator-friendly practices will predict psychological motivation) was not supported. The results showed that encouraging factors of installing FFL landscapes did not affect homeowners' prioritization of psychological features of their landscape. The homeowners' prioritization of psychological factors

was unaffected by environmental concerns and concerns for sales and price. Homeowners were less likely to prioritize the psychological features of their landscape if they had a greater knowledge of conservation practices for their landscape and if they had knowledge of encouraging financial factors related to their landscape.

The COVID-19 pandemic influenced gardening and health. Mateer et al. (2021) found that promoting one's personal health mattered most to gardeners during the pandemic (Mateer et al. 2021). There was a positive effect on students and adolescents who were near plants and gardens compared with those who were not (Jackson et al. 2021; Trevinov et al. 2022). Interestingly, most people were visiting green-spaces more during COVID-19 than before the pandemic (Grima et al. 2020). In Switzerland and China, these behaviors persisted after COVID, but this has yet to be formally reported in the United States (Chen et al. 2022; Venter et al. 2021).

Uren et al. (2015) reported that knowledge played a part in influencing homeowners to be more environmentally sensitive and to place less importance on the psychological benefits they derive from their landscape, but the knowledge of wildlife-friendly and pollinator-friendly practices showed insignificant effects on the prioritization of psychological benefits. In addition, more educated and white homeowners were more willing to prioritize psychological features of their landscape. This may indicate that these individuals are not financially or environmentally motivated to participate with their landscapes; however, they may prioritize meaningful interactions with people and mental and emotional engagement with wildlife (Maiteny 2002). More investigations are required to understand other psychological aspects of landscape motivation.

## Conclusions

American homeowners' engagement with landscape care varies widely. These homeowners have different priorities in term of landscape features and benefits, such as social, environmental, financial, or psychological features and benefits. These priorities can be affected by the homeowners' environmental- or landscape-related

knowledge, perceptions, as well as their sociodemographic characteristics. For policymakers and extension agents, understanding these priorities is helpful to effectively engage with homeowners and promote environmentally friendly landscape programs, such as the FFL program. Curb appeal and environmental, financial, and psychological factors are often emphasized to promote the adoption of EFL landscapes.

EFL programs develop landscape designs to fulfill these aesthetic and psychological needs. Although these factors are certainly important, it is important to recognize that different homeowners may have other priorities. For example, homeowners who prioritize social norms are more likely to seek out EFL design options. This highlights the importance of understanding the motivations and priorities of different homeowners when promoting landscape programs.

Curb appeal and aesthetics are the main priorities for most homeowners in Florida. Communicating the benefits of FFL programs while also communicating how they can be aesthetically pleasing is essential to appeal to these homeowners. Extension agents should consider providing pictures or design examples of FFL landscapes that are comparable in aesthetics to non-FFL landscapes to show that incorporating environmentally friendly practices do not diminish the aesthetic quality of the landscape. Because these consumers care less about how environmentally friendly their landscapes are, education and programming should have a greater effect by showing the impact on wildlife and the environment through facts about improvement or mitigation. Achieving buy-in from HOAs may also be effective for implementing FFLs for aesthetic homeowners. Socially influenced homeowners often are governed by the rules of their HOA. If the entire neighborhood must adhere to new landscape rules, then there may be the same level of comparability as before, but with different requirements.

Moreover, the educational materials related to FFLs were effective among Florida homeowners who prioritize environmental features. This is because Florida homeowners are relatively more knowledgeable about the FFL principles and have a positive attitude about their landscape care and

wildlife as well as pollinator habitats. Continuing to provide these educational materials will appeal to these homeowners with higher environmental concerns. Effective education and programming for homeowners who prioritize the environment should include information about FFLs during landscape or pruning workshops. Asking independent garden retail centers to provide information about FFLs may create a connection point to reach more consumers. These homeowners have highly positive landscape attitudes, thus indicating that they spend time and money on their landscape. The focus should not be on discount sales or cost-savings by implementing FFLs because this is ineffective; instead, it should be on the environmental benefits and impacts of these types of landscapes. Care should be taken to not provide information about turf-grass care and sweep FFLs into the general education about landscapes. These types of consumers are less likely to be familiar with "standard" lawn care techniques and are only interested in the environmental options, exclusively. Therefore, retail garden centers should focus on environmental messages about FFLs.

For financially motivated homeowners, money talks. Extension agents should communicate the benefits of FFLs through the lens of monetary savings on fertilizer and pesticide inputs, water savings, and the potential increase in the homeowner's property value with the installation of environmentally friendly landscapes. Explaining these benefits as financially beneficial is paramount. Additionally, it is advantageous to show this group of consumers pictures or designs of FFLs and non-FFL landscapes to visually demonstrate this point. Another method is to show a "before" picture of a non-FFL landscape and an "after" picture of the upscaled, FFL-converted landscape to determine if they perceived improved property value from this installation.

The endeavor would appeal to the homeowners who prioritize financial features of their landscape as aesthetically pleasing. It is helpful to discuss the county's or state's natural environment remediation cost-savings (i.e., savings of any county's or state's public funds) if all homeowners participated in the FFL or Water Star programs. Florida Water Star is a certification

program for homes and commercial buildings that use less water in landscapes, irrigation systems, and indoors. These types of messages may resonate with the financially driven homeowners and influence them to engage in the FFL landscape program to save money, which is of most interest to them.

Care must be taken during the interpretation of these results. More work is necessary before we can understand the underlying factors of why homeowners prioritize psychological benefits in their landscape. The present study only analyzed Florida homeowners' choices, and the results cannot be extrapolated to the general United States population. Additionally, the distribution and data collection of this survey were conducted before COVID-19. Some consumer landscape and gardening decisions may have changed since this prominent event. Understanding the priorities and motivations of homeowners regarding the adoption of landscape practices is essential to the effective promotion of EFL programs. By tailoring communication and educational materials to homeowners with different priorities, policymakers and extension agents can increase the effectiveness of these programs and help create a more sustainable urban environment for everyone.

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