

# **Building Extension Partnerships with Government to Further Water Conservation Efforts**

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## **Abstract**

*Extension, being a local, state and federally funded program has a natural partnership with government agencies at all three levels, however these partnerships could be built upon and targeted at specific audiences for greater effect if more is known about how government influences public perception. The government has recognized the need for increased public engagement in water conservation to ensure the sustainability of water resources for future generations and taken action through incentive programs and regulations. Political affiliation is known to influence public perception of government initiatives, which may impact levels of intention and engagement in water conservation. This study explored how US residents responded to positive and negative governmental influences on water conservation practices using an online survey. The findings revealed significant differences in the water conservation activities respondents are currently engaged in, as well as future intentions, depend upon political affiliation. Additionally, intention can be predicted by political affiliation and positive government perceptions. By examining the dissonance created by respondents' engagement and intention to take water conservation action, guidance can be provided to extension educators on how to collaborate with government agencies to develop and implement programs and policies that encourage or enforce engagement in water conservation behaviors.*

**Keywords:** Extension, political affiliation, public perception, government, water conservation

This research was supported by funding from the UF/IFAS Center for Public Issues Education.

## **Introduction**

Extension educators have played an important role connecting local needs with research and then providing assessments of established programs (Terry & Osborne, 2015). The role of Extension educators is to provide the public with knowledge based on research, so the public will make informed decisions on local and national issues. Water conservation is one of the pinnacle issues that must be addressed by Extension educators (Lamm, Lamm, & Carter, 2015; Huang & Lamm, 2015a; Huang & Lamm, 2015b; Huang, Lamm & Dukes, 2016). Increases in agricultural production, irrigation, recreation, industry, and power generation have been leading to increased water scarcity as the population continues to grow (Adams et al., 2013; Hoekstra, Mekonnen, Chapagain, Mathews, & Richter, 2012, Huang et al., 2016). Today's Extension educators play a significant role in understanding public perceptions and assist in the implementation of water

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conservation practices. This role can be effectively filled by programs and messages that encourage water conservation efforts (Warner, Lamm, Rumble, Martin, & Cantrell, 2016). Since local, state and federal funding largely funds extension, partnerships with government agencies including local public officials, water management district personnel and state regulatory agencies should be natural. However, engagement between Extension educators and their government partners has been limited due to a lack of understanding in how they can support one another.

Domestic water use has been an issue of discussion driving the development of government water policies and strategies (Babel, Gupta, & Pradhan, 2007). Conservation practices are largely encouraged through policies and associated programs and activities. These government-supported programs and activities can be perceived as positive or negative by the public and have varying degrees of success (Gneezy, Meier, & Rey-Biel, 2011). According to Manner and Gowdy (2010), policy design that takes advantage of a person's intrinsic motivation for conservation may be more effective than policy that is strict and imprisons the public.

Government policymakers have tried many types of motivators to encourage adoption of efficient conservation practices and technologies, which meet national environmental performance targets (Higgins, McNamera, & Foliente, 2014). These motivators include incentives such as rebates, tax breaks, and other fiscal instruments (Higgins et al., 2014). Government policymakers have supported programs and activities that increase water application efficiencies, including the encouragement of installing more efficient irrigation systems, applying converting practices, and introducing market mechanisms (Boelens & Vos, 2012). On the other side, a study conducted on negative incentives showed that negative framing could create a more motivated population (Goldsmith & Dhar, 2013). However, negative incentives have been studied far less and are used less often than rewards and positive incentives (Promberger, Brown, Ashcroft, & Marteau, 2011).

Political affiliation and polarization have been studied extensively, but few studies have been conducted that examine the relationships between political parties and areas that exist outside of the political arena (Coffey & Joseph, 2012). Coffey and Joseph (2012) found that political affiliation can extend into the populations' personal, social, and economic choices. In fact, strong relationships between political affiliation and conservation efforts had been found (DuPont & Bateman, 2012). According to Costa and Kahn (2013), political liberals were more likely to receive notification about their electricity usage than political conservatives. These notifications can encourage energy conservation within the population. Additionally, an individual's psychological value regarding conservation can be connected to a person's political ideology (Gromet, Kunreuther, & Larrick, 2012). Gromet et al. (2012) found the more conservative individuals were, the less psychological value they placed on environmental conservation. This may be due to the pattern that occurs between a party's social cue and endorsement which effects voters' behaviors (Lau & Redlawsk, 2001).

Pressure on water resources from a growing population will increase future costs for conserving water, such as rationing of water for agricultural use, recreation, the public and will require the installation of new (potentially expensive) technologies (Olmstead & Stavins, 2009; Phelps, Carrasco, Webb, Koh, & Pascual 2013). With future conservation costs increasing and few policy measures being taken to ensure water conservation, more effective motivators and incentives need to be created to preserve water. Therefore, understanding the full effect of how to enact positive and negative governmental influences to encourage the greatest conservation is needed. Extension educators can then work with policy makers and government partners to develop policy and educational programs that utilize cognitive influences on water conservation (Leal, Rumble, & Lamm, 2015). By understanding public perception of water use and knowing the most efficient

government support that encourages engagement in water conservation, Extension educators can encourage policymakers to create policies that work.

This study sought to address two research priorities of the National Research Agenda (Roberts, Harder, & Brashears, 2016), “public and policy maker understanding of agriculture and natural resources” (p. 13) and “addressing complex problems” (p. 57). Extension educators need to understand the relationships between political affiliation and perception of governmental influence, as well as their effect on public engagement in water conservation, so they can more appropriately work with and support government action. Perhaps this could even lead to the development of policies that support and promote water conservation (Higgins et al., 2014).

### **Theoretical Framework**

This study applied the theory of cognitive dissonance (Festinger, 1957) to identify the relationships between positive and negative perceptions of governmental influence and water conservation, as well as examine how political affiliations connects and influences these perceptions. Cognitive dissonance theory was proposed by Festinger (1957) and has made a significant mark on the field of social psychology (Metin & Camgoz, 2011). Metin and Camgoz (2011) explained that cognitive dissonance theory proposes “when people experience psychological discomfort (dissonance), they strive to reduce it through either changing behaviors and cognitions or adding new cognitive elements” (p. 131). The reward for the change in behavior would be to live in agreement with others with their own beliefs. The theory was built on the notion that individuals strive for consistency and therefore, inconsistencies lead to dissonance that must be dealt with. Jarcho, Berkman, and Lieberman (2011) explained that decision-making is a part of daily life and these decisions often include choices between outcomes, which appear equally attractive. To compensate for their decision and the unchosen alternative, “people will adjust their attitudes to support their decision by increasing their preference for the selected option, decreasing their preference for the rejected option” (Jarcho et al., 2011, p. 460). An example of cognitive dissonance was given by Vining and Ebreo (2002): an individual who performs pro-environmental behavior, such as water conservation currently leaves the water on while brushing teeth and washing dishes. In order to resolve the negative emotion and the dissonance created between the individual’s conflicting viewpoints, the individual will align their actions by reducing their water waste. This can be an effective tool for Extension educators when attempting to inform the public about water conservation.

A study conducted by Kantola, Syme, and Campbell (1984) focused on cognitive dissonance and energy conservation behavior by monitoring an Australian Population. The participants experienced cognitive dissonance when the participants consumed higher amounts of energy than they indicated on their willingness to save energy. The observation was then made that the randomly assigned group which received a letter that they were over-users of energy, would significantly reduce their energy usage in the post-trial follow ups. Stone and Fernandez (2008) described the observation as, “inducing dissonance by making homeowners aware of a discrepancy between their pro-conservation attitude and past conservation behavior did seem to motivate them to alter their conservation behavior above and beyond the other influence strategies” (p. 1030).

Thøgersen (2004) performed a cognitive dissonance study on the consistencies and inconsistencies in environmentally responsible behaviors. The findings of this study recognized that most people desire to respond consistently by identifying respondents’ environmentally relevant behaviors and performance norms. Thøgersen (2004) resolved,

Behavioral inconsistency threatens the individual's self-perception as a morally reliable person only if he or she holds moral norms of some strength for this type of behavior. Hence, for individuals who have no or only weak moral norms for environmentally relevant behaviors it matters little if they perceive their behavior in this domain to be inconsistent. However, for individuals with strong moral norms the desire to avoid cognitive dissonance creates a drive to behave consistently. (p. 95)

Thøgerson's (2004) study provided evidence that in order for the population to become more environmentally sustainable, their actions should become more consistent with the norms. Cognitive dissonance within individuals would drive their conservation behaviors to be more consistent with their perceived conservation responsibility and develop strong moral norms towards water sustainability.

Between 2001 and 2010, a study on governmental influence was conducted regarding the conservation of the Brazilian Amazon area (Nolte, Agrawal, Silvius, & Soares-Filho, 2013). The study was performed under the pretext that the Amazon was managed under different government regime, and the different approaches had led to some debates on which approach was the most effective one. Nolte et al. (2013) asserted the most effective approach was reliant upon two other main factors: the level of deforestation pressure that the area had been exposed to and the intensity of governmental enforcement. The locations observed were categorized into sustainable use and strictly protected areas. The proponents of strict conservation continued to argue that ending resource extraction and equipping enforcement techniques should be a more effective way in ensuring conservation than an inclusionary approach. However, other contributors continued the argument that indigenous people have intrinsic need to protect their livelihood and that this incentive would be far superior to any other incentives given from a governmental agency. Nolte et al. (2013) concluded that both strictly protected and sustainable use areas substantially reduced deforestation rates inside the Amazon, but strictly protected areas were more consistent with conservation efforts.

The theory of cognitive dissonance provides an explanation for the inconsistencies created between current actions and future intentions of water conservation and governmental influence (Thogerson, 2004). Therefore, the inconsistencies that will be noted in this study can be used as tools by policymakers and extension educators to inform public water use, such as the study conducted on energy use by Kantola et al, (1984). This study examined the impact a strict government may have on public water conservation action versus one that offers incentives and is perceived by the public as supportive of taking personal action without enforcement.

### **Purpose and Objectives**

The purpose of this study was to determine how US residents' perception of government and political affiliations influenced current water conservation actions and willingness to act towards water conservation. The research objectives for this study were to:

1. Describe the current water conservation actions, willingness to act towards water conservation, and perceptions of government influence on water conservation.
2. Determine if differences in political affiliation impacted perceptions of government, current action, and willingness to act towards water conservation.
3. Determine if political affiliation and perception of government predicted current action and willingness to act towards water conservation.

## Methodology

A quantitative study using an online survey design was conducted to explore how individuals' intention to conserve water can be predicted by their political affiliation and perception of government influence on water conservation. The survey instrument was researcher-developed based on the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012) and the Government Style Questionnaire (Green-Demer, Blanchard, Pelletier, & Béland, 1994). To accomplish the objectives, three sections of the instrument were used: perceptions of government, the water conservation activities respondents are currently engaged in, and respondents' willingness to act on water conservation-related activities. Prior to data collection, the developed instrument was reviewed by a panel of experts specializing in water issues, public opinion research, and survey design to ensure face and content validity. The panel of experts included the Chief Executive Officer of [Association], an Extension specialist in water economics and policy, the Director of the [Center], the Director of the [Institute], the Associate Director of the [Center], and an assistant professor specializing in agricultural communication.

Once the instrument was reviewed, a pilot test was conducted with 50 respondent's representative of the target population to confirm reliability of the constructs. All were found reliable with Cronbach's alpha levels greater than .80. The survey was then distributed nationwide to respondents aged 18 or older by collaborating with a public opinion survey research company. Data were collected using a non-probability opt-in sampling method. A total of 2,703 respondents were invited to respond to the survey. Quotas were set *a priori* as well as attention filters integrated. If a respondent did not fill a quota or failed an attention filter they were dismissed and their response was not recorded resulting in 1,050 complete responses and a participation rate of 42%. Since the use of a non-probability data collection method can lead to selection, exclusion, and non-participation biases, post-stratification weighting methods were applied to ensure the responses were representative of the population of interest (Baker et al., 2013; Kalton & Flores-Cervantes, 2003). Data were weighted by respondents' residential state, age, gender, and race/ethnicity according to the 2010 U.S. Census. Descriptive statistics were used for objective one, ANOVAs for objective two and linear regression for objective three.

The respondents were first asked to indicate their perceptions of government using four negative perception statements and three positive perception statements on a five-point Likert-type scale ranging from 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither agree nor disagree*, 4 = *Agree*, or 5 = *Strongly Agree*. The index scores were calculated by averaging the scores of the four negative perception statements and the three positive perception statements. Both indices were found reliable with Cronbach's  $\alpha$  of .77 (negative) and .93 (positive). Respondents' water conservation activities they currently engaged in were measured by asking respondents to indicate how often they performed seven actions on a five-point Likert-type scale ranging from 1 = *Never*, 2 = *Almost Never*, 3 = *Sometimes*, 4 = *Almost Every Time*, 5 = *Every Time*. Respondents were able to select *Does Not Apply*. The responses of *Does Not Apply* were transformed as missing values when analyzing data. The construct of water conservation activities was found reliable ( $\alpha = .71$ ) using an index score created by averaging the seven items. Respondents' willingness to act toward water conservation was measured by asking how likely respondents were to engage in 20 activities in the future on a five-point Likert-type scale ranging from 1 = *Very Unlikely*, 2 = *Unlikely*, 3 = *Undecided*, 4 = *Likely*, 5 = *Very Likely*. *Not Applicable* was also included as an option in the willingness to act questions. The responses of *Not Applicable* were also transformed as missing values. The measurement of willingness to act was found reliable ( $\alpha = .93$ ) by creating the index score, which was calculated by averaging the 20 items. Lastly, respondents were asked a set of demographic questions including sex, race, ethnicity, age, region of residency, education level, income level, and political affiliation.

The respondents were 51% female and 49% male. The majority of the respondents were white (67%), while the rest of the respondents were 12% Black, 5% Asian or Pacific Islander, 1% Native American, 1% were multiracial, and 14% identified as other type of race. Fifteen percent of the respondents considered themselves to be Hispanic. Thirty-five percent of the respondents were between the age of 20 and 39 years old, 37 % were between 40 and 59 years old, and 28% were over 60 years of age. More respondents lived in the South (35%) compared to those living in the Midwest (23%), Northeast (22%), and West (20%). In terms of education level, 2% of the respondents had less than a 12<sup>th</sup> grade education, 22% had a high school education or General Education Development certificate, 25% had some college education without a degree, 13% had a 2-year college degree, 26% had a 4-year degree, and 13% had a graduate or professional degree. The respondents reported their political affiliation as: 26% Republicans, 38% Democrats, 26% Independents, and 10% non-affiliated. For income levels, 22% of the respondents had an income level of less than \$24,999, 29% had an income level between \$25,000 and \$49,999, 24% had an income level between \$50,000 and \$74,999, 21% had an income level between \$75,000 and \$149,999, and 4% made more than \$150,000.

## **Results**

### **Perceptions of Government**

Respondents were asked to indicate their perceptions of government using seven provided statements. The perception statements were divided into two categories: negative government perception (see Table 1) and positive government perception (see Table 2). Within the negative government perception statements, 40% of respondents agreed or strongly agreed the government imposes its environmental strategies on them. However, 36% of the respondents disagreed or strongly disagreed the government is trying to force them to adopt environmental behaviors. Of the positive government perception statements, 62% of the respondents agreed or strongly agreed they have the choice to participate in the environmental programs established by the government; 16% disagreed or strongly disagreed with the statement that “The government gives me the freedom to make my own decisions in regards to the environment.”

Table 1

Negative Government Perceptions (N =1050)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	%				
I feel the government wants to make me feel guilty when I do nothing for the environment	12.2	23.1	27.2	24.5	13.1
I feel the government imposes its environmental strategies on us	8.1	21.1	30.2	27.4	13.0
I feel that the government is trying to force me to adopt environmental behaviors	11.6	24.6	28.7	23.9	12.1
I think the government puts a lot of pressure on people to adopt environmentally-conscious behaviors	7.7	21.8	28.8	31.0	10.8

Table 2

Positive Government Perception (N=1050)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	%				
I feel I have the choice to participate in the environmental programs established by the government	4.6	7.5	26.4	46.5	15.0
I feel I have the choice to use the strategies provided by the government in order to help the environment	4.8	7.7	31.8	42.6	13.1
The government gives me the freedom to make my own decisions in regards to the environment	5.9	10.3	29.6	43.0	11.2

**Current Water Conservation Activities**

Respondents were asked about how often they participated in six water conservation practices (see Table 3). “I allow used motor oil to run down a storm drain” was the practice with the highest percentage of the respondents indicating they never or almost never participate in (93%). However, only 50% of respondents reported they never or almost never leave the water running in the kitchen while washing and/or rinsing dishes.

Table 3

*Water Conservation Activities*

		Never	Almost Never	Some- times	Almost Every Time	Every Time
	<i>N</i>	<i>%</i>				
I allow used motor oil to run down a storm drain.	874	88.6	4.0	2.5	2.8	2.1
I let my sprinklers run when rain is predicted in the forecast.	773	70.9	15.1	6.9	5.0	2.1
I hose down my driveway to wash it.	861	60.4	17.8	16.8	3.1	2.0
I allow soapy water to run down a storm drain.	868	53.2	15.8	14.6	78.2	8.3
I allow oil from cooking to run down the drain.	1017	50.4	17.2	21.4	7.6	3.3
I leave the water running in the kitchen when washing and/or rinsing dishes.	1024	30.4	19.4	28.7	13.7	7.8

**Willingness to Act**

Respondents were asked the likelihood of participating in 20 water conservation practices (see Table 4). Over 89% of respondents identified they were likely or very likely to responsibly dispose of hazardous materials (n = 826). The activity with the most respondents identified they were unlikely or very unlikely to participate in was buying a specialty license plate that supports water protection efforts (n = 605, 62 %).

Table 4

Willingness to Act on Water Conservation

	N	Very Unlikely	Unlikely	Un-decided	Likely	Very Likely
		%				
Only run the dishwasher when it is full	802	3.7	3.5	6.7	16.5	69.6
Responsibly dispose of hazardous materials	924	1.4	.8	8.4	21.2	68.2
Only run the washing machine when it is full	1010	3.6	3.7	6.5	22.3	63.9
Sweep patios and sidewalks instead of hosing them down	848	4.3	2.0	8.6	26.7	58.4
Reduce the number of times a week you water your lawn	695	5.5	3.0	12.7	24.8	54.0
Only water your lawn in the morning or evening	731	5.9	1.6	14.8	26.6	51.1
Support water restrictions issued by my local government	993	4.1	4.6	18.7	30.3	42.3
Avoid purchasing plants that require a lot of watering	921	4.1	5.6	21.1	31.0	38.2
Reduce use of pesticides if your landscape quality would decrease	738	4.2	6.1	20.9	33.3	35.5
Vote to support water conservation programs	1009	2.8	3.0	18.0	42.3	33.9

Table 4 (continued)

Willingness to Act on Water Conservation

	N	Very Unlikely	Unlikely	Un-decided	Likely	Very Likely
		%				
Reduce use of fertilizer if your landscape quality would decrease	738	3.8	7.3	23.5	33.6	31.8
Vote for candidates who support water conservation	1002	3.1	1.5	25.8	39.2	30.4
Reduce your use of natural resources	995	4.8	8.1	23.8	34.9	28.3
Use biodegradable cleaning products	1018	9.6	6.9	23.3	35.0	25.3
Visit springs, lakes, state parks, etc., to learn about water issues	995	10.9	12.7	29.2	27.9	19.3
Donate to an organization that protects water	984	21.7	14.9	28.7	24.0	10.7
Volunteer for a stream clean up or wetland restoration event	973	29.0	15.9	29.4	16.4	9.2
Keep a timer in the bathroom to help you take a shorter shower	993	29.9	24.3	20.9	15.8	9.2
Join a water conservation organization	997	23.2	22.9	29.9	16.0	7.9
Buy a specialty license plate that supports water protection efforts	976	40.0	21.9	19.8	13.0	5.3

Note. N for each item varies based on the option to select Does not apply that was coded as missing data.

### Impact of Political Affiliation on Perceptions, Current Activities and Willingness to Act

Impact of political affiliation on perceptions, current activities, and willingness to act regarding water conservation were examined (see Table 5). Respondents neither agreed nor disagreed that the government imposes values upon them ( $M = 3.52$ ;  $SD = .83$ ). Respondents slightly more agreed the government is supportive of whatever the public's actions may be ( $M = 3.78$ ;  $SD = .71$ ). Current Activities had a mean of 4.02 which indicated participants' actions aligned with the listed activities almost every time ( $SD = .56$ ). Willingness to Act had a mean of 3.92 revealing the public was likely to have intentions to conserve water in the future ( $SD = .68$ ).

Table 5

#### *Descriptive Statistics of the Variables of Interest*

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
Negative Government Perception <sup>a</sup>	1050	3.52	.83
Positive Government Perception <sup>a</sup>	1050	3.78	.71
Current Activities <sup>b</sup>	659	4.02	.56
Willingness to Act <sup>c</sup>	476	3.92	.68

Note. <sup>a</sup>Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Disagree nor Agree, 4 = Agree, and 5 = Strongly Agree; <sup>b</sup>Scale: 1 = Never, 2 = Almost Never, 3 = Sometimes, 4 = Almost Every Time, and 5 = Every Time; <sup>c</sup>Scale: 1 = Very Unlikely, 2 = Unlikely, 3 = Undecided, 4 = Likely, 5 = Very Likely.

An analysis of variance was conducted to determine if differences in the indices existed based on political affiliation (see Table 6). Statistically significant differences were found between political affiliation and negative government perception ( $F(1, 670) = 2.933$ ,  $p = .09$ ) and between political affiliation and positive government perception ( $F(1, 670) = 26.594$ ,  $p = .00$ ). Post-hoc tests were conducted between the political affiliation groups and the result showed compared to Democrats, Republicans tend to have a more negative government perceptions, whereas Democrats tend to have more positive government perceptions than Republicans. Statistically significant differences between political affiliation and current activities were not found, however, a difference between political affiliation and willingness to act was found to be statistically significant ( $F(1, 316) = 20.768$ ,  $p = .00$ ). The post-hoc tests revealed Democrats scored higher on the willingness to act than Republicans. Table 6 was composed using a dummy variable for Republicans (0) and for Democrats (1) in order to test the countries most influential political parties.

Table 6

*Mean Comparison of Political Affiliation in Different Variables*

Political Affiliation Groups	Variables											
	Negative Government			Positive Government			Current Activities			Willingness to Act		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Republican	276	3.91	.63	276	3.41	.89	170	4.00	.54	129	3.56	.72
Democrat	397	4.00	.66	397	3.74	.75	255	4.04	.60	189	3.94	.74

**Predicting Current Activities and Willingness to Act**

Two linear regression models were run to determine if political affiliation and perception of government were predictors of current activity engagement and willingness to act. The results are presented in Table 7. The first model using current activities as the dependent variable was significant and revealed current activities can be predicted by positive government perception but neither negative government perception nor political affiliation. The model shows that as an individual's perception of the government becomes more positive the less likely they are to engage in water conservation activities ( $b = -.12$ ,  $p = .01$ ), however, the effect size was small explaining only 2% of the variation. The second model using willingness to act as the dependent variable revealed political affiliation, negative government perception and positive government perception were all significant predictors of willingness to act and accounted for 52% of the variance.

Table 7

*Predictors of Current Water Conservation Activity Engagement and Willingness to Act in the Future to Conserve Water*

Variable	Current Activities ( $R^2 = .02$ )		Willingness to Act ( $R^2 = .52$ )	
	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>
Political Affiliation - Democrat	.01	.93	.19	.03*
Negative Government Perception	.1	.09	.63	.00**
Positive Government Perception	-.12	.01**	.21	.00**

*Note.* Political affiliation was dummy coded with Democrat entered into the model as a 1 versus being Republican as a 0. \* $p < .05$ ; \*\* $p < .01$ .

### **Conclusion and Implications**

The findings revealed the existence of dissonance between current actions and future intentions with willingness to act in the future predicted by perception of government support and enforcement along with political affiliation, but current actions hardly impacted at all. Looking at the descriptive results, the public failed to align their intended water conservation actions with their desired positive government perception. Goldsmith et al. (2013) indicated that using negative framing could motivate the population towards a desired outcome. However, this study revealed negative framing would only be effective on activities the public is willing to do in the future rather than on their reported current activities. Such findings imply that Extension educators should be focusing on an individual's willingness to act rather than their current activities. It also implies extension professionals should partner with government agencies to develop enforcement policy and regulation, as well as incentive programs, as an effective tool to get people to engage in the activities they claim they are willing to participate in the future.

The finding that revealed public current activities and willingness to act in the future were both predicted by positive government perception implies individuals' intentions are to conserve water without enforcement and strict guidelines set in place by the government. Thogerson (2004) asserted that behavioral inconsistencies can threaten individuals' self-perception, and when individuals are confronted with such inconsistencies they will work to align their actions and beliefs. The findings of this study align with Thogerson's (2004) beliefs in that the water conservation activities individuals were currently participating in were inconsistent with their intention to participate in water conservation activities in the future. This conflict can be identified as a cognitive dissonance (Festinger, 1957) and can drive behavior change.

Although few studies have been conducted to explore the influences of political affiliation (Coffey et al., 2012), this study added to the conversation by examining the influence of political affiliation on water conservation. Previous research revealed liberals were more likely to conserve energy by finding out about their over-usage (Costa et al., 2013). In this study Democrats were found to be more willing to act in the future towards water conservation than Republicans. Additionally, Republicans had a stronger negative government perception than Democrats who had a greater positive government perception. This finding implies that Republicans may respond to negative impositions by the government while Democrats may have a stronger response to positive government influence. Extension educators working within communities that have a more liberal or conservative bent should be aware of these differences and work with their government partners to develop restrictions in more conservative areas and provide incentive programs in more liberal areas.

### **Recommendations**

With conservation costs increasing and new regulation being developed to ensure water protection, the need for effective governmental policies is imperative. Extension has a place at the table when working with government partners in the development of these policies since they are working directly with the public and can offer the most understanding of their target population. Based on the results of this study, it is evident that dissonance exists between current actions and willingness to act regarding water conservation. Intention to engage in water conservation efforts may be influenced by the feeling that participation in water conservation practices are optional, but that the public also needs strong government influence to increase conservation (Nolte et al., 2013). Effective extension educators and policymakers should be aware of this cognitive dissonance that can be used to drive participation in water conservation (Terry & Osborne, 2015).

Extension educators need to work with decision makers to leverage this effect. For example, working collaboratively to assist local governments in developing campaigns that use notifications of overuse, communicating about this over use, offering educational opportunities, and possibly implementing fines for overuse may encourage water conservation (Kantola et al., 1984). Extension education programs could be built in to this campaign where home visits or trainings at central neighborhood locations are offered by Extension educators to discuss water conservation activities in conjunction with notifications (Warner et al., 2015). This way the dissonance created by the notifications would encourage participation in Extension programs that could lead to further action.

Extension educators should also open communication channels with the public to provide feedback about why strict government enforcement can be a vital tool in water conservation (Costa et al., 2013). Given political affiliation influences perception of government enforcement, and this perception influences future willingness to engage in water conservation efforts, Extension educators should target their communication methods based on their communities political leaning (Gromet et al., 2012). For example, since Republicans are more inclined to react to increases in negative government perception, the programs should be implemented with appropriate amounts of pressure to encourage conservation from Republicans. Moreover, Extension educators should be aware of policymakers' political affiliation so that when they are working with them they can enhance communication effectiveness (Terry & Osborne, 2015).

Future studies are recommended based on the findings of this study. Researchers should examine public attitudes and perceptions of available government programs and policies related to water conservation, as well as explore specific government programs and policies that should be implemented to further increase public engagement in water conservation (Higgins et al., 2014). Specific water conservation programs and policies, as well as specific practices could then be identified as either negative (restricted) government influence or positive (unrestricted) government influence. Future studies should also be conducted to explore the magnitude of variance between current actions and future intentions (Wicklund & Brehm, 1976). Researchers should also consider examining the impacts party social cues and endorsements may have on conservation policy (Lau et al., 2001) to confirm if current participation in water conservation truly aligns with political affiliation and examine the strength of that relationship.

### References

- Adams, D. C., Allen, D., Borisova, T., Boellstorff, D. E., Smolen, M. D., & Mahler, R. L. (2013). The influence of water attitudes, perceptions, and learning preferences on water-conserving actions. *Natural Sciences Education*, 42(1), 114-122. doi:10.4195/nse.2012.0027
- Babel, M. S., Gupta, A. D., & Pradhan, P. (2007). A multivariate econometric approach for domestic water demand modeling: an application to Kathmandu, Nepal. *Water Resources Management*, 21(3), 573-589. doi: 10.1007/s11269-006-9030-6
- Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A.,... Tourangeau, R. (2013). *Report of the AAPOR task force on non-probability sampling*. American Association for Public Opinion Research. Retrieved from <http://www.aapor.org/AM/Template.cfm?Section=Reports1&Template=/CM/ContentDisplay.cfm&ContentID=5963>

- Boelens, R., & Vos, J. (2012). The danger of naturalizing water policy concepts: Water productivity and efficiency discourses from field irrigation to virtual water trade. *Agricultural Water Management*, *108*, 16-26. doi: 10.1016/j.agwat.2011.06.013
- Coffey, D. J., & Joseph, P. H. (2012). A polarized environment: the effect of partisanship and ideological values on individual recycling and conservation behavior. *American Behavioral Scientist*, 0002764212463362. doi: 10.1177/0002764212463362
- Costa, D. L., & Kahn, M. E. (2013). Energy conservation “nudges” and environmentalist ideology: Evidence from a randomized residential electricity field experiment. *Journal of the European Economic Association*, *11*(3), 680-702. doi: 10.1111/jeea.12011
- Dupont, D. P., & Bateman, I. J. (2012). Political affiliation and willingness to pay: An examination of the nature of benefits and means of provision. *Ecological Economics*, *75*, 43-51. doi: 10.1016/j.ecolecon.2012.01.012
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson.
- Gneezy, U., Meier, S., & Rey-Biel, P. (2011). When and why incentives (don't) work to modify behavior. *The Journal of Economic Perspectives*, *25*(4), 191-209. doi: 10.1257/089533011798394550
- Goldsmith, K., & Dhar, R. (2013). Negativity bias and task motivation: Testing the effectiveness of positively versus negatively framed incentives. *Journal of Experimental Psychology: Applied*, *19*(4), 358. doi: 10.1037/a0034415
- Green-Demer, I., Blanchard, C., Pelletier, L. G., & Béland, A. (1994). *Perception of government environmental strategies by the citizens: The government style questionnaire (GSQ)*. (Research Paper No. 13). Ottawa: University of Ottawa Institute for Research on Environment and Economy.
- Gromet, D. M., Kunreuther, H., & Larrick, R. P. (2013). Political ideology affects energy-efficiency attitudes and choices. *Proceedings of the National Academy of Sciences*, *110*(23), 9314-9319. doi: 10.1073/pnas.1218453110
- Higgins, A., McNamara, C., & Foliente, G. (2014). Modelling future uptake of solar photovoltaics and water heaters under different government incentives. *Technological Forecasting and Social Change*, *83*, 142-155. doi: 10.1016/j.techfore.2013.07.006
- Hoekstra, A. Y., Mekonnen, M. M., Chapagain, A. K., Mathews, R. E., & Richter, B. D. (2012). Global monthly water scarcity: Blue water footprints versus blue water availability. *PLoS One*, *7*(2), e32688. doi: 10.1371/journal.pone.0032688
- Huang, P., & Lamm, A. J. (2015a). Impact of experience and participation in Extension programming on perceptions of water quality issues. *Journal of International Agricultural and Extension Education*, *22*(3). Doi:10.5191/jiaee.2015.22303
- Huang, P., & Lamm, A. J. (2015b). Understanding public engagement in water conservation behaviors and knowledge of water policy: Promising hints for Extension. *Journal of Extension*, *53*(6). Retrieved from <http://www.joe.org/joe/2015december/rb1.php>

- Huang, P., Lamm, A. J., & Dukes, M. (2016). Informing extension program development through audience segmentation: Targeting high water users. *Journal of Agricultural Education*, 57(2), 75-89. doi: 10.5032/jae.2016.02075
- Jarcho, J. M., Berkman, E. T., & Lieberman, M. D. (2011). The neural basis of rationalization: cognitive dissonance reduction during decision-making. *Social Cognitive and Affective Neuroscience*, 6(4), 460-467. doi: 10.1093/scan/nsq054
- Kalton, G., & Flores-Cervantes, I. (2003). Weighting methods. *Journal of Official Statistics*, 19(2), 81-97.
- Kantola, S. J., Syme, G. J., & Campbell, N. A. (1984). Cognitive dissonance and energy conservation. *Journal of Applied Psychology*, 69(3), 416. doi: 10.1037/0021-9010.69.3.416
- Lamm, K. W., Lamm, A. J., & Carter, H. (2015). Bridging water issue knowledge gaps between the general public and opinion leaders. *Journal of Agricultural Education*, 56(3), 146-161. DOI: 10.5032/jae.2015.03146
- Lau, R., & Redlawsk, D. (2001). Advantages and disadvantages of cognitive heuristics in political decision making. *American Journal of Political Science*, 45(4), 951-971. Retrieved from <http://www.jstor.org/stable/2669334>
- Leal, A., Rumble, J. N., & Lamm, A. J. (2015). Setting the agenda: Exploring Florida residents' perceptions of water quality and quantity issues. *Journal of Applied Communications*, 99(3), 53-68.
- Manner, M., & Gowdy, J. (2010). The evolution of social and moral behavior: Evolutionary insights for public policy. *Ecological Economics*, 69(4), 753-761. doi: 10.1016/j.ecolecon.2008.04.021
- Metin, I., & Camgoz, S. M. (2011). The advances in the history of cognitive dissonance theory. *International Journal of Humanities and Social Science*, 1(6), 131-136.
- Nolte, C., Agrawal, A., Silvius, K. M., & Soares-Filho, B. S. (2013). Governance regime and location influence avoided deforestation success of protected areas in the Brazilian Amazon. *Proceedings of the National Academy of Sciences*, 110(13), 4956-4961. doi: 10.1073/pnas.1214786110
- Olmstead, S. M., & Stavins, R. N. (2009). Comparing price and nonprice approaches to urban water conservation. *Water Resources Research*, 45(4). doi: 10.1029/2008WR007227
- Patterson, L. (2012). *2012 RBC Canadian water attitudes study*. RBC Blue Water Project. Retrieved from <http://www.rbc.com/community-sustainability/environment/rbc-blue-water/index.html>
- Phelps, J., Carrasco, L. R., Webb, E. L., Koh, L. P., & Pascual, U. (2013). Agricultural intensification escalates future conservation costs. *Proceedings of the National Academy of Sciences*, 110(19), 7601-7606. doi: 10.1073/pnas.1220070110

- Promberger, M., Brown, R. C., Ashcroft, R. E., & Marteau, T. M. (2011). Acceptability of financial incentives to improve health outcomes in UK and US samples. *Journal of Medical Ethics*, 37(11), 682-687. doi:10.1136/jme.2010.039347
- Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication. Retrieved from [http://aaaeonline.org/resources/Documents/AAAE\\_National\\_Research\\_Agenda\\_2016-2020.pdf](http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf)
- Stone, J., & Fernandez, N. C. (2008). To practice what we preach: The use of hypocrisy and cognitive dissonance to motivate behavior change. *Social and Personality Psychology Compass*, 2(2), 1024-1051. doi: 10.1111/j.1751-9004.2008.00088.x
- Terry, B. D., & Osborne, E. (2015). Fundamental dimensions and essential elements of exemplary local Extension units. *Journal of Agricultural Education*, 56(2), 43-63. doi: 10.5032/jae.2015.02043
- Thøgersen, J. (2004). A cognitive dissonance interpretation of consistencies and inconsistencies in environmentally responsible behavior. *Journal of Environmental Psychology*, 24(1), 93-103. doi: 10.1016/S0272-4944(03)00039-2
- Warner, L. A., Rumble, J., Martin, E., Lamm, A. J., & Cantrell, R. (2015). The effect of strategic message selection on residents' intent to conserve water in the landscape. *Journal of Agricultural Education*, 56(4), 59-74. doi: 10.5032/jae.2015.04059
- Wicklund, R. A., & Brehm, J. W. (1976). *Perspectives on cognitive dissonance*. Hillsdale, NJ: Psychology Press.