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Associating Importance with Behavior: Providing Direction for Water Conservation Communication

Alexa J. Lamm

Lisa K. Lundy

Laura Warner

See next page for additional authors

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Abstract

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Keywords

Segmenting Publics, Situational Theory of Publics, Water Conservation

Authors

Alexa J. Lamm, Lisa K. Lundy, Laura Warner, and Kevan W. Lamm

RESEARCH

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ABSTRACT

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KEY WORDS

Segmenting Publics, Situational Theory of Publics, Water Conservation

INTRODUCTION

Water is one of the single most critical elements to a productive society (Young & Dhanda, 2013). Without sufficient water resources it is impossible to sustain life, therefore the active monitoring, management, and engagement in water related endeavors is paramount (Morris, 1995). Despite the necessity for water the indifference, obliviousness, and apathy of the general public in water related issues has been observed (Lamm, Lamm, & Carter, In Press-a).

As a fungible resource water may serve a multitude of purposes: potable, recreation, natural habitat, agriculture, industry, or aesthetics (Chiras, 2009). However, use within each particular category may result in a deficiency within another; for example, water used for aesthetic, or landscaping purposes, may become non-potable until going through the necessary reclamation process. Such conflicts over use are starting to emerge with greater frequency, especially in geographies where water is beginning to be viewed as a finite resource (Barnett, 2007).

In Florida one of the largest conflicts centers around competing and diverging interests related to the restoration of the

Everglades (Carter, 2004). Those in favor of returning the Everglades to a more natural environment express concerns of the water quantity needs of the agricultural industry upstream, as well as questionable water quality associated with post-agricultural use (Carter, 2004). From the agriculturalists perspective, their adherence to best management practices and net contribution to cleaning the Everglades tends to go unnoticed. "Farmers have spent an estimated $200 million implementing the improved practices, including fertilizer controls, water management and soil conservation" (Salisbury, 2015, para. 13).

A similar conflict has emerged between public water consumption and competing interests. Within Florida public water demands are expected to grow by 29% over the next 20 years (Florida Department of Environmental Protection, 2013). Based on 2005 data Marella (2013) found public consumption in Florida already accounted for 52% of fresh groundwater and 13% of fresh surface water withdrawals. Based on estimates by the United States Environmental Protection Agency (USEPA, 2014) the average United States household consumes more than 300 gallons of water a day with 30% going for outdoor uses. The implication of these estimates is that a larger number of individuals are going to be competing for the same limited water resources (Florida, 2013; USEPA, 2014). Additionally, the volume of water directed to outdoor endeavors, specifically, aesthetic and landscaping, are expected to increase dramatically (Haley, Dukes, & Miller, 2007; Marella, 2013).

One recommendation to mitigate the potential consequences of water resources directed at outdoor water use, particularly for landscaping purposes, has been to identify individuals that tend to use an excessive amount of water for such purposes and focus educational initiatives at behavior change within this group (Monaghan, Ott, Wilber, Gouldthorpe, & Racevskis, 2013). According to Monaghan et al. (2013) individuals in Florida that use an excessive amount of water, classified as High Water Users (HWUs), have a tendency to share similar characteristics. This recommendation is consistent with research that has found that similarities in individual characteristics can have a significant bearing on communication channel preferences (Lamm, Rumble, Carter, & Lamm, In Press-b).

Despite previous efforts to provide educational materials to the general public through the Florida Extension service (Greene, 2010; Lee, Tansel, & Balbin, 2013) knowledge gaps related to water issues have continued to persist (Lamm et al., In Press-a). Two of the National Research Agenda (Doerfert, 2011) priority areas are germane to the study of HWUs and their preferred educational channels. First, priority area one focuses on public and policy maker understanding of agriculture and natural resources (Doerfert, 2011). As a natural resource, water is essential to all elements of life. Consequently, a study directed at better understanding and classifying HWUs may serve as a benchmark to the public, as well as policy makers, regarding the use of water for outdoor, urban landscaping purposes as well as engagement in water conservation behaviors. Secondly, priority area five emphasizes efficient and effective agricultural education programs. Understanding the needs and preferences of an audience is paramount in providing the most effective educational experiences possible (Doerfert, 2011). A study which empirically analyzes channel preferences may have significant bearing on recommended educational intervention strategies and may ultimately influence individual knowledge and behavior (Lamm et al., In Press-b).

THEORETICAL FOUNDATION

In the context of natural resource issues like water management, groups of citizens can be identified that have shared characteristics or demographics with regard to the issue at hand. These groups can be described as publics. "Publics develop around issues that affect them because they have a similar problem, they recognize that problem, and

they organize to do something about the problem" (Lee & Rodriguez, 2006, p. 5). Researchers have long sought to categorize and describe publics in terms of how and why they seek out information for problem solving. Within the Situational Theory of Publics (STP) framework, publics are categorized based on how they respond to problems and their communicative behavior. STP also examines the cognitive, attitudinal and behavioral effects of communication messages (Grunig, 1997, 2003).

According to STP, three independent variables can be measured to explain and predict communication behaviors in a particular situation: problem recognition, involvement recognition, and constraint recognition. Problem recognition refers to an individual's cognitive perception of discrepancy between a held expectation and an observed reality (Kim & Grunig, 2011). For agricultural communicators, there are many examples of societal issues that are not perceived as problems by some individuals. For example, a city may have areas designated as food deserts lacking access to healthy food options. For many citizens and leaders in that city, however, lack of awareness and information may preclude them from perceiving food deserts as an issue for their city. They do not recognize a problem. Kim and Grunig (2011) distinguish between perceptual problems and cognitive problems, defining "problem recognition as one's perception that something is missing (perceptual problem) and that there is no immediately applicable solution to it (cognitive problem)" (p. 128).

Involvement recognition stems from an abundance of social psychological research on the concept of involvement related to attitudes and information processing. As an example, within the Elaboration Likelihood Model of Persuasion involvement is an important variable influencing the amount of cognitive processing individuals will devote to a communication message. Grunig (1997) defined level of involvement as "the extent to which people connect themselves with a situation" (p. 10). Low involvement tends to result in more passive communication behavior, defined by Grunig (1976) as information processing. Higher involvement results in more active communication behavior or information seeking (Grunig, 1976). According to Grunig (1983), publics will express concern about environmental issues when they are unwilling to seek out information to learn more about the problem. At issue in these instances is personal involvement. If they perceive an environmental problem to be of personal concern, they are more likely to seek out information (Major, 1993).

While involvement recognition comes from the field of social psychology, Grunig's (1989) concept of constraint recognition is rooted in economics and management science. It is, however, analogous to Bandura's (1977) social psychological concept of personal efficacy. According to Grunig (1997), constraint recognition occurs when "people perceive that there are obstacles in a situation that limit their ability to do anything about the situation" (p. 10). Even when problem recognition and perceived involvement are high, individuals are not likely to engage in information seeking or process if they perceived significant restraints (Ramanadhan & Viswanath, 2006).

Residents' landscape water conservation practices are influenced by constraints in the form of Homeowners' Association (HOAs) membership and the presence of water restrictions. HOAs typically elect their leadership, regulate activities, and provide services to their residents and "are quickly becoming the most common and fastest growing units of local governance in the United States" (McCabe, 2005, p. 404). Residents of HOAs "are contractually obliged to follow the rules and regulations" (Turner & Ibes, 2013, p. 1168) specified in an HOA's covenants, codes, and restrictions (CCRs). In 2012, Florida was reported to have 46,000 HOAs, which makes up the largest percentage (14.2%) of the country's growing numbers of HOAs (Foundation for Community Association Research, 2012). In a recent study of Florida residents, 66% indicated they resided in an HOA (Odera & Lamm, 2015).

HOAs generally prioritize landscape aesthetics despite their potential to contribute to water conservation (Cook, Hall, & Larson, 2011; Dyckman, 2008). Many HOA CCRs require specific combinations of plant species, turfgrass coverage, and quality of turfgrass, which affects landscape water consumption (Turner & Ibes, 2013). Additionally, both perceived and codified social norms within HOAs shape individuals' landscape water use practices (Cook et al., 2011; Larson & Bruman, 2014). HOA CCRs paired with the pressure to conform to a neighborhood norm have been identified as barriers to environmentally responsible landscaping practices (Cook et al., 2011; Hansen de Chapman, Sanagorski, Monaghan, Lewis, & Momol, 2014).

While residing within an HOA is recognized as a local driver for residential landscape practices, the presence of water restrictions is recognized as a broader-scale constraint, which may be imposed by counties or municipalities (Cook et al., 2011). Water restrictions are one of the most common water conservation strategies (Survis & Root, 2012), yet reports on effectiveness have been mixed. Restrictions may be voluntary or mandatory, and are often prescribed as allowable irrigation days, times, and durations (Kenney, Klein, & Clark, 2004). Water restrictions may also detail rules for different watering methods and sources, such as hand watering with a hose or using reclaimed water (Kenney et al., 2004). Ozan and Alsharif's (2012) study on water restrictions and compliance demonstrated that stringent water restrictions actually increased water usage. Additionally, people who had received water usage citations during water restrictions increased their usage more that those who did not (Ozan & Alsharif, 2012). Survis and Root (2012) found that individuals may substantially wastewater through irrigation despite compliance with water restrictions. This loss of potential water savings may be attributed to a perceived obligation to water during a resident's allowable days (Kenney et al. 2004). Both HOA membership and water restrictions represent constraints to water conservation practices.

The cognitive effort needed to evaluate communication messages is a limited resource for consumers who are bombarded with messages each day and can serve as an additional constraint for individuals presented with water conservation communication. Effective communicators can use audience data to determine which individuals are most likely to actively attend to their message. Depending on an individual's problem recognition, involvement recognition and constraint recognition related to an issue, they acquire information about the issue either actively (information seeking) or passively (information processing) (Grunig, 1997). Information seeking is premeditated and involves an individual actively looking about their environment for messages about a topic. Information processing is the "unplanned discovery of a message, followed by continued processing of it" (Clarke & Kline, 1974, p. 233). Information seekers often rely on interpersonal discussion and specialized booklets or pamphlets (Clarke & Kline, 1974). They are more likely to look for media sources developed to provide problem-specific information. This could also include issue-related websites. Information processers rely more on mass media for information. While they're not seeking issue-related information, they may stumble upon it through exposure to mass media. Through the use of STP, high water users can be better understood, and therefore more easily communicated with, by examining how problem recognition, involvement recognition and constraint recognition related to water conservation impacts information processing and information seeking.

PURPOSE AND OBJECTIVES

The purpose of this study was to gain a deeper understanding of high water users based on their problem recognition that plentiful water is important, level of involvement in water conservation behaviors, and constraint recognition related to HOA membership and being required to abide by water restrictions. This will aid communicators in encouraging adoption of water conservation behaviors. The study was guided by the following objectives:

1. Identify differences in characteristics of high water users based on the level of importance they associated with plentiful water and engagement in water conservation behaviors within the landscape.
2. Determine if the level of importance associated with plentiful water and engagement in water conservations behaviors within the landscape is associated with HOA membership and being required to abide by water restrictions.
3. Identify the communication needs of high water users based on the level of importance they associate with plentiful water and engagement in water conservations behaviors within the landscape.

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METHODS

This study used an online survey research design to address the research objectives. The population of interest was high water users in the state of Florida age 18 or older. A high water user was defined as living in specific counties within the state, having an irrigated landscape and hiring an outside landscaping company to manage their landscape. Previous literature has identified individuals with these characteristics as consuming an unusually high amount of water to ensure they have a green, lush home landscape (Davis & Dukes, 2014; Huang, Lamm, & Dukes, 2015). The study was limited to Florida because water has been identified as the top issue facing the agricultural and natural resource sector despite it being surrounded by water on three sides and having an extensive spring system. The state is also currently undergoing a strategic restructure of their extension system where enhancing and protecting water quality, quantity and supply has emerged as one of the priority initiatives.

The survey instrument was researcher adapted with items based on the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012). For this study, the original instrument was adapted to fit a Florida audience and researcher-developed questions specific to learning interests and communication preferences were added. As the research is part of a larger study, five sections of the survey instrument were germane to the findings in this study: importance of plentiful water, self-reported engagement in water conservation behaviors, interest in water-focused learning experiences, communication preferences, and demographics. Once the instrument was developed an expert panel ensured content and face validity. The expert panel included the Director of the Center for Landscape Ecology and Conservation, the Director of the UF Water Institute, the Director of the Center for Public Issues Education, and an evaluation specialist with expertise in survey design.

First, respondents were asked to indicate the level of importance they associated with seven items related to plentiful water on a five point Likert-type scale ranging from 1 = *Not at all important*, 2 = *Slightly important*, 3 = *Fairly important*, 4 = *Highly important*, and 5 = *Extremely important*. Responses to the seven items were averaged to create an overall measure of importance of plentiful water score. Reliability was calculated *ex post facto* resulting in a Cronbach's alpha coefficient of .79 deemed to be reliable. The overall mean score for the index was a 3.67 (SD = .60) indicating the respondents, on average, perceived plentiful water as highly important but there was a diverse level of response. Next, respondents were asked to indicate if they had engaged in six specific water behaviors related to the protection of water when using it in the home landscape. If they marked they had engaged in the specific method, they were given a point. The points were then summed to create an overall water conservation behavior score that could range from zero to six with a zero indicating they did not engage in any of the behaviors and a six indicating they engaged in all of the behaviors. The overall mean score was a 4.01 (*SD* = 1.43).

Respondents were also asked whether or not they were a part of an HOA and if they currently had to abide by any water restrictions for their lawn. Communication needs were measured in two ways. First, respondents were asked to indicate the types of learning opportunities they would most likely take advantage of to learn more about water topics. Respondents were presented with 11 options and asked to check all that apply. Second, respondents were asked to indicate which of 14 subject matter areas they would be most interested in learning more about. Respondents were presented with 14 options and asked to check all that apply. Finally, respondents identified their sex, education level, race, ethnicity, age, annual household income, and political affiliation.

In order to categorize the respondents, both the importance of plentiful water index score and engagement in water conservation behavior scores were transformed into z scores. The z scores were used to classify the respondents in to one of four groups: (a) positive importance of plentiful water z score and positive water conservation behavior z score (+I+WC), (b) negative importance of plentiful water z score and positive water conservation behavior z score (-I+WC), (c) negative importance of plentiful water z score and negative water conservation behavior z score (-I-WC), and (d) positive importance of plentiful water z score and negative water conservation behavior z score (+I-WC). Chi-square tests were used to determine if significant differences existed between the four groups on the variables of interest.

A non-probability opt in sample was obtained using a public opinion survey research company, Qualtrics. Non-probability samples are commonly used in public opinion research to make population estimates (Baker et al., 2013) and in this case was the best way to reach the population of interest: high water users. Although there are limitations in being able to generalize non-probability samples, they have been shown to yield results as good as, or even better than, probability-based samples (Abate, 2008; Twyman, 2008; Vavreck & Rivers, 2008). The researchers fully acknowledge the limitations of opt-in panels and the lack of coverage associated with on-line survey designs. Weighting techniques were implemented in an effort to mitigate the coverage error associated.

Qualtrics sent a link to the developed instrument to 3,493 Florida residents representative of the state population based on the 2010 Census data. Only residents who answered they were residents of Florida, lived in specific counties within the state, had a home landscape they were responsible for maintaining that used an irrigation system and that reported hiring an outside landscaping company to maintain their landscape (classifying them as high water users) were allowed to participate. As a result, 932 responses were obtained representing a 26.7% participation rate. To compensate for potential exclusion, selection, and non-participation biases that tend to be limitations of using a non-probability sample, quotas established a priori were implemented (Baker et al., 2013).

RESULTS

Differences in characteristics of high water users based on level of importance of plentiful water and engagement in water conservation behaviors – To identify differences in characteristics of respondents based on the level of importance they associate with plentiful water and their engagement in water conservation behaviors, both the importance of plentiful water index score and engagement in water conservation behavior scores were transformed into z scores. The z scores were then used to classify the respondents in to one of four groups for further data analysis. The four groups were respondents who had a (a) positive importance of plentiful water

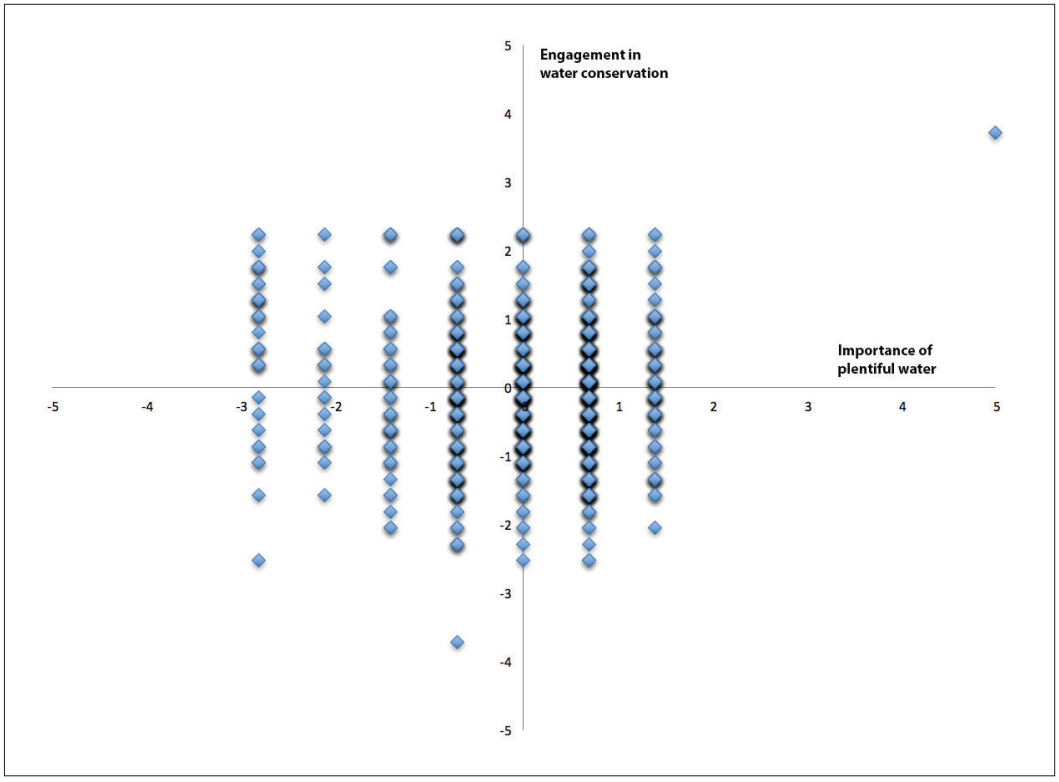

Figure 1. Distribution of groups based on water conservation behaviors and importance of plentiful water z scores

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z score and positive water conservation behavior z score (+I+WC), (b) negative importance of plentiful water z score and positive water conservation behavior z score (-I+WC), (c) negative importance of plentiful water z score and negative water conservation behavior z score (-I-WC), and (d) positive importance of plentiful water z score and negative water conservation behavior z score (+I-WC). The distribution of respondents based on their z scores can be seen in Figure 1.

Overall, when identifying the characteristics of the high water user respondents, there was an even gender split (Table 1). The majority was Caucasian/White (Non-Hispanic), had at least a four-year college degree, was older and had an annual family income of more than $75,000 a year. In terms of political affiliations, all were present but the largest group was Republican (37.1%).

Chi-square tests were conducted to compare the demographic characteristics of the four groups. Differences in sex were significant ($X2 = 8.07$; $p < .05$). The +I-WC group exhibited more males than the other three groups and the +I+WC group had the least. Differences in the number reporting being Hispanic ($X2 = 13.28$; $p < .01$) was also significant with the +I-WC group exhibiting more Hispanic respondents than the other three groups and the –I+WC the least. The Caucasian/White race indicator was also significant ($X2 = 7.90$; $p < .05$) with the –I+WC group having the most Caucasian/White respondents and the +I-WC having the least.

Table 1
Demographic characteristics of high water users overall and in groups

	Overall (*N* = 932) %	+I+WC (*n* = 222) %	-I+WC (*n* = 195) %	-I-WC (*n* = 252) %	+I-WC (*n* = 253) %
Sex*					
Male	48.1	41.0	47.2	49.2	53.4
Female	51.9	59.0	52.8	50.8	46.6
Race					
African American	4.4	4.5	3.1	4.4	5.1
Asian	1.5	1.4	0.0	1.6	2.4
Caucasian/White*	93.5	93.7	97.4	93.3	90.9
Native American	.5	0	1.0	0.0	0.8
Hispanic Ethnicity**	6.8	5.4	3.6	5.6	11.5
Age					
18 - 39	12.1	11.7	9.7	10.7	15.8
40 - 49	11.6	10.8	14.4	7.9	14.2
50 - 59	20.2	18.5	19.5	23.8	18.6
60 - 69	33.5	35.6	33.3	35.3	29.6
70 - 79	20.2	22.1	20.0	19.4	19.4
80 years and older	2.5	1.4	3.1	2.8	2.4
Annual Household Income					
$50,000 to $74,999	26.2	28.4	26.2	29.0	20.9
$75,000 to $149,999	49.5	80.0	51.8	49.6	48.2
$150,000 to $249,999	17.9	15.8	14.9	16.3	23.3

$250,000 or more	6.4	5.9	7.2	5.2	7.5
Education					
High school diploma	5.9	10.4	3.6	4.4	5.1
Some college education	16.4	18.5	13.3	16.3	17.4
2 year college degree	10.1	11.3	10.3	7.9	11.1
4 year college degree	38.1	35.6	38.5	42.9	35.6
Graduate degree	29.4	24.3	34.4	28.2	30.8
Political Affiliation					
Republican	37.1	43.7	33.8	35.3	35.6
Democrat	30.2	26.6	29.7	32.1	32.0
Independent	22.6	19.8	28.2	21.4	21.3
Non Affiliated	9.0	9.0	6.7	9.9	10.3
Other	1.1	.9	1.5	1.2	0.8

Note. *$p < .05$; **$p < .01$.

HOA membership and requirements regarding water restrictions - Respondents were asked to indicate whether or not they currently resided in an HOA and if they were currently required to abide by water restrictions for their lawn. The overall results, as well as the results by group, can be seen in Table 2. The –I-WC group exhibited the lowest level of respondents currently residing in HOAs and the lowest number required to abide by water restrictions for their lawn. The +I+WC group had the most respondents reporting they were required to abide by water restrictions for their lawn. Chi-square tests were conducted to determine if the four groups differed. The results indicated there were significant differences between the four groups in terms of currently residing in an HOA ($X^2 = 7.76$; $p < .05$) and being required to abide by water restrictions for their lawn ($X^2 = 10.63$; $p < .01$).

Table 2

HOA membership and requirements regarding water restrictions

	Overall ($N = 932$) %	+I+WC ($n = 222$) %	-I+WC ($n = 195$) %	-I-WC ($n = 252$) %	+I-WC ($n = 253$) %
Currently residing in an HOA*	70.4	74.3	74.9	64.7	68.8
Currently required to abide by water restrictions for their lawn**	74.6	79.3	77.9	67.5	75.5

Note. *$p < .05$; **$p < .01$.

Communication needs - Types of communication needs of the respondents were identified by asking respondents to indicate which of 11 learning opportunities they would most likely take advantage of to learn more about water topics (Table 3). Respondents were allowed to check all that apply. A "none of the above" option was also offered. Overall, respondents were most interested in visiting a web site to learn more about water topics, followed by reading printed fact sheets, bulletins or brochures. When examining groups, the –I-WC group was the least interested of the four groups in visiting a website and the –I+WC was least interested of the four groups in reading printed materials. The +I-WC group was more interested in watching TV coverage to learn about water than the other groups. A series of Chi-square

tests were run comparing the results from the four groups to determine if differences existed. Differences in interest in watching TV coverage were significant ($X^2 = 7.72$; $p < .05$) with the +I-WC group indicating the highest level of interest in this form of communication.

Table 3

Types of communication needs of high water users overall and in groups

	Overall ($N = 932$) %	+I+WC ($n = 222$) %	-I+WC ($n = 195$) %	-I-WC ($n = 252$) %	+I-WC ($n = 253$) %
Visit a web site	72.6	73.0	77.9	67.5	74.3
Read printed fact sheets, bulletins or brochures	50.4	52.3	45.1	51.6	51.8
Watch TV coverage*	47.5	45.9	48.7	41.3	53.4
Read a newspaper article or series	41.4	45.9	37.4	39.7	43.1
Watch a video	30.2	30.2	34.4	26.2	30.4
Attend a fair or festival	20.2	24.8	14.9	19.0	21.7
Attend a short course or workshop	19.5	17.6	15.4	21.0	23.7
Look at a demonstration or display	18.7	16.7	16.9	17.1	23.3
Take part in a one-time volunteer activity	14.7	13.1	12.3	14.7	18.6
Attend a seminar or conference	11.5	13.5	9.2	11.5	11.5
Get trained for a regular volunteer position	5.5	6.3	4.1	5.6	5.9

Note. *$p < .05$.

Subject of communication needs of the respondents were identified by asking respondents to indicate which of 14 water topics they would be most interested in learning about (Table 4). Respondents were allowed to check all that apply. A "none of the above" option was also offered. Overall, respondents were most interested in home and garden landscaping ideas for yards. When examining groups, the –I+WC group was the most interested in landscaping ideas of the four groups and the –I-WC was least interested. A series of Chi-square tests were run comparing the results from the four groups to determine if differences existed. Differences in interest in learning about irrigation management were significant ($X^2 = 10.70$; $p < .01$) with the -I-WC group indicating the lowest level of interest and the +I-WC indicating the highest. Differences in interest in fish and wildlife water needs were also significant ($X^2 = 11.77$; $p < .01$) with the +I+WC indicating the lowest level of interest and the +I-WC indicating the highest. Differences in interest in learning about private well protection and interest in learning about watershed protection were also significant.

Table 4

Subject of communication needs of high water users overall and in groups

	Overall (*N* = 932) %	+I+WC (*n* = 222) %	-I+WC (*n* = 195) %	-I-WC (*n* = 252) %	+I-WC (*n* = 253) %
Home and garden landscaping ideas for yards	51.0	54.5	54.9	47.6	47.8
Irrigation management**	22.4	22.5	22.6	16.7	28.9
Fertilizer and pesticide management	21.9	23.9	24.6	16.3	23.7
Community actions concerning water issues	20.3	20.7	14.9	21.4	22.9
Water policy and economics	19.7	18.9	19.5	19.0	21.3
Fish and wildlife water needs**	18.9	12.2	19.5	19.0	24.5
Landscape buffers	17.7	16.2	21.0	16.7	17.0
Shoreline cleanup	17.0	14.4	18.5	16.3	19.0
Restoring fish and aquatic habitat	16.6	14.9	20.5	13.9	18.2
Septic system management	11.7	12.2	6.7	12.7	14.6
Private well protection**	10.1	8.1	6.7	9.1	15.8
Watershed management**	10.0	5.0	7.7	11.1	15.0
Watershed restoration	9.8	6.8	8.2	9.9	13.4
Forest management and water issues	9.4	9.0	8.2	8.7	11.1

Note. *$p < .05$.

CONCLUSIONS

This study identified differences in characteristics of HWUs based on their perceived importance of plentiful water and their engagement in water conservation behaviors. Four primary groups of respondents were identified: High Importance/High Engagement, Low Importance/High Engagement, Low Importance/Low Engagement and High Importance/Low Engagement. These groups were significantly different in terms of gender and race. For respondents who perceived plentiful water to be of high importance, men reported significantly less engagement in water conservation than women. Likewise, for Hispanic HWUs respondents who perceived plentiful water to be of high importance, they reported significantly less engagement in water conservation than respondents of other ethnicities.

HOA membership does appear to impact perceived importance of plentiful water and their engagement in water conservation behaviors. High Importance/High Engagement Respondents were significantly more likely to reside in an HOA and to be required to abide by water restrictions for their lawn than other respondents. In terms of communication needs, websites were the overall preferred communication channel for all audiences, while High Importance/Low Engagement respondents demonstrated a significantly greater preference for TV coverage than other respondents. In terms of subject interests, all of the respondents were most interested in home and garden landscaping ideas for yards. High Importance/Low Engagement respondents, however, were significantly more interested in irrigation management, fish and wildlife water needs, private well protection and watershed management than the other respondents.

IMPLICATIONS AND RECOMMENDATIONS

As communicators seek to promote water conservation behaviors, it is essential to understand consumers' attitudes and behaviors. Communicators seeking to understand HWUs must identify their unique characteristics and communication channel preferences in order to develop effective communications content and programs. This study reveals that HWUs' behavior does not always correspond with perceived importance of water conservation. Situational Theory of Publics (STP) provides a framework for understanding why HWUs might perceive water conservation to be important (problem recognition) but may not feel personally responsible (involvement recognition) and may perceive barriers to changing their behaviors (constraint recognition). STP is especially useful in identifying publics with high potential for communication impact. In this case, communicators should consider targeting messages to male HWUs who perceive plentiful water to be of high importance but are not engaging in water conservation behaviors.

One group with potential for communication impact is HWUs with a Hispanic ethnicity indicating that some communication messages may be more effective if they are translated into Spanish. Messages may also be more effective if they are situated within cultural contexts for Hispanic audiences. These may differ widely for audiences in different cities or those from different countries of origin and it is suggested that research be done within a region or specific location to determine relevance. Regional and county Extension agents, that know their local audiences well, can play an important role in developing messages that will resonate with the audiences they serve. Communicators should also consider focusing some of their efforts on High Importance/Low Engagement respondents. This group has distinct communication preferences (TV) and subject interests (irrigation management, fish and wildlife water needs, private well protection and watershed management than the other respondents). A communication program targeted toward this group could result in measurable impact for increasing water conservation behaviors among HWUs. There is great potential here for video-based messages to visually demonstrate the importance of water conservation and help contextualize the issue for audiences by relating it to issues they care about. These could then be placed strategically on local stations and disseminated through online mediums for maximum effect.

Future research with this audience could further extend the application of STP, measuring and describing other perceived constraints that keep citizens who value plentiful water from adopting water conservation behaviors. In addition, a qualitative approach targeting high importance/low engagement respondents could be used to further discuss how perceived constraints are limiting engagement and how they can be overcome through communication campaigns. Finally, communication materials could be made based on these recommendations and tested to determine their level of effectiveness.

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ABOUT THE AUTHORS

Alexa Lamm is an assistant professor and Associate Director of the UF/IFAS PIE Center. She specializes in conducting research on decision making and consensus building around agricultural and natural resource issues.

Lisa Lundy is an Associate Professor, teaching Agricultural Communication. Her research focuses on the role of narrative and storytelling in agricultural communication.

Dr. Laura Warner is an assistant professor of extension education in the Department of Agricultural Education and Communication at the University of Florida. She focuses on program evaluation, behavior change, and social marketing.

Kevan is an experienced leadership, education, and evaluation professional with a passion for helping individuals and organizations perform at their best. He has a Ph.D. from the University of Florida in Leadership Development and Education with an emphasis on evaluation and data analytics.