

AN EXAMINATION OF COMMUNITY BASED SOCIAL MARKETING STRATEGIES TO
INCREASE WATER CONSERVATION PRACTICES BY HOMEOWNERS WITH
AUTOMATED IRRIGATION SYSTEMS IN CENTRAL FLORIDA

By

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To my husband, John, and my twin daughters, Catherine and Julia,
for all your love and support to make this Ph.D. a realization.

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DEFINITION OF TERMS

Automated irrigation system	An irrigation system is a collection of hydraulic devices that deliver water to the turf and landscape plants (Zazueta, Brockway, Landrum, & McCarty, 1995).
Barrier	Anything that inhibits an individual from engaging in the activity being promoted. It can be either internal to the individual, such as lack of knowledge on how to carry out the activity, or external, such as a structural or physical change that makes the behavior less convenient (McKenzie-Mohr & Smith, 1999).
Community-Based Social Marketing (CBSM)	An approach that involves identifying barriers and benefits to sustainable behavior, designing a strategy that utilizes behavioral change tools, piloting the strategy with a small segment of the community, and finally evaluating the impact of the program once it has been implemented across the community (McKenzie-Mohr & Smith, 1999, p.15).
Communication	The use of interesting information, aimed at a targeted audience, using a credible source and a persuasive emphasis that influences attitude and/or behavior (McKenzie-Mohr & Smith, 1999, p. 83).
Extension Agent	An individual who “reaches out,” along with teaching and research from land-grant institutions to “extend” their resources, solving public needs with university resources through non-formal, non-credit programs (USDA, 2012).
Incentive	A type of motivation, either financial or otherwise (i.e., social approval), to encourage performance of an activity an individual is already engaged in (McKenzie-Mohr & Smith, 1999, p. 103).
Irrigation clock	A device electronically attached to an automated irrigation system that allows the homeowner to set the days of the week, the time of day, and length of time each needs to run the supply water (Dukes & Haman, 2002).

Non-formal education	An alternative form of education that addresses learning that occurs outside of the traditional classroom environment by adults and children (Anzalone, 1995, and Robinson, 1999).
Norms	Accepted societal behavior that guides how people should behave; if members of a community are observed acting sustainably, others are more likely to act the same (McKenzie-Mohr & Smith, 1999, p. 156).
Pro-environmental Behavior	Actions that consciously seek to minimize the negative impact on the natural and built world (Kollmuss & Agyeman, 2002).
Prompt	Something that serves as a reminder to engage in an action we are already predisposed to do (McKenzie-Mohr & Smith, 1999, p. 61).
Self-presentational	The use of behavior to communicate some information about oneself to others (Baumeister, 1982).
Social behavior	Interactions among individuals, normally within the same species, that is usually beneficial to one or more of the individuals (Biology Reference, 2009).
Social marketing	The planning and implementation of programs designed to bring about social change using concepts from commercial marketing. (Social Marketing Institute, 2009).

Abstract of Dissertation Presented to the Graduate School
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The purpose of the study was to examine the perceptions of homeowners in Orange County, Florida who have automated irrigation systems concerning Community Based Social Marketing (CBSM) strategies that could be employed to reduce water used for lawn care. Specifically, the study utilized the theory of planned behavior and the theory of diffusion of innovations to understand what influenced homeowners to increase water conservation behaviors. The study also looked at the pragmatic approach of social marketing and the effectiveness of CBSM to bring about behavior change. The practical strategies used by CBSM seek to determine the barriers to behavior change and to understand the accepted societal behaviors, also known as norms. Once barriers and norms are established, the use of CBSM has a greater opportunity to be successful.

This study used qualitative research methods through the use of focus groups to determine whether a CBSM approach would be a successful method to increase water conservation practices. The focus group participants consisted of residents from Orange County, Florida who were determined by the water utility company to be high water

users. A total of four focus groups were conducted which included 32 participants, and represented 20 different homeowner associations (HOA's).

Emerging themes for barriers revealed pressure from the HOAs to have perfect grass, lack of knowledge about proper lawn care, confusion over when to water per week and the inability to use the irrigation timer correctly. Participants indicated that the norm was to abide by the water restrictions and have a nice lawn. The responses also indicated that following water restrictions was their primary means of conservation.

The following recommendation was made for practitioners to use CBSM to create a program for the HOA board members to reduce water usage and eliminate wasteful practices. Using CBSM strategies, a program tailored to the target audience (HOAs) should be created to encourage pro-environmental behavior change. Future research would include replicating this study in similar urban areas. Additionally, a comparison study of HOA practices between HOA's in sustainable communities and HOA's with a more traditional approach would be appropriate.

CHAPTER 1 INTRODUCTION

World population projections for 2030 predict that there will be 8.3 billion people on the planet, an increase of 1.5 billion from the current 6.8 billion (Population Institute, 2013). The world population increase also means increased consumption of and a global demand for food. Along with such growth will come an increased competition for land, water, and energy. Furthermore, this will affect the ability of various populations to produce food, while at the same time increasing the need to reduce the impact of the food system on the environment (Godfray, Beddington, Crute, Haddad, Lawrence, Muir, & Toulmin, 2010).

The United States (U.S.) faces similar challenges, as the U.S. Census Bureau in 2004 projected the population would increase to nearly 364 million by 2030. A study done by Hightower and Pierce (2008) pointed out that economic development hinges on the availability of water. Drinking water supplies, agriculture, energy production and generation, mining and industry all require large quantities of water, and all will be in competition for an increasingly limited supply of fresh water.

In 2008, research done by Ge Sun, McNulty, Myers, and Cohen predicted that western Texas, central North Carolina, and Florida would have a growing water supply crisis (Sun et al., 2008). In North Carolina and Florida, it was predicted that both states will experience water supply stress, due to population growth and development. The 2011 U.S. Census Bureau subsequently reported that over the previous year, Florida's growth was 1.2%.

Growing populations need ever more water for drinking, hygiene, sanitation, food production, and industry (Rogers, 2008). According to the United States Geological

Survey (USGS), Florida freshwater use by the public in 2005 averaged 2.5 billion gallons a day, which accounted for a total of 37% of the freshwater withdrawals (United States Geological Survey, 2010). In 2012, the Florida Department of Environmental Protection (FDEP) estimated that by 2025, freshwater withdrawals will be 9.9 billion gallons per day. Water use will continue to increase as population and development continue to grow.

Concerns over water shortages have caused some cities in Florida to offer cash incentives to reduce the amount of grass in the landscape because of the volume of water typically consumed (City of Oviedo, 2009). In addition, Florida's water management districts, under the Department of Environmental Protection, continue to regulate and mandate how many days a week water can be applied to the landscape (St. Johns River Water Management District, 2009). A large percentage of Orange County homeowners have in-ground irrigation systems and desire high-quality landscapes (Haley, Dukes & Miller, 2007).

Within Florida, irrigation systems are common in many residential communities built in recent years, as they are needed to support the high-quality landscapes that are typically installed in modern developments. Turf grass is typically a key landscape component (Haley et al., 2007). According to Trenholm, Gilman, Denny, Bryan, and Unruh (2009), many Floridians take pride in having a well-maintained lawn and landscape that enhances the beauty of their homes. Maintained landscapes contribute much to a home and a neighborhood. Following proper maintenance practices is critical for the benefit of the lawns and landscapes and also for the viability of Florida's water resources (Trenholm et al., 2009). Proper maintenance includes understanding

fertilization requirements and applying the necessary amount of water through an automated irrigation system to sustain the grass.

An irrigation system is a collection of hydraulic devices that deliver water to the turf. An irrigation system may consist of a single sprinkler with a hose that is moved from location to location, or it may consist of an elaborate pipe network with pop-up sprinklers that irrigate based on soil moisture sensor readings (Zazueta, Brockway, Landrum, & McCarty, 1995). Although Florida has a humid climate, the spring and winter are normally dry, and this dryness, combined with the low capacity of the soil to hold water, makes irrigation necessary to ensure the high quality of landscapes desired by homeowners year round (Haley et al., 2007). These demands have pushed municipalities and counties to increase water restrictions in addition to the ones imposed by the various water management districts.

One such county is Orange County, Florida. Orange County is located in the central part of the state and includes the city of Orlando and a dozen other incorporated municipalities. It is the home of world-famous attractions, the nation's second largest convention center, and the University of Central Florida, the second largest university in the United States with 59,767 students (Orange County Florida, 2013). It is primarily an urban county with a significant capacity for future growth. Orange County has nearly 1.2 million residents. According to the Orange County Utilities Department, in 2013 Orange County will have reached the limit of its consumptive use permit with the St. John's Water Management District (SJRWMD). That means even with the expected county population increase, from the current 1.2 million to approximately 1.8 million (Orange

County Utilities, 2008), the amount of water permitted for residential use will remain the same.

The Orange County Government and the SJRWMD have long recognized the twin threats of population increase and development. They have tried to reduce the amount of water used per resident from 160 gallons to 90 gallons through a mixture of educational campaigns and punitive fines, but have yet to achieve the goal of a reduction in gallons used per person per day. In 2009, the St. Johns River Water Management District approved water restrictions that mandate watering once a week at the most during fall and winter (SJRWMD, 2009). This ordinance applies for all water resources, including wells, public supplies, and surface water, and is still in use today.

In 2008, the Florida Department of Environmental Protection, Office of Water Policy issued the following statement, "Conservation is the most important action we can take to sustain our water supplies, meet future needs, and reduce demands on Florida's fragile water dependent ecosystems such as lakes, streams and the Everglades" (FDEP *Office of Water Policy: Water Conservation*, 2008).

Although restrictions and regulations are currently being used to maintain water supplies, many experts contend that regulations need to go hand-in-hand with water conservation strategies. According to Dziegielewski (2011):

The term water conservation is currently used almost exclusively in the context of reducing water consumption by achieving improvements in efficiency of various uses of water. Such practices will have to be sustainable in order to ensure there will be fresh water in the future.

Water conservation practices fall into two categories of efficiency practices: engineering practices, which are based on modifications in plumbing, fixtures, or water supply operating procedures; and behavioral practices, which are based on changing

water use habits (Environmental Protection Agency, 2011). The EPA recommends the following for engineering practices:

- installation of indoor plumbing fixtures
- toilet displacement devices
- low-flow showerheads
- faucet aerators
- pressure reduction
- gray water
- proper landscape plant choices
- efficient landscape irrigation technology.

The EPA also recommends the following under the category of behavioral changes:

- run the dishwasher only when it's full;
- when hand washing dishes, fill the sink with water rather than running the water continuously;
- turn the water off while brushing teeth or shaving;
- take shorter showers;
- adjust water levels in the washer when doing the laundry;
- water the lawn early in the morning or late in the evening to reduce evaporation;
- turn the hose off between rinses when washing the car;
- wash the car on the lawn to reduce run-off;
- sweep sidewalks and driveways rather than hosing them down.

Orange County predicts water shortages that are only increasing. At the same time, county citizens are not conserving water appropriately (Orange County Utilities, 2008). Florida's Orange County is ranked the fifth largest in the state. The population increased by 2% between July 1, 2011 and April 1, 2012 (United States Census Bureau, 2011). According to the United States Census Bureau (2011) this number can be considered fairly representative of growth rates for the past 40 years.

In a study done in 2003 over a 30-month period, Haley et al., (2007) found that irrigation accounted for 64% of residential water use in all homes monitored. In an effort to decrease the amount of water used outside the home, utility companies and municipalities have mandated water restrictions. Yet the history of reducing water use via irrigation restrictions in the U.S. is mixed. In some cases, irrigation restrictions can cause water use reductions of 30% (Haley et al., 2007). In other cases, irrigation restrictions actually increase total water usage—some customers irrigate on allowed days, even if weather conditions do not warrant it, or they over-irrigate, as they know they will be restricted on future days. Recent research by Ozan and Alsharif (2012) determined that water usage increased after more stringent water use restrictions were invoked. For residents who received citations for being restriction violators, usage increased to a greater extent than for those who had not received a citation. Hence, the efficacy of irrigation restrictions depends on local circumstances (Whitcomb, 2005).

Using Community-Based Social Marketing (CBSM) for Water Conservation

Water conservation practices are included in the area of environmental concerns. The development of Community-Based Social Marketing (CBSM), specifically for sustainability arose out of concerns about the ineffectiveness of environmental campaigns that relied solely on providing information (McKenzie-Mohr & Smith, 1999, p. 15). CBSM, as defined by McKenzie-Mohr and Smith (1999), is an approach that draws heavily on social psychology, which indicates that initiatives to promote behavior change are often most effective when they are carried out at the community level and involve direct contact with people. The pragmatic approach of social marketing has been offered as an alternative to conventional non-formal educational campaigns, and, in contrast to traditional education methods, has been shown to be very effective at

bringing about behavior change (McKenzie-Mohr & Smith, 1999, p.15). Additionally, Andreasen (1995) points out the importance of understanding how consumer behaviors change. Such considerations include understanding the mood or preoccupations of consumers. In more complex circumstances, this may mean understanding consumer perceptions, knowledge, attitudes, and predispositions.

In other cases, there may be a need to understand how environments affect behaviors (Andreasen, 1995, p.141). The primary advantage of social marketing is that it starts with people's behavior and works backwards to select a particular tactic suited for that behavior (Mackenzie-Mohr and Smith, 1999, p. 7). The research on CBSM indicates that the approach has been successful in transcending the gap between knowledge and action that has characterized many local environmental and sustainability projects to date (Kollmuss and Agyeman, 2002). In 2011, Ozaki found that social influence has a positive effect on the intention to engage in environmental behaviors and confirmed that strong social norms are required to encourage the adoption of various pro-environmental behaviors.

Unlike statewide efforts to reduce water use, many local efforts have focused on educational programs. Such efforts have included flyers mailed with the utility bill or non-formal education presentations to homeowners conducted by utilities staff or by county Extension agents. In the early 1970s, Sheffield and Diejomaoh (1972) and Coombs and Ahmed (1974) defined non-formal education as an alternative form of education that addressed learning by adults and children which occurred outside the traditional classroom environment (Anzalone, 1995, and Robinson, 1999). Literature suggests that education is important to people and crucial to their success in adopting

new behaviors. However, researchers agree that information alone will not motivate someone to adopt a new behavior (Schultz, 2002; Kollmuss & Agyeman, 2002; Stern, 2000; Hungerford & Volk, 1990). Information is knowledge communicated from facts and news, whereas education is the process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment for future use. Neither definition includes any mention of the behavioral change that might occur as a result.

Kollmuss and Agyeman refer to this information-driven approach as a linear progression model of learning. This approach is based on the linear progression of environmental knowledge leading to environmental awareness and concern (environmental attitudes), which in turn was thought to lead to pro-environmental behavior. Burgess (1998) reported that these rationalist models assumed that educating people about environmental issues would automatically result in more pro-environmental behavior, and termed them (information) “deficit models of public understanding and action” (p.1447). Basically, providing educational materials to people about beneficial environmental practices doesn’t always result in a behavior change that supports a particular environmental concern.

It is equally clear that a lack of information can be a barrier to changing behavior (Schultz, 2002; Cochran, et al. 2007). DeYoung (1988) indicated that the basic how-to-conduct-the-behavior information package is important to the participant. If specific and necessary details are not provided, the participant may feel confused and lack the confidence needed to make behavioral changes, thus creating an impediment to the desired change.

Success stories of early adopters can play a role in establishing a new behavior (Bardwell, 1991). Early adopters are associated with the Theory of Diffusion of Innovations by E. M. Rogers (2003). According to Rogers, diffusion is a process that begins with an innovation, which is then passed through certain communication channels over time between members of a social system. The four main elements of the process are innovation, communication channels, time, and the social system. The following are Rogers' definitions of an innovation and a communication channel. An innovation is a concept or object perceived as new by an individual. Newness of an innovation does not just involve new knowledge. Communication channels allow messages about an innovation to pass from one individual to another. Rogers added that interpersonal channels involving face-to-face exchanges tend to be more effective in persuading individuals to accept new ideas.

Diffusion investigations show that most people depend on the experiences of peers to evaluate an innovation. In other words, diffusion consists of modeling and imitation by potential adopters of those who have previously implemented the behavior. This in turn shows the importance of interpersonal communication relationships to enable the acceptance of innovation (Rogers, 2003). According to Weir and Knight, (2000) early innovators tend to be educated and to be imitated by those who adopt later, obscuring the relationship between education and adoption. As Monroe (2003) explains, the relationship between education and adoption can be obscured because an educational program may be influenced by the teacher and the peer group, making it difficult to measure results consistently.

CBSM is an educational intervention that has been shown to hold promise in influencing conservation attitudes and behavior. When combined with educational efforts, CBSM could provide a tool to increase water conservation practices. It is a complement to regulatory and information-intensive campaigns (McKenzie-Mohr & Smith, 1999). The pragmatic approach of CBSM can identify barriers and benefits to adopting new conservation behaviors, as well as enable the use of tools for behavioral change.

CBSM could be the tactic to reach people who prefer to disregard rules and regulations. In reference to consumer behavior, Brehm and Brehm (1981) pointed out that some people dislike rules and regulations, and that they will go to great lengths to circumvent them. This observation supports the belief that regulations alone cannot make people change their behavior. Other research done by Schultz (2002), and Kollmuss and Agyeman (2002), concurred that non-formal education is important to people and to their success in adopting new behaviors.

One of the issues associated with water conservation is that individuals need to have basic knowledge and information about the new behavior to feel comfortable and confident about performing the act (DeYoung, 1988). DeYoung stated that any influence which makes the participant feel uncomfortable or lack confidence in performing the behavior would be seen as a barrier.

Recognizing what external barriers exist to practicing sustainable behaviors is imperative to success in CBSM. A barrier is whatever inhibits an individual from engaging in the activity being promoted. It can be either internal to the individual, such as lack of knowledge on how to carry out the activity, or external, such as a structural or physical change that makes the behavior less convenient (McKenzie-Mohr & Smith,

1999). Some possible barriers may be that the activity is seen as unpleasant, costly, or time-consuming to perform. McKenzie-Mohr and Smith cite the case of a misconception about a small yard compost bin that was seen as unpleasant and inconvenient. Once participants learned the bin was an enclosed unit and could be placed anywhere in the yard, acceptance of the practice increased. Literature reviews, focus groups, and phone surveys can also be used to identify the external barriers (McKenzie-Mohr and Smith, 1999).

No matter what the model community program turns out to be, one thing all behavior change techniques have in common is that they have to be visible. It is through visibility that others will model their own behavior (McKenzie-Mohr & Smith, 1999). Once the barriers are uncovered, a research study can be designed and used to create a model for a community program that increases water conservation practices.

Communicating successes about early adopters who have achieved results in adapting to the new behavior is also important. Norms are the accepted societal behaviors. They guide how people should behave; for example, if members of a community are observed acting sustainably, others are more likely to act in the same manner (McKenzie-Mohr & Smith, 1999, p. 156). A new norm may be created by strategically providing information about the benefits others have derived from the new behavior. These success stories can play an important role in formal education as well as the informal media (Bardwell, 1991).

Another strategy that looks at the influence of behavioral norms is social marketing. Lee and Kotler present a definition of the concept of social marketing as

outlined by Jeff French in their book, *Social Marketing*, (2011). French, the CEO of Strategic Social Marketing LTD., captured all the facets of the field when he said:

Social marketing is a set of evidence- and experience-based concepts and principles that provide a systematic approach to understanding behavior and modifying it for social good. A fusion of science, practical know-how, and relative practice focusing on continuously improving performance of programmes aimed at producing net social good” (p. 8).

Another approach to increasing conservation behavior has been through environmental literacy. The National Environmental Education Act of 1990 established the law to increase understanding of the natural and built environment and to improve awareness of environmental problems through environmental education and training programs. Hungerford and Volk (1990) addressed the effectiveness of environmental education towards promoting responsible behavior by citizens. They point out that the traditional idea behind environmental education specifies that by increasing knowledge about environment and associated issues, human behavior will change. They add that education serves as a tool for environmental awareness but doesn't provide the skills needed to make behavior changes. Hungerford and Volk concluded that when environmental education efforts focus on one particular issue, the flaw is generalizability to other issues. Unfortunately, with a single issue focus, also known as a unilateral approach, there exists little opportunity to generalize knowledge and skills to other issues unless they are closely related to the original focus.

Kollmuss and Agyeman (2002) tried to explain the gap between the possession of environmental knowledge and environmental awareness, and the display of pro-environmental behavior. They reviewed selected frameworks used for analyzing pro-environmental behavior. They concluded that environmental knowledge, values, and attitudes, together with emotional involvement, make up a complicated network called

“*pro-environmental consciousness.*” Included in this complicated network are personal values, personality traits, and social and cultural factors. In addition, they argued that the more extensive the education, the more comprehensive the knowledge about environmental issues will be. However this does not necessarily mean increased pro-environmental behavior.

Heinlich and Ardoin (2008) reviewed the literature pertaining to behavior change in an attempt to provide a foundation for behavior-related discussions in environmental and conservation education. They concluded that if environmental education is to produce citizens capable of making sound decisions and acting pro-environmentally and in a way that is personally sustainable, it is imperative that the field avoids unilateral assumptions.

Related to behavior change, it is necessary to understand that individuals are not all alike, nor are they motivated by the same things or equally capable of altering their routines.

In closing, Heinlich and Ardoin (2008) stated:

Nearly 20 years after Hungerford and Volk (1990) challenged the 1970s belief of linear causality of affect and knowledge leading to behavior, the field continues to struggle with the perception that *telling* someone to behave in a certain way and providing sound reasoning to support that command, equals *teaching behavior* (p. 231).

Research problem

A study conducted with homeowners in central Florida found that on average 64% of the drinking water used by homes went to irrigation. In the summer months, this percentage increased to 88%. As the population increases, it will be necessary for homeowners to reduce their use of drinking water to irrigate lawns in order to conserve water to meet future demands. The area is serviced by the Orange County Utilities

Division which primarily serves unincorporated areas of Orange County Florida. The Orange County Utilities Water Division has more than 140,000 accounts serving a population of approximately 490,000 (Romero, O'Malley, Dukes, 2010). The county is within the Central Florida Coordination Area where it has been determined that groundwater resources are not sufficient at the current rate of population growth (CFCA, 2010).

Currently, there is a limited amount of research on the use of Community Based Social Marketing as a tool to increase the adoption of water conservation behaviors. Corral-Verdugo, Bechtel, and Blanca stated in 2003 that limited research had been done regarding predictors of water conservation. De Oliver pointed out in 1999 that there is little research to indicate how CBSM approaches can influence the public and their willingness to adopt better water conservation practices.

Purpose and Objectives

The purpose of this study was to examine the perceptions of homeowners with automated irrigation systems about Community Based Social Marketing variables that could reduce water used for lawn care.

The following research objectives were used to guide this study. The study will attempt to:

- determine the barriers to increasing water conservation practices by homeowners who have automated irrigation systems within Orange County, Florida
- determine the norms of water use and how they influence water conservation behavior change
- determine what motivates homeowners to conserve water when using their automated irrigation systems to water the lawn

- identify the prompts or other communication methods that the target audience determines is helpful to increase their conservation behavior.

Significance of the Study

This investigation has coordinated and developed a significant amount of social research to encourage pro-environmental behaviors and water conservation. The literature review and references can be a resource for future water conservation as well as for use by other pro-environmental researchers and practitioners.

The research methods discussed in Chapter Three can inform future qualitative research in the area of environmental conservation. This study also adds to the research literature about increasing water conservation practices. The following quote from Miguel De Oliver illustrates the need for more research in urban water conservation:

Environmental policy makers and local governments need research to understand this behavior and the barriers to changing it. Urban water conservation is an increasing imperative as growing cities strain existing water supplies. Comprehending the demographics of popular support for water conservation becomes critical as a variety of multifaceted strategies are contemplated and employed to promote participation (1999, p.387).

By researching homeowner perceptions qualitatively, this study has generated helpful insights for water utilities, decision makers, regulatory agencies, Extension Agents, conservation practitioners and community residents. Recently Hurlimann and others (2009), stated that prior work aimed at understanding water conservation behavior, as well as the willingness of people to use water from alternative sources, was limited. Great potential exists to further understand these behaviors and behavioral intentions through additional research of water-related interventions, social norms and perceived behavioral control. In addition, research results presented at the 2012 Association of Metropolitan Water Agencies (AMWA) annual meeting in Portland,

Oregon, pointed to the need for more research to understand behaviors and the barriers to decreasing wasteful water use practices. Research sponsored by AMWA found that 45 per cent of the respondents (water utility executives) agreed that wasteful consumer behavior is the biggest barrier hindering progress towards increased water efficiency (Association of Metropolitan Water Agencies, 2012). Results from this study can inform the use of Community Based Social Marketing in conjunction with education campaigns to encourage efficient water conservation practices.

Limitations of the Study

The specific focus on homeowners in Orange County—just one county out of 67 in the state of Florida—means that there are some limitations to this research study. Given the Florida focus, this study is exploratory in nature and the results are not generalizable to other counties or states. However, Morgan and Hodgkinson (1999) advocate a need for conducting site-specific research despite the apparent lack of generalizability. The data from this study could be used to compare the habits of other high water use residents in urban landscapes as well as homeowners living within deed-restricted communities, also known as homeowner associations (HOAs).

Basic Assumptions

Certain basic assumptions extend from this research. To begin with, non-formal education combined with social marketing strategies and a CBSM approach through the use of norms will influence various populations to engage in water conservation adoption. Other assumptions include ensuring that the amount of water used by homeowners will be reduced while still meeting the daily needs of consumers. It may take some time for these behavioral changes to occur. A measureable change may not be evident immediately. Of course, as in any research study, a further assumption is

that the participants in the focus groups were truthful in their responses to the researcher and did not purposely confound them.

Summary

In this chapter, the crises that Florida is experiencing, particularly in Orange County, and the heightened water restrictions that have been implemented as a result, were discussed. An examination was begun to use social marketing strategies to determine the barriers people perceive to the adoption of water conservation practices. The use of Community Based Social Marketing practices, including determining the influence of norms on behavior change, and what motivates individuals to adopt conservation practices, is a necessary part of the research. This will be important in order for successful behavior change to occur. Removing the barriers will assist the population in adopting water conservation practices as part of their everyday lives. Uncovering the norms within the community will be imperative to launching behavioral changes and sustaining those changes. This research project seeks to add data to close the gap between knowledge gain and action to motivate behavior changes initiated as a result of newfound knowledge. The focus is on landscape water use and behavioral aspects of how people interact with their landscapes, in an effort to decrease their water use. The ability to use a CBSM approach to help increase other conservation practices will be very helpful for future pro-environmental efforts.

CHAPTER 2 LITERATURE REVIEW

In Chapter 1, the growing water shortage across the United States was reviewed, including a review of methods to improve water conservation. This chapter explores the pertinent literature upon which the current study was built and presents two theories and two strategies that guided the study. This research project focused on the following theories and strategies: The Theory of Planned Behavior and the Theory of Diffusion of Innovations, and also included strategies from Social Marketing and Community Based Social Marketing to inform the study. From the theory constructs, concepts were developed that helped inform the development of the research design, objectives and analysis used in the study.

Theory of Planned Behavior

Planned behavior is a social psychology behavioral model used to explain and predict human behavior (Ajzen, 1988). The theory of planned behavior states that one's behavior is a function of certain salient beliefs related to that behavior (Ajzen, 1991). Sheppard, Hartwick, & Warshaw (1988) pointed out that the strength of this theory is its ability not only to predict behavioral intentions and behavior, but also to provide a basis for identifying where and how to target strategies for changing behavior.

In this theory, behavior is believed to be guided by three kinds of salient beliefs. **Behavioral beliefs** are beliefs about likely outcomes of the targeted behavior and the associated evaluations of those outcomes. These beliefs are important in CBSM. One of the first steps taken in CBSM practice is to determine the barriers to a selected behavior. Once the barriers have been determined, one is selected as a behavior to be changed. A program is created to overcome that barrier, and a pilot program is

evaluated for effectiveness in changing the behavior before a broader implementation of the program occurs (McKenzie-Mohr, 2002).

Normative beliefs are beliefs about the normative expectations of important individuals or groups regarding the targeted behavior (Ajzen, 1991). Research done by Cialdini, Reno & Kallgren (1990) pointed out how crucial it is to discern the difference between a descriptive norm and an injunctive norm. Each refers to a separate source of human motivation (Deutsch & Gerard, 1955). A descriptive norm describes what is normal. It is what most people do, and therefore provides evidence about what adaptive action will likely be most effective (Cialdini, Reno, & Kallgren, 1990). Injunctive norms refer to rules or beliefs about what constitutes morally approved and disapproved conduct. In contrast to descriptive norms, which specify what is actually done, injunctive norms specify what *ought* to be done (Cialdini et al., 1990). CBSM contends that when faced with making a decision, people will do what those around them do, which is considered following the descriptive norm (McKenzie-Mohr, 2011).

Control beliefs are beliefs about factors potentially aiding or impeding the performance of the behavior along with the perceived power of those factors (Ajzen, 1991; 2006). It measures the perceived presence (or absence) of required skills, resources and other prerequisites required, and how much power people perceive each of these factors have in making the behavior easy or hard to do (Ajzen, 1991). Such factors are important in decision making, because people who believe that they have all the necessary resources, and those who perceive the opportunity to perform the behavior exists (with limited obstacles) are ultimately more likely to engage in the behavior (Conner and Sparks, 2005).

Each of the salient beliefs has a corresponding variable. The three corresponding variables in the theory of planned behavior are: (1) **attitude toward the targeted behavior**; (2) a perceived **subjective norm**; (3) **perceived behavioral control** (Ajzen, 1991). The variable of perceived behavioral control was added by Ajzen (1985,) who recognized that for some behaviors there may be personal deficiencies—for example, skills, abilities, knowledge, and adequate planning—while for other behaviors there may be external obstacles, such as time or opportunity, which may limit goal attainment.

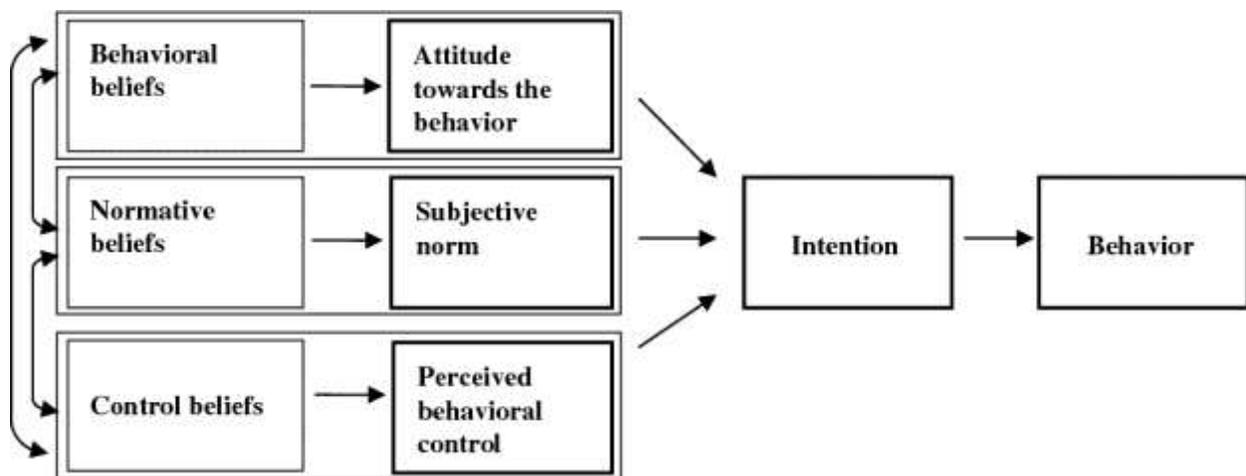


Figure 2-1. The theory of planned behavior (Ajzen, 1991)

The revised theory of planned behavior consists of three separate deciding factors connoting intention. Giles and Larmour (2006) pointed out that perceived behavior control has both direct and indirect implications for the prediction of behavior. They summarized version one as having motivational implications for intention; this is represented by a direct link between control and the intention variable. Individuals who believe they lack the necessary resources or opportunities to perform a particular behavior are unlikely to form strong behavioral intentions, despite the fact that their attitude and subjective norm may be favorable. Thus, perceived behavior control is expected to contribute to the prediction of intention over and above the effects as a

result of the other major independent variables of the model. It is important to note that successful performance of a particular behavior is considered dependent not only on motivation, but also on adequate control over the behavior.

Giles and Larmour's second version of the theory of planned behavior therefore considered the possibility that perceived behavior control may serve as a measure of actual control. Hence they claim a direct link between control and behavior that is not mediated by intention. According to Giles and Larmour, Ajzen (1988):

perceived behavioral control can help predict goal attainment independent of behavioral intention to the extent that it reflects actual control with some degree of accuracy. As such, it may be a partial substitute for a measure of actual control (p.134).

Perceived behavioral control stems from Bandura's (1977) work on self-efficacy, which referred to "beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainments" (p. 624). In other words, the perception someone has of their own capability to successfully perform the behavior influences their action. In support of Bandura's work, Ajzen (2002) stated that this specific component of self-efficacy theory relates best with perceived behavioral control, which focuses on the perceived ability to perform a particular behavior. Therefore, some believe, intent is synonymous with control when it comes to performing a goal-directed behavior (Giles and Larmour, 2006). However, Terry and O'Leary (1995) pointed out that "it cannot be assumed that there will be a correspondence between the person's perception of the extent to which external barriers may impede the performance of the behavior and his or her judgment that the behavior will be easy to perform" (p. 202). There may not be a correlation between an individuals' perception of the barriers

making the behavior difficult to perform and whether they think they can easily perform the task.

Terry and O'Leary were also able to provide evidence that there was a distinction between the notions of self-efficacy and perceived control. They were able to demonstrate that these variables influence behavior in different ways. Specifically, efficacy expectancies influenced behavioral intentions but not actual behavior, whereas levels of perceived control had no effect on behavioral intentions but emerged as a significant predictor of actual behavior. Self-efficacy influenced an individual's intention to perform a behavior, whereas levels of perceived control influenced whether the individual performed the behavior. Schwarzer and Fuchs (1996) found that self-efficacy levels can enhance or impede the motivation to act. Basically, how one feels about whether they can or cannot perform a particular behavior will influence their desire to act on the behavior.

Conservation behavior may also be influenced by self-efficacy, the belief that an individual has about their ability or capacity to carry out a behavior. Taberero and Hernández (2011) pointed out that in recent years, research into the role of self-efficacy in explaining behavior has taken center stage. They stated that few studies have analyzed the role of self-efficacy in pro-social and altruistic behaviors, for which a quantifiable reward is either not received or received after a substantial period of time has elapsed. To carry out acts of pro-social and altruistic actions and make their abilities available for the well-being of others, it is not enough for people to perceive that they have the emotional and social abilities required for pro-social behavior. The perception

of capacity must be accompanied by the intrinsic motivation that the behaviors generate.

Walton and Hume (2011) pointed out three strategies that were used to create positive habits in water conservation. They included a benefits/costs approach, social influences or norms, and the skills and abilities of various individuals. The final strategy aimed to enable behavioral change by increasing an individual's knowledge, skills and efficacy for undertaking the new behavior and reducing any environmental barriers to change. The project acknowledges that the three strategies are common approaches associated with marketing and social marketing.

The campaign was reviewed by Walton and Hume and implemented by the Queensland Water Commission in Queensland, Australia, from May 2007 to December 2007, a period of eight months. It involved 2.3 million people. The goal was to reduce the 300 liters/person/day of water consumption down to 140 liters. At the end of the campaign, a 22 per cent reduction in average daily consumption netted 20,680 million liters of water saved. The greatest impact was that two years after the campaign had ended, the residents had instilled long-term water conservation behavior and still averaged 129 liters/person/day.

Self- efficacy influences many types of people in the area of behavior adoption. McGinty, Swisher and Alavalapati (2008) found that farmers' behavior was significantly correlated to their perceived behavioral control for four of nine salient control beliefs. The research indicated that the perceived behavioral control aspect of self-efficacy may influence farmers' intentions to adopt or maintain agroforestry and were positively correlated to self-efficacy as well as the availability of volunteer labor.

A study was done by Cheng and Monroe (2012) to determine the connection of children to a nature index and they examined how this affective element influenced children's pro-environmental choices. They conducted small group interviews with a total of 80 children, to better understand fourth graders' experiences with and their attitude toward the natural environment, their non-school experiences in nature, and their interest in environmentally friendly practices. The results found that the connection children had to nature, as well as their previous experiences in nature, their perceived family value toward nature, and their perceived control, positively influenced their interest in performing environmentally friendly behaviors. Self-efficacy was also a predictor of children's interest in environmentally friendly practices. Cheng & Monroe point out that this is consistent with research done by Hungerford and Volk (1990) which implied that providing environmental education opportunities aimed at increasing children's knowledge and skills for solving environmental problems may help promote pro-environmental actions. Another interesting finding of this research is that self-efficacy was also a strong predictor of a connection to nature, which suggests that it is influenced by children's sense that they are able to help the environment.

Most recently, research on normative messaging and pro-environmental behavior has primarily focused on reducing litter (Cialdini et al., 1990), reusing towels by guests in hotel rooms (Schultz et al., 2008; Goldstein et al., 2008; Cialdini et al., 2006), or reducing energy consumption (Nolan et al., 2008; Schultz et al., 2007).

There is very little research on the use of pro-environmental behavior for water conservation. However, in the area of sustainability, de Groot, Abrahams and Jones (2013) produced research on reducing the use of free plastic bags in grocery stores

through the use of persuasive normative messages, which concurred with previously reported research findings. The results showed that customers used fewer free plastic bags when they received an injunctive normative message combined with the standard environmental message, in comparison to just the standard environmental message that merely emphasized the environmental benefits of reusing plastic bags. De Groot, et al., suggested that making an injunctive norm salient in a setting (like the grocery store) where a descriptive norm favors the undesired behavior (the use of free plastic bags) may be an effective way to promote a variety of environmental behaviors. The use of combined injunctive and descriptive norm messaging about the outdoor water use of homeowners inserted within their monthly utility bills would be worth investigating.

In 2010, Welte and Anastasio, conducted research to establish whether previous findings, which demonstrated that environmentally friendly behavior was perceived as low status, still existed, therefore impeding the adoption of conservation behaviors. However, greater awareness of environmental issues and the advent of a “green” movement may have fostered a change in those attitudes. Welte and Anastasio concluded that self-presentation, also known as status, may no longer present a barrier to engaging in conservation. Such behavior demonstrated the support for the common good and was not just about individual desires and satisfaction. It is feasible that this lack of overall stigma, coupled with current financial conditions, may present a new opportunity for promoting conservation. An unstable global economy, rising gasoline prices, and concern for the future may succeed in creating change where public service advertising has failed. It is also possible that these conditions could help remove any

remaining stigma from behaviors carrying a low-income connotation; money-saving could come to be seen as “savvy” and desirable rather than low status.

Millennials and Conservation Behavior

The generation known as “millennials” represents a good example of individuals who understand supporting causes for the common good. Nowak, Thach and Olsen (2006) pointed out that the millennial generation is known for certain traits and behaviors. This generation was born between 1982 -1999. A primary trait is that they are very technologically savvy. Most have grown up with the Internet and are adept at using it for product research and purchasing.

Nowak, Thach and Olsen (2006) referenced Moriarty (2004), who stated that the Internet is the primary source of information for millennials and they trust it. These young people have grown up with computers and the Internet and are said to have a natural aptitude and high skill levels when using new technologies (Jones, Ramanau, Cross & Healing, 2010). Nowak et al. (2006) continued the description of millennials by stating that they are concerned for the environment and social responsibility issues. They have been known to boycott brands which they perceive to be violating these values (Business Wire, 2004; Neuborne, 1999). Smith and Brower (2012) stated that millennials are aware of environmentally preferable products and how they impact their purchasing behaviors. Results of a three year study found millennials take note of a company's reputation, read product labels, and look for clues on product packaging to discern if a product is environmentally preferable.

Millennials have grown up in an age in which diversity was taught in school, and one third of the millennial generation is non-Caucasian (Nowak et al., 2006). Therefore,

they look for, and expect to see, advertising that includes diversity of race and gender. Finally, Nowak et al. referenced Lancaster and Stillman, (2002) who state that millennials are very optimistic by nature and believe they can make a difference in the world. This is balanced by a strong practical streak. They are reputed to be financially savvy, and don't like owing money. A final characteristic is their belief in work/life balance. Millennials tend to believe that life should be fun and enjoyable, but at the same time they do want responsibility and challenge on the job (Nowak et al., 2006).

Today's teens are very different from previous generations; they are the world's first computer-literate generation and they are better-traveled than many of their parents. Also, they are concerned with social issues, particularly environmentalism (Tully & Schonfeld, 1994). Pasricha (2009) pointed out that millennials were raised with the concept of Earth Day, and grew up watching cartoons like *Captain Planet*, which make recycling cool. They are tired and bored with consuming, have truly global tastes, and view the world as a social construction. For this generation, sustainability involves being community-oriented and supporting socially conscious and small local businesses. They refer to sustainability as "going green" and are extremely aware of the local and global environment.

Pasricha also referenced the following information. According to the UN Division of Sustainable Development (2004), the millennial generation forms almost a third of the world's population. The UN conducted a study on youth and consumption which included 24 countries. Seventy five percent of the respondents agreed that the biggest challenges are reducing environmental pollution, improving human health, and respecting human rights (McGregor, 2002). Additionally, this generation, which totals

approximately 80 million, makes up 43 percent of the volunteers in America compared to Baby Boomers (those born between the years 1946 and 1964) who make up 35 percent (Patusky, 2010). Proportionally, more millennials volunteer than older Americans.

However, Taylor, Barber and Deale (2010) referenced previous studies that found linking age to environmental concerns had mixed results. Mohai and Twight (1987) found age to be a strong predictor of environmental concern, while Guagnano and Markee (1995) found the opposite effect. In research reviewed by Diamantopoulos, Schlegelmilch, Sinkovics and Bohlen (2003), links were found between age and environmental consciousness that indicated younger people had higher levels of knowledge about environmental issues. They also found evidence that younger people support environmental reform and accept pro-environmental ideologies more readily than their elders.

McDougle, Greenspan and Handy (2011) presented recent research on what motivates young adults to participate in environmental volunteering. They also pointed to the fact that there is some evidence to indicate that today's young adults may be more interested in environmental issues than other generational cohorts. They referred to research by Thiele (1999, p.211) who stated as many as 85% of young adults (under the age of 30) have been known to identify themselves as environmentalists. In recent years, young adults have expressed greater interest in environmental issues (Galbraith, 2009; Hewlett et al., 2009; Lopez, 2003; McKay, 2010). They also pointed out that according to the Bureau of Labor Statistics (2010) young adults in the US between the ages of 20 to 24 have already been shown to volunteer for environmental organizations at nearly double the rate of the general population.

The results from McDougle, Greenspan and Handy (2011) found that two general motivations predict volunteer intensity. They found young adults who volunteered for egoistic reasons, such as the development of social connections, were more likely to invest greater amounts of time volunteering for environmental organizations, whereas young adults who volunteered to gain greater understanding were significantly less likely to invest greater amounts of time volunteering for environmental organizations. Therefore, many young people invest greater time volunteering for environmental organizations as a way of building, enhancing, and/or developing their social ties as opposed to developing their learning experiences (McDougle, Greenspan and Handy, 2011).

Additionally, they found that young adults are driven to volunteer for environmental organizations because they are already volunteering and engaging in other forms of pro-environmental behaviors. Hence, recruiting young adults into voluntary environmental activities should not be too burdensome. They concluded that if young adults invest greater amounts of time in environmental organizations as a way to socialize and/or expand their social networks, as opposed to seeking personal enhancement, then conveying the social benefits of environmental volunteerism may be a much simpler process than attempting to create environmental learning experiences. Thus, the social value of environmental volunteerism should undoubtedly be integrated into the planning and implementation of volunteer projects for young adults (McDougle, Greenspan and Handy, 2011).

However, although these types of pro-environmental actions are undoubtedly important, confronting the ecological challenges of today will likely require more

community-oriented solutions such as volunteerism and civic participation. Indeed, volunteering and active engagement in civic life constitute not only fundamental dimensions of civil society but also critical aspects of the promotion of both self and collective efficacy (Ohmer, 2007). Thus, understanding how to motivate and sustain environmental volunteerism among young adults will certainly be an important issue when confronting the ecological challenges of today, especially because it is likely these young people will serve as future leaders of the environmental movement. This generation is pro-environmental and promotes that behavior to the rest of society. Being “green” is a trait of their self-presentational goals (McDougle, Greenspan and Handy, 2011).

Self-presentational goals are extraordinarily powerful motivators of behavior, often more powerful than appealing to the common good (Corral-Verdugo et al., 2002; McKenzie-Mohr et al., 1995). More recently, Lapinski, Rimal, DeVries & Lee (2007), determined that environmentally conscious behaviors such as water conservation have an important contribution in that such behaviors primarily take place at a collective level and not on an individual level. Provided that all other influences are equal, normative influences would have a greater impact on behaviors that benefit the collective rather than individual gain (Goldstein et al., 2008; Schultz et al., 2007).

Marketing campaigns can utilize normative social influence to promote conservation as chic and desirable; indeed, utilizing injunctive norms has been shown to be a promising tool in promoting conservation (Goldstein et al., 2008; Schultz et al., 2007). Welte and Anastasio (2010) report that previous research demonstrated that environmentally friendly behavior was perceived as low status, which could explain why

such behavior is not more widespread. However, the on-set of the “green” movement may have influenced attitude change. Some conservation behaviors used in past research were associated with lower socioeconomic status. Welte and Anastasio concluded that the stigma pertaining to conservation practices, which had been viewed as having low socioeconomic status, has been removed; concern over one’s status is no longer the question. Welte and Anastasio (2010) concluded by saying, “Conservation may be heading toward a ‘tipping point’ in which the unusual (limiting one’s resource use) is about to become the norm.

Additionally, Griskevicius, Tybur, Van den Bergh (2010), set out to establish a better understanding of the links between altruism, status, and conservation, while also providing the first test in determining whether activating motives based on status can be a viable strategy for promoting pro-environmental behavior. They found activating status motives led people to choose green products over more luxurious products. Such choices supported the notion that altruism signals one’s willingness and ability to incur costs for the benefit of others. The status motives increased desire for green products when shopping in public (but not in private) and when green products cost more (but not less) than non-green products. The findings suggest that status competition can be used to promote pro-environmental behavior. Therefore, status could be gained by the consumer if they were viewed as someone who contributed to the common good.

Norms Influence Pro-environmental Behavior

Given that norms are key to achieving behavior change, it is important to understand just how strongly held and powerful they can be. Feagan and Ripmeester (2001) point out that the current ideal of a monoculture lawn dates back to the privileged

French and British individuals in the 16th and 17th century and was seen as a status symbol. They also noted that in the United States, the likes of Andrew Jackson Downing and Thomas Jefferson envisioned the landscape intertwined with the progress of democracy, liberty and moral health. Downing went so far as to contend that people's pride in their country was tied to pride in their homes, and therefore to show patriotism they must tend to their homes appropriately.

Americans have become more affluent and now promote the expansion of lawns in the suburbs. Robbins and Birkenholtz (2003) confirm that a lawn is no longer an elitist means of displaying patriotism. Feagan and Ripmeester (2001) concluded that the lawn and the aesthetics associated with it reflect purity, cleanliness and decency within American suburbs. Currently the lawn's greatest role in the social process is ideological: it supports a set of concepts and norms regarding the way a society should be organized. What started out as a status symbol in the 1500's has become a norm that represents social and moral order (Feagan and Ripmeester, 2001).

Human behavior exists in a social context, and as such is often driven by how one believes particular behaviors will be viewed by others. Welte and Anastasio pointed out the enormous impact that normative social influence has on behavior and suggest it shows promise when regarding conservation behavior. Research has found environmentally friendly behavior to be no different. Welte and Anastasio referred to other research that found individuals take cues about environmental choices based on observing the environmental behavior of others (McKenzie-Mohr et al., 1995; Oskamp, Harrington, Edwards, & Sherwood, 1991). Because people tend to make choices that will project a positive image of themselves (Riess, Kalle, & Tedeschi, 1981), assessing

the manner in which different environmentally friendly behaviors are perceived may help in designing strategies to increase conservation overall.

To get an idea of consumer conservation behaviors, Hornik, Cherian, Madansky, & Narayana (1995), compiled a meta-analysis of 67 studies based on consumers' recycling behavior and determined that next to internal motives, social influence was the best predictor of recycling behavior. The perception that others are engaging in a particular conservation behavior predicts one's own participation in that behavior. Further elaboration on the role that normative social influence plays in recycling behaviors was researched by Ohtomo and Hirose (2007). They suggested that the conscious and deliberate intention to perform conservation behavior is influenced by injunctive norms, or the perception of others' approval or disapproval of an action. Unintended, unplanned action or non-action is influenced by descriptive norms, or what others appear to be doing at the time. They concluded that descriptive norms serve as a shortcut for decision-making about conservation, as people take their cues from others about whether to engage in eco-friendly behavior regardless of their own behavioral intentions.

According to Endter-Wada (2008) there is very little current research focused on landscape water use and how people interact with their landscapes, the performance of the irrigation system in an everyday setting, or integrating perspectives on water conservation from different academic disciplines. Endter-Wada assembled a team of researchers in Layton, Utah from the following disciplines: plant science, engineering, social science, and policy. The research project assumed that the primary cause of water overuse in the Utah study was human behavior and, consequently, the study was

designed to understand the perceptions, knowledge, incentives, and practices of people responsible for landscapes that would account for overwatering.

The results of the study indicated that the most significant factor affecting water use was the type of irrigation system: manual watering with a hose and spray nozzle tended to be associated with increased water conservation practices, while the use of programmed sprinkler systems tended to be associated with more wasteful watering practices. Additionally, Endter-Wada's team concluded that wasteful watering was the result of many complex factors such as soil type, plant material, irrigation technology, and human behavior. Patterns of water use and conservation were affected by the extent to which people understood these interactions and adjusted their watering behaviors accordingly. Endter-Wada recommended that water conservation programs should be more narrowly focused in order to teach people how to use their sprinkler systems efficiently. She also suggested that companies that design irrigation systems should design their equipment at the greatest level of efficiency. Her final recommendation was to encourage people to hand-water during a drought to decrease wasteful watering.

Corral-Verdugo et al., 2002, determined that little research had been done on water conservation behavior and what influenced people to engage in conservation practices. The research project was conducted in Mexico and consisted of a comparison of two large cities and three comparable neighborhoods. The project contained four phases. First, a questionnaire was used to determine water conservation practices as well as what the motives were for conserving and perceptions about water waste and demographics of the participants. Second, the housewives from the

participating residences were trained to record water consumption within their home. The third phase compared the answers from the questionnaires with the recorded water consumption behaviors. The fourth and final phase compared the water bills with recorded consumption. The final results uncovered a significant association between what was recorded and what was reflected in the utility bill.

The results found that the effects of social norms are not limited to publicly visible behaviors. There is evidence that water usage, typically a private behavior, is also influenced by social norms. Individuals who perceive that others do not limit their water consumption are less likely to reduce their own water consumption (Corral-Verdugo, Frías-Armenta, Pérez-Urías, Orduña-Cabrera, & Espinoza-Gallego, 2002).

Another study pertaining to energy conservation, this time in California, was done by Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, in 2008. The purpose of the research was to explore how normative information may have a different effect on important social behavior depending on whether the behavior of the recipient who received the message was above or below the norm within their neighborhood. Three main predictions were explored. First, it was predicted that descriptive normative information would decrease energy consumption in households consuming more energy than their neighborhood average. Such a result would be indicative of the constructive power of social norms, demonstrating that normative information could facilitate pro-environmental behavior.

Second, the research showed that descriptive normative information would increase energy consumption, causing an undesirable boomerang effect, in households using less energy than their neighborhood average. Such would be indicative of the

destructive power of social norms, demonstrating that a well-intended application of normative information could actually serve to decrease pro-environmental behavior.

Third, providing both descriptive normative information and an injunctive message that other people approve of low-consumption behavior would prevent the undesirable boomerang effect in households consuming less energy than their neighborhood average; therefore, these households would continue to consume at low rates. Such a result would be indicative of the reconstructive power of injunctive messages to eliminate the unfavorable effects of a descriptive norm.

Schultz et al. (2008) found that different messaging approaches influenced behavior change. Through the use of the descriptive norm-only condition, each message contained (a) handwritten information about how much energy the recipient had used, (b) descriptive normative information about the actual energy consumption of the average household in their neighborhood during that same period (in kilowatt-hours per day), and (c) preprinted suggestions for how to conserve energy.

The results for households that consumed more than the average during the baseline period indicated that the descriptive norm-only feedback produced a significant decrease in energy consumption relative to the baseline. This result illustrated the constructive potential of social norms.

In contrast, for households that were below the mean on baseline energy consumption, the descriptive-norm-only message produced an increase in energy consumption from the baseline. Thus, the descriptive normative information led to an undesired increase in energy consumption for the households who were consuming

less than the average for the neighborhood, a clear example of the destructive potential of social norms.

The households in the descriptive-plus-injunctive-information condition received the same information as did those in the descriptive-norm-only group, with one key addition: If the household had consumed less than the average for the neighborhood, the researcher drew a happy face; if the household had consumed more than the average, the researcher drew a sad face. The happy face or sad face was used to communicate an injunctive message of approval or disapproval for the amount of energy being consumed.

The results for the injunctive message plus the descriptive normative feedback for households who were consuming less energy than average showed that they continued to consume at the desirable low rate, therefore eliminating the boomerang effect of increased usage among households low in energy consumption. When an injunctive message was added to the descriptive normative information, the result highlighted the reconstructive potential of social norms. Finally, for households consuming above the average, the combined descriptive-plus injunctive message served to decrease energy consumption.

This study provided valuable information that can be used to meet objective 3 of the current study, which is to identify the prompts or other communication methods that might be used to increase conservation behavior. Further support that normative information influences conservation behavior change can be found in research done by Nolan et al., (2008). Nolan and team point out that until recently it was believed that direct observation of the behaviors of others was needed to influence behavioral

change. Instead, communicating a descriptive norm—how most people behave in a given situation—via written information, can induce conformity to the communicated behavior (Parks, Sanna, & Berel, 2001; Von Borgstede, Dahlstrand, & Biel, 1999). In 1999, Schultz found that households who received normative information describing the amount recycled by an average neighborhood family increased both the amount and frequency of their subsequent curbside recycling behaviors. Similar results were found in a hotel setting, where normative messages increased towel reuse by more than 28% (Goldstein, Cialdini, & Griskevicius, 2008).

Nolan et al., set out to test five different messages among home owners about energy conservation. The home owners were notified that a university research project was occurring in their neighborhood and that they could withdraw from the study if they desired. Households were randomly assigned to receive one of five experimental messages: descriptive norm, self-interest, environment, social responsibility, or information-only control. The messages were printed on door hangers in both English and Spanish and contained a message promoting a single energy conservation behavior along with a graphic icon illustrating the behavior. Door hangers in the information-only condition stated only that participants could save energy by adopting the behavior being promoted. In the descriptive norm, self-interest, environment, and social responsibility conditions, the door hangers also contained motivational information about why the household should adopt the energy-conserving behavior (e.g., 99% of people in your community reported turning off unnecessary lights to save energy) and a graphic that symbolized the condition. Meter readings were conducted by the research team and were correlated with the data provided by the local utilities

company to determine if any change occurred after receiving the messages on the door hangers.

The results showed despite the private nature of conserving energy in the home, normative social influence had a direct impact on residents' conservation behavior. Meter readings showed that a descriptive normative message—a message merely containing information about the conservation behavior of the majority of one's neighbors—spurred people to conserve more energy than did the control message or any of the three other messages that contained appeals that are traditionally accorded motivational power (Nolan et al., 2008).

In conclusion, Nolan et al., found that normative information spurred people to conserve more energy than any of the standard appeals that are often used to stimulate energy conservation, such as protecting the environment, being socially responsible, or even saving money. This research project was also found to have empirical support in which descriptive normative beliefs were the strongest predictor of energy conservation behavior, but were rated as the least important reason to conserve energy. Therefore, such results proposed that descriptive social norms might work outside of an individual's awareness. Nolan et al. showed that individuals often fail to recognize the strength of social influence.

Additional research done by Nolan (2011) investigated the extent and durability of changes in normative beliefs following a one-shot social norms communication program, and despite concerns that normative interventions have an effect for only a short time. The longer-term results indicated that the effects of the normative messages continued to be strong even 4 weeks after the initial intervention. Adding a social norms component to communications (telling folks what people around them were doing) increased the likelihood of behavior change. Evidence suggested that new cognitive

anchors were created, and subsequently normative estimates were adjusted over time, thereby increasing behavioral change over time.

Perhaps just as important as what Nolan et al. (2008) found that worked was their discovery of what did not work. A similar survey conducted earlier indicated environmental reasons and social responsibility were rated as strong reasons for conserving energy, yet neither approach succeeded in reducing energy conservation in the field study when used in messaging. This result is consistent with a growing body of research on environmental education and pro-environmental behavior—which is that appealing to people to do the right thing, or to protect the environment, rarely succeeds in increasing levels of pro-environmental behavior (Schultz, 2002). Environmental protection or social responsibility messages may still motivate pro-environmental behavior, but fail to produce behavior change.

This may have been the case with the following results from research projects such as one that installed drought-tolerant plants in home landscapes, or programs that paid homeowners to remove grass along with agreements to install efficiency upgrades to their irrigation systems. These resulted in no change to watering frequency behavior (Peterson et al., 1999; Addink, 2005; Devitt & Morris, 2009; Borisova, et al., 2012).

Therefore, water use was not reduced.

It is also possible that people are already engaging in conservation efforts for these reasons and appealing to these motivational bases merely preaches to the choir. What is needed is an alternative motivational basis that appeals to a different portion of the population or an alternative behavior that has not yet been linked with environmental or social responsibility (Schultz & Zelezny, 2003). Social marketing concepts would

indicate that by determining the target audience, messages could be refined to maximize responses from a specific group (Kotler & Zaltman, 1971) hence encouraging conservation behavior in new areas. Nolan et al. concluded that by going beyond environmental protection and social responsibility, normative messages reach a new population of individuals who might not otherwise have a reason to conserve.

Theory of Diffusion of Innovations

Bardwell (1991) pointed out that success stories of early adopters can play a role in establishing new behaviors. Early adopters are associated with E.M. Rogers' Theory of Diffusion of Innovations. According to Rogers (2003), diffusion is a process that begins with an innovation, which is then passed through certain communication channels over time between members of a social system. The four main elements of the process are innovation, communication channels, time, and the social system. For this research, the innovation will be the change in behavior to reduce water use by home owners with automated irrigation systems.

Rogers also said that an innovation is a concept or object that is perceived as new by an individual. Newness of an innovation does not just involve new knowledge. Individuals may have known about the innovation for some time but didn't develop either a favorable or unfavorable attitude about it. Therefore, "if an idea seems new to an individual, it is an innovation" (Rogers p. 12).

Water conservation practices are a type of technology. Rogers states that technologies have two components, a hardware aspect and a software aspect. Hardware consists of the physical tools of the innovation—for example the irrigation timer. Software consists of the information that supports the tools, such as how much time a zone needs to run to deliver enough water for proper lawn care. Technological

innovations are generally beneficial for potential adopters. It should be noted that potential adopters are usually wary of new innovations and may not consider them superior to the previous practice (Rogers, 2003). Potential adopters are also uncertain because of the unknown effects of the new innovation.

Rogers (2003) pointed out five important characteristics of innovations that help explain the rate of adoption. These characteristics include: relative advantage, compatibility, complexity, trialability and observability. Relative advantage is explained as the extent to which the new innovation has improved upon the previous version. The improvements can be measured in terms of economic benefits, social status, convenience and satisfaction. Therefore, the greater the perceived level of relative advantage, the faster the rate of adoption. Compatibility is measured by how consistent the innovation is with previously existing values, norms, experiences and needs of potential adopters. The adoption rate will be faster when the innovation is considered more compatible. Complexity refers to how difficult the innovation is to use and understand. Ideas that are easy to understand are easier to adopt. Innovations that require an adopter to learn a new skill are less frequently adopted. Trialability refers to the ability to experiment with an innovation. An innovation that can be tried on a limited basis is generally adopted more quickly. Finally, observability is how visible the results of an innovation are to other potential adopters. High observability encourages faster diffusion of the innovation (Rogers, 2003).

Another element of this theory consists of communication channels, which allows messages about an innovation to pass from one individual to another. Although mass media such as radio, television and newspapers tend to be a more rapid and efficient

way to inform potential adopters, Rogers concluded that interpersonal channels involving face-to-face exchanges tend to be more effective in persuading individuals to accept new ideas. The significance of this theory illustrates that when people discuss innovations and hear about the successful experiences of people they know, this becomes an effective means of getting new ideas accepted. These exchanges are especially effective if the individuals are similar in socioeconomic status, education or other important demographic characteristics. Diffusion investigations suggest that diffusion consists of modeling and imitation by potential adopters of those who have previously adopted, emphasizing the importance of interpersonal communication relationships (Rogers, 2003).

The element of time involves three dimensions: the innovation-decision process, the innovativeness of an individual compared with other members of the system and an innovation's rate of adoption in a system. The innovation-decision process is how an individual passes from first knowledge of an innovation to forming an attitude to either adopt or reject the innovation or the new idea (Rogers, 2003).

The innovativeness demonstrated by an individual is the degree to which they are relatively early in adopting new ideas compared to other individuals in the system. The more innovative the individual, the more likely they are to adopt (Rogers, 2003). There are five adopter categories based on innovativeness: innovators, early adopters, early majority, late majority and laggards. Rogers (2003) developed the following categories of adoption and a percentage rate for each category, which included: innovators, 2.5 per cent; early adopters, 13.5 per cent; early majority, 34 per cent; late majority, 34 per cent; and laggards, 16 per cent. Martinez and Polo (1996) stated that it

is important to recognize the adoption categories but it's also important to realize that there is an element of time necessary for members within each category to adopt. Their research showed that for innovators, it took less than a year to adopt, while for laggards, the time frame was up to 16 years to adopt. Another conclusion of their research was that word of mouth had greater influence on adoption than external influences such as advertising promotions (Martinez and Polo, 1996).

The third dimension is rate of adoption, which is the speed with which an innovation is adopted into a social system. The rate of adoption is measured by the length of time it takes a certain percentage of the system to adopt the innovation (Rogers, 2003). The system is the structure under which the diffusion is taking place, such as an organization or community. The rate of adoption for the same innovation may differ among social systems (Rogers, 2003).

The fourth and final element of the process is the social system. A social system has a direct effect on diffusion through its unified parts that are engaged simultaneously to accomplish a common goal (Rogers, 2003). A social system can offer containment or boundaries for the diffusion of an innovation. A social system affects diffusion through its structure, norms, the roles of opinion leaders and change agents (Rogers, 2003).

The structure is how the system is arranged and gives regularity and stability to human behavior so that it can be predicted with some accuracy (Rogers, 2003). There are formal and informal types of structures within the system. A well-developed formal structure involves hierarchies and bureaucracies, while informal structures involve interpersonal networks linking a system's members (Rogers, 2003).

It is important to point out that Rogers mentions ways in which the social system affects diffusion through structure, norms which were described in detail earlier in the chapter, and opinion leaders, which will be detailed later in this chapter, as well as change agents. Change agents influence clients' innovation decisions in a direction desired by a change agency. Change agents may even use opinion leaders to encourage the diffusion of an innovation (Rogers, 2003). It is possible that within this study the change agent or opinion leader may be a well-respected neighbor within a community and could deliver the message and model the behavior of increased water conservation practices. Diffusion investigations show that most people depend on the experiences of peers to evaluate an innovation, suggesting that diffusion consists of modeling and imitation of those who have previously adopted the behavior. Within the current research study, changing an individual's behavior in order to reduce water used for lawn care can be seen as a new innovation. Communication from one neighbor to another about what practice changes they made and how successful they were can influence the adoption rate within the neighborhood. This in turn proves the importance of interpersonal communication relationships in accepting innovation (Rogers, 2003).

Sofoulis and Williams (2008) concluded that shifts in norms can be effective even without everyone's participation. They found that change was easier if the new information made sense within established frameworks of reference and prior self-understanding. Their research found that conversations and shared activities helped people connect old norms with new norms, allowing pre-existing knowledge and practices to be transformed. According to Weir and Knight (2000), early innovators tend to be educated and to be copied by those who adopt later, obscuring the relationship

between education and adoption. This theory increases support for the normative beliefs segment of the theory of planned behavior.

Social Marketing Strategies

Social marketing has been utilized for many years, particularly in the 1970's. Recently, social marketing practitioners realized that this technique could be used to increase pro-environmental behavior. Monaghan (2011) defined social marketing as the use of common commercial techniques to promote changes in behavior for a societal benefit, such as campaigns to encourage using seatbelts, recycling, or vaccinating children, or campaigns to discourage tobacco use. In social marketing, the targeted behavior change must be something that benefits society, such as safety, health, or environmental conservation. For a campaign to be considered successful, a significant percentage of the public must adopt the new behavior.

Kotler and Lee (2011) define social marketing as a “process that applies marketing principles and techniques to create, communicate, and deliver value in order to influence target audience behaviors that benefit society (public health, safety, the environment and communities) as well as the target audience” (p.7). Through the use of proven marketing concepts and an understanding of practical daily life experiences, a program can be created that aims to change behavior that all of society will benefit from.

Social marketing uses the same key variables as marketing strategies. These, commonly called “the four P's,” include product, promotion, price, and place (Kotler and Zaltman, 1971). In social marketing, not only are products and services created to meet the desires of targeted buyers but they must capture the social idea that best relates to the target audiences in order for them to find the products and services desirable and worth purchasing. “Promotion” relies on the communication-persuasion strategy and

tactics that will make the product familiar, acceptable, and even desirable to the audience. Kotler and Zaltman pointed out that “place” involves accessibility; the factor that can help put motivation into action and makes it possible for participants to find out information to support their engagement in the activity. “Price” usually refers to the monetary cost of an item, but also includes the cost of other opportunities foregone, how much energy and time need to be expended, and psychological concerns associated with the decision to participate.

McKenzie-Mohr compared the traditional marketing use of the four P’s with the way they are used in a social marketing application. The following table is presented as part of the Recyclemania program started in 2001, between Ohio University and Miami University, a tournament to motivate individuals on college and university campuses to recycle and reduce waste. Table 2-1 illustrates how a program that seeks to increase a pro-environmental behavior such as recycling fits into the traditional marketing and social marketing concept.

Table 2-1. Recycling Marketing Mix

Proven marketing Concepts	Social Marketing Interpretation of Proven Marketing Concepts
Traditional Marketing	Social marketing for recycling
Product	The behavior of recycling
Price	The cost to the individual (e.g., time, convenience)
Place	Where recycling occurs (e.g., common areas, outdoor receptacles)
Promotion	The message delivery method (e.g., posters, video)

The table shows how social marketing uses traditional marketing concepts in a pro-environmental campaign.

Monaghan (2011) applied the four P’s to Extension programming. Extension programs are non-formal educational classes provided by land-grant universities within

local communities to provide information to solve public needs. Such programs involve teaching attendees about planting a vegetable garden, caring for their lawn and garden, and sustainable practices (USDA, 2012). When it comes to “product,” he recommended Extension agents focus on behaviors that are simple to adopt and maintain. If the behavior is not adopted by the public, then the agents need to re-evaluate their program to increase desirability. Monaghan pointed out that product is about what the customer wants and not about what Extension wants to provide. Here “price” is the cost of adopting the new behavior. Social marketing aims to lower these costs and make adoption convenient, fun, and desirable. It determines the barriers to a desired change before instituting a program; this in turn increases the likelihood that change will occur and be maintained. In contrast to the traditional Extension model of providing answers to problems, in the social marketing model, Extension agents will have to provide information to their clientele and consider the price of change in order for them to adopt a new behavior (Monaghan, 2011).

Monaghan (2011) stated that “place,” or placement, is all about what is convenient for the consumer when it comes to finding the information, how to do it correctly, and how they can implement it with low risk. He suggested locating information in areas where the consumer is likely to make a decision about something related to that behavior, such as the point of purchase, or educating members within neighborhoods that can present new behavior alternatives.

The final variable is “promotion.” This includes communicating, advertising, social networking, and educational outreach. Extension services are well-versed about the

most cost-effective method of communicating to a large audience. However, continuous research on what methods reach a particular audience segment is recommended.

It is clear that social marketing and CBSM share many of the same concepts. And together they use the summary of strategies commonly used in marketing and social marketing interventions (Walton & Hume, 2011). Research from this project suggests that social marketing and community-based social marketing are connected to the Theory of Planned Behavior through the use of norms. Also through the use of norms, both social marketing and community-based social marketing create social influences to encourage a desired behavior or discourage a desired behavior, and encourage new social norming.

Even though the Theory of Planned Behavior has a limited notion of norms discussed as subjective norms, social marketing and community-based social marketing constructs have many norms. Some of these include subjective norms, defined as what an individual thinks his peers expect his behavior to be, descriptive norms which describe what is normal and what most people do, injunctive norms which describe what people should do, and cultural norms which refer to core values within a particular culture. It is expected that the data collected from the focus groups will provide insights into the influence of norms as well as the perceived barriers towards increased water conservation behavior.

Community Based Social Marketing (CBSM)

CBSM, as defined by McKenzie-Mohr and Smith (1999), is an approach that draws heavily on social psychology, which indicates that initiatives to promote behavior change are often most effective when they are carried out at the community level and involve direct contact with people. The pragmatic approach of CBSM has been offered

as an alternative to conventional campaigns, and, in contrast to traditional education methods, and has been shown to be very effective at bringing about changes in behavior (McKenzie-Mohr & Smith, 1999). McKenzie-Mohr and Smith claimed that the primary advantage of social marketing is that it starts with people's behavior and works backward to select a particular tactic suited for that behavior (*ibid.*). The research on CBSM indicates that incorporating social marketing into the approach has been successful in transcending the gap between knowledge and action that has characterized many local environmental and sustainability projects to date. Given the fact that this study is about increasing water conservation practices by homeowners with automated irrigation systems, it belongs in the category of increasing pro-environmental behavior. CBSM has had success with pro-environmental behavior change.

The practices used in CBSM include identifying barriers to practicing the behavior; the norms, and incentives that motivate action; using creative communication; and understanding the use of commitments and what prompts increase the likelihood of behavior change. The first step, identifying what the external barriers are to practicing sustainable behaviors, is imperative to success in CBSM. A barrier is whatever inhibits an individual from engaging in the activity being promoted. It can be internal to the individual, such as lack of knowledge on how to carry out the activity, or external, such as a structural or physical change that makes the behavior less convenient (McKenzie-Mohr & Smith, 1999). The following study points out some examples of barriers.

Ozan & Alsharif (2012) recently evaluated the effectiveness of water restrictions in Tampa, Florida. They found that water use increased as water restrictions became

more stringent. Interestingly, they concluded that primary violators who were frequently cited for not following the water restrictions were not affected enough by the fines to reduce their water use. They suggested that disregard for the restrictions could be influenced by several factors, including lack of enforcement workers from the water utility, a contradiction of policies in that water restrictions are completely opposite of the requirements by deed-restricted communities to have a healthy lawn, and also the culture of normative landscape practices (Ozan & Alsharif, 2012).

The next concept, according to McKenzie-Mohr (1999), is norms, which build community support:

People look to the behavior of those around them to determine how they would respond. If we are to make the transition to a sustainable future, it is critical that we are able to develop a new set of societal norms that support sustainable lifestyles (p. 73).

This supports Ajzen's theory about norms, which is that individuals or groups approve or disapprove any given behavior. The Theory of Planned Behavior includes subjective norms as one of its salient beliefs. A subjective norm influences an individual's behavior, causing them to behave in a manner that they believe is expected of them.

An illustration of a lack of influence by norms can be found in the Borisova and Useche (2013) evaluation of the effectiveness of Extension workshops on household irrigation water use behavior. The irrigation management workshops were conducted from 2007–2010 by the Florida Cooperative Extension Service in collaboration with a local water provider. Program attendees could choose to attend the workshop or pay a fine for not following water restrictions. The results showed water use dropped in the month of the workshop, and then increased to the level observed in the base period,

which was water use for four months prior to the month of the workshop. In other words, the effect of the workshop was very short-lived. In general, research has found that it is more difficult to alter and maintain repetitive behavior changes than it is to bring about one-time changes in behavior (Kempton, Darley, & Stern, 1992; Kempton, Harris, Keith, & Weihl, 1984).

Urban water conservation research done by Sofoulis & Williams (2008) proposed that in addition to technical innovations, water could be saved through changes in cultural norms about what water was used for and shifting habits and expectations around water services. They concluded that changing water conservation values will have little effect on savings unless accompanied by practical changes in water techniques, technologies and systems. They also pointed out that targeting a street or neighborhood can allow group norms to be renegotiated according to the new values, making it easier for people to take more steps towards change.

The “Skip a Week” program integrated social marketing and traditional marketing principles and was conducted by the Southwest Florida Water Management District (SWFWMD) from December 2009–February 2010. The program used research and experiences from a recently completed pilot program combined with social research and social marketing principles. The results were obtained by comparing differences between the pre and post survey behavior. There was a 450 per cent increase in campaign message awareness, knowledge gain about how many times to water the grass during the winter as well as year round care of grass, self-reported behaviors such as manually turning off the irrigation timer, and increased participation in skipping

a week of irrigating. These changes resulted in a projected water savings of 1.2 billion gallons (SWFWMD, 2010).

In a study done about water demand management by Russell and Fielding (2010), the researchers suggested water conservation programs should seek to gain widespread support in the community. They can then provide strategies that people find easy to use to engage in water conservation behavior.

The use of incentives is another concept integral to CBSM, whether financial or less concrete (e.g., social approval). An incentive is something that encourages or stimulates action. It can be financial, through cost share, a rebate or discount. Incentives can provide the motivation for individuals to perform more effectively, especially if they already engage in an activity, such as recycling, or to begin an activity that they otherwise would not perform, such as composting (McKenzie-Mohr, 1999).

The next component is communication. Persuasion means to communicate in a way to influence or convert an individual's way of thinking and ultimately acting. Persuasion begins with capturing attention. One of the most effective ways to ensure attention is to present information that is vivid, concrete, and personalized (McKenzie-Mohr, 1999).

Once participants have been persuaded, commitment must follow. Commitment is moving from good intentions to action. Participants whose attitudes have been changed also need to change their behaviors for the program to be effective, and commitment is one way to ensure such a follow-through (McKenzie-Mohr, 1999). Commitment comes in many forms, although written commitments appear to be more effective than verbal. Public commitments are likely effective because of our desire to

be consistent. Group commitments are likely to be effective in well-established groups in which individuals care how they are viewed by other members of the group. Actively involving the homeowner in the assessment of what will be affected by the behavioral change is more likely to achieve the desired change (McKenzie-Mohr, 1999).

Importance of a Block Leader or Opinion Leader

Commitment strategies have also been shown to be effective when a community “block leader” implements them. A block leader is a community resident who already engages in the behavior that is being promoted and agrees to speak to other people in their immediate community to help get them started (McKenzie-Mohr, 1999). The concept of a “block leader” may be a valuable tool when working in subdivisions that use large quantities of water, especially when it comes to achieving sustained behavior change that reduces water use. The block leader would be viewed as a role model and provide the appropriate prompts when needed.

The concept of a block leader is similar to that of an opinion leader. Feder and Savastano (2006) point out work by Chatman (1987) and Valente and Davis (1999) that state opinion leaders are individuals who have status, expertise, are connected to external sources of knowledge or experiences that enable them to provide information and advice about innovations to others within their community. They have the ability to influence others’ attitudes and knowledge. People tend to seek advice from their peers, from individuals of the same background, interests, and values (Rogers, 1995).

Another Valente and Davis (1999) citation from the Feder and Savastano study was that “learning occurs most efficiently when individuals are trained by their ‘near

peers,' whom they have chosen as their models.'" In more current research by Maibach, Roser-Renouf and Leiserowitz, the researchers stated:

personal influence, especially that of community opinion leaders, is a powerful source of social change that will be needed to engage U.S. residents in responding rapidly to the issue of climate change (2008)

Nisbet and Kotcher (2009) stated that opinion leaders not only help draw the attention of others to a particular issue, product, or behavior but also, perhaps most importantly, signal how others should in turn respond or act. Weimann (1994) pointed out that opinion leaders can influence others by giving advice and recommendations, by serving as a role model that others may imitate, by persuading or convincing, a process whereby ideas or behaviors are spread with the initiator and the recipient unaware of any intentional attempt at influence. An opinion leader is someone who communicates well and sets an example for others to follow. A block leader is someone who can offer that same type of guidance and influence to the neighbors on their street.

Feder and Savastano referenced Rogers (1995), who provided a coherent theory, as well as empirical evidence, of the many aspects of the diffusion of innovation. One of the themes elaborated upon is the role and characteristics of "opinion leaders." Such individuals have the status, expertise, and links to external sources of knowledge or experience that enables them to provide information and advice about innovations to others within their community. Opinion leadership is thus reflected in the ability to influence others' attitudes and knowledge (Chatman, 1987; Valente & Davis, 1999). Such leadership may be informal rather than formal, but many scholars observed that opinion leaders tend to have higher social status than "followers" (Bandura, 1986, p. 151). Feder and Savastano cited the works of other researchers and noted that opinion leaders are often more exposed to external sources of information, such as mass media

or change agents (e.g., extension workers), have higher formal education, higher levels of literacy, a more cosmopolitan orientation, and higher income and wealth (Chatman, 1987; Rogers, 1995, p. 92; Valente, 1996; Weimann, 1994, p. 217).

According to Barton (1985), it is important to remember that experts influence the rate and extent of acceptance by serving as negative or positive opinion leaders. She states that communication among potential adopters is a major force determining the rate at which the new idea, product, or process spreads. Within any given social system, relatively few individuals can be identified who lead opinion formation among their peers on a given topic. Barton cited Ryan and Gross (1943) who concluded these individuals disproportionately influence the ultimate shape of the diffusion curve. Studies of such opinion leaders usually assume that the only information worth tracking is pro-innovation (e.g., Dichter 1966) and that the influential innovation is transmitted verbally.

Barton's (1985) research found that experts who dislike innovation serve mostly as sources of information. The anti-innovation experts influence evaluation of the new product by shaping and reinforcing opinion rather than through the actual experience of use. This distinction between the function of the positive and negative opinion leader is likely to hold true any time the innovation requires acquisition of complex skills in addition to those required for the alternative product or method. The positive opinion leader must propagate new skills; the negative opinion leader need only denigrate the innovation (1985). In essence, Barton points out that if the accepted opinion leader does not support the innovation, that influence will affect the adoption rate of the new product or behavior.

As stated above, the research about opinion leaders is important to understand, particularly their influence on a community-based social marketing campaign. It points out the need for selecting a block leader who can positively promote the desired behavior change. The block leader, much like an opinion leader, comes from the same community and is viewed as a peer. Also word of mouth has great influence on innovation adoption as does behavior modeling. Through behavior modeling, the block leader can show behavior practices that will lead to a new norm for the community. A block leader is someone who can offer guidance and influence to the neighbors on their street.

When they aren't present, then the use of prompts is helpful. Prompts are a step within the CBSM model, said McKenzie-Mohr (1999):

Prompts are important to help people remember to act sustainably. A prompt is a visual or auditory aid which reminds us to carry out an activity that we might otherwise forget. The purpose of a prompt is not to change attitudes or increase motivation, but to simply remind us to engage in an action that we are already predisposed to do. (p. 61)

Kurz, Donaghue and Walker (2005) did a field experiment to promote water and energy conservation. They found the use of prompts, containing information in the form of a label at the actual point of interaction between residents and the environmentally relevant objects, caused changes in the amount of water being consumed, compared to those who were not provided with this intervention.

In summary, CBSM identifies the barriers first and encourages the use of norms, incentives, communication, commitment and prompts as a way to increase adoption practices. The development of CBSM specifically for sustainability arose out of concerns about the ineffectiveness of environmental campaigns that relied solely on providing information (Kollmuss & Agyeman, 2002). Combining social marketing with

CBSM is frequently used to promote environmental behavior change (Monaghan, 2011).

Figure 2-2 provides a visual example of the interaction among the theory of planned behavior, the theory of the diffusion of innovations, and the strategies used in social marketing and community-based social marketing. The model was adapted from Taylor and Todd (1995).

Summary

Empirical research has provided predictors of environmentally responsible behavior and the basis for claiming relationships among these predictors. The literature review revealed knowledge gaps within empirical studies focused on qualitative research in the area of conservation psychology, specifically with the use of focus group methodology and landscape irrigation management; CBSM and increased water conservation practices with home landscape watering behavior; and the connection the diffusion of innovation theory may have on decreasing water use on home landscapes. Finally, individual characteristics and factors associated with conservation practice adoption, based on other studies, were introduced as potential elements of use within the research framework for this study. The characteristics included the role of beliefs, norms and self-efficacy.

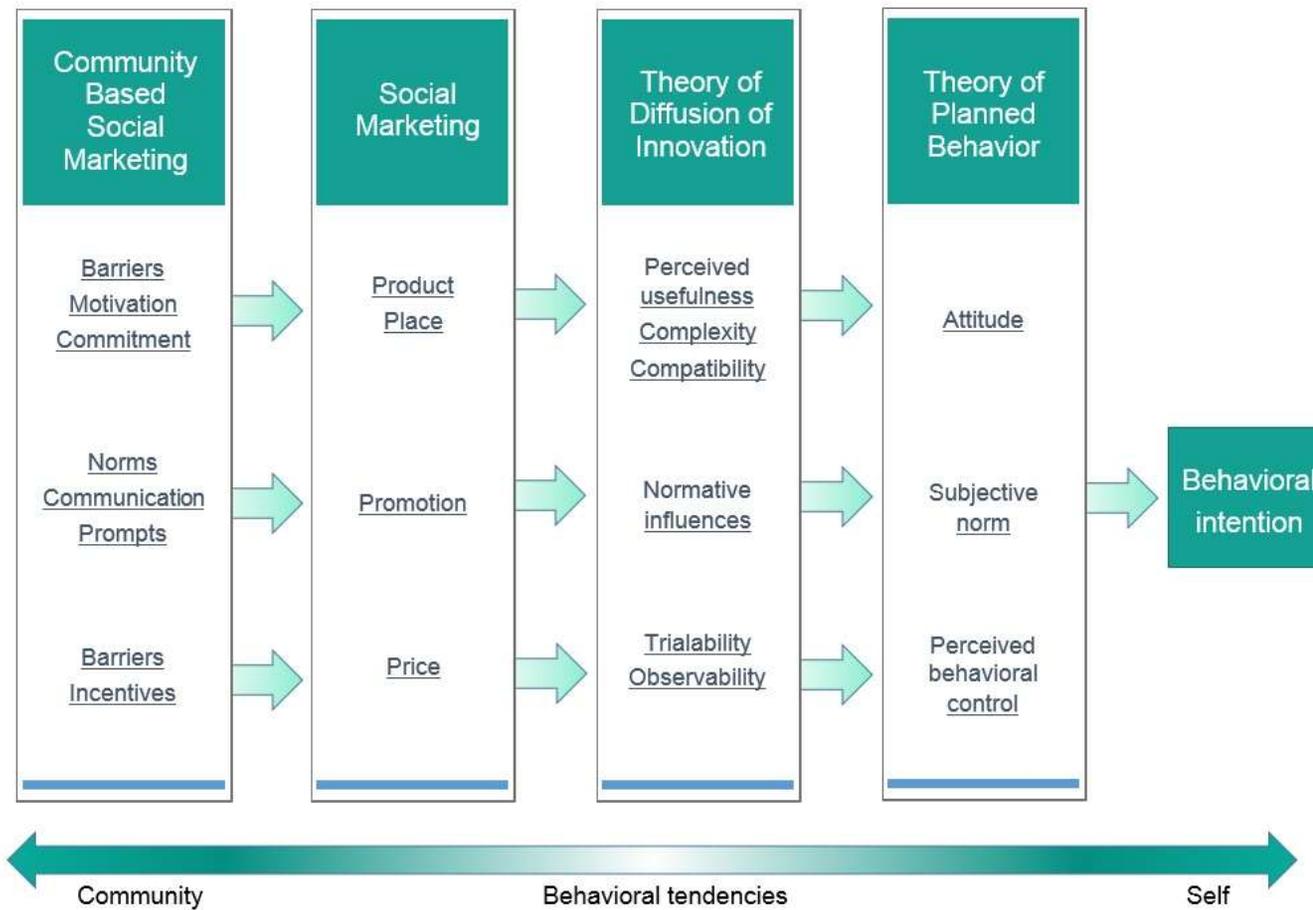


Figure 2-2. Illustration of the interaction of the theory of planned behavior, the theory of the diffusion of innovations, and the strategies used in social marketing and community based social marketing.

CHAPTER 3 METHODS

Chapter 1 provided an introduction and background for this study, which aims to use social marketing strategies and community-based social marketing concepts, combined with non-formal education, to increase water conservation practices of homeowners with automated irrigation systems. An overview of community based social marketing practices compared to environmental educational campaigns, limitations of the study, assumptions, and definitions of key terms used in this study were outlined in that chapter.

A review of the literature was provided in Chapter 2. The literature highlighted the gaps concerning water conservation and the use of a community-based social marketing approach to influence the adoption of water conservation practices. Applicable theory was introduced, including the theory of planned behavior and the theory of diffusion of innovations along with strategies from social marketing and community based social marketing, in order to explain and predict behavioral intent to engage in water conservation adoption. Given this need, from the methodological viewpoint, one of the goals of this study was to provide rigorous measurement of a specific target audience's decision to adopt water conservation practices.

The current chapter explains the qualitative research methodology used to address each of the research objectives for this study, including the phenomenological approach, focus group procedures and participants, sampling methods, data collection, and data analysis.

Research Design

A qualitative research approach was chosen for the study in an effort to understand the experiences and perceptions of people when it came to water conservation practices and to determine the influence of community-based social marketing concepts. Denzin and Lincoln defined qualitative research as:

the study of things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves the studied use and collection of a variety of empirical materials that describe routine and problematic moments and meaning in individuals' lives. (p. 2)

To better understand the barriers to water conservation practices, it was important to understand and break down the barriers that impeded such practices. As a result, the researcher needed to understand what was occurring in the everyday lives of the participants.

The narrowly focused study of individuals and their perceptions and experiences related to water conservation practices lent itself to qualitative methodology, and more specifically the phenomenological research approach. Moustakas (1994) stated that phenomenology seeks to discover both what is happening in the lived experiences of participants and to uncover the meaning participants have drawn from such experiences in order to identify the essence of the phenomenon and how it relates to others.

Phenomenological Research Approach

For the purposes of this study, focus groups were utilized as a phenomenological technique. This approach was used in the present study to seek information about the phenomenon of understanding the influence of a community-based social marketing approach on the adoption of water conservation practices. Residents of Orange County, Florida, were chosen as a population of interest because Orange County is included

within the Central Florida Coordination Area (CFCA), an area created by the Southwest Florida, South Florida and St. Johns River Water Management Districts. The coordination area was created along with an action plan to facilitate coordination among the three districts on water supply planning and resource regulation. The CFCA action plan limits additional groundwater withdrawals to no more than that needed to meet year 2013 demands, as new water permits will not go past 2013 unless supplemental water supplies are committed to meet demands after 2013 (CFCA 2010). Therefore, Orange County Utilities (2010) must focus on water conservation as the primary source of water for new residents.

Focus group methodology is used in qualitative research and was selected for this study. Focus group discussions create a process of sharing and comparing among the participants to provide the context and depth behind their thoughts and experiences (Morgan & Krueger, 1998). They also “provide insight into complicated topics where opinions or attitudes are conditional or where the area of concern relates to multifaceted behavior or motivation” (Krueger, 1994, p 45). Focus group methodology is similar to the phenomenological approach in that such studies strive to understand the everyday experience of the participants. Focus groups are commonly utilized by researchers, marketers, and consultants to explore marketing ideas (Boren, 2004). They are used to provide local perceptions in rich detail and report actual statements from real people (Creswell, 1998). Focus groups can also provide high quality data about programs and services that surveys may miss (Iowa State University Extension, 2004).

Ary, Jacobs, Razavieh and Sorenson (2006) perceived the phenomenological approach as demonstrating the uniqueness of social reality. This approach sees the

individual and his or her world as so interconnected that essentially the one has no existence without the other. The researcher must look beyond what people do to evaluate how they think and feel, and how they experience what happens to them. Furthermore, phenomenological studies begin with an assumption that multiple realities are rooted in the subject's perspectives. Marshall and Rossman (2006) stated that the purpose of phenomenology was trying to understand the experiences of a few in an effort to create a broader understanding of them. The approach also assumes "there is a structure and essence to shared experiences that can be narrated" (p. 104).

Phenomenology, for Moustakas (1994) and further, that this approach:

attempts to eliminate everything that represents a prejudgment setting aside presuppositions, and reaching a transcendental state of freshness and openness, a readiness to see in an unfettered way, not threatened by customs, beliefs, prejudices of normal science, by the habits of the natural world or by knowledge based on unreflected everyday experience (p. 41).

Phenomenology casts off inherited meaning and places one's perceptions aside so one can receive experiences in a new way (Creswell, 1998; Crotty, 2003). This new way of seeing the phenomenon results in richer, more all-encompassing significance.

Epistemology is the theory of knowledge (Crotty, 2003). Hamlyn (1995) described epistemology as the "nature of knowledge, its possibility, scope and general basis" (p. 242). This theory is the foundation for the manner by which the researcher pursues her inquiry and determines the type and value of any newly generated knowledge. Epistemology helps determine how knowledge will be shaped.

Epistemologies span a wide range of beliefs and approaches and are broken down into three stances: subjectivism, objectivism, and constructivism. This research study will be based on objectivism and subjectivism.

The objectivism viewpoint sees meaning as independent from consciousness, in existence apart from one's interaction with the world (Crotty, 2003). Phenomenology requires one to revisit an object from a fresh, naïve perspective and see it in a new way (Moustakas, 1994). Textural descriptions of the phenomenon's meaning and essence are formed from this type of openness. In contrast, the subjectivism viewpoint suggests one ascribes meaning to an object (Crotty, 2003). It suggests that meaning is derived elsewhere, rather than through interaction with an object. Reality is found in the universality of the experience through both objective and subjective aspects of the work (Marshall and Rossman, 2006; Moustakas, 1994).

A theoretical perspective anchors a study in a particular world conception, helping one make sense of the surrounding stimuli and helping to better understand "how we know what we know" (Crotty, 2003, p.8). This perspective guides a study's methodological decisions, serving as the philosophical foundation. Phenomenology was used to focus this aim of thinking, by setting aside meaning established through customs and beliefs, and attempting "to understand the hidden meanings and essence of an experience" (Grbich, 2007, p.84). Phenomenology takes a fresh look at the everyday, reinterpreting meaning crafted from firsthand experience with a phenomenon (Moustakas, 1994).

Lived experiences are the foci of phenomenological research (Hatch, 2002). Reflecting on these experiences, researchers are better able to describe the various aspects of the experience and identify those elements moving the experience beyond isolation to universal access (Moustakas, 1994). Such questions as "What is the essence of the phenomenon?" are posed in the hopes of uncovering the multiple

perceptions to expand the knowledge about, and meaning of, various human experiences (Crotty, 2003; Moustakas, 1994).

The interpreter, in this case the researcher, becomes part of the meaning-making process (Nealon & Giroux, 2003). By making known the personal experiences and knowledge related to the inquiry, the researcher can better understand the lens through which he or she makes all methodological decisions (LeCompte & Preissle, 1993). A subjectivity statement created by the researcher acknowledges the researcher's existing knowledge related to the phenomenon and, through bracketing, allows the researcher to distance him/herself from preconceived beliefs which compel them to render judgment (Grbich, 2007; Moustakas, 1994).

The phase encapsulating this altered vantage point is called "epoche" (Marshall & Rossman, 2006; Moustakas, 1994, Sokolowski, 2000). Epoche produces purity of vision, distancing the researcher from their customary perspective (Moustakas, 1994). Although important, completing a statement of currently held beliefs makes up only one aspect of epoche (Marshall & Rossman, 2006; Moustakas, 1994; Sokolowski, 2000). Less an act and more a process, epoche alters the way a researcher approaches the work from the moment they capture a preconception on paper, continuing through analysis when the researcher considers his/her beliefs against those shared by the participants (Marshall and Rossman, 2006).

Focus Group Procedures

Focus group methodology includes the use of special methods in terms of purpose, size, composition, and procedures. The ideal size is 5-10 people per session. Multiple groups are used to insure reliability and validity.

In this study, a total of four focus groups were conducted. Krueger recommends at least four sessions in order to observe and document reoccurring themes among the sessions. Two sets of two groups each were held in a central area of the county. The composition of the groups were representative, following predetermined characteristics. Participants were recruited by a screener using the following criteria: gender, age, education level, income level, ethnicity, and homeownership status. This criterion was used to further determine the demographics of the target audience among the high water users, which in turn would further the development of a community-based social marketing campaign to ultimately increase water conservation practices.

Participants

Prior to the collection of data, a proposal to conduct the focus groups was submitted to the University of Florida Institutional Review Board (IRB) for non-medical projects. The proposal was approved (Protocol #2009-U-0392. See Appendix A IRB Approved Letter.)

The focus group sessions used purposive techniques. According to Teddlie and Yu (2007), purposive sampling techniques are primarily used in qualitative studies and may be defined as selecting units (e.g., individuals, groups of individuals, institutions) based on specific purposes associated with answering a research study's questions. Maxwell (1997) further defined purposive sampling as a type of sampling in which "particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices" (p. 87).

Participants were randomly selected from a list provided by Orange County Utilities. The list consisted of 7,712 addresses of residents who were determined to be high water users (Romero, O'Malley & Dukes, 2010). Subtracted from that list were

1,000 residents who received a survey from another study. Also subtracted from the list were 167 residents who were selected to participate in another research project about the use of soil moisture sensors (Davis & Dukes, 2013). The balance of the list was given to a marketing firm and a recruiter was used to call potential participants.

Sampling Methods

The qualified individuals were contacted and recruited to participate by a market research firm located in Gainesville, Florida. The initial recruitment questions and callback script are in Appendices B and C. Participants received \$70 as a recruitment incentive at the conclusion of the focus group session. A skilled, objective moderator worked from a protocol comprised of a script including questions to be asked, prompts, and message interventions. Sessions were recorded using audio tapes and field notes and the sessions were then transcribed.

Focus groups allow for delving into attitudes and perceptions more deeply, while mitigating response bias problems sometimes found with surveys. They also provide local perceptions in rich detail and report actual statements from real people (Creswell, 1998). It is an “accepting” environment (no right or wrong responses) that reduces personal inhibitions since perceptions are not “judged.” This open, relaxed atmosphere is particularly important when collecting data focused on reaction to message stimuli (Krueger & Casey, 2000).

Data Collection

A moderator’s guide (Appendix D) was used for each focus group to help guide each session. The questions in the moderator’s guide were created through the use of a panel of experts, and utilized data from an unpublished survey about Florida

homeowners and their lawn care practices. The questions were designed to collect data that would contribute information to the four research objectives.

The same moderator and the same two note takers were present at each of the four focus groups. It is important to point out the importance of a skilled focus group moderator. Krueger and Casey (2000) listed some factors to consider when selecting a moderator. One of the most influential factors affecting the quality of focus group results is the ability of the moderator to show respect for the participants. S/he must be able to exhibit the respect throughout all scheduled sessions, something that becomes more difficult after the fourth or fifth group, when reoccurring themes begin to emerge. The moderator makes an effort to listen to each person in the group and does not dismiss any of the comments. Some behaviors the moderator can use include leaning forward when listening or taking notes on key points. The participants have to feel that the moderator cares about them.

In addition, Krueger and Casey (2000) point out that the moderator must have adequate knowledge of the topic; this can help keep comments in perspective and allow follow up on critical areas of concern. The moderator must have the ability to communicate clearly in both written and oral styles. Additionally, moderating requires the ability to listen, self-discipline to control personal views, and the ability to smile and say thank you. In the end, the participants must feel comfortable with the moderator, which encourages the group to openly discuss their thoughts about the questions pertaining to the research topic.

In order to encourage participation from all people in the group, the moderator spurred dialogue among participants by asking questions such as, "Does anybody feel

differently?” To increase the number of probing questions the moderator would ask, for example, “How does that make you feel?” This in turn would encourage participants to describe why they felt a certain way. The moderator also invited each participant to respond to every question from the guide in order to foster more equal contributions from everyone. Inviting people explicitly was a strategy intended to draw out less assertive participants (Krueger & Casey, 2000).

Focus group questions reflect important insight into the participants’ attitudes and beliefs about water conservation. After introductions and an ice breaker, where participants described the type of yard they had, the moderator moved through questions such as, “How do you handle watering your yard?” The moderator then prompted the group with “How many times a week?” “How do you set the timer?” In order to learn more about whether the timer was a problem for the home owners’ ability to increase water conservation practices, questions were asked such as, “Do you have a problem setting the timer?” and “Describe the process you use to make changes to the timer.” The moderator continued to ask questions that would help obtain the thoughts of participants about what they perceived as actions that wasted water in their neighborhood.

To get an idea about their attitudes about wasting water, follow-up questions addressed how participants’ felt when they saw such actions by their neighbors. The next section of questions probed the group about what they might be willing to do in order to use less water. The sessions continued with questions about what concerns they would have if they substantially reduced their water use. They were asked, “Would

you be worried that your lawn would look bad if you tried to cut the water in half? Why is that an issue for you?”

The next set of questions were asked to determine what would motivate them to reduce their water use and what type of program would need to be created in order for them to get involved. The final questions looked for their perceptions on how they as individuals had an impact on Florida’s water shortage crisis and their willingness to conserve more by watering the lawn less. They were asked, “Do you ever worry that you personally may be contributing to Florida’s water crisis by how much you water your lawn?” The moderator prompted this question with, “What makes you say that? What if you found out you were wasting 50% of your water outdoors? What would it take to convince your neighbors to stop wasting water?”

The moderator concluded the sessions by asking the group if they had any final thoughts. To confirm that the session accurately represented the discussion, a summary of the session was read to the group. After each focus group, the moderator and both note takers summarized their impressions of both the content of responses as well as the moderating process. The sessions were recorded and the recordings were sent to a transcription service to provide a text file for each focus group session.

Data Analysis

Analysis of qualitative data involves identifying recurring patterns or themes. Data are analyzed to develop meaning, understanding, or insight, which constitute the findings of a study (Merriam, 1998). For focus groups, data analysis is a constant process that begins with the initial collection. Three components occurred during the focus groups (Krueger, 1998): first, the moderator team listened to participants to ensure that the intent of participants’ responses were as fully understood as possible;

second, the focus group moderator provided a summary of findings near the end of a session to get any final thoughts or clarification from participants; and finally, the moderator and the two assistant moderators debriefed after each focus group as a means of sharing their interpretations and understandings of each focus group.

The next step was the creation of categories and/or themes to organize the data (Creswell, 2007). Emergent coding uses the data as the source for the codes, as opposed to having predetermined codes (Creswell, 2007). Emergent coding was used to limit the amount of researcher bias in analysis. Focus groups allowed participants to select how they provided information (Krueger, 1998), and, as such, the codes and themes that emerged should be largely influenced by participants. To insure a close relationship with the data, I was present at all the focus groups to help understand the context for responses and to aid in the analysis.

The focus groups were audio recorded. Before any data could be deeply analyzed it needed to be transferred from verbal form to written form. The process of transcribing the recorded audiotapes involved writing out each question and each of the responses verbatim from the focus group sessions. The transcribing was done by a third party. Transcript-based analysis, though more time-intensive, is considered the most rigorous means of analyzing focus groups (Krueger, 1998), and transcripts are necessary to maintain the richness of the data (Bloor, Frankland, Thomas, & Robson, 2001). The transcripts were used to ensure the accuracy of information the researchers used to make interpretations and as a means of justifying findings (Creswell, 2007; Flick, 2006). Notes were also taken by two note takers. The notes were intended to be complete accounts of the focus groups in case the recording machinery didn't work

(Krueger, 1998). The moderator also took notes while moderating each focus group. By using transcripts and notes, a new reality can be constructed that is accessible to and can be analyzed by researchers (Flick, 2006).

Data was analyzed using Glaser's constant comparative technique (1978). This technique is based on comparative analyses between or among groups of persons within a particular area of interest. This comparative analysis is the central feature of grounded theory in qualitative research and often allows the researcher to identify patterns and relationships within the collected data (Glaser, 1978). The process sets out to determine frequencies and themes which become part of the categories.

The following process was used for this determination. Step 1, when an incident was coded into a category, it was compared with other incidents in that category. The researcher then reviewed the nature of the category from the information in the notes. Step 2, categories and their respective properties were integrated through constant comparisons. In Step 3, the boundaries of the categories were set. As the boundaries were set, categories decreased in number and the focus of each area was improved. Step 4 included writing the theory, using information in the notes about the categories, which in turn served as the content of each of the categories. For this study, writing theory consisted of describing the themes concerning barriers to the development of increased water conservation practices, and describing current norms and their influence on adopting new water conservation behavior. In addition, it was important to determine what was perceived as motivation to change behavior and what communications and prompts would accelerate the adoption of new water conservation practices. Categories were established through the use of transcriptions and field notes.

The transcriptions were loaded into MAXQDA Qualitative Data analysis software. The potential advantages of using a computer program for data analysis are that the program provides an organization system for files, helps the researcher find materials quickly, increases the ability of the researcher to scrutinize data, provides concept mapping, makes retrieving memos easier, and increases the transparency of the research process (Creswell, 2007; Flick, 2006). The disadvantages are that it takes the researcher time to learn the program, and there is a potential for increased distance between the data and the researcher. Further, the researcher could feel inhibited to make changes to categories during the analysis process, and the program could alter how the data are analyzed (Creswell, 2007; Flick, 2006).

After the transcripts were uploaded into the program, the researcher (author of this dissertation) completed the first round of open coding. During this analysis phase, the researcher read through the focus group transcripts and categorized portions of data into lists of categories or codes. Codes were created inductively with the goal of expanding the range of codes to capture minute differences in perspectives (Richards, 2009). Throughout the open coding process, a detailed audit trail was maintained using a hand-written journal (Flick, 2009).

After the first round of open coding, the process and resulting range of codes were presented and discussed with the moderator who attended all four of the focus groups. A first phase summary report was created to describe the collective focus group themes the researcher felt were most important, as well as individual focus group contexts and emergent themes specific to individual groups. In order to describe the groups collectively, several strategies were employed by the researcher. To get a

general overview of categories that the researcher most frequently coded, summary reports were generated using the MAXQDA software. While the frequency of categorized portions of data into specific codes did not provide a total picture, this strategy was a good place to start to understand which themes the researcher perceived in the data and how often they occurred.

After reviewing the coding summary report, the researcher began a constant repetition or back and forth process of reflecting on the four focus groups as a whole, as well as within the individual groups from the set of four. The researcher would record ideas about the meaning of topics raised in all groups as well as themes present only in some of the groups by hand writing notes in the journal. The researcher then returned to the focus group transcripts to make sure her new understanding was supported by participant's statements in the transcript. This "filtering process" allowed limited judgments or prejudices to be identified and discarded (Crotty, 1998). The responses provided evidence to support a new understanding, which came from a combination of the textual data and the researcher's subjectivity (see Crotty, 1998).

After the preliminary analysis of focus group transcripts, the researcher reviewed the research objectives and the two theories and two strategies used to guide the study. The researcher then engaged in another round of data analysis focusing on attitudes, norms and self-efficacy as well as social systems communications, and barriers to behavior that in turn helped to better understand the relationships between and among themes in the data. A chronological review of the focus group transcripts was conducted. Again, portions of data were coded by selecting statements made by

participants and placing them into categories. The researcher kept a textual record of thoughts and observations by documenting them in the hand written journal.

Another round of analysis involved the researcher recording reflections on the collective and individual focus group data. Writing itself was a method of inquiry and analysis -- a method of asking questions of and interpreting the data. The author would refer back to the transcripts as well as to the categories created in MAXQDA.

The use of MAXQDA made it easier to determine emerging themes. It demonstrated that extensive discussion of disdain occurred when the topic of the HOA was mentioned. The themes and sub themes would determine the barriers faced by the residents to increase water conservation practices, such as pressure from their HOA. The themes would also establish the norms among the neighbors, and determine what would motivate them to change their behavior in order to reduce their water use. Interestingly enough, in relation to the theme pertaining to pressure from the HOA, it should be noted that each of the residents signed the HOA covenant at the time of their home purchase and many of them said they didn't know what they had signed up for. The theory of diffusion of innovations points out that communication in a social system is important for the adoption of an innovation. A sub division is a social system and within that social system many sub sets of social systems exist. Two of the sub-sets would include: one, the residents; and two, the HOA board members.

. Communication from the HOA board members to the residents is that they are required to have nice grass. The easiest method for the homeowners to follow in order to meet that demand was to water the lawn more. For the homeowners, the end result was that the HOA was happy and the neighbors were happy. The homeowner was

happy because they had avoided the pressure from the HOA as well as the possibilities of paying a fine or paying for costly replacement of the grass.

Questions that included the term HOA were met with sneers, sarcastic laughter and requests to the group about whether they had to “watch their language” before answering the questions. Many times the moderator wasn’t able to finish the questions that included the term HOA before someone would interrupt with a comment about living in an HOA community. Many participants expressed difficulty in talking to their neighbors about water conservation for fear the neighbors would think they were trying to cause them trouble with the HOA board. The theme of pressure from the HOA became a theme to look for throughout each of the focus group sessions.

The researcher drafted her findings based on her preliminary understanding, previous literature, the focus group data and notes from the analysis process. The process of formulating a new understanding of participants’ perceptions of water conservation, the barriers that existed to increasing water conservation practices, how to motivate homeowners to conserve more, and the best way to communicate the importance of water conservation, were multi-dimensional, informative, and valid inasmuch as the findings are plausible.

The results of the four focus groups were used to understand the attitudes and perceptions of the participants as well as to determine if there were additional barriers to increasing water conservation behaviors. The information gathered from the focus groups were used to determine the barriers to increasing water conservation practices and to uncover what would motivate behavior change as well as what type of communication and prompts would be helpful to the participants.

Validity

In qualitative research, validation is determined through credibility, transferability, dependability, and confirmability (Ary et al., 2006). However, Merriam (1995) suggested that the rigor of qualitative research should be discussed using the same terms as quantitative research: internal validity, reliability, and external validity. Internal validity can be addressed through multiple strategies such as triangulation; a rich, thick description; and a statement of the researcher's experiences, assumptions, and biases (Merriam, 1995), all of which were used in this study. A subjectivity statement was developed to state the researcher's experiences, assumptions, and biases prior to collecting data.

Reliability in the social sciences is problematic because "human behavior is never static" (Merriam, 1995, p. 54). For qualitative research, Merriam (1995) suggested it is more important to ask "whether the results of a study are consistent with the data collected" (p. 56). As with internal validity, there are strategies that can be used to ensure greater consistency.

The measures taken to help readers assess the trustworthiness of this study and the plausibility of the interpretations offered by the researcher have been numerous. The researcher detailed data collection and analysis methods to provide indicators of the interpretive rigor of this study (see Guba & Lincoln, 2005). Within the data collection and analysis methods, audio recording the focus groups and consistent note-taking were used to ensure transcript accuracy and to bolster the trustworthiness of the textual data (Flick, 2009; Lincoln & Guba, 1985). To maintain transcription consistency, a single person was employed to transcribe the four focus groups.

The methods included transcribing participant statements word for word rather than correcting grammar or tense to afford the opportunity for potentially different subsequent interpretations. Laughter was also recorded as a scene note as researchers thought that was an important element in recording the tone of individual statements and in some cases, the level of agreement by other group members. The methods were intended to help the transcriber develop consistency when recording all participants' statements; recording statements in systematically different ways could impact their meaning, or create other forms of bias.

Through the data collection and analysis phase of this research, an audit trail was maintained (Flick, 2009). During the analysis phase, the researcher continually referred back to the data to confirm interpretations and understanding. This understanding was obviously influenced by the researcher's previous comprehension of water conservation issues, the connection between people and their landscape maintenance practices, and the data. What the participants said in their own words has been presented to show what influenced the researcher's interpretation of the material as well as any new understanding (Richards, 2009).

Finally, external validity can also be known as reader or user generalizability, which is the extent to which the reader or user can apply the findings of a study to other situations. Merriam (1995) states that it is not up to the researcher to generalize the findings to other settings, but instead up to the reader of the research. External validity can be established through a rich, thick description of the setting, the participants, and the themes of a qualitative study, to provide the reader with enough information to determine how closely the research situation matches his or her own situation.

Trustworthiness is then established by how well the study does what it was designed to do (Merriam, 1995).

Researcher Subjectivity

The subjectivity statement should express the researcher's proximity to that which he or she is examining (Glesne, 1999). By presenting the researcher's experiences, assumptions, and biases, the reader is better able to understand how the data was interpreted by the researcher (Merriam, 1995). This study's subjectivity statement follows.

The research topic examined in this dissertation has been an integral part of my career for over 30 years. Water conservation practices have been a part of my everyday tasks, whether as part of daily behavior or incorporated into educational presentations as an Extension Agent in Orange County, Florida. According to the United States Dept. of Agriculture (USDA), Extension means "reaching out," and—along with teaching and research—land-grant institutions "extend" their resources, solving public needs with college or university resources through non-formal, non-credit programs taught by Extension agents (USDA, 2012). As a Horticulture Extension Agent, my job is to educate members of the community about plants and their care. If the audience is residential, the topics are plants in their yard or inside their home. If the audience consists of commercial growers, the topics are growing plants for large-scale production.

With either audience, water is always a part of the discussion. Since 2007, I have had the opportunity to teach classes to both types of audiences. The residential audience clearly demonstrated a need to know when to water and how much to water, all while staying within the water restrictions established for their community. It became

clear to me that regulators were asking commercial growers to continually decrease the amount of water they used to produce plants and the growers would be monitored through each of their consumptive use permits granted by the water management district. Residential members of the community were being asked to reduce water use by their utilities provider, but according to their monthly bills, reductions were not occurring (Romero, O'Malley, & Dukes, 2010).

I wanted to explore the possibility of creating new methods to better reach residents on a level they understood, that would make it easier for them to reduce the amount of water they used in their yard, all the while maintaining a quality appearance. It was important to determine what barriers homeowners encountered; whether they lacked knowledge on proper use of the irrigation systems at their homes; whether they lacked knowledge about plants and the care they needed; and whether the demands of their homeowners association influenced their decisions. There were so many variables to consider that a qualitative research design enabled this researcher to ask questions face to face in focus groups, thus allowing for a deep discussion of the topic.

It is important to mention transferability at this time. According to Ary, (2006) transferability is the degree to which findings in a qualitative study can be generalized to other contexts or to other groups. In a quantitative study this is known as external validity. A qualitative researcher does not have the goal of generalizability. However, a qualitative researcher does have the responsibility to provide sufficient rich, detailed descriptions of the context so that potential users can make necessary comparisons and judgments about similarity and transferability.

Summary

This chapter described the research methods that were used to determine the perceptions of home owners with automated irrigation systems and community-based social marketing strategies to increase water conservation practices by these homeowners. The research design of this study was qualitative and used focus group methodology. Chapter 1 introduced the need to increase water conservation practices by homeowners who use potable water to maintain their lawns. Chapter 2 was a literature review that established the parameters of the study based on previous research. Chapter 3 discussed the research design, participants, data collection and analysis for the study. Chapter 4 will provide specific information on the results from the focus group sessions.

CHAPTER 4 RESULTS

Discussion

A major challenge for Orange County is to reduce the gallons of water that homeowners use to water their lawns. The purpose of this study was to examine the perceptions of homeowners in Orange County, Florida who have automated irrigation systems about their interest in Community Based Social Marketing. These variables could be employed in a persuasive education effort to reduce water used for lawn care. The purpose of the Orange County Utilities conservation program is to reduce water use from 160 gallons of water per person per day to 90 gallons. Additionally, Orange County falls within the Central Florida Coordination Area (CFCA). The CFCA action plan limits additional groundwater withdrawals to no more than that needed to meet year 2013 demands. New water permits will not go past 2013 unless supplemental water supplies are committed to meet demands after 2013 (CFCA 2010). Therefore, Orange County Utilities (2010) must focus on water conservation as the primary source of water for new residents. Determining what the barriers are for residents to conserve water is imperative in order to reduce the amount of water used per person per day and to be able to provide water for future growth in the community.

This chapter includes the demographic characteristics of study participants and analysis of the data. To conduct the study, a series of four focus groups of Orange county homeowners was utilized. A market research firm was used to recruit the focus group participants. The market research firm recruited participants from a list of residents provided by Orange County Utilities who had been classified as high water users, as discussed in Chapter Three.

During recruitment, a screener questionnaire was utilized to collect basic demographic data pertaining to gender, age, income, education and ethnicity, along with responses to a question confirming home ownership. The initial recruitment questions and callback script are in Appendix D. A total of four focus group sessions were conducted with a total of 32 participants. An overview of the barriers to water conservation is listed in Table 4-1. Individuals ranged in age from 25 – 79 and annual income ranged from less than \$20,000-30,000 to greater than \$75,000. All levels of education were represented, from high school/GED to graduate degrees. Each of the four focus groups was culturally diverse (see Table 4-2). In total, there were 20 different homeowners' associations represented in the sessions. See Table 4-3 for details. Focus group participants were identified by the specific group they were in and given a specific number for identification purposes (Table 4-4).

Description of Participants by Focus Group

In order to understand more about the participants and how they interacted within each focus group session, a brief description of the group as a whole is outlined below. All sessions were conducted in a large boardroom-style conference room at the same location in Orlando, Florida. Refreshments were provided to each group.

Focus Group One

The session for Focus Group One took place on April 24, 2013 at 5 pm. There were 10 participants in this group, 4 male and 6 female. Within this group 8 of the 10 lived in a community with an HOA.

The women in Group One had the following characteristics: One was a retired school teacher, Caucasian, in her 70's. She had lived in Florida for over 40 years and

was originally from Ohio. Another female participant was newly retired from the postal service, Caucasian, in her late 50's and had moved to Florida in 1963. A third female had been working as a counselor since 1976, was Caucasian, and in her late 40's. Female number 5 was a child care provider, Hispanic, in her mid to late 40's and had lived in Florida for 4 years. The sixth female had been a realtor but now liked to play golf. She is Caucasian, has lived in Florida 41 years, and was originally from Canada.

The male participants in Group One consisted of the following people: One was a civil engineer, Caucasian, in his mid-60's who moved to Florida in 1989. A second male participant claimed he was from the islands; a retired broadcaster in his late 60's who has lived in Florida for 4 years. The third male in this group was retired from the mining and manufacturing industry. He was in his late 70's, Caucasian and had been a member of an environmental committee for a professional association. The fourth male of this group was an assistant high school principal, in his early 30's, African American, born and raised in Florida.

Additionally, this group was well-educated; 8 of the 10 had a college degree. This group also had 5 members who made over \$75,000 a year. The group had 7 people in the age range of 47 - 68.

Focus Group Two

The Focus Group Two session took place on April 24, 2013 at 7:30 pm. There were 9 participants in Group Two, of whom 4 were male and 5 were female. Within this group, 8 out of 9 lived in a community with an HOA.

The women in this group consisted of the following: a computer programmer, Caucasian, in her 50's. She had lived in Florida for 10 years. Another female participant

was a Pampered Chef consultant and ex-military, Caucasian, in her mid-to-late 40's and has lived in Florida 13 years. A third female worked in the health care industry; Caucasian, in her 50's, and she had moved to Florida from Missouri in 1983. Female number 4 worked outside the home, was Hispanic, in her 50's and had lived in Florida for 30 years. She was originally from Nicaragua. The fifth female taught pre-school and had a vegan cupcake business. She is Caucasian and in her late 20's.

The male participants in Group Two were as follows: One was an Orange County HVAC technician, Hispanic, in his 30's who moved to Florida in 2008 from New York. A second male participant was a middle school teacher who worked part time at Disney's Animal Kingdom. He was Caucasian, in his 40's, originally from Houston and has lived in Florida for 14 years. The third male in this group was retired. He was in his late 60's, Hispanic. He has lived in Florida for 24 years and was originally from New York. The fourth male of this group was a high school teacher, in his 40's, African American, from Georgia, who has resided in Florida for 13 years.

Additionally, this group was well educated; 6 of the 9 had a college degree. This group also had 4 members within the income range of \$50,000 - \$75,000 a year and 3 whose income was over \$75,000. The age range was more evenly spread out in those who were between 26 and 65 years of age.

Focus Group Three

The Focus Group Three session took place on April 25, 2013 at 5:00 pm. There were 5 participants in this group, of whom 2 were male and 3 were female. Within this group, 3 out of 5 lived in a community with an HOA.

The women in this group consisted of the following: One was a United Nations retiree, Hispanic, in her 60's. She was originally from New York and had lived in Florida for 40 years. Another female participant was an unemployed ex-banker, of Pacific Islander descent and in her mid-40's. She moved to Florida from Pennsylvania 11 years ago. A third female was a retired banker; Caucasian, in her 60's who had moved to Florida from New York in 1979.

The male participants in Group Three consisted of a retail auto businessman currently unemployed, Hispanic, in his 60's, who had moved to Florida in 1999. A second male participant was previously employed in the pharmaceuticals industry for 20 years, Caucasian, in his late 40's, and had moved to Florida from Texas in 2008.

Additionally, this group only had 2 people with a college degree. The group also had 3 members in the income range of \$20,000 - \$30,000 a year. The ages that were represented were 2 in the mid – late 40's and 3 in the early –mid 60's.

Focus Group Four

This session took place on April 25, 2013 at 7:30 pm. There were 8 participants in this group of which 4 were male and 4 were female. Within this group 6 of 8 lived in a community with an HOA.

The women in this group consisted of these four people: One was a CFO for a laser institute, African American, in her 50's. She has lived in Florida for 24 years. Another female participant was a nurse, Caucasian, in her mid to late 40's who has lived in Florida 30 years. A third female was the director of family education at a large church; Caucasian in her late 40's to early 50's and has lived in Florida for 27 years.

Female number 4 was a middle school math teacher and has lived in Florida for 33 years.

The male participants in Group Four were composed of the following: One was an aerospace engineer, Hispanic, in his late 20's who has lived in Florida for 10 years. A second male participant was a software engineer, Caucasian, in his early 30's, born and raised in Orlando. The third male in this group was self-employed and owned a remodeling and home repairs business. He was Caucasian, and has lived in Florida for 28 years. The fourth male of this group was currently bussing tables, Caucasian, in his late 20's – early 30's and had lived in Florida for 13 years.

Additionally, this group was well-educated; 5 of the 9 had a college degree. The members of this group elected not to disclose their income. This group had the largest number of participants in the 25-36 years of age category and the least number of participants in the 58-79 years of age category.

It is important to note that characteristic differences existed among the individuals within the focus groups. The age group represented within Focus Group Three was notably older. Therefore, the researcher expected the responses to be more geared toward financial savings. However, upon comparison with the other three focus groups it was determined that their responses were no different.

The results of the study were analyzed according to the four research objectives (RO):

1. determine the barriers to increasing water conservation practices by homeowners who have automated irrigation systems within Orange County, Florida
2. determine the norms of water use and how they influence water conservation behavior change

3. determine what motivates homeowners to conserve water when using their automated irrigation system to water the lawn
4. identify the prompts or other communication methods that the target audience determines as helpful to increase their conservation behavior

Themes were developed based on Glaser's constant comparative method (Glaser, 1969), using MAXQDA, a qualitative analysis software, for assistance in data analysis.

The findings are further subdivided within each RO into themes and sub-themes.

RO 1: Determine the Barriers to Increasing Water Conservation Practices by Homeowners Who Have Automated Irrigation Systems within Orange County, Florida.

To address RO #1, the participants were asked to introduce themselves, to give their name, their career, where they were from, and how long they had lived in Orange County. Then they were asked to describe what kind of yard they had. Major themes that emerged were lack of knowledge about proper lawn care, confusion over how many days residents were allowed to water per week, inability to use the irrigation timer correctly, and pressure from the (Homeowner's Association) HOA to water the grass so the lawn would be perfect or face the consequences of being notified by a bright colored paper on the front door or a flag in the front yard, or worse—being fined.

One of the major themes to emerge from the focus groups was a lack of knowledge on how to care for the grass. Many of the comments inferred that watering the grass kept it green, kept weeds out of the yard and kept insects away. The following three comments were from participants who believed that watering was the best method of ensuring a healthy lawn and controlling weeds and bugs:

My sprinkler system comes on every other morning, like five in the morning...that way nobody with Code Enforcement is riding around...you know? (*Laughter*). Every other day, mine comes on for about fifteen minutes, maybe twelve. I think it is twelve per zone, three zones on my front lawn. My grass is green and there are no weeds in there. I don't

have any weeds in there, it's St. Augustine (Focus Group 1, Participant 10).

You have to water to keep your St. Augustine green (Focus Group 2, Participant 5).

I think it is cheaper in the long run to pay for water; personally, than when you don't water. You get the brown spots and then the bugs come and then it's going to cost you more in the end to re-sod your lawn than to pay for water. I know that, for me, I'll pay the extra fifteen bucks on the water bill or an extra twenty bucks in the summer...it is going to be higher in the summer, of course, just to not have to replace my yard because I didn't water it enough and now the bugs have it (Focus Group 1, Participant 3).

During these interviews, a sub-theme emerged, one of frustration with lawn care maintenance, which was vented by blaming the difficulty of care on the variety of the grass. The majority of participants had St. Augustine grass in their yards. One participant said:

We have had a lot of trouble with our St. Augustine grass. I mean, my husband has had to re-sod a few times. So, we attributed it to the sandy soil. Now we have stepped up the watering a little bit, but of course...I think it is twice a week or three times a week that it is set to go on. So, we have had a little problem with it. Actually, it is a big problem because it is very expensive when you have to re-sod (Focus Group 1, Participant 5).

An interviewee who was originally from Georgia said, "I tried St Augustine here and man...it takes a lot of work" (Focus Group 2, Participant 3).

Another participant stated:

I was actually shocked, but last week my husband asked me if we wanted to look into Astroturf for the yard. (*Laughter.*) I thought he was kidding, I really thought he was kidding, and we were at Sears this weekend and they sell it in Sears. And when I saw it, I was shocked" (Focus Group 2, Participant 7).

The major theme and sub-themes of these comments demonstrate the role of self-efficacy, the belief that an individual has about the ability or capacity to carry out a behavior, in this case to successfully care for their lawn.

Another barrier that emerged was confusion over how many days a week lawn watering was allowed. The water management district restrictions allow watering twice a week during Eastern Standard Time and once a week during Daylight Savings Time. However, many participants were not sure of the current allowance.

One participant said, “I don’t...now you can only water...now they changed the dates that you can water only...” (Focus Group 3, Participant 1). Another participant said, “It is depending on your address, so sometimes I forget. And then you get a little flag at your door, from the HOA” (Focus Group 1, Participant 2). And a third participant stated, “I don’t know when I am restricted. I just do it” (Focus Group 1, Participant 3).

Another sub-theme that emerged was confusion over what water sources are affected by the restrictions. Currently, water restrictions apply to private wells and pumps, ground or surface water and water from public and private utilities. However, the water management district’s restrictions allow the use of reclaimed water anytime. But local governments are allowed to restrict the use of reclaimed water for their customers. As one participant stated:

There is a case in my neighborhood where the neighbors have done their own wells in contravention of the homeowner’s association rules. Well, they claim that it is for irrigation only and they stop paying for water from the public supply. But the homeowner’s association doesn’t like that (Focus Group 1, Participant 4).

Another interviewee said, “Does that apply with a reclaimed water system?” (Focus Group 2, Participant 4). “I would think it doesn’t for reclaimed water.” This same participant interjected, “It’s like my father-in-law. As I say, he had a well and so his grass looked excellent. But he’d run that water like that well was never going to end. To him it wasn’t” (Focus Group 2, Participant 6).

Another barrier to water conservation that emerged during discussions with focus group participants, and one that resulted in a lively discussion in each session, was the inability to use the irrigation timer properly. Understanding how to use the timer properly is imperative to making sure the irrigation system runs only on the allowed days of the restrictions, as well as the correct time of day and length of zone time needed to deliver the recommended amount of water for proper grass care. Not only does this example add to the self-efficacy challenges, it also highlights one of the factors from CBSM, which is that the desired behavior has to be convenient and easy.

One participant said,

We have a sprinkler system. But whenever the energy goes off, well forget it and you have to reset that. And to be honest, I never know how to do it. It is very difficult, the one we have, I don't know why. It is very difficult to reset. Like her, we would have to call somebody to help with that. Even the instructions, you try to follow...it is so difficult. You have to push those little pins and those horrible things. Believe me, you waste like a half hour trying to reset that thing (Focus Group 2, Participant 5).

Another participant commented,

Neither my husband or I...we can't because it is very difficult. Very difficult. There are these little pins, there are little things. You have instructions that you try to follow and neither he nor I...we have to hire somebody to do it for us because it is so difficult (Focus Group 2, Participant 1).

This participant stated

It is just that oftentimes he, my husband, would think that he had it set for this day or this time and it didn't go on. "I thought I turned that on and the water didn't come on." Or, "I thought I turned it off and it is coming on now." Just general frustration level. Then the notice comes from the HOA (Focus Group 1, Participant 7).

One respondent commented,

Mine was set by the sprinkler man when he came and fixed whatever he fixed a couple of years ago. And whatever he says, I mean, I am not 'techy.' I left it alone (Focus Group 2, Participant 6).

When I get the notice, I have a guy that comes and adjusts my sprinklers and I check my sprinklers every two weeks... I have a guy that comes out and actually checks the sprinklers for me (Focus Group 4, Participant 7).

A sub-theme emerged pertaining to irrigation systems. The participants could tell how long the zones ran but could not tell how much water was delivered at the end of the run time. This information is necessary because proper grass care only requires that a half inch to three quarters of an inch of water be applied to ensure the grass remains hydrated (Trenholm, Unruh & Cisar, 2001). Watering too little means that roots will not grow deep enough and those close to the surface are more likely to dry out in the event of a drought (Trenholm et al., 2001).

In response to questions about how long they run their sprinklers, and what their zones were, participants had different answers, which seemed to indicate a lack of understanding. One respondent said, "Every other day, mine comes on for about fifteen minutes, maybe twelve. I think it is twelve per zone" (Focus Group 1, Participant 9). Another said, "Mine is on a sprinkler system two days a week for thirty minutes, three zones" (Focus Group 2, Participant 3). And another said, "Mine's automatic sprinklers; it's set for Sunday and Thursday. The grass, I think, I have set for forty minutes and the little sprayers on the bushes run about fifteen minutes" (Focus Group 4, Participant 5).

Residents who lived in a community with an HOA felt pressure from the HOA to have perfect grass. They felt that the HOA harassed them. Lively and intense discussions occurred in each of the sessions centered on the HOA's mode of operations. After introductions by the moderator, the HOA was discussed by the participants while answering the first question the moderator presented. The group was asked to describe the kind of yard they had. One respondent said, "Some of us don't have a choice. We have got by-laws; thou shalt have St. Augustine" (*laughter*) (Focus

Group 2 Participant 5). Another said, “I think the HOA has a standard for what we have...are allowed to do, but we go by what they...what they tell us, otherwise we get a letter in the mail”. (*Laughter*) (Focus Group 4, Participant 2). And another said, “Have the legislature or somebody tell these homeowner associations that they can’t demand St. Augustine grass anymore. (*Agreement heard*) (Focus Group 1, Participant 1).

The moderator presented the following question, “If you found out that your homeowner’s association got together and decided to cut your total water use in half, how would that make you feel?” Below is a sample of representative responses over the four focus group sessions.

One participant said, “I would be concerned about using less water, yes. Because if the lawn goes, then the homeowner’s gives you a ticket” (Focus Group 1, Participant 5). Another participant asked, “Can you do anything about the homeowner’s association?” (Focus Group 1, Participant 3) which produced laughter from the other participants. When one participant mentioned that their spouse considered changing from grass to AstroTurf, another interjected, “Better check the association and see if they will let you use AstroTurf” (Focus Group 2, Participant 1). Another participant added, “Some of us don’t have a choice. We have got by-laws; thou shalt have St. Augustine” (Focus Group 2, Participant 5). This produced more laughter. Another participant said, “One time our sprinkler broke and that area was just yellow and we got a letter from the association, “Your grass is not green, you have to take care of that or there will be a fine” (Focus Group 1, Participant 5).

Participant 1 in Focus Group 2 added, “If I cut back on the water then I would get a letter from the homeowner’s association for having dead grass.” And participant 3 in

Focus Group 2 agreed, adding, “We will get a fine. If my grass is not green...I told you I have to go and buy sod because...it was yellow.”

Not only do these responses support the fact that the HOA is a barrier to the homeowners’ ability to change their watering practices but they also support CBSM strategies. Granted, one of the first principles of CBSM is to determine the barriers to change in order to create a program that eliminates these barriers. It also stresses that the success of a CBSM approach comes from behavior change that is carried out at the community level and involved direct contact with people. The homeowners are not involved with the decisions about what type of grass to have or how to best take care of it in order to conserve water. The homeowners have been mandated by the HOA on what type of grass to have and how it is to be maintained. According to the theory of diffusion of innovations, communication within a social system is important to the adoption of an innovation – in this case, a new watering practice.



The figure is a table titled "Summary of Barriers" with a teal header. To the left of the table is a teal vertical bar with the word "Barriers" in white. The table has two columns: "Major themes" and "Sub-themes".

	Major themes	Sub-themes
Barriers	Pressure from HOA for perfect grass	Frustration with difficulty of lawn maintenance
	Lack of knowledge about proper grass care	Unaware of amount of water delivered by irrigation system
	Confusion over what day to water (restrictions)	
	Confusion over what water resources are restricted	
	Inability to set the irrigation timer	

Figure 4-1. Provides a summary of focus group responses about barriers.

The two social systems represented by the HOA board and the residents do not communicate with each other and communication among the residents is limited for fear that allegiance to the HOA may be perceived.

RO 2: Determine the Norms of Water Use and How They Influence Water Conservation Behavior Change. To address RO #2, the participants were asked to describe how they watered their yard and what water conservation practices they currently performed. Then they were asked to describe what they considered wasteful watering practices. The groups were asked to describe what they would be willing to do to reduce their water use and what concerns they would have about their lawns if they used less water. Finally they were asked if they had neighbors who were trying to conserve water. The major theme that emerged was that the norm is to abide by the restrictions and water twice a week when the restrictions allow twice a week, and once a week when the restrictions change to only once a week.

One participant said, "I abide by the county rules" (Focus Group 1, Participant 1). Another said, "Well, I think we spoke about watering at night, which obviously is better than watering in the daytime" (Focus Group 1, Participant 3).

Another participant stated:

I just try to adhere to the policies. Like sometimes if they say, okay, only water once a week or something like that. So, I just try to adhere to the policies that they have for water conservation (Focus Group 2, Participant 4).

A participant in that same group added:

Ours is on the sprinkler system, twice in the summer, once in the winter. It starts in the front and goes around to the back. I think it's fifteen minutes, but whatever the time is, my husband sets the timer. It does it, so we don't water the lawn ourselves; we depend on the system to do it. (Focus Group 2, Participant 2).

A sub-theme that emerged concerned their conservation practices. The participants believe they are practicing conservation by only watering on the days they are allowed by the restrictions. As one participant explained, “I have a, you know, programmed system that just goes on once a week on Sundays, which is what we are allowed to do.” (Focus Group 1, Participant 6). Another participant said:

I keep it to the Sunday, and I thought we were down to the once a week at this time of year. And I try to keep it within the times, too. Because if you are watering in the heat of the day, you are wasting a lot of it. (*Agreement heard.*) So, yeah, I am green. I am afraid to break the rules, I don't know. Maybe it is just the schoolteacher in me. I remember some neighbors saying that one time they had done it on the wrong day or something and they got some sort of a warning on their door. I don't want to be warned, I've got enough problems (Focus Group 1, Participant 8).

Participant 1 in Focus Group 2 explained, “So we water on the right days. So we follow the right amount of water that we are supposed to use.”

The input from this section of questions provides insight in relation to the Theory of Planned Behavior and the variable of a perceived subjective norm. A norm describes what is normal, or what people actually do in their day-to-day behavior. The responses contribute to the Community Based Social Marketing strategy.

When participants were asked to describe what they thought were wasteful watering practices, the major themes included watering while it is raining, irrigation heads watering the sidewalks or roads, broken sprinkler heads, and the system running in the middle of the day. These responses confirm that the participants know what practices contribute to wasting water. One participant said, “When you see it raining hard and the median and stuff...they have to have sprinklers on it” (Focus Group 1, Participant 3). Another participant added:

That they are...they get twisted or are facing the wrong way and then they are... The thing that has been happening in my neighborhood, the

sprinklers are on during the day, even at noon. Besides that, only maybe a neighbor is working every day, seven days a week (Focus Group 1, Participant 4).

Another participant pointed out a number of ongoing problems: “I see broken sprinklers, and as you said, watering the sidewalk...facing the wrong direction – that don’t get fixed” (Focus Group 4, Participant 2).

When they were asked to describe their feelings about observing water being wasted the participants said the sight of water being wasted made them feel angry, frustrated, confused and worried. One participant said, “Yeah, angry because we are told not to run it. (*Agreement heard.*) And then it is just running down in the street” (Focus Group 1, Participant 1).

But another participant stated, “Well, indifferent. I wouldn’t say it makes me angry, but I am just...when I see it raining and the sprinklers are on, it just kind of makes me scratch my head and wonder” (Focus Group 2, Participant 4). And a respondent in Focus Group 4 said:

I just get the feeling that it is unfair because...like somebody else said, the homeowner’s association will send you this mean little letter about...either you haven’t watered your grass enough or you watered too much and then here is some nut watering his grass every day. How come they haven’t sent him a letter? (Focus Group 4, Participant 7).

Another participant said:

I think we all realize it, you know? We have to conserve all kinds of things, but water most importantly. Because the population keeps exploding and I guess the Florida aquifer has got a limit to it. (Focus Group 1, Participant 3).

The responses to the set of questions provided input related to the Theory of Planned Behavior, in particular to the variable of attitude toward the targeted behavior. The data represented here indicates a positive attitude toward increasing water

conservation practices by reducing the amount of water used. Continuing in that thought process, the next set of questions sought input on what the target audience was willing to do to actually save more water.

The first question they were asked was, "If you had a goal to cut your outdoor water use substantially, in half, what do you think you would have to do?" One participant said, "No turf, but some kind of low ground cover that was green, but it was very...it was able to take a lot of dry." (Focus Group 4, Participant 4). Another participant said, "You could go drastic and put more rocks out instead of having a lot of grass" (Focus Group 4, Participant 2). In the same focus group, Focus Group 3, participant 4 added, "Pave it and paint your lawn green." Another participant said, "Get artificial turf." The same participant said, "Use Bahia grass" (Focus Group 3, Participant 1).

In response to similar suggestions from participants, other members in the groups had the following thoughts. One participant said:

Take some of the plants out. Or get plants like cactus, or get plants that don't require so much water. You would have to kind of alter the landscaping to make it environmentally friendly. We have thought about that, but we haven't done it (Focus Group 2, Participant 1).

Another participant interjected:

I would have to say, for me, it would kind of make me very unhappy to take all my flowers...we have lots of butterflies and lots of birds. You know, I was thinking about my sprinkler system while you were talking about it. I actually put mine on at 7:30, 8:00 and 8:30 because that is when the little birds in the neighborhood wake up and I have little trays, little saucers of planters out and they take baths. And we just enjoy the flora and the fauna at my house. And I would be very hard pressed... So, I would not be happy with it if I had to do it, let me say that. If I had to change my entire...and go to cactus and this and that, it just wouldn't work for me (Focus Group 2, Participant 3).

Another participant, in Focus Group 3, said:

You know, probably the majority of the waste water is with people with automatic systems or automatic systems, regardless of where they're installed. They're coming on, they're coming off. They're not regulated like they should be or watched like they should be. And so I mean, I imagine that's the majority of the waste water in the state of Florida, you know. Maybe that's a good place to start (Participant 5).

Participants in all sessions were asked whether they would be interested in cutting their water use by learning to use the timer. The responses were varied. One participant said:

Um, I work. I am trying to make my life easy, not spend more time on chores. That would be something...to be honest, even if I wanted to, I cannot possibly do it. And one of my biggest frustrations is that friggig timer (Focus Group 2, Participant 1).

Another participant in that same group stated:

More conservation. I mean, we are trying to be green across the board. (*Agreement heard.*) If there is basic fundamental things that are easy to do, I think that the public is willing to do it, they just need to be educated on what to do" (Focus Group 2, Participant 2).

Another respondent said:

I guess because we have a timer on the system, I think that I am doing the smart thing already. I think it is set to be the most economical that there is, but maybe it isn't (Focus Group 2, Participant 5).

One participant said, "Especially, I still have kids, you know, that are young. And I work, so my husband and I don't have the time to spend on the timer" (Focus Group 2, Participant 1). Another stated, "Not at the cost of the lawn" (Focus Group 4, Participant 1).

These responses indicate an interest in learning to use the timer more efficiently. However, the participants do not want it to take up too much of their time or take a chance that the lawn would have to be replaced. There is an interest in conserving more

but there is also confusion because participants already have a timer and think they know how to use it properly.

The next question asked if the participants would have any concerns about their lawn if they tried to cut their outdoor water use in half. Here is a representative sample of their responses. One homeowner said, “If you live with a homeowner’s association, you would be very concerned” (Focus Group 4, Participant 1). Another participant (Focus Group 2, Participant 1) echoed this response by saying, he knew “that it (the grass) would die. And I would get a letter from the homeowner’s association for having dead grass” This participant also stated:

Again, the cost. I would be more concerned about the cost if it weren’t effective. If I lost it in trying to learn the process or it got too brown. I mean, it is not just the cost, but the time and the effort to make it green again” (Focus Group 4, Participant 3).

Another participant said:

I think it is cheaper in the long run to pay for water, personally, than when you don’t water you get the brown spots and then the bugs come and then it’s going to cost you more in the end to re-sod your lawn than to pay for water (Focus Group 1, Participant 3).

The four quotes used to illustrate concerns participants had about their lawn if they tried to cut their water use in half represented a large portion of the responses in each of the focus group sessions.

The responses in the section pertaining to norms also support the fact that human behavior does exist in a social situation, and is often driven by how one believes their behaviors would be perceived by others. McKenzie-Mohr et al., (1995) found individuals consider pro-environmental choices based on watching the pro-environmental behavior of others. Riess, Kalle, & Tedeschi, (1981) remind us that people also tend to make choices that will project a positive image of themselves.

Understanding the manner in which different pro-environmental behaviors are perceived may help design strategies to increase conservation practices overall.

RO 3: Determine What Motivates Homeowners to Conserve Water When Using Their Automated Irrigation System to Water the Lawn. To address RO #3, the participants were asked what would motivate them to cut their outdoor watering use in half. Below are some of their responses.

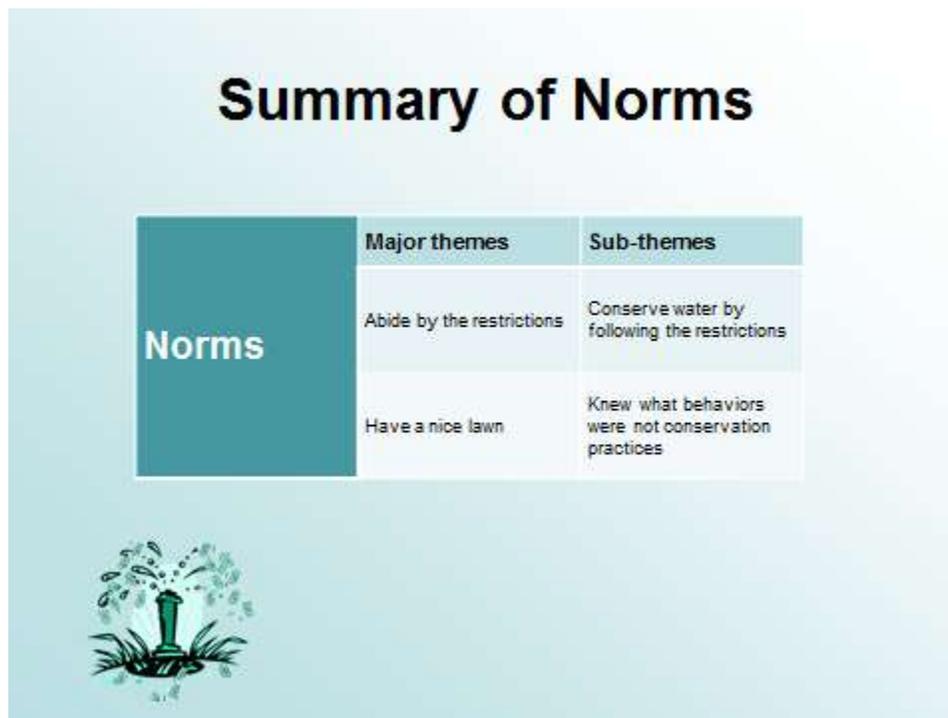


Figure 4-2. Summary of focus group responses about norms

One person said, "Sure, money." Another participant stated, "I can tell you right now, the financial incentive" (Focus Group 4, Participant 1). A participant added:

The aquifer. Especially with all the sink holes that are happening in Florida lately. (*Agreement heard.*) I mean, environmentally I have concerns. Anything that I can do that would help the landscape and the aquifer and stop the sinkholes, absolutely. (Focus Group 2, Participant 2).

Another participant interjected,

I totally agree with that (the sinkholes), I am afraid...it sounds like all of us are kind of on the same page, but I think the average person, if they can't see it...it is kind of like *Horton Hears a Who*, if I can't see it, it is not there. I think a lot of people, I can tell my students until I am blue in the face that there are aquifers underneath them and that their water comes from below them in a cave below them, but they don't believe it if they don't see it (Focus Group 2, Participant 1).

Participant 4 in Focus Group 3 said:

Well, I'm originally from northern Indiana and up there, there was no water problem when I was growing up. But once I got down here, it didn't take me long to realize that, you know, that water is pretty precious down here. Especially since it does dry up so fast and once the water's being taken out of the ground, well then you got your sinkholes, and so on and so forth. So just simple thoughts of, you know, just not over-usage.

In summary, the responses were concerned with financial motivation, the aquifer, the environment, and fear of sinkholes.

The next question asked participants if any of their neighbors were conserving water and how their yards looked. Interestingly, the participants said they had neighbors who were conserving water and that their yards were acceptable but just not as green.

Here are some of their responses. One participant said:

I would say, all in all in my area, the lawns are not as green as they used to be...let's say five years ago or so. But, it is not bad. It is not...years ago they used to be more...well, I guess before they started to conserve some water and then it used to be more green then. But it is not bad (Focus Group 1, Participant 2).

Another participant stated:

All the lawns around us pretty much look fine. I mean, it is obviously not trying to...they are not trying to win the lawn of the month award or anything like that. But they are well manicured and they keep up with it. It is just obvious that they are conserving water, like we are, for the most part" (Focus Group 2, Participant 6).

A participant in Focus Group 4 asked, "Does water conservation equate to not as nice grass? I mean, is that connected?" (Focus Group 4, Participant 4).

The next question asked participants how they would feel about their HOA coming up with a program that would cut their water use in half. Each session consisted of a lively conversation about this topic. The major theme that resulted was about the HOA imposing more rules on the residents. Here are some responses that represent participants' views:

One participant stated, "As long as they didn't try to enforce the length of the grass in front of your house, I guess. You can't have both" (Focus Group 1, Participant 4).

Another participant asked, "How can they control how much water you use?" (Focus Group 3, Participant 3). Participant stated, "The likelihood of getting a homeowner's association to agree to that...yeah, good luck. I don't think they would do it unless they were forced into it" (Focus Group 2, Participant 6). Another participant explained:

What is happening in my neighborhood is that they know to keep the value of the house they want the lawn to look good, the house to... I just had to spend money on doing the roof because they complained that the houses need to be pressure cleaned and the roofs. And the reason is to keep the value of the property. Which has worked. It hasn't gone down even during this bad market. And that means that the lawn has to look good. So I find that even if it would be beneficial, the association's concern is that the neighborhood will keep up the value of the property. And they have to do that in order to...I don't know about if my neighborhood would go for it, honestly (Focus Group 2, Participant 7).

Another respondent added:

It is hard for me to fathom because you have these...these rules just don't...by homeowner's associations...just don't come out of the blue. These are guidelines through the state. I mean, they have to file... (*Crosstalk.*) You are talking about rewriting all the covenants. That is not a small task (Focus Group 2, Participant 1).

A sub-theme emerged on what the HOA would have to consider in order for this program to be successful. A participant in Focus Group 4 suggested, “Great, if they relaxed standards on grass lengths or plants” (Focus Group 4, Participant 2).

Another participant said:

I just think, from my standpoint, they would have to kind of prove to me that my house and lawn and everything are going to pretty much look still the same. I think something of that nature...there is a lot of ridiculous rules that homeowner’s associations enforce. But I think that something like that is, overall, beneficial to everyone in the long run. So, I don’t think that is something that would really bother me at all. I would, you know, especially since it is affecting everyone equally, I would be totally on board with it (Focus Group 2, Participant 4).

A homeowner in that same focus group added:

I was thinking more of people just agreeing, too. You know what I mean? Like a group of ten people saying, “Okay, well we are going to cut our water in half.” They could agree on some kind of thing better than...I wasn’t really talking about somebody saying, “You are gonna do this. This is the law in our neighborhood now”. (*Laughter.*) More like an agreement, I guess (Focus Group 2, Participant 3).



Figure 4-3. Summary of focus group responses on motivations

In summary it was clear that the HOA was not the vehicle to use to get the message of increased water conservation practices to the residents. It was also insightful for the residents to suggest possible ideas that the HOA could initiate in order for water conservation programs to be successful. This section added to the information needed to support a community-based social marketing campaign. The residents are willing to try to conserve water, but the requirements of the HOA remain a large barrier to their ability to try to reduce water use. The responses to this set of questions also demonstrated that their attitude was positive about increasing water conservation behavior in that they realized the need to lessen the demand on the aquifer, they understood there were potential environmental concerns, and that in the end, they could save money.

RO 4: Identify the prompts or Other Communication Methods that the Target Audience Determines as Helpful to Increase Their Conservation Behavior. To address RO #4, the participants were asked what type of communications would help them remember to conserve water. Here are some of their responses. One participant said:

I like when the newspaper tells you and gives you the rules and they say it is this time of year and this is what you are supposed to do. Sometimes they even send you a postcard in the mail and you put it on your refrigerator (Focus Group 1, Participant 1).

Another participant added, “Something comes out with your water bill saying...with information every month” (Focus Group 3, Participant 3). And in Focus Group 4, participant 4 made reference to a similar mailed information system:

Just the card that I received in the mail and I just put that over the gauges on the water system and it reminds me when it turns to one day and when it goes to two days and I guess if I had a nice little sticker to put there, that would help as well when the card gets wet.

In another focus group, a respondent said:

I like the commercial that came out a few years ago...I don't remember...it was a swimmer and he dives into the front lawn and swims around. I don't know who put that out. (*Crosstalk and agreement.*) That was just brilliant, simple, clear marketing. It is just saying, "It is your responsibility as a citizen to not make your yard a swimming pool" (Focus Group 2, Participant 4).

A participant in the same group commented:

You see, so no one really, really thinks about it. And I think it needs that, maybe, personal touch...like me going to my neighbors, now understanding water conservation and the importance of it. And maybe just talking to them. And I think they would really be receptive to the fact of water conservation (Focus Group 2, Participant 8).

The participant added:

Yeah, I was going to simply say awareness. You know, since I have been at this, I am more aware of water conservation. And I would have to say that when I saw my neighbors sprinkling during the rain, the concept of water conservation never did come to me. And I am just wondering how many in here really thought about water conservation before tonight. Anyone? (Focus Group 2, Participant 8).

A participant in Focus Group 4 suggested:

Or if you are going to go through the community, spotlight a family that already practices conservation and they talk about the benefits for their family and the benefits for the planet, and you know... (Focus Group 4, Participant 4).

A sub-theme that emerged in this section concerned possible incentives that would increase water conservation practices. The responses were well thought out and sincere. Here's what some of the participants had to say. One participant said:

Well, I would think that the water company should send out notices to people reminding them that they should have rain sensors and advise them where to get them and maybe they could work up a deal with Home Depot. Like E-PASS has a thing, I think, with Lowe's, you get a free battery. Maybe they could work out something with Lowe's and Home Depot to provide those things at a discount (Focus Group 1, Participant 6).

Another participant in the same focus group suggested, "Coupons to get a rain sensor" (Focus Group 1, Participant 7). And still another said, said, "I mean, it's simple

enough, but not for every homeowner. But why couldn't the water company go around and put one on every house?" (Focus Group 1, Participant 8).

"The incentive is to make this convenient so everyone wants to do it," suggested another respondent (Focus Group 4, Participant 3). A participant in that same group added, "What about a conservation credit on your bill?" (Focus Group 4, Participant 7).

By the end of each session there were some comments that showed great insight and understanding about the need to reduce water use and the need to concentrate on increased water conservation practices. The following responses illustrate this concept.

One participant said:

Yeah, and it is so that...it is for electric conservation or conservation of electricity and they are not picking on one person, you know, but in order to size an electric generating plant so that it satisfies everybody, then everybody has got to contribute by only using so much. Well, I am just going to kind of go forward to the water consumption business and if we don't get a handle on conserving water, we are not going to have water to drink, let alone water our grass. (*Agreement heard*) And I can see the day when electric meters are put in out at the street on your water line and you are going to be given five thousand gallons of water a month. And if you exceed that, you don't get any more, it shuts the meter off (Focus Group 1, Participant 6).

Another participant made an important point by saying:

But I think for people that are either building new or needing to rehabilitate their landscaping, they should consider the Florida native species or drought tolerant species of shrubs and flowers and grass and everything else; they require less water. So, picking the right kind of landscape material would be a big conservation tool (Focus Group 1, Participant 8).

Participant 4 in Focus Group 1 interjected:

I don't know if you are going to get to this subject later on or not, but a lot of the newer developments and even some of the older ones...the county and the city utility companies have been through and put in these new purple pipes that are the recycled or reclaimed water, somebody has

forced us to conserve water by using it a second time. And that is a good thing.

Another participant suggested a need to:

Change people's minds. You know they think that resources are limitless, that we have water forever, that we have oil forever that we have all these things and they are just never going to end. And you have to educate people to know that these things are finite, that we live on a circular planet. So, whatever it takes, like you said...TV, emails, flyers, whatever it is (Focus Group 2, Participant 4).

And in Focus Group 1, a participant summed it up by saying:

Yeah, so pretty soon, one of these days if things keep going and water becomes scarcer and scarcer because we haven't been doing a good job of conserving it, we will be faced with a choice and the choice is going to be...I am going to drink my water instead of giving it to my lawn (Focus Group 1, Participant 6).

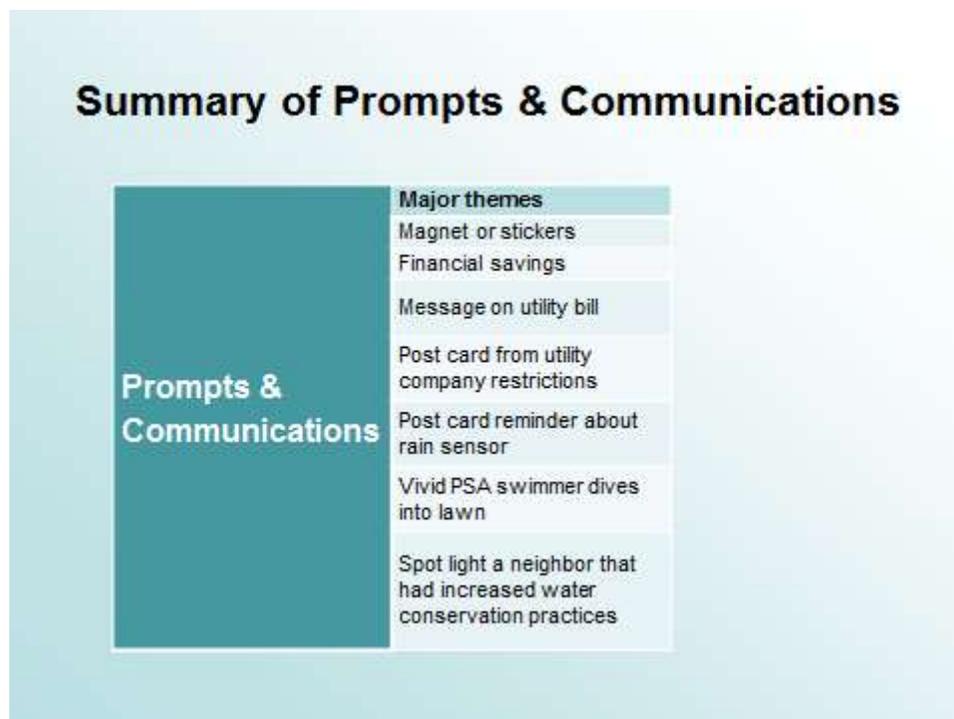


Figure 4-4. Summary of focus group responses on prompts & communications

In summary, the responses to what prompts and communications would be helpful to the participants supported the CBSM strategies for the use of prompts and

persuasive communications. CBSM uses prompts to help people remember to act sustainably. A prompt is a visual or auditory aid which serves as a reminder to carry out an activity that might otherwise be forgotten. The participants responses reinforced that the prompts were helpful and needed to be placed either where the activity took place or where it would conveniently remind them to engage in the desired behavior. The responses pertaining to communications supported the CBSM emphasis for the need to employ persuasive messages and vivid attention-getting approaches that were pertinent and relative to their everyday life.

Summary of Findings

Overall, findings from analysis of focus group data found that there were some barriers for participants when it came to increasing their water conservation practices. The barriers included a lack of knowledge about proper lawn care, confusion over how many days residents were allowed to water per week, inability to use the irrigation timer properly and pressure from the HOA to water the grass so the lawn would be perfect. Participants indicated that the norm is to abide by the restrictions and water twice a week when the restrictions allow twice a week and once a week when the restrictions change to only once a week. The responses also indicated that following the water restrictions was their means of conservation.

The responses also showed they were willing and open to increasing their conservation practices just as long as it didn't result in a notification or fine from their HOA. They were accepting of their neighbors who were trying to conserve water and understood that their grass might not look as good as it had in previous years.

The responses also demonstrated that if a water reduction program was to be presented to them, it would not be well received if it came from the HOA. This was due

to the perception that the HOA already had too many rules required for residents, coupled with the fact that less water was seen as a contradiction to what the HOA required, a “perfect lawn.” The participants felt pressured by the HOA’s.

They expressed a need to step up awareness to the general population that water was a finite resource. However, the participants also felt that unless the legislature stepped in to tell the HOAs to decrease their demands, they could not fully participate in a program that reduced their outdoor water use.

Table (4-4) illustrates the findings from this study about water conservation practices and how they fit within a CBSM strategy. It provides a summary of the perceived barriers and norms. It also highlights motivations and the prompts and communications preferred by participants.

Table 4-1. Demographic characteristics of participants for outdoor water conservation focus groups.

	Group 1	Group 2	Group 3	Group 4
Gender				
Male	4	4	2	4
Female	6	5	3	4
Age				
25-35	1	1	0	3
36-46	0	2	0	0
47-57	3	4	2	4
58-68	4	0	3	1
69-79	2	2	0	0
Income				
Less than \$20,000	1	1	3	0
\$20,000-30,000	2	1	1	0
\$30,000-50,000	2	4	0	0
\$50,001-75,000	5	3	1	0
> \$75,000				
Education level				
High School/GED	1	2	1	1
Some College	1	1	2	2
College Degree	5	4	2	4
Grad/ Professional Degree	3	2	0	1
Ethnicity				
Black/African-American	2	1	0	1
White	5	5	3	6
Asian/Pacific Islander		1	1	
Hispanic	1	2	1	1
Other	2	0	0	0

Table 4-2. Home Owners Associations (HOA's) represented in the focus groups.

HOA's	Group 1	Group 2	Group 3	Group 4
Avalon Park Property Owners Association, Inc.	2	1	1	
Beacon Park Phase 1		1		
Bella Notte		1		
Bonneville Pines		1		
Brighton Woods	1			
Crossroads		1		
Eastwood Community	1			
Gatlin Heights Community		1		
Huckleberry Fields				2
Hunters Creek Community	1			
Lake Sheen Reserve			1	
Lakewood Forest				1
Moss Park Landings	1			
North Shore at Lake Hart		1		
Parkview Pointe	1			
Roberta Place	1			
Surrey Ridge Community		1		
University Acres				1
Waterford Chase East				1
Willow Wood				1

Table 4-3. Focus group participants in Orlando, Florida (P)

Focus Groups (F)	Date & Time	P	P	P	P	P	P	P	P	P	P
Focus Group 1	April 24, 2013, 5 pm	1	2	3	4	5	6	7	8	9	10
Focus Group 2	April 24, 2013, 7:30 pm	1	2	3	4	5	6	7	8	9	
Focus Group 3	April 25,2013, 5 pm	1	2	3	4	5					
Focus Group 4	April 25,2013, 7:30 pm	1	2	3	4	5	6	7	8		

Table 4-4. Summary of responses incorporated into CBSM

Barriers	Norms	Motivation	Prompts & Communication
Pressure from HOA's to have perfect grass	Abide by the restrictions	Financial savings	Magnet/sticker/postcard reminder
Lack of knowledge about proper lawn care	Have a nice lawn	Lessen demand on aquifer	Message on utility bill
Inability to use irrigation timer/system efficiently	Conservation practices were to follow the restrictions	Environmental concerns	Vivid TV PSA swimmer dives into over watered lawn
Confusion about water restrictions	Knew what was not acceptable conservation practices	Rebate to install rain sensor or inspect currently owned sensor	Spot light a neighbor that has increased water conservation behavior

CHAPTER 5 CONCLUSION

The purpose of this study was to examine the perceptions of homeowners with automated irrigation systems about Community Based Social Marketing variables that could reduce water used for lawn care. This chapter explains the key findings, implications, limitations, discussion and recommendations for research and practice, based upon the results of four focus group sessions discussed in the previous chapter.

To accomplish the purpose of the study, focus group discussions addressed the following: landscape maintenance issues; concerns and perceptions homeowners have about watering yards; water conservation in general, as well as what would motivate water conservation behavior; and what prompts, incentives and communication methods would be helpful in their quest to increase their conservation practices. The focus group responses were used to address the following research objectives (RO), which will be discussed in the following order:

1. determine the barriers to increasing water conservation practices by homeowners who have automated irrigation systems within Orange County, Florida
2. determine the norms of water use and how they influence behavioral changes in water conservation
3. determine what motivates homeowners to conserve water when using their automated irrigation systems to water lawns
4. identify the prompts or other communication methods that the target audience determines as helpful to increase their conservation behavior

Review of Theories and Strategies Used in this Study

It is important to recall the two theories and two strategies that this study used to guide the research. The first theory is the Theory of Planned Behavior, which is guided by three kinds of salient beliefs. These include: behavioral beliefs which are about likely

outcomes of the targeted behavior; normative beliefs which include expectations from individuals or groups about the targeted behavior; and control beliefs, described as beliefs about factors that aid or impede the ability to perform the targeted behavior (Ajzen, 1991).

These beliefs play an important role in the strategies employed by Community Based Social Marketing (CBSM). The success of a CBSM campaign is based on finding the barriers perceived by members of the target audience that would impede their abilities to engage in or change a specific behavior. CBSM also seeks to establish the existing norms to determine if they are a barrier to behavioral change, because ultimately individuals will do what those around them do. Control beliefs are important for people making a decision about engaging in behavior change, because those who believe they have all the necessary resources, and perceive that they have the opportunity to perform the behavior, are more likely to engage in that behavior.

In research about environmentally significant behavior, Stern (2005) indicated that narrow educational approaches (such as telling people what behaviors are environmentally beneficial or simply that environmental disaster is looming) have not proven overly effective. However, programs where information arrives at the time and place of decision making, is linked to available choices, is delivered from trusted sources, and is delivered personally, are more likely to yield success. Stern also indicates that personal norm activation may be enhanced in a “community context,” where face-to-face communication, mutual interdependence, and the possibility for social influence can build interpersonal norms that support personal norms. This is consistent with the strategies used in community-based social marketing.

The second theory used to guide this study was the Theory of Diffusion of Innovations. Rogers (2003) defined diffusion as a process that begins with an innovation, which is then passed between members of a social system through certain communication channels over time. He continued by saying that an innovation is a concept or object that is perceived as new by an individual. Diffusion investigations suggest that diffusion consists of modeling and imitation by potential adopters of those who have previously adopted, emphasizing the importance of interpersonal communication relationships. In addition, a social system affects diffusion through its structure, norms, the roles of opinion leaders and change agents (Rogers, 2003).

Rogers (2003) discussed five important characteristics of innovation that influence adoption rates. Each characteristic was discussed in detail in Chapter Two. A brief summary is included here. The five characteristics that influence adoption rates include: relative advantage, compatibility, complexity, trialability or the ability to test the innovation, and observability. Relative advantage is the extent to which the new innovation has improved from the previous version. The improvements can be measured in terms of economic benefits, social status, convenience and satisfaction. Compatibility is measured by how consistent the innovation is with previously existing values, norms, experiences and needs of potential adopters. Complexity refers to how difficult the innovation is to use and understand. Ideas that are easy to understand are easier to adopt. Trialability refers to the ability to experiment with an innovation. Finally, observability is how visible the results of an innovation are to other potential adopters.

More recently, research results from Tabernero and Hernandez (2011) showed that individuals with a higher judgment of their ability to recycle engaged in more

recycling behaviors, set more ambitious goals for themselves, felt more satisfied with their behavior, as well as felt greater intrinsic motivation.

The Theory of Diffusion of Innovations supports the normative beliefs in the Theory of Planned Change and also provides support to the social marketing strategy being used to guide this study. When looking at the five characteristics of innovation that influence adoption rate, one can see where they fit into social marketing techniques. To recap, social marketing uses the same key variables as marketing strategies. These variables, commonly called “the four P’s,” include product, promotion, price, and place (Kotler and Zaltman, 1971). When the variables are transferred into a CBSM campaign the following can be observed: product is the behavior to be adopted, promotion is about communicating to the target audience, price is the cost to the individual of the new behavior (time or money), and place refers to the convenience of finding out information to correctly implement the behavior. When comparing the five characteristics of innovation adoption to definitions of “the four P’s,” the category of price would include relative advantage, compatibility, complexity and trialability, while the category of place would include observability. Complexity would also be included in self-efficacy and CBSM, which requires new behaviors to be easy and convenient for individuals. Together they influence the adoption of a behavior change.

Key Findings

In an effort to gain insight into Research Objective #1, the data revealed that four major themes emerged as barriers for homeowners that might prevent them from increasing their water conservation practices. One of the first steps taken when using CBSM strategies is to determine the barriers to performing a new behavior. One theme in particular accounted for over half the discussions in each of the four sessions. This

theme generated lively and passionate debates in each group. Residents who lived in an HOA felt a great deal of pressure to have perfect lawns. There were 32 participants total and within the four interview sessions, 20 different HOAs were represented. Consequences for not having perfect grass included the embarrassment of receiving a brightly colored notice or flag in their yard, or worse, a monetary fine. Many expressed the fact that they felt powerless against the HOA because these organizations were run by state-mandated covenants. They also said they didn't want any trouble with their neighbors; therefore they kept the lawn watered. One of the first steps taken when using CBSM strategies is to determine the barriers to performing a new behavior.

Another major theme to emerge was a lack of knowledge about proper lawn care. The most common response of participants as to how they kept their lawn green was to water it. However, the interview participants reported that they watered their grass because the HOA told them this was required to keep it green and healthy. The knowledge gap concerning proper care practices also contributes to the importance self-efficacy plays in a behavior change program. However, it was clear that the respondents were apprehensive about reducing the amount of water because the HOA could decide their grass didn't look good enough and fine them.

A sub-theme to this particular theme emerged, one of frustration with the difficulty of lawn care maintenance practices, which in turn was blamed on the variety of grass. The majority of participants had St. Augustine grass. After listening to their responses, it would be clear to a subject matter expert that by overwatering the grass they had actually conditioned the grass to become dependent on large amounts of water. The overwatering also contributed to leaching any available nutrients out of the soil. This

allowed the nutrients to run off into storm drains, eventually ending up in lakes and streams (Hochmuth, Nell, Sartain, Unruh, Martinez, Trenholm & Cisar, 2012). If this happens, it can become part of a continuous cycle. The grass becomes stressed from a lack of nutrients and begins to lose its dark green color, the homeowners water more to make their lawns green so the HOAs don't harass them and a non-stop cycle of poor care practice continues. The role of self-efficacy becomes apparent when the participants begin to doubt their ability or capacity to carry out behaviors needed to care for their lawn.

Another major theme was confusion over what water sources are restricted and how many days a week, as well as what days of the week, residents were allowed to water. It became clear that the participants did not find this system easy to remember. They had to remember if they were on Daylight Savings Time, which allows two days a week watering but includes a requirement for odd residential addresses to water only on Wednesday and Saturday and even residential addresses to water on Thursday and Sunday. When Eastern Standard Time begins again, residents must change this schedule. They are allowed to water for one day a week, odd addresses on Saturday and even addresses on Sunday. The one restriction that doesn't change is that watering cannot occur between 10 am and 4 pm. Upon review of the St. Johns River Water Management District Web site, there were 10 items these residents had to remember about watering restrictions and 8 items to remember concerning the exceptions to the restrictions (SJRWMD, 2009).

Another theme that emerged was confusion about reclaimed water restrictions. The Water Management District does not have restrictions on the use of reclaimed

water at any time but local governments are allowed to restrict the use of reclaimed water to their customers if they deem it necessary (SJRWMD, 2009). Adding to the confusion is that the Water Management District requests people to conserve water, and on the other side the HOA is telling people to water more so the grass stays green. Participants indicated that those in their neighborhood would water on the two days they were allowed. The homeowners would water on both days to keep the HOA and the neighbors happy, even if the lawn didn't need it. These responses played a part in both theories and both strategies used in this study. They are consistent with the three salient beliefs of the Theory of Planned Behavior, which includes behavior beliefs, normative beliefs and control beliefs. They also fit the Theory of Diffusion of Innovations in that the new behavior has to be easy to understand and perform in order to adopt the practice. This input is a part of the "price" element of social marketing, which isn't necessarily about the financial cost. It also includes the cost of energy and time needed to participate in the behavior change. Finally, this input affects CBSM in that it is a barrier, goes against the established norms, and does not allow for convenient or easy participation.

Another major barrier to water conservation which resulted in further lively discussion was the lack of ability to use the irrigation timer. For many focus group participants, using the clock was a struggle. Some homeowners tried to adjust the timer themselves but many times failed in their attempts and received a notice for running their irrigation on the wrong days. Others had given up completely and paid an irrigation company to come out and adjust the clock after each power surge. They indicated that they believed if they paid a person from an irrigation company to make adjustments to

the timer, the repairman would be a professional and therefore the settings would be correct and properly adjusted. This is an example that demonstrates the influence of self-efficacy and the fact that one of the CBSM requirements of behavior change is that it must be easy and convenient.

Another sub-theme emerged pertaining to the irrigation system. It became apparent that the participants knew how much time the sprinkler zones ran but could not say how much water was applied to the grass. This information is very important since only $\frac{1}{2}$ to $\frac{3}{4}$ of an inch of water should be applied each time the system is used. Each of them had a different answer about how long their system ran. Some said 12 minutes, and others said 15 or 20 minutes. A few residents knew that the irrigation system was set to run the zone for the shrubs for 20 minutes while the zone for the grass was set to run for 40 minutes. However, as mentioned previously, the research participants were apprehensive to make any adjustments to the watering practices they currently used because the grass might not be acceptable to the HOA. They said they needed proof that the grass would not die and that it would be acceptable to the HOA before they would make any reductions in the amount of water used. Again the lack of knowledge affected self-efficacy and interfered with their ability to effectively and efficiently use their irrigation system.

In the discussion of RO 1, normative beliefs are touched upon within the Theory of Planned Change and the Theory of Diffusion of Innovations, which support the social marketing strategy and the community based social strategy being used to guide this study. Research Objective #2 was to determine the norms of water use and how they influenced water conservation behavior change. As a reminder, norms are defined as

accepted societal behavior that guides how people should behave. There are injunctive norms or the perception of others' approval or disapproval of an action, and there are descriptive norms, or what others appear to be doing at the time. Ohtomo and Hirose (2007) concluded that descriptive norms serve as a shortcut for decision making about conservation, as people take their cues from others about whether to engage in eco-friendly behavior regardless of their own behavioral intentions.

The major theme that emerged from the focus groups in connection with this research objective was that the norm was to abide by the restrictions and water twice a week when the restrictions allow twice a week, and once a week when the restrictions change to only once a week. This is seen as an example of people following the behavior of their neighbors. It also became clear that having a nice yard was the accepted norm among neighbors. In a study about the effectiveness of water restrictions, Ozan & Alsharif, (2012) suggested that disregarding water restrictions could be influenced by several factors. These included a lack of enforcement workers utilized by the water utility, contradictory policies of water restrictions that are completely opposite of the demands made by deed-restricted communities (HOA's) for a green lawn, and the culture of normative landscape practices.

Given that norms are a key factor for achieving behavior change, it is important to understand just how strongly held and powerful norms can be. Feagan and Ripmeester (2001) pointed out that the current ideal of a monoculture lawn dates back to the privileged French and British individuals in the 16th and 17th century and was seen as a status symbol. They summarized by saying that lawns started out as a status symbol in the 1500's and have become a norm that represents social and moral order

within a neighborhood. The relationship that homeowners have with their lawn is over 500 years in the making. These norms are well-rooted within society and as a result encouraging behavior change will be difficult and slow at best.

A sub-theme that emerged was participants' beliefs about their conservation practices. The participants believe they are practicing water conservation by following the water restrictions, as this is the accepted norm. They set their irrigation timer for the days they are allowed to water and don't worry about it until the restrictions change. Two issues to consider in this scenario are the fact that based upon participants' responses they do not know how much water is applied to the grass after each zone runs. Participants indicated they, "set it and forget it." The implication is they are probably not turning off their system even when there has been plenty of rain to adequately water the grass. Both situations have the capability to waste water. If the irrigation system delivers more than $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, more water than the grass needs, the water is wasted, and the nutrients in the soil run off the lawn and into the water supply (Trenholm et al., 2009). The same is true when the summer rains provide more than enough precipitation during each rain event. Therefore the irrigation system could be periodically shut off during the rainy season.

Another sub-theme reported by participants was their ability to describe the actions that were not acceptable conservation practices. They knew that watering in the middle of the day, broken sprinkler heads, irrigation heads watering the road or sidewalks, and watering while it was raining all contributed to wasting water. They agreed that conserving water was important because the population in Florida continues to grow but the water supply is finite. Their responses represented a positive attitude

towards water conservation and indicated they were willing to reduce the amount of water they use. This correlates with the Theory of Planned Behavior and the need for a positive attitude towards making a specific behavior change. It also illustrated what was not an accepted normative practice.

However, it became clear that their attitude was positive towards increasing water conservation practices only if it didn't cost them money to replace the lawn because it wasn't acceptable to the HOA, or if more time was added to their list of yard chores. The behavior had to be convenient and easy and not cost them money. They did not want to have conflict with their HOAs. They also did not want to be restricted in their plant choices as a means to conserve water. One of the ways to apply CBSM to these findings is to determine what norms exist. Then solutions that are convenient can be found and easy behaviors may be adapted that could be performed by the members of the target audience in order to create a new norm.

Based on the findings from responses to the questions in each focus group that a positive attitude existed towards increasing water conservation practices, Research Objective #3 sought to obtain input from the participants on what would motivate them to adopt water reduction behaviors. The responses concur with recent studies, and included financial savings, a desire to lessen demand on the aquifer, environmental concerns and fear of sinkholes.

These findings were corroborated by recent research done by Nolan et al. (2008), in which a self-reported survey was administered. It found respondents' perceptions about what motivated their participation in conservation activities, were as follows (ranked highest to lowest): protect the environment, benefit society, save money, and

participate because other people are doing it. As a follow-up analysis to the stated reasons for conservation, part two of the study examined the relationship between conservation efforts and beliefs about saving energy: saving energy saves money, benefits future generations, protects the environment, and other people are saving energy. Correlation coefficients showed the strength of the relationship between each of these beliefs. The strongest predictor of energy conservation was the belief that other people are doing it, despite the fact that it was rated as the least important motivating factor.

It is important to understand recent research in psychology and behavioral economics which suggest that non-price interventions can be as powerful as prices in changing consumer choices. These behavioral approaches included commitments, information, temporarily adopted devices such as a rain sensor, appeals to social norms, or small price changes, are quite inexpensive and can be extremely powerful (Allcott & Mullainathan, 2010). Stern (2006) pointed out that participants stated they want to save money. However, there is a marked resistance to changing their on-going behavior and habits. Convenience, comfort, and maintenance of status quo behaviors have an underestimated allure that frequently impedes behavior changes. Both the Theory of Planned Behavior and CBSM stress the influence that norms have on behavior change. Also the importance of a social network, as pointed out in the Theory of Diffusion of Innovations, would apply in that people learn from each other and do what other people around them do.

Along the lines of motivation, it became very clear that participants would not be motivated if the program was initiated by the HOA. The participants felt that they were

already pressured enough by the demands of their HOAs and did not want one more thing to comply with. They also made suggestions that if the HOA pursued a program of using less water, the HOA's would have to relax their requirements concerning lawn specifications, i.e. type of grass required, expectations of perfect grass, and types of plants used in the landscape. The participants' input supported a willingness to conserve water but the HOA remains a large barrier to their comfort level in actually performing the desired behavior.

The conversation continued to gather data for Research Objective #4 by probing participants about prompts and other communication methods that would be helpful to increase water conservation practices. Participants emphasized that the message of saving money would draw people to increase their water conservation practices. Many of the responses indicated that information on the water bill was an effective means of communication. Others stated that a post card sent to them by their utility company was a helpful reminder when water restrictions changed. Many recalled a TV Public Service Announcement (PSA) about a swimmer who dove into a lawn that was so over-watered that he could swim in it. They remarked that the PSA was brilliant, it got your attention quickly, the message was simple, and what you could do to remedy the problem was clearly stated. The referenced PSA was a good example of the CBSM practice to use persuasive communications to capture the attention of individuals and influence and convert their way of thinking. It should be vivid, concrete and personalized. They suggested creating a PSA that spotlighted a family within the community that successfully employed water conservation practices and how it has benefitted their family and the environment. This would help raise awareness of the importance each

person could contribute to a collective difference in reducing water use. It would also be an example of how a new norm was working in everyday life as performed by one of their neighbors.

The discussion also included incentives that would be helpful to increasing water conservation practices among the participants. One suggestion was to send a reminder postcard to check the rain sensor. If the cork wafer inside the rain sensor needed replacement, the postcard would give instructions on how to redeem for a free replacement wafer. Along the same lines, a coupon could be provided that could be used to purchase a rain sensor. In addition, the water company could provide a service to install a rain sensor. The suggested incentives support a positive attitude towards conservation and illustrate that convenience and ease in performing the behavior are important to the participants. These results support Theory of Planned Behavior and CBSM strategies.

Another creative suggestion was to have a conservation credit on water bills. This could be a reward if water use was decreased or environmentally friendly landscape plants were installed in order for future water reduction to occur. Additional input suggested copying the energy conservation programs from the past which emphasized the importance for everyone to conserve. Another suggestion was a monthly water budget which allotted a certain number of gallons of water for outdoor use by each household. Suggestions to increase accessibility to reclaimed water for yard use were also presented.

Implications

The results of this study offered several theoretical implications for the use of the Theory of Planned Behavior and the Theory of Diffusion of Innovations. It also

contributed valuable insights into what was needed to have a successful social marketing and community-based social marketing strategy to reduce water used to maintain yards. The theoretical implications are followed by an explanation of practical implications based on the collected data.

Researchers agree that the Theory of Planned Behavior is a well-established theory used not only to predict behavioral intentions but also to provide a basis for identifying where and how to target strategies for changing behavior. The Theory of Diffusion of Innovations can also play a role in establishing new behaviors. Both theories discuss the importance of the influence of norms, perceptions of whether the individual can perform the new behavior, and what the attitude of the individual is towards the new behavior.

The present study found the following evidence to support both theories, particularly in the area of norms and the influence of social networks. The responses from the participants that belong to the category of a lack of knowledge included proper grass care, confusion about water restrictions, the ability to use the irrigation timer correctly, and efficient use of the automated irrigation system. All these would contribute to the three salient beliefs of the Theory of Planned Behavior. To recap the salient beliefs, they consist of behavioral, normative and control beliefs. Each of the salient beliefs has the following three variables: attitude about the new behavior, subjective norms or what the individual thinks his peers expect of his behavior, and perceived behavior control or the belief the individual has about performing the new behavior.

The responses also support the Theory of Diffusion of Innovations, particularly in the area of self-efficacy where the individual has to believe they have the capacity to

carry out the new behavior. Other characteristics within this theory supported by the participants' input include complexity or the difficulty of using the new skills. Also supported was trialability or the ability to experiment with the new skills for a limited amount of time, and observability or how quickly the results from the new behavior are visible. Also supported was the fact that adoption of an innovation is done through communication within a social system. Each sub-division is a social system and within that social system exist all the homeowners – those who are on the HOA board and those who are not on the HOA board. Even though the sub-division is one social system, the subset made up of HOA board members have control over the social system that consists of homeowners who are not on the HOA board. The communication is not on a community level with equal inputs from all members. Rather it is the HOA board members' social system mandating required lawn maintenance practices.

Social marketing strategy uses traditional marketing principles which include product, price, place and promotion, also known as the 4 P's. In this study, product refers to the behavior of increased water conservation; price refers to the cost to the individual which could be time, convenience or financial cost; place refers to where the behavior occurs, in this case outside in the yard; and promotion refers to message delivery method. Community-based social marketing identifies barriers to practicing the behavior; the norms, and incentives that motivate action; using creative communication; and understanding the use of commitments and what prompts would increase the likelihood of behavior change. Both social marketing and community-based social marketing create social influences to encourage a desired behavior, or to discourage an

undesired behavior such as watering on rainy days and further, to encourage new social norming.

The data from this study supported the importance of norms, and the participants' discussions about watering on the days of the restrictions outlined the accepted norms. This was also seen as the norm for conservation because they only watered on the days allowed by the restrictions, even when watering was not necessary. Also the norm was to have a very nice lawn to please the HOA and to make the neighbors happy. It should be mentioned that the love affair with a lush green lawn has existed for over 500 years, demonstrating that this is a well-established norm which will add to the difficulty of creating a new social norm.

Research on the Millennial Generation, those born between 1982 and 1999, find this generation is pro-environmental after being raised on curbside recycling and energy conservation. Those born in the early 1980's are approaching home-buying age and will likely not consider purchasing a home in a sub-division where the HOA has a reputation of encouraging the residents to waste water in order to have perfect grass, a process which in turn contributes to pollution from the nutrient run-off caused by excess watering. Communication and marketing about pro-environmental support to this generation will be important.

With regard to communications and messaging, the suggestions of the participants were vivid, influential and personal. The following responses supported CBSM strategies pertaining to incentives that motivate. They suggested reminders be sent to homeowners to check their rain sensors to ensure they were working properly. If the measurement wafer needed to be replaced, this same reminder card could be

redeemed towards the purchase of a new wafer. They also stressed the importance of including succinct directions on exactly what changes should be made in their behavior as an integral part of the communications effort. They agreed that prompts were helpful. Their input included such items as a magnet that stated when the restrictions changed, and a sticker that could be placed in the area of the irrigation timer.

The theories are useful in determining elements such as barriers. The implications suggest that in order to be effective with homeowner audiences, Extension needs to change the programming approach used in order to obtain behavior change results. The data implies that Extension programs that work through an HOA to reach the residents who live within a particular community would not be a favorable partnership.

Limitations to the Study

Even though the results of this study could be relevant to similar large urban counties, or high water use residents in urban landscapes, as well as homeowners living within deed-restricted communities, also known as homeowner associations, qualitative research results of this study can only be applied to Orange County, Florida. Another limitation to the study was that even though participants were deliberately selected to represent a target audience of high water users, the perceptions of the participants may not apply to other Florida residents because random sampling was not employed.

This study used focus groups as a research procedure. One of the benefits of focus groups is the interplay between participants (Flick, 2006; Morgan, 1998). Participants' discussions were likely influenced by other participants' responses (LeCompte & Goetz, 1982). The researcher, or moderator, for example, has less control

over the data produced (Morgan 1988) than in either quantitative studies or one-to-one interviewing. The nature of focus group research is open ended and cannot be entirely predetermined. Gibbs (1997) pointed out that the moderator has to allow participants to talk to each other, ask questions and express doubts and opinions, and has very little control over the interaction other than generally guiding participants to stay focused on the topic. It should not be assumed that the individuals in a focus group are expressing their own definitive individual view. Participants are speaking in a specific context and within a specific culture, which can make it difficult for the researcher to clearly identify an individual message (Gibbs, 1997)

Webb & Kevern (2001) pointed out that because the main idea of a focus group is the interaction among the participants and the moderator has little control over the interaction, no two focus groups are exactly the same. They also state that data analysis techniques differ among researchers. Therefore analysis is not exactly the same.

Discussion

The data showed a need for Extension to change the approach it currently uses for developing Extension programming for non-traditional audiences. The non-traditional audience includes people who are not involved with agricultural production, and pertains to populations located within highly urban areas. Extension programs need to be created using information developed through research about behavior change, such as finding barriers and knowing the accepted norms. A “one size fits all” programming approach is not effective and adjustments need to be made to influence behavior change, particularly with clientele from urban and metropolitan areas.

Residential homeowners are a different audience from traditional agricultural producers and need a different approach in order to maximize the impact to achieve behavior change. This research study demonstrated that even if Extension programs operate continuously, they will not result in behavior change unless the barriers and norms are known ahead of time and adjustments are made. Adopting such behavior would be beneficial, particularly when the behavior change involves increasing water conservation practices.

Using CBSM strategies to determine the barriers and the existing norms prior to creating an educational program would increase the opportunity for Extension programs to measure behavior change as a result of their efforts. Once the barriers and norms are established, a program tailored to the needs of that specific audience can be created. This would include choosing messages that resonate with them through persuasive communications. The benefits come from knowing the barriers that impede them from moving from education to action, ultimately resulting in behavior change for the betterment of themselves and their community.

There is a need for research in non-formal education with the target audience of home owners. Understanding the norms is important because people are going to do what their neighbors do. Extension programs could capitalize on this information in order to create an educational program that works within the accepted norms or works on establishing new norms.

Once the variables of barriers and norms are determined, educational programming can be developed and customized to meet the needs of the targeted audience via a specific behavior change campaign. This will require Extension offices

to provide custom programs that meet the needs of a specific audience, instead of a “one size fits all” approach to educational programs. The need for program pre-planning that includes an evaluation of the program and documentation of baseline data prior to conducting the program will need to occur in order for the end result to show behavior change impacts. The combination of CBSM strategies and non-formal education can be used to overcome barriers to change, market the new desired behaviors and make the behavior change desirable to society as well as influence the longevity of the behavior change.

In order for more water conservation to occur, a new cultural norm will need to be created in order for HOA's to support less water use and relax the requirement for perfect grass. When creating a new cultural norm, the Theory of Diffusion of Innovations needs to be considered. The theory suggests long-term change can be enhanced when the “innovation” can be modified or customized to the consumer. Once the individual starts using the new idea or behavior, using the notion of “re-invention,” the degree to which an innovation can be modified or customized to the user is addressed (Rogers, 2003).

Rogers contends a higher degree of re-invention leads to a higher degree of sustainability of an innovation, whereas sustainability relates to how long an innovation continues to be used over time. Walton and Hume (2011) worked with the water utility company and incorporated the customized-to-each-customer approach along with three strategies to create positive habits in water conservation. They included a benefits/costs approach, social influences or norms, and individual's skills and abilities. Barriers to conserving more water were identified; the campaign established a specific target of

gallons of water per day per person. The target made the campaign personal for each resident. Key messages were developed to combat the barriers, and all forms of media communications were employed to reach the residents. The campaign selected one behavior to be emphasized as a behavior change that could make a large impact. Households received feedback on their performance towards attaining the target goal accompanied by a congratulations or suggestions for improvement. Practitioners tried to use social influences in ways that promote the desired behavior and address situations where others may be influencing individuals to maintain the undesired behavior.

Walton and Hume (2011) reported that after an eight month campaign each resident had reached their target goal and within a year after the end of the campaign, the target goal had been maintained. The campaign had successfully achieved a long-term behavior change and sustained it, thus creating a new norm. Results from this study showed that participants were willing to conserve more water as well as to accept less than perfect lawns within their sub-division. The new norm needs to establish that HOA's that pressure homeowners to have a perfect lawn and do not encourage water conservation are no longer acceptable.

The largest barrier, pressure from the HOA to have perfect grass by watering excessively, will have to be addressed. It is clear that even with the proper information and the ability to perform the new skills needed to reduce their water use, participants were concerned about repercussions from the HOA. A representative from the state association of HOA's needs to be present along with the Florida Department of Environmental Protection, the water management districts, water utilities and municipalities when these organizations meet to plan for future water needs and use.

Creative messaging to communicate the new norm to the citizens of Florida will be imperative to achieving behavior change and sustaining practice change. By knowing the target audience characteristics, the messages can be tailored to what will influence them the most to change their behavior. In the case of reducing water use, some of the participants indicated they would do it to save money, others said they would do it to save water. Both of these themes, along with normative messages should be tested with the target audience to determine what is salient with them in order to launch a successful campaign to persuade residents to use less water on their lawn.

A proactive change to reduce water used to care for the yard needs to occur before the cost of water increases and /or the legislature mandates how water will be saved. Research shows that voluntary participation versus mandated restrictions has a greater impact when it comes to sustaining long term behavior change. Most people prefer doing something of their own accord rather than being made to do so through regulatory enforcement. McKenzie-Mohr and Smith argue that the ability to regulate effectively is contingent upon the willingness of people to be regulated. The participants feared that tiered water pricing would be initiated by the water utility companies. They also feared that they would be given a monthly water budget which allows a specific number of gallons each month for outdoor use and they would be given limited plant options to use in their yard. These options would force water conservation behavior to occur.

This research study sought to determine how to increase water conservation practices by gathering data from members of a target audience who were deemed high water users. Based on the research results, the barrier of pressure from the HOA to

have perfect grass will be a difficult barrier to overcome. Extension offices are poised to help remove some of these barriers to increasing water conservation behavior.

Extension programs have an opportunity to change the approach used to reach members within a target audience that would result in greater behavior change impacts.

The results of this study have provided a road map on how to use CBSM to accomplish the approach to changing behavior. This study established baseline information which is important to the evaluation component of a CBSM program which measures whether behavior change occurred.

Additional Discussion

The following section will present data that, although not a major theme needs to be discussed. The responses relate to water conservation practices which include water resources, instrumentation and plant choices. Discussion also included support for CBSM strategies, particularly in the area of communication and implementation of a water reduction program.

Water Conservation

Interestingly enough, each of the focus group sessions had a discussion about saving water that included the use of rain sensors or soil moisture sensors, separate irrigation meters, reclaimed water and water catchment efforts. The conversation led to discussion about a futuristic water meter that rationed the amount of water allowed per month, and ways potable water could be replenished or new sources added.

The following responses supported the rain sensor/soil moisture sensor discussions. It also supported a positive attitude towards water conservation practices.

The input also demonstrated that the respondents understood that the rain sensor would save money as well as water.

One participant said, “My sprinkler system actually has...we have an outside gauge that is attached to my gutter system and if it rains, then my sprinkler doesn’t go on” (Focus Group 1, Participant 2).

Another participant said, “I think the concern, it sounds like for a lot of the people here, is that if there is a rain sensor, if the rain sensor doesn’t work, you kind of...I mean, even though it is an ideal thing to have the timer on there, it kind of defeats the purpose a little bit of saving some water if the rain sensors aren’t up to par with what our needs are” (Focus Groups 2, Participant 4).

A third participant said, “I wonder if it is something like it senses what is in the ground, sensors...moisture sensors or something. I mean, is that kind of the idea that we are going for? I mean, I know you can’t tell us, but...” (Focus Group 4, Participant 5).

Another participant responded with, “Well, if you have a fully automatic system, and you have a properly working rain shutoff system, why would you need to adjust it?” (Focus Group 4, Participant 4).

The discussion about the use of a separate irrigation meter was supported by the following responses. The respondents’ discussion pointed out that a separate irrigation meter would allow them to monitor how much water was actually being used for landscape purposes. The participants would be able to save water and money each month. The responses also support a positive attitude toward increased water conservation practices.

One respondent said, “Well, there’s other things you can do too, to save money is make sure you’re on an irrigation meter. Because two-thirds of your water bill is in fact sewage. So if you have a separate one for your sprinkler system, you pay a whole lot less in water bill” (Focus Group 4, Participant 1).

Another said, “Well, the irrigation meter, it separates out from the amount of water that goes into the house which is considered sewage water and that is a higher price” (Focus Group 1, Participant 9).

A third respondent said, “Say you had a meter that measured how much water you actually were using for irrigation and will cut that out of your water bill” (Focus Group 2, Participant 1).

The discussions about reclaimed water were supported by the following responses. The participants’ input indicated an interest in using reclaimed water. They also support a positive attitude towards water conservation.

One interviewee commented, “Um, I don’t know if you are going to get to this subject later on or not, but a lot of the newer developments and even some of the older ones...the county and the city utility companies have been through and put in these new purple pipes that are the recycled or reclaimed water that comes...you know...we use the water the first time through the batch, it goes down the sewer, goes through the sewage plant and they clean it to a point where it is probably better or as good as the drinking water, but they won’t let anybody drink it right now. They put it into this reclaimed water system and so the county has already done a pretty good job...well, probably EPA requirements or whatever, but somebody has forced us to conserve

water by using it a second time. And that is a good thing” (agreement heard) (Focus Group 1, Participant 4).

Another interviewee stated, “Reclaimed water only in common areas, but not individual homes. I would be interested in using reclaimed water on my grass” (Focus Group 2, Participant 1).

A third interviewee replied, “Reclaimed. Water your lawns with reclaimed water to increase conservation” (Focus Group 4, Participant 7).

The following responses supported the discussion pertaining to rain barrels or other means of water collection. The responses support a positive attitude toward water conservation practices. They also demonstrate that the participants understand the need to collect water and reserve it for future use.

One respondent said, “I like the idea of the rain barrels which I will get eventually. And I know when we were in Hawaii visiting, especially on the big island, they don’t have municipal water or anything. They have to have cisterns. And with...even though, like I said, we are more arid than I think people realize, we still get a good amount of rain in the summer and why not put storage devices in homes for the rainwater? But then again, you are taking it out of the aquifer by collecting it. So, I mean, obviously we need to do some research to see if that is really feasible. But, I think somehow conserving water that would maybe evaporate, that we can use (Focus Group 2, Participant 1).

A second respondent stated, “Um, you can do something else, too. You could do something called rainwater entrapment or whatever. Put in a cistern. It could be nothing more than fifty-five gallon barrels. I know they are not too beautiful, but connect

them to the downspouts on your house. You might not want to drink that water, but it certainly would be fine to water your lawn and your plants with. And connect a little, you know, pump to that for whenever you need to water or have it go into your irrigation system. It would take a little bit of thought to plan it out properly, but it certainly could work (*crosstalk*) (Focus Group 1, Participant 4).

Another respondent commented, "...collect a lot of rain and then if you were to just let gravity take it out and flow out onto the yard, you'd get a lot. (*Crosstalk*) (Focus Group 3, Participant 3).

A fourth respondent said, "You know, back to that fifty-five gallon barrel, plastic barrel saving rainwater, I wonder if you could tie that into somehow...for every fifty-five gallon barrel you save, you get some sort of credit on your water bill. And how could you verify that you saved fifty-five gallons? There must be some simple inexpensive way." (Focus Group 3, Participant 5). Another participant responded, "Well, they do that with electricity; people with solar panels, do it with the electric company" (Focus Group 3, Participant 1).

The following responses support the need to increase water availability. Both participants were considering meeting future water demands. Both these participants could be considered as change agents or block leaders and support their neighbors as they adopt new water conservation practices.

One participant said, "Yeah, and it is so that...it is for conservation of electricity and they are not picking on one person, you know, but in order to size an electric generating plant so that it satisfies everybody, then everybody has got to contribute by only using so much. Well, I am just going to kind of go forward to the water consumption

business and if we don't get a handle on conserving water, we are not going to have water to drink, let alone water our grass. (Agreement heard) And I can see the day when electric meters are put in out at the street on your water line and you are going to be given five thousand gallons of water a month. And if you exceed that, you don't get any more, it shuts the meter off. Comment~ "Like rationing your water" (Focus Group 1, Participant 6).

Another participant pondered, "And then also the engineer, I think...to how do you take the water that we have that's non-usable, the saltwater, to remove the salt and make it usable? So, you get it from both ends. How do we replenish, can we add to the consumable water supply while you're trying to conserve what we do have? So, get it from both ends and then you'd get all the future engineers, that they're.... (Focus Group 4, Participant 7).

Plant Choices and Care

The responses below demonstrate that the participants are aware that plant care and plant varieties can reduce water use. It also shows a positive attitude towards water conservation practices. The quotes support the need for accurate information that increases the ability of the participants to perform water conservation behavior. It demonstrates that they are open to non-formal educational classes such as those Extension agents can provide.

One respondent said, "But I think for people that are either building new or needing to rehabilitate their landscaping, they should consider the Florida native species or drought tolerant species of shrubs and flowers and grass and everything else; they require less water. So, picking the right kind of landscape material would be a big conservation tool" (Focus Group 1, Participant 8).

A second respondent commented, "Yeah, I know St. Augustine likes to be cut tall because if you scalp it down it will burn out. By cutting it...oh, I kind of lost my train of thought. Some people, by cutting their grass the wrong height, I think, require more water to be used" (Focus Group1, Participant 5).

Another respondent said, "The University of Florida came up with, I can't remember the name of it now. But it is the different types of varieties of grass that come off the St. Augustine branch, you know, tree, that are drought tolerant, bug resistant...and they work out a little bit better because they need less water than your Floratam, St. Augustine" (Focus Group 1, Participant 5).

A fourth respondent stated, "The University of Florida does a lot of research about plants and things like that. Not only about grasses, but a lot of plants. I think if you went to the University of Florida's web site you could find just all sorts of information about drought tolerant, bug resistant, and all sorts of things" (crosstalk and agreement) (Focus Group 1, Participant 4).

A fifth respondent lamented, "Get rid of what I call my guilt plants which is the tropicals: the bird of paradise, the avocado, mango and all that stuff. I really...I really enjoy nonnative plants, but I definitely know to appreciate the native plants, you have to do some xeriscaping. And now that I have more responsibilities it seems even more attractive to do xeriscaping. Yeah, definitely, I would agree, getting rid of some of the more tropical plants...which I have noticed, in my opinion, living here in Orlando, it is not as wet as we might think. It is a lot more arid, we just do a lot of irrigation, so it looks it with all the theme parks and everything. You get away from all the hotels and the

theme parks and neighborhoods and you see what Florida is really like and it is pretty arid. Not very wet” (Focus Group 2, Participant 2).

CBSM

Within this section the responses support various strategies within CBSM. Input about the implementation of a water conservation program suggested that residents within a neighborhood would be more receptive to the program if it came from the community level. Other responses indicate that a block leader would be accepted as a change agent. Finally, responses support that establishing a new norm would be feasible.

Program Implementation

One participant interrupted the question with, “Well, it all depends upon your approach, you know? If you’re a jerk, you’re a, you know, as opposed to, you know, just walking up nicely and saying, ‘Getting a lot of water out there,’ and seeing what the comment back is” (Focus Group 3, Participant 1).

Another participant said, “With me, I have a pretty good relationship with one of my neighbors that does it that I believe if I went to him and spoke to him about it, he would, you know, start. And the other neighbors, they are an elderly couple and so I don’t know them as well, but I feel like it is like a, “Hi,” and “Hey, how are you doing?” thing. But I really do think if I went to them personally and talked about water conservation, and just brought it to their attention, because I don’t even think they realize...hey it is raining...I really don’t need to water today. So, I feel like I do have some power just by going to them and explaining water conservation (Focus Group 2, Participant 5).

A third participant suggested, “Or maybe just call it to their attention, so it’s not, ‘Hey, you are wasting my money, where are my dues going?’...more like, ‘Were you aware...?’ Because I would think... ‘I know you are on my side, I know you want to make the most of our dollars, so did you know that this was happening?’ So, you say the same thing, it is just in the way in which it is presented. And I don’t feel like I am...it wouldn’t feel like a criticism, it would be more of informing” (Focus Group 4, Participant 4).

A fourth participant stated, “It would be better received from me if it was from my, like, my neighbors (*agreement heard*) that you all get together with than it would from the HOA” (*crosstalk*) (Focus Group 4, Participant 3). Another participant within the group replied, “It has to be voluntary. But still, there would be like a cheerleader for the environment. But still make it voluntary rather than trying to force you to do it, you know?” (Focus Group 4, Participant 5).

Another participant interrupted, “I think we need to keep it out of an HOA, period. We get enough from them. If they’re going to do it from the water districts...hey, we had to swallow it when they told us we could only water twice a week and we did. And we’re used to it now. In fact, was it two years ago they...now we’re down to one day during the winter. I think pretty much everybody...a high percentage probably adhere to the law” (Focus Group 4, Participant 2).

A sixth participant said, “One of my neighbors, I brought over cookies and let them know that their sprinkler was watering the street and they fixed it. (Laughter.) They turned it around. But I wouldn’t go to my homeowner’s association president because, bless her heart, she is tipsy with crazy and she...once you draw her attention, even if it

is not on you, then she starts messing with your house and nitpicking about your house. So, I don't want that kind of crazy in my world. You cushion it with the cookies first and then a few people have come and asked tips about setting up a rain barrel and things like that because they have noticed us doing it in our yard. And my husband is the water nerd, (laughs after saying this) so they know where to come and ask questions" (Focus Group 2, Participant 4).

A Block Leader

In respect to their block leader, one respondent explained, "I think, to be honest, and this works in our neighborhood, we have a wonderful neighbor that, since she moved in, is trying to do things to get everybody together. And a lot of things are to kind of benefit one another...to know who your neighbor is. So, if maybe...you get like some kind of incentives. Like, the first thing she did is, she had everybody's emails so we would get a newsletter by email telling about the events or the good things or bad things about the neighborhood. She organizes the events, you know, like for the different holidays. And you know, I think the neighborhood benefits from it. Just get like one person locally...like she is home, you know? I don't know if she works, but she has time. She is a volunteer; she doesn't get paid for it. And she has done a wonderful job in our neighborhood. When there was an incident that happened, she notified us so that we are aware of what is going on. So, somebody like that I would think would...communication is very important" (Focus Group 2, Participant 2).

New Norm

Concerning the fact that a new norm is emerging, one interviewee said, "We don't have a homeowner's association, so we see a wide range of like the luscious grass you have ever seen to the people that conserve...I would say more like our lawn.

It is green, it looks fine. You know, in the summer it is not brown, but it is not the lushious...it has got a little mix of weeds in there and everything because we don't use chemicals. But there are some lawns that are either vacant or rentals that people don't care and they are a little bit browner" (Focus Group 2, Participant 4).

Another interviewee interrupted, "But if everybody had to do it and was going to be on board and this was across the board and everyone had to do it, then we would all have to learn. But the way they enforce...EastWood is huge. I have two homeowner's associations, too. It is a huge community. I just think that would be difficult to enforce. But, if that was the rule, we would abide by the rule" (Focus Group 2, Participant 2).

A third interviewee commented, "I think something of that nature...there is a lot of ridiculous rules that homeowner's associations enforce. But I think that something like that is, overall, beneficial to everyone in the long run. So, I don't think that is something that would really bother me at all. I would, you know, especially since it is affecting everyone equally, I would be totally on board with it" (Focus Group 2, Participant 5).

Communication Strategies

A key component to CBSM is communications. The approach has to grab your attention and be relevant and meaningful to the individuals. They have to be aware that a problem exists and that they can be a part of the solution. The responses support this CBSM strategy.

Awareness

One participant said, "I think the idea that people have, that water is infinite. I mean, I think most people...you turn on, water comes out, anywhere you go, it is free, and whoever thinks of running out of water? No one. You know? And so..." (Focus Group 2, Participant 2).

Another participant commented, “I think we are becoming more aware, but maybe we just don’t know how serious it is, yet. We don’t think of water as gasoline. Water is an endless supply to us and it really isn’t” (*agreement heard*) (Focus Group 4, Participant 3).

A third participant stated, “Outdoor, because all my thinking is the indoor...you know, turn off the faucet while you’re brushing your teeth, showering instead of bathing, we have a front load washer versus the top load. It’s hard for me to think external, have to get people to think about outdoor watering” (Focus Group 4, Participant 4).

How to Communicate

One respondent stated, “All of these things that we are suggesting, you have to have somebody who will do this, who has the consciousness raised and will do these things and put out these Facebook and social media and all these things” (Focus Group 2, Participant 3).

Another respondent suggested, “And I think one thing, tap into the young people and the social media. Because once...sometimes when these young people get into something like that, because I know at school one time, kids were coming and telling me about Kony, Kony. You know, Joseph Kony and there was a social media thing (*crosstalk*) about Kony and I mean, kids were actually coming to me...” (Focus Group 2, Participant 2).

A third respondent said, “Waste of money on a TV campaign? Why don’t they use the money, like he said, to send someone to put the rain thing on?” (Focus Group 1, Participant 2).

A fourth respondent stated, “Well....that’s you know, that’s what has to be done I mean, you know? What can you do, you know, put out a sign, put out a commercial?”

You know, shit, who ah watches commercial...who reads the damn...you know? Make, you know, get Marco Rubio to talk about it, he speaks Spanish. Get a spokesperson” (Focus Group 3, Participant 1).

Persuasive and Vivid

One participant suggested, “You know...you know, what? Shut everybody’s water off for a week and give them a feeling of what it’s like not to have any water (Focus Group 3, Participant 2). Another participant within the group interjected, “Or just a day would panic a lot of people” (Focus Group 3, Participant 3).

Another participant said, “No, I just think it makes you think about the future, you know, everything seems to be changing. It kind of makes me wonder what...if we are conserving water right now, what is it going to be like later if we don’t all do our part? You know? It is kind of a worry like that if you want to take it further” (Focus Group 4, Participant 2).

A third participant summarized, “Focusing on homeowner use isn’t to the same scale as other things such as agriculture and businesses use. This is only a part of the bigger picture. All Americans tend to be just wasters of a lot of stuff. I mean, how much garbage do we throw away every day? It just goes to a landfill. We just need to be, overall, like more conscious of all the wasting that we do” (Focus Group 4, Participant 1).

Recommendations

For Future Research

The results from this study suggest several areas of future research. From a theoretical perspective more research needs to be done in the area of increasing water

conservation practices to reduce outdoor water use. Most research has been done in recycling and energy conservation. Other research topics include:

- Replicate the current study throughout Florida in urban counties such as Miami-Dade, Palm Beach, Sarasota, Hillsborough, Pinellas and Duval, to identify similarities within the target audiences. When CBSM strategies are used, it is important to identify a target audience in order to tailor the campaign based on individual needs.
- Conduct focus group sessions with HOA board members to get their perceptions of the responsibilities of an HOA board. A comparison of their responses to the responses collected from the focus group sessions completed with homeowners who reside within an HOA community would contribute to developing a CBSM program that met the needs of both parties.
- Research done using descriptive and injunctive norms in the area of outdoor water conservation practices. The influence of norms is a variable in the Theory of Planned Behavior and the Theory of Diffusion of Innovations as well as a basis for social marketing and CBSM strategies.
- A comparison of communities that have HOA's to those communities that do not have an HOA. Using CBSM to determine the barriers and the norms in relationship to water conservation practices when caring for their yard.
- A comparison of HOA board practices between HOA's in sustainable communities and HOA's that have a more traditional approach. Using the Theory of Planned Behavior and CBSM to determine what norms exist in a sustainable community and what barriers residents perceive to water conservation practices.
- Use mixed methods research and compare quantitative to qualitative and how they inform each other to develop an effective non-formal educational program.
- Test messaging related to water savings, financial savings, protection of the environment and perceptions about how neighbors are conserving and how this is relevant to the target audience. The Theory of Diffusion of Innovations, as well as social marketing and CBSM use communication as a vehicle to change. The message has to resonate with the target audience to have an impact on their behavior change.
- Test pro-environmental marketing messages for HOA's/sub-divisions to use with potential buyers from the millennial generation.

For Practitioners

The results of this study indicate the following needs:

- Extension offices should use CBSM as a systematic research approach to inform programmatic needs that would result in behavior change. The use of CBSM would determine the barriers perceived by participants to overcome behavior change. It would establish what current norms exist within the community and determine a target audience.
- Extension programs should not use a “one size fits all” approach to programming. Based on the findings from this research study, participants needed different information to break down the barriers and perform the new behavior.
- Put a CBSM water conservation pilot program into place, evaluate it and make adjustments to improve the program before launching on a larger scale. If the findings indicated a positive attitude towards increasing water conservation practices, a pilot program would help get the change started.
- Have research specialists train Extension agents on the use of CBSM and how to put it into action. The participants in this study indicated a willingness to make changes to reduce water use. By determining the barriers and the norms, great strides could be made in achieving behavior change as an impact. Other areas of Extension programming could benefit from this approach.
- Using the Green Industry Best Management Practices, create a training program for HOA board members. The participants indicated that the HOA is a barrier for residents when trying to reduce their water use. Using CBSM strategies, a program tailored to the target audience (HOA) should be created to encourage behavior change.

APPENDIX A
IRB APPROVAL



PO Box 112250
Gainesville, FL 32611-2250
352-392-0433 (Phone)
352-392-9234 (Fax)
irb2@ufl.edu

DATE: March 16, 2012

TO: Liz R. Felter; Tracy Irani, PhD; Paul Monaghan, PhD
6021 South Conway Road
Orlando, FL 32812

FROM: Ira S. Fischler, PhD; Chair *ISF*
University of Florida
Institutional Review Board 02

SUBJECT: **Renewal of Protocol #2009-U-0392**

TITLE: Benefitting the Environment and Increasing the Competitiveness of the Turfgrass Industry

SPONSOR: Florida Turfgrass Association

Your request to continue your research protocol involving human participants has been approved. Participants are not placed at more than minimal risk by the research. You are reminded that any changes, including the need to increase the number of participants authorized, must be approved by resubmission of the protocol to the Board.

Re-approval of this protocol extends for one year from the date of the review, the maximum duration permitted by the Office for Human Research Protection. This approval is valid through **April 3, 2013**. If this project will not be completed by this date, please telephone our office (392-0433) at least six weeks in advance so we can advise you how to reapply. **Additionally, should you complete the study before the expiration date, please submit the study closure report to our office.** The form can be located at http://irb.ufl.edu/irb02/Continuing_Review.html.

It is important that you keep your Department Chair informed about the status of this research project. Further, if your project is funded, you should send a request to extend your grant along with a copy of this project renewal notification to DSR, Awards Administration, P.O. Box 115500.

ISF:dl

APPENDIX B
INFORMED CONSENT

Mar. 16. 2012 8:35PM

No. 0989 P. 6

Informed Consent

Protocol Title: Is Education Enough to Create a Behavior Change in Water Conservation Practices?

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study: The purpose of this study is to obtain information from participants about use of their irrigation timer and determine information needs, document opinions about water use and landscape quality.

What you will be asked to do in the study: Provide your input on water conservation methods by adjusting your irrigation clock

Time required: 90 minutes

Risks and Benefits: You will encounter no risks by participating in this study. We do not anticipate that you will benefit directly by participating in this experiment.

Compensation: You will not be compensated for participating in this research.

Confidentiality: Your identity will be kept confidential to the extent provided by law. Your name will be changed and your information will be assigned a code number. The list connecting your name to this number will be kept in a locked file in my faculty supervisor's office. When the study is completed and the data have been analyzed, the list will be destroyed. Your name will not be used in any report.

Voluntary participation: Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study: You have the right to withdraw from the study at anytime without consequence.

Whom to contact if you have questions about the study: Liz Felter, Doctoral Student, Department of Agricultural Education and Communication, P.O. Box 110540, Gainesville, Fl. 32611-0540, phone 407-254-9203.

Whom to contact about your rights as a research participant in the study: IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone 352-392-0433.

Agreement: I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

Approved by
University of Florida
Institutional Review Board 02
Protocol # ... 2009-U-0392
For Use Through ... 04-3-2013

APPENDIX C
RECRUITMENT PROTOCOL

Hello, my name is _____ and I'm calling from the Florida Survey Research Center at the University of Florida. We are working with researchers at the University of Florida to recruit participants for focus groups that will meet in Orlando on Wednesday, April 24th and Thursday, April 25th regarding water conservation. The group will take about 2 hours to complete and participants will receive \$70 for their time. Are you at least 18 years of age and interested in hearing more about this research project? **(INT: If not 18: May I speak to someone in your household who is at least 18 years old?)**

University researchers will be leading a discussion with residents of Orange County regarding their perceptions and attitudes toward water usage in their yard and conservation.

The focus groups will be held at the FNGLA (Florida Nursery, Growers and Landscape Association) office in Orlando on Wednesday April 24th and Thursday, April 25th at 5:00 PM and 7:30 PM. It will take about 2 hours to complete. Refreshments will be served and all participants will receive a \$70 stipend at the close of the session.

1. Are you interested in being considered for participation for one of these focus groups?
[YNDR1289]

IF Q1=YES

1A. Which day and time is most convenient for you?

Wednesday at 5:00=1 Wednesday at 7:30=2 Thursday at 5:00=3 Thursday at 7:30=4
anytime=5

Thank you. I'll need to ask you a few demographic questions so that we can be sure that the groups are representative.

2. Gender **[INT: Don't ask; just record]**

Male=1 Female=2

3. Do you own your own home?

[YNDR1289]

4. In what year were you born? **(INT: Verify year after you have typed it)**

[yeardr89,1916-1993]

5. What is the highest level of education you have completed?

Less than High School=1 High School or GED=2 Some College=3 College
Degree=4

Graduate Degree=5 Professional Degree=6 Other=7 Refused=9

6. Is your family's total yearly income before taxes \$35,000 or less, or more than \$35,000?

\$35,000 or less=1 More than \$35,000=2 Don't know=8 Refused=9

IF Q6=LESS

6A. And is that:
\$30,001-\$35,000=3 \$20,000-\$30,000=2 less than \$20,000=1 Don't know=8
Refused=9

IF Q6=MORE

6B. And is that:
\$35,001-\$50,000=1 \$50,001-\$75,000=2 more than \$75,000=3 Don't know=8
Refused=9

7. Just to be sure we have a representative sample, would you please tell me your race or ethnicity?
Black/African American=1 White=2 Asian/Pacific Islander=3 Native American=4 Other=5
Refused=9

8. And would you say that you are Hispanic?
[YNDR1289]

If you are selected to participate in this focus group study, a representative will call you and a confirmation letter containing details such as time, date, location, and a map will be mailed (or emailed) to you.

9. To facilitate that follow-up, can you please tell me your name and mailing or email address? **(INT: check spelling of name and type email address into address if they prefer)**
[address]

10. Is @phone@ the best telephone number to reach you?
[YNDR1289]

IF Q10=NO

10A. What number would you prefer that we use to contact you? **(INT: Enter number only-no hyphens. Read back number to check for errors)**
[numdr89,10]

Thank you, that completes the first part of the process. If you are selected to participate, you will receive a call within 5 business days.

“Thank you for your time. Have a nice evening (day).”

APPENDIX D
EXAMPLE OF CALLBACK SCRIPT

**Water Usage
Orlando
Callback script**

May I please speak with [see name on call sheet]?

You were contacted about participating in a focus group for researchers at the University of Florida regarding your perceptions and opinions about water conservation. I'm calling to confirm your interest in participating.

The focus group will be held at the FNGLA (Florida Nursery, Growers and Landscape Association) office in Orlando on **Thursday**, April 25th at (**see call sheet**) PM. It will take about 2 hours to complete. Refreshments will be served and all participants will receive a \$70 stipend at the close of the session.

A confirmation letter and directions will be mailed or emailed to you. May I confirm your name and email or mailing address? **(INT: Double check spelling etc. so that mailings are not returned)**. A seat has been reserved for you and your responses are important. If you do not receive the mailing by Friday, April 19th, please call us at 352-392-5957.

FNGLA Office
1533 Park Center Drive
Orlando, FL 32835-5705

APPENDIX E
MODERATOR'S GUIDE

**UNIVERSITY OF FLORIDA/IFAS/AEC
FOCUS GROUP MODERATOR'S GUIDE
Felter Doctoral Dissertation Research Project**

Location: Orlando, FL

Dates: April 24, 25, 2013

WELCOME/GROUP PROCESS & PURPOSE (5 minutes)

Moderator reads: Hello and welcome to our focus group session. Thank you for taking time to join our discussion today. My name is Quisto, and I will be moderating this session. This is Liz and she is my assistant moderator.

You have been invited here today because we are interested in hearing your opinions of landscape issues. We are also interested in knowing what concerns and perceptions you have about watering your yard and water conservation in general. The one thing we know you all have in common is you have an automated irrigation system at your house.

My role here is to ask questions and listen. I won't be participating in the conversation. Please feel free to share your point of view even if it differs from what others have said. Please speak up and only one person should talk at a time. I'll be asking around 16 questions, and I'll be moving the discussion from one question to the next. Sometimes there is a tendency in these discussions for some people to talk a lot and some people not to say much. But it is important for us to hear from each of you today because you have different experiences. So if one of you is sharing a lot, I may ask you to let others respond. And if you aren't saying much, I may ask for your opinion.

We welcome all opinions and will keep them confidential, so please feel free to say what you think. Additionally, we encourage you all to keep this discussion confidential. However, we cannot guarantee that you all will do so. There is no particular order for the responses, and there are no correct/incorrect answers to any of the questions. This session will be recorded so that we are able to consider your views later. For the sake of clarity, please speak one at a time and be sure to speak clearly so that our recorders can pick up your comments.

You can see that we have placed name cards on the table in front of you. That is because we will be on a first-name basis, but in our later reports there will not be any names attached to comments to keep response confidential.

Our session will last about an hour and a half, and we will take a break halfway through. If you have your cell phone with you, we would appreciate it if you could turn it off while we are in the discussion.

I hope that everyone will feel comfortable with the process, and will feel free to share their opinions as we proceed. If you did not fill out a waiver when you arrived, please

see Liz and complete this form before we begin our discussion. Are there any questions before we begin?

ICEBREAKER/GROUP INTRODUCTIONS (10 minutes)

Before we get started in the discussion, let's find out some more about each other by going around the room one at a time. Tell us your name and a little about you, including your occupation and how long you have lived in Florida.

THEIR LAWNS

1. Tell us about what kind of yard you have.
 - a. how big is it
 - b. is it sunny or shady
 - c. what do you like about your yard
 - d. do you have a lot of grass?

2. What would you change about it?

WATERING THEIR LAWNS

3. Let's tell each other about how you handle watering your yard?
 - How many times a week?
 - How do you decide how often to water?
 - Do you manually water or do you use an automatic timer?
 - a. For those who water manually, why do you do so?
 - b. For those who the automatic timer, why do you do so?
 - For those who have used the timer, can you describe the process of setting the timer?
 - a. Have there been any difficulties using the timer?

4. Have you had problems setting the timer?
 - If so, what problems have you had?
 - Were you able to get past the problem?
 - How so?

WATER WASTE

5. Can you describe any water conservation practices you do now?

6. Do you see water being wasted in your neighborhood?
 - Can you describe how you see water being wasted in your neighborhood?
 - What makes you say that?
 - How do you feel about water being wasted in your neighborhood?
 - Do you feel like you have any power to do something about it?

7. If you had a goal to cut your outdoor water use in half, what do you think you would have to do?
8. If you knew how to cut your outdoor water use in half just using the timer, would you be interested?
 - Why (or why not) would you be interested?
 - If it took more time to turn on the timer each week, would you still be interested?
 - What are your thoughts about more time spent turning on the timer to save water?
8. Would you have any concerns about your lawn if you tried to cut your outdoor water use in half?
 - Why (or why not) is that an issue for you?
9. Do you have any motivation for cutting your outdoor watering use in half?
 - Can you describe those motivations?
 - What else could motivate you to conserve water?
 - save water for money?
 - save water for the environment?

NEIGHBORS SAVING WATER

10. Do you have neighbors that try to conserve water?
 - What do their lawns look like?
 - How does it make you feel?
 - Have you spoken with these neighbors about conserving water?
 - If so, what did they say?
11. If your HOA got together and decided to cut their total water use in half, how would that make you feel?
 - What would this program probably be like?
 - Who would lead a program like that?
 - Would you be willing to get involved?
 - If so, how would you like to be involved?
 - How would you motivate your neighbors to go along with it?
 - How could the neighbors be reminded to take the steps to use less water?
12. Do you think about how your outdoor water use contributes to declining water resources in Florida?

- What makes you say that?
- Does thinking about your individual water use affecting Florida's water resources change your views on reducing your water use?
- why or why not?

COMMUNICATIONS

13. What would help you remember to conserve water?
- signs, flyers, stickers, etc.?
14. What types of messages should these focus on?
- What could they say to help motivate you to conserve water?
 - Saving money?
 - Saving water?
 - Saving natural resources?
 - Don't waste water?

RECOMMENDATIONS

15. Do you have any other recommendations for how water could be conserved by homeowners?
16. Do you have any other recommendations for promoting water conservation by homeowners?

CONCLUSIONS

15. Do you have any final thoughts about conserving outdoor water use at home or anything else we have discussed today?

I am going to quickly summarize some of the things we have talked about today.

[summary is read]

17. Is this an accurate summary of today's discussion?

Thank you for taking time out of your day to share your opinions. Your participation is greatly appreciated and has provided valuable insight into this topic. As you leave, please pick up your incentive as a token of our appreciation. Thanks again.

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BIOGRAPHICAL SKETCH

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