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Predicting Intent to Conserve Freshwater Resources Using the Theory of Planned Behavior (TPB)

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Abstract: Freshwater resources are being rapidly depleted by unsustainable human activities in the United States (U.S.), causing concern for water security. If individuals were targeted with appropriate information, public engagement in water conservation may increase. Political affiliation and ideology may play a role in grouping individuals based on their engagement in water conservation, as environmental issues are politically contentious in the U.S. The purpose of the study was to determine if political affiliation, political ideology, and theory of planned behavior variables related to water conservation predicted intent to engage in water conservation. Data were collected from 1049 U.S. residents using non-probability opt-in sampling methods. Descriptive statistics and multiple linear regression models were used to analyze the data via the Statistical Package for the Social Sciences (SPSS) 26. The results from a multiple linear regression model revealed that political affiliation, political ideology, attitude, subjective norms, and perceived behavioral control predicted 27.5% of variance in respondents' intent to engage in water conservation; however, the variance accounted for was mostly attributed to theory of planned behavior variables. The findings have implications for environmental communication, namely focusing on increasing subjective norms towards water conservation.

Keywords: political affiliation; political ideology; theory of planned behavior; water conservation

Citation: Gibson, K.E.; Lamm, A.J.; Woosnam, K.M.; Croom, D.B. Predicting Intent to Conserve Freshwater Resources Using the Theory of Planned Behavior (TPB). *Water* **2021**, *13*, 2581. https://doi.org/10.3390/w13182581

Academic Editor: Elias Dimitriou

Received: 2 July 2021
Accepted: 13 September 2021
Published: 18 September 2021

1. Introduction and Background

Earth's ecosystems and human life depend on water, yet freshwater resources are rapidly depleting from unsustainable human activities [1]. Many regions of the world over-extract groundwater supplies, experience water stress, and have river systems without adequate freshwater flows [1]. Numerous economic activities, such as energy and food production, require large amounts of freshwater use [2]. The diminished freshwater supply is further complicated by poverty, conflict, diseases, and water quality issues [3].

The security of the freshwater supply in the United States (U.S.) is a growing concern [4] and is strained both locally and regionally [5]. Over 300 gallons of water, on average, are consumed per household per day in the U.S. even though daily basic human water needs are estimated to range from 15–25 gallons for one person [6,7]. Increasing public engagement in water resource protection behaviors is a challenging but essential task for environmental educators and communicators [8]. Education campaigns typically provide simple education around water conservation, which does not "move people to action" to conserve water [9] (p. 109). Thus, minimal environmental behavior changes have resulted from information-only water conservation campaigns in the U.S. [10–13]. Improving water conservation in the U.S. by focusing on individual and social factors is one crucial step in addressing the global water crisis [14–16].

During the Reagan administration in the 1980s, viewpoints of environmental protection shifted from a non-partisan issue to one viewed as harmful to the free market and economic growth by Republican leaders [17,18]. The political divide over environmental protection has continued to grow in recent decades [19], including water resource protection. Today, individuals who are politically conservative or belong to the Republican Party are generally not as concerned about the health of the environment as individuals who are politically liberal or belong to the Democratic Party [20,21]. According to [22], public engagement in water conservation behaviors increases when people are targeted with specific and appropriate information. Therefore, political affiliation and ideology may provide environmental communicators with a basepoint for effectively communicating water conservation behaviors with the public.

Conserving water in the household often involves water consumption reduction behaviors, such as turning off taps while brushing teeth and installing low-flow shower heads [23]. Numerous studies have investigated factors that predict household water consumption, including sociodemographic characteristics [1,24], attitudes and values [24–26], and water consumption behaviors [27]. However, previous literature forgoes the effect that an individual's political affiliation and ideology may have on household water consumption. Environmental communicators need to understand how the public engages with environmental issues in order to effectively communicate about water conservation. Therefore, this study goes beyond past research to determine if individual political affiliation and ideology predicted household water conservation behaviors.

1.1. Theory of Planned Behavior

The theory of planned behavior [28] (TPB), which has been used previously to study intent to adopt water conservation behaviors [1,3,14,16,29–31], models behavioral decision-making. Three variables are included in the TPB that serve to predict an individual's intent to engage in a behavior: attitude, subjective norms, and perceived behavioral control [28] (Figure 1). Attitude is defined as the positive or negative values an individual has about carrying out specific behaviors. Subjective norms are defined as how specific behaviors are viewed by others who are important to an individual and if they expect the behavior to be performed or not. Perceived behavioral control is defined as how an individual's perception of a behavior is under volitional control [28]. The strongest predictor of an individual's behavior change is an intention to engage in that specific behavior [28,32].

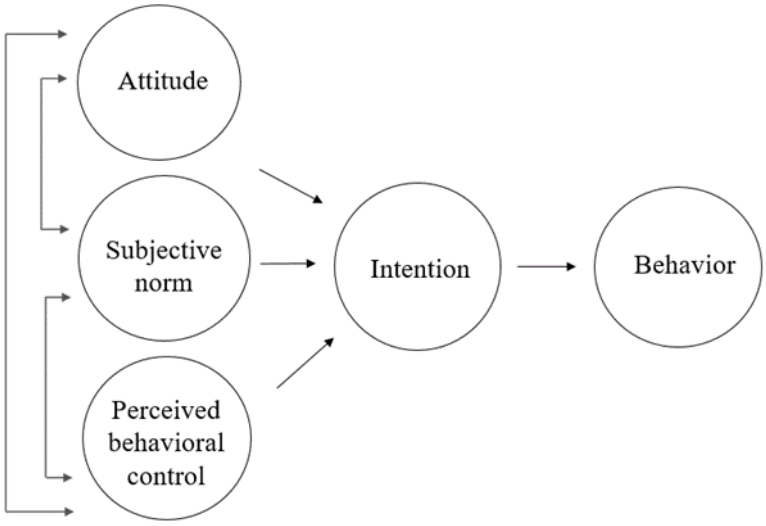

Figure 1. TPB by Ajzen (1991).

The TPB has been successfully applied in numerous fields and studies, including environmental practices [33–36] and, more specifically, water conservation behaviors,

e.g., [1,3,14,16,29–31,37,38]. For example, ref. [16] examined strategies for encouraging the use of water-saving technologies and practices and found individuals who were highly engaged in water conservation practices also reported high levels of subjective norms, perceived behavioral control, and attitudes towards adopting water-saving technologies. Ref. [37] examined determinants of green stormwater infrastructure being installed by residents on their properties with TPB and found social norms and perceived control factors determined residents' decisions to install green stormwater infrastructure. The researchers in [29] investigated determinants of Bulgarian households' intention to engage in water conservation with the TPB and found attitude, subjective norms, and perceived behavioral control each significantly predicted water conservation intention.

One critique of the TPB for predicting natural resource conservation is that it only encompasses basic variable-effect relationships [23]. However, extended models of the TPB have been used successfully with natural resource conservation behaviors [32] and the importance of investigating additional moderating effects for the framework are acknowledged in the literature [39]. For example, ref. [14] examined TPB relationships between attitudes, subjective norms, perceived behavioral control, personal norms, demographic factors, and past behaviors on intent to engage in good irrigation practices in Florida and found subjective norms, perceived behavioral control, personal norms, past behaviors, and demographic factors (sex and age) were significant predictors of respondents' intent to engage.

1.2. Political Affiliation and Ideology

Historically, political affiliation and ideology were strong indicators of environmental protection efforts [21]. For the purpose of this study, a "political party identification" [20] (p. 354) is defined as an individual's political affiliation. There are two major political affiliations within the U.S.: Democratic (31% of the public) and Republican (26% of the public) parties. In addition, 38% of the U.S. public is registered as Independent voters, who are non-affiliated but often lean towards Democrat or Republican political stances [40,41]. Members of the Democratic Party are generally concerned about environmental protection and their political agenda includes environmental issues [20]. According to [21], "the Democratic Party has made significant efforts to preserve and protect the environment and emphasizes that understanding the importance of America's natural resources [. . .] is imperative for future generations" (p. 55). Conversely, members of the Republican Party are not usually as concerned with environmental protection as the Democratic party and think too much money has been spent by the government on environmental issues [21,42].

Political ideology is defined as the shared principals, beliefs, and values that people use to view the world around them [20]. In the U.S., political ideology groups the public into conservatives, moderates, and liberals. Individuals who identify as liberal are more likely to engage in pro-environmental behavior than those who identify as conservative [43]. Typically, liberals are associated with the Democratic Party and conservatives are associated with the Republican Party [20]. However, political affiliation should be examined separately from political ideology [44] because the ability of political affiliation to predict environmental concern is conflicting, e.g., [45–47]. Liberalism, on the other hand, consistently predicts a positive and significant relationship with environmental concern, e.g., [46,48–50].

The TPB has been evaluated in conjunction with numerous demographic variables (e.g., age, gender, household size, household income, and education), but little is known about the influence of political affiliation and ideology on intent to engage in water conservation behavior (Figure 2). The researchers in [21] evaluated the effect of political affiliation on water conservation behaviors and interest in water-based education programs and found political affiliation did not influence water conservation behavior but Democrats were more interested in water-based education programs than Republicans. They [21]

acknowledged several limitations of the study, namely only exploring political affiliation and recommended including political ideology in future studies.

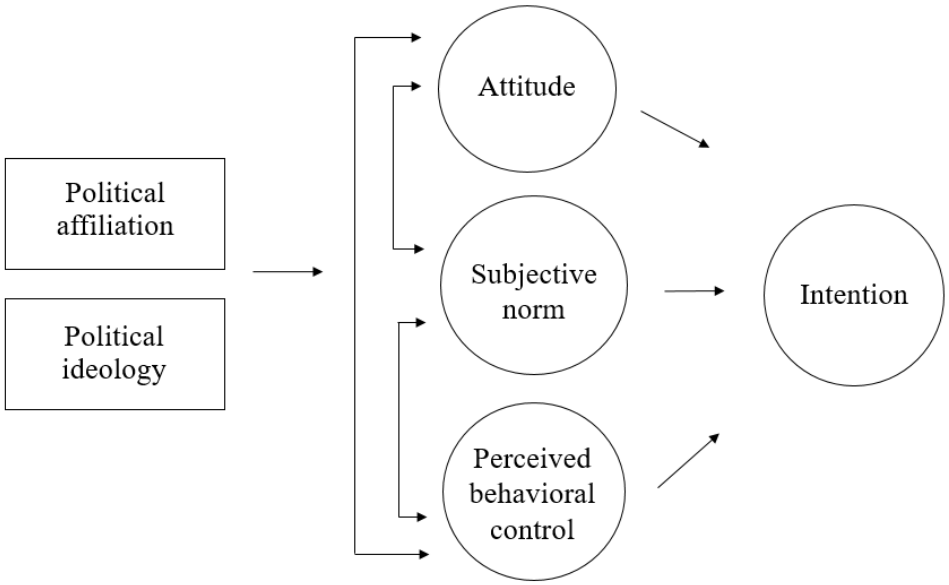

Figure 2. TPB with Political Affiliation and Ideology (Adapted from Ajzen, 1991).

There is an urgent need to develop new communication and education techniques to spread information about water conservation practices as the freshwater supply rapidly depletes [51]. The TPB offers data to environmental communicators that can be applied in campaigns/programs targeting behavior change [52,53]. Therefore, environmental communicators must determine the most effective way to disseminate information about water conservation to the public and political affiliation and ideology may provide a basepoint.

The purpose of this study was to determine if political affiliation, political ideology, and TPB variables predict water conservation intention. The following objectives guided the study:

1. Describe respondents' political affiliation, political ideology, attitude towards water conservation, subjective norms around water conservation, perceived behavioral control towards water conservation, and self-reported intent to engage in water conservation behaviors; and
2. Determine if political affiliation, political ideology, attitude, subjective norms, and perceived behavioral control predicted self-reported intent to engage in water conservation behaviors.

2. Materials and Methods

The study described here was part of a larger research effort conducted to determine public perceptions of water resources and climate change, see [54]. Four sections of the survey instrument were pertinent to this study: respondents' political affiliation and ideology, attitude, subjective norms, and perceived behavioral control toward water conservation behaviors, and self-reported intent to engage in water conservation behaviors.

2.1. Survey Measures

The survey instrument included demographic, semantic differential, and Likert-type questions. These measures are reported below.

2.1.1. Political Affiliation and Political Ideology

Respondents' political affiliation was presented as a categorical variable with five options: Republican, Democrat, Independent, Nonaffiliated, and Other [21]. Respondents' political ideology was determined using a five-point Likert scale (1 = Very Liberal;

3 = Moderate; 5 = Very Conservative) adapted from [55]. Political affiliation and ideology were coded as dichotomous variables for the correlation matrix and multiple linear regression (research objective 2).

2.1.2. Attitude

Respondents' attitudes about water conservation was determined using seven semantic differential items (on a five-point scale) adapted from [14]. Individuals were asked to indicate if they believed engaging in everyday actions to save water around the house and in their home landscape was:

1. Bad/good;
2. Harmful/beneficial;
3. Worthless/valuable;
4. Unpleasant/pleasant;
5. Not acceptable/acceptable;
6. Foolish/wise;
7. Not essential/essential.

Reliability was calculated post hoc ($\alpha = 0.92$).

2.1.3. Subjective Norms

Six items were utilized (adapted from [14]) to identify respondents' subjective norms concerning water conservation using a five-point Likert scale (1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree). The questions asked respondents to indicate:

1. If it is expected of them to save water;
2. If there is social pressure to save water;
3. If the people who are important to them want them to save water;
4. If their neighbors would approve of them saving water;
5. If most people in their lives whose opinions they value would approve of them saving water;
6. If the people they are close with would approve if they explored ways to reduce water use around their house and in their home landscape.

Reliability was calculated post hoc ($\alpha = 0.85$).

2.1.4. Perceived Behavioral Control

Five items (adapted from [14]), presented on a five-point Likert scale (1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree), were used to identify respondents' perceived behavioral control over water conservation. Items asked respondents to indicate:

1. If they are confident they can save water if they wanted to;
2. If the decision to save water is in their control;
3. If whether or not they save water is entirely up to them;
4. If they are certain they could save water if they wanted to;
5. If they have complete control over the decision to save water around the house and in their home landscape.

Reliability was calculated post hoc ($\alpha = 0.87$).

2.1.5. Intent to Engage

Self-reported intent to engage in water conservation behaviors in the future were measured by adapting a scale introduced by [21]. Respondents were asked to indicate their level of likelihood engaging in 20 water conservation behaviors using a five-point Likert scale (1 = Very Unlikely; 2 = Unlikely; 3 = Undecided; 4 = Likely; 5 = Very Likely). Respondents were also allowed to indicate if the behavior was not applicable to them. For example, if someone was asked when they water their lawn yet they live in an apartment,

they would likely select "not applicable." Intention items included how likely individuals were to: donate to an organization that protects water; join a water conservation organization; buy a specialty license plate that supports water protection efforts; only run the washing machine and dish washer when it is full; keep a timer in the bathroom to help them take a shorter shower; use biodegradable cleaning products, only water their lawn in the morning or evening; reduce the number of times a week they water their lawn; sweep patios and sidewalks instead of hosing them down; volunteer for a stream clean up or wetland restoration event; vote for candidates who support water conservation; reduce use of fertilizer and pesticides if their landscape quality would decrease; responsibly dispose of hazardous materials; avoid purchasing plants that require a lot of water, reduce their use of natural resources; visit state parks to learn about water issues; and support their water restrictions used by their local government in the future. Reliability of the scale was calculated post hoc ($\alpha = 0.95$). If respondents selected Not Applicable to an item, they received a mean score based on the number of items answered rather than the entire set. Based on Cronbach α estimates, composite means were calculated for each TPB construct (i.e., attitudes, subjective norms, perceived behavioral control, and intention) within the model.

2.1.6. Validation of Research Design

The entire instrument was reviewed for face and construct validity by a panel of faculty with expertise in survey design, natural resource conservation, and education research. The research design was approved by the University of Georgia Institutional Review Board (IRB #00001893) and the instrument was pilot tested with 50 individuals who were representative of the sample for content validity. All scales were deemed reliable based on Cronbach alpha coefficients in excess of 0.70. No changes were made to the instrument following the pilot test.

2.2. Data Collection

Data were collected from U.S. residents aged 18 years or older who were representative of the U.S. population based on geographic location, gender, age, and race/ethnicity. The data were weighted based on geographic location, gender, age, and race/ethnicity from the 2010 Census to ensure the respondents were representative of the population of interest [56]. Respondents were recruited using non-probability opt-in sampling methods via Qualtrics, an online survey platform. Non-probability opt-in sampling methods are often used for public opinion research but do limit access to those with internet access [57]. Post-stratification weighting methods were used to compensate for potential exclusion, selection, and non-participation biases [57].

2.3. Sample Demographics

A total of 1049 responses were collected and usable for analysis. The average respondent was White (72.4%), had at least a two-year college degree (59.2%), and had a total family income (before taxes) of less than USD 149,999 (85.4%; Table 1). Respondents' sex was equally distributed between males (50%) and females (50%). Detailed demographic characteristics of the respondents can be viewed in Table 1.

2.4. Data Analysis

Descriptive statistics were used to address objective one. Multicollinearity diagnostics were conducted using correlation coefficients and interpreted following Cohen's (1998) work prior to the analysis of objective two to ensure there were no issues of high multicollinearity [58]. Multiple linear regression models were used to address objective two. Multiple linear regression is commonly used for analysis in social sciences when there are several independent variables predicting one dependent variable. The dependent variable in the regression analysis was the overall scale for respondents' self-reported intent to engage in water conservation behaviors in the future. Independent variables in the regression analysis included political affiliation, political ideology, attitude, subjective

norms, and perceived behavioral control. The first model used political affiliation to predict intent to engage; the second model used political affiliation and political ideology to predict intent to engage; and the third model used political affiliation, political ideology, and TPB variables to predict intent to engage. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) 26 (Chicago, IL, USA).

Table 1. Demographics of Respondents (N = 1049).

-	N	%
Sex	-	-
Male	525	50.0
Female	524	50.0
Age	-	-
18–34 years	353	33.7
35–54 years	349	33.3
55+ years	347	33.1
Race *	-	-
White	759	72.4
Black	148	14.1
Asian	102	9.7
American Indian or Alaska Native	33	3.1
Other	22	2.1
Ethnicity	-	-
Hispanic	99	9.4
Non-Hispanic	950	90.6
Education	-	-
Less than 12th grade	22	2.1
High school diploma	202	19.3
Some college	204	19.4
2-year college degree	109	10.4
4-year college degree	272	25.9
Graduate or Professional degree	240	22.9
Family Income	-	-
Less than USD 24,999	185	17.6
USD 25,000–USD 49,999	240	22.9
USD 50,000–USD 74,999	215	20.5
USD 75,000–USD 149,999	256	24.4
USD 150,000–USD 249,999	101	9.6
USD 250,000 or more	52	5.0

Note: * Respondents were allowed to select more than one race.

3. Results

3.1. Descriptive Statistics

Respondents aligned with the Republican (33.2%) or Democratic (41.3%) party. Respondents were fairly equally distributed between Very Liberal and Liberal (33.5%), Moderate (36.6%), and Very Conservative and Conservative (29.8%). Detailed responses can be seen in Figures 3 and 4.

Survey respondents were asked to indicate their opinion on engaging in everyday actions to save water around the house and in their home landscape (i.e., bad/good). Respondents' attitudes towards water conservation, which was the average of the responses to six semantic differential items designed to measure attitude, was positive (M = 4.45, SD = 0.71).

Survey respondents were asked to indicate their subjective norm towards water resource protection (Table 2). There was a notable percent of respondents who neither agreed or disagreed there was social pressure to save water around the house and in their home landscape (28.7%), the people who were important to them wanted them to save water around the house and in their home landscape (31.0%), and their neighbor

would approve if they saved water around the house and in their home landscape (31.9%). Respondents' overall aggregated subjective norms towards water conservation, which was the average of the responses of the six items, indicated respondents neither agreed nor disagreed about subjective norms towards water conservation (M = 3.63, SD = 0.80).

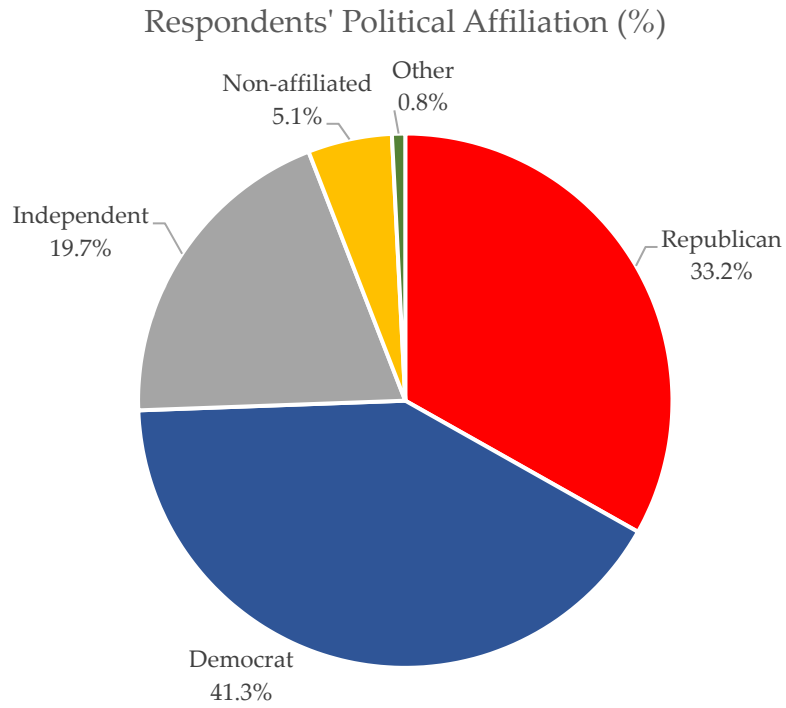

Figure 3. Respondents' self-reported political affiliation (N = 1049).

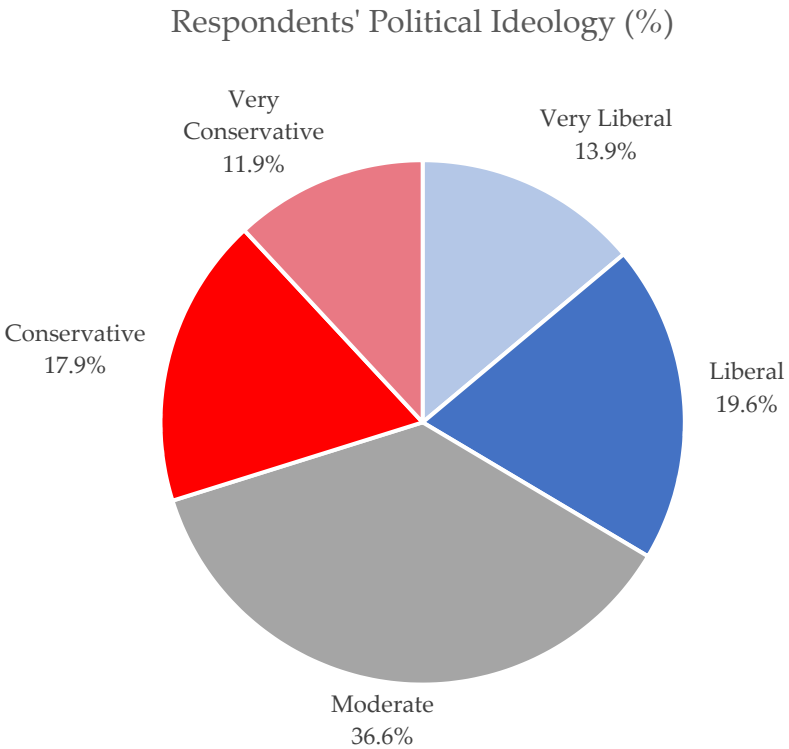

Figure 4. Respondents' self-reported political ideology (N = 1049).

Table 2. Respondents' subjective norms around water conservation (N = 1049).

-	Strongly Disagree %	Disagree %	Neither Agree nor Disagree %	Agree %	Strongly Agree %
It is expected of me that I save water around the house and in my home landscape	4.9	7.3	21.3	37.4	29.2
I feel like there is a social pressure to save water around the house and in my home landscape	12.8	18.5	28.7	25.3	14.8
The people who are important to me want me to save water around the house and in my home landscape	6.8	9.7	31.0	31.6	21.0
My neighbors would approve of me saving water around the house and in my home landscape	4.0	5.4	31.9	36.9	21.7
Most people in my life whose opinions I value would approve of me saving water around the house and in my home landscape	2.8	3.9	23.6	41.8	27.9
The people that I am close to would approve if I explored ways to reduce my water use around the house and in my home landscape	3.1	3.8	24.6	42.3	26.2

Survey respondents were asked to indicate their perceived behavioral control over water resource protection (Table 3). Respondents overall perceived behavioral control towards water conservation, which was the average of the responses of the five items, indicated respondents agreed they had control over whether or not they could engage in water conservation efforts (M = 4.10, SD = 0.75).

Table 3. Respondents' perceived behavioral control towards water conservation (N = 1049).

-	Strongly Disagree %	Disagree %	Neither Agree nor Disagree %	Agree %	Strongly Agree %
I am confident that I could save water around the house and in my home landscape if I wanted to	2.7	2.6	10.5	43.4	40.9
The decision to save water around the house and in my home landscape is in my control	1.1	3.6	14.6	42.3	38.3
Whether or not I save water around the house and in my home landscape is entirely up to me	2.4	4.7	16.9	40.3	35.7
I am certain that I could save water around the house and in my home landscape if I wanted to	1.5	2.4	14.6	43.0	38.5
I have complete control over the decision to save water around the house and in my home landscape	2.2	6.3	15.9	37.5	38.1

Respondents were asked to indicate their intent to engage in water conservation behaviors (Table 4). Respondents' self-reported intent to engage in water conservation behaviors, which was the average of the responses to the 20 items, indicated respondents were undecided if they intended to engage in water conservation behaviors (M = 3.59, SD = 0.78).

Table 4. Respondents' self-reported intent to engage in water conservation behaviors (N = 1049).

-	Very Unlikely %	Unlikely %	Undecided %	Likely %	Very Likely %	Not Applicable %
Donate to an organization that protects water	15.6	13.0	23.2	21.7	21.5	5.0
Join a water conservation organization	19.7	17.6	24.7	19.6	13.3	5.1
Buy a specialty license plate that supports water protection efforts	26.0	19.2	17.7	20.0	11.2	5.8
Only run the washing machine when it is full	5.1	5.7	12.6	28.2	44.9	3.5
Only run the dishwasher when it is full	5.4	6.1	10.3	22.3	41.4	14.5
Keep a timer in the bathroom to help you take a shorter shower	26.0	18.0	19.0	19.4	13.8	3.8
Use biodegradable cleaning products	10.3	8.3	21.6	30.5	25.5	3.8
Only water your lawn in the morning or evening	6.2	4.4	13.0	25.0	27.2	24.3
Reduce the number of times a week you water your lawn	6.9	3.7	13.9	22.7	28.2	24.6
Sweep patios and sidewalks instead of hosing them down	6.2	4.1	12.2	25.1	38.8	13.6
Volunteer for a stream clean up or wetland restoration event	22.1	14.1	20.9	20.0	15.4	7.4
Vote for candidates who support water conservation	7.4	4.0	22.8	29.6	33.0	3.1
Vote to support water conservation programs	7.4	4.1	18.2	34.7	33.5	2.3
Reduce use of fertilizer if your landscape quality would decrease	6.4	4.5	21.7	26.6	22.8	18.0
Reduce use of pesticides if your landscape quality would decrease	6.2	4.6	17.2	27.3	27.0	17.8
Responsibly dispose of hazardous materials (e.g., motor oil)	5.0	2.5	11.8	23.4	46.7	10.7
Avoid purchasing plants that require a lot of watering	7.2	5.7	20.1	29.5	29.0	8.5
Reduce your use of natural resources	7.4	6.9	22.4	31.8	26.4	5.1
Visit springs, lakes, state parks, etc., to learn about water issues	9.4	9.9	23.2	28.8	23.4	5.3
Support water restrictions issued by my local government	7.0	3.3	18.4	27.2	38.9	5.2

3.2. Multicollinearity Diagnostics and Multiple Linear Regression Analysis

Prior to the multiple regression analysis, correlations were used to assess multicollinearity (Table 5). The Democratic political affiliation had a negative, strong relationship with Republican political affiliation ($r = -0.59$). Based on these findings, the results of the multiple linear regression models should not be affected by the rate of multicollinearity among independent variables [58].

A multiple linear regression model was used to determine if political affiliation predicted self-reported intent to engage in water conservation behaviors (see Table 6, Model 1). The model was statistically significant ($F = 9.16$, $p = 0.000$) and predicted 3.4% of the variance. Within the model, independent, no political affiliation, and other political affiliation significantly predicted self-reported intent to engage in water conservation behaviors when compared to Republicans.

Table 5. Relationships between Political Affiliation, Political Ideology, and TPB Variables (N = 1049).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Intent to engage	-													
2. Very Liberal political belief	0.163 **	-												
3. Liberal political belief	0.056	−0.199 **	-											
4. Moderate political belief	−0.089 **	−0.306 **	−0.376 **	-										
5. Conservative political belief	−0.066 *	−0.188 **	−0.231 **	−0.355 **	-									
6 Very Conservative political belief	−0.032	−0.148 **	−0.182 **	−0.279 **	−0.172 **	-								
7. Republican political affiliation	0.024	−0.125 **	−0.206 **	−0.199 **	0.267 **	0.366 **	-							
8. Democrat political affiliation	0.114 **	0.250 **	0.283 **	−0.094 **	−0.205 **	−0.231 **	−0.591 **	-						
9. Independent political affiliation	−0.087 **	−0.130 **	−0.058	0.270 **	−0.057	−0.123 **	−0.349 **	−0.416 **	-					
10. No political affiliation	−0.114 **	−0.042	−0.081 **	0.150 **	−0.017	−0.058	−0.163 **	−0.193 **	−0.114 **	-				
11. Other political affiliation	−0.087 **	−0.035	−0.016	0.002	0.016	0.035	−0.062 *	−0.073 *	−0.043	−0.02	-			
12. Attitude	0.311 **	0.088 **	0.025	−0.01	−0.046	−0.056	−0.017	0.124 **	−0.082 **	−0.073 *	−0.051	-		
13. Subjective norms	0.470 **	0.134 **	0.016	−0.078 *	−0.047	0.008	0.070 *	0.068 *	−0.119 **	−0.081 **	−0.019	0.319 **	-	
14. Perceived behavioral control	0.320 **	0.106 **	0.043	−0.110 **	−0.06	0.068 *	0.05	0.063 *	−0.071 *	−0.116 **	−0.012	0.373 **	0.463 **	-

Note: * $p < 0.05$, ** $p < 0.01$.

Table 6. Predicting intent to engage in water conservation behaviors using TPB variables and political affiliation and political ideology (N = 1049).

	Model 1	**Model 2**	**Model 3**
R^2	0.034 ***	0.058 ***	0.275 ***
ΔR^2		0.051 **	0.268 *
Demographics			
Democrat political affiliation	0.080	−0.043	−0.011
Independent political affiliation	−0.164 *	−0.195 **	−0.056
No political affiliation	−0.415 ***	−0.443 ***	−0.233 *
Other political affiliation	−0.801 **	−0.789 **	−0.627 **
Very liberal political ideology		0.337 ***	0.202 **
Liberal political ideology		0.121	0.094
Conservative political ideology		−0.083	−0.033
Very conservative political ideology		−0.068	−0.045
TPB Variables			
Attitude			0.162 ***
Subjective norms			0.355 ***
Perceived behavioral control			0.078 *

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A second model included political ideology as a predictor (see Table 6, Model 2). The second model was also statistically significant (F = 8.06, p = 0.000) and predicted 5.8% of variance. The change in R^2 from the first model was significant, indicating the second model was more effective at predicting self-reported intent to engage in water conservation behaviors than the first model. Consistent with observations in the first model, independent, no political affiliation, and other political affiliation significantly predicted self-reported intent to engage in water conservation behaviors. In addition, Very Liberal political ideology significantly predicted self-reported intent to engage in water conservation behaviors as compared to moderate political ideology.

A third model included attitude, subjective norms, and perceived behavioral control as predictors (see Table 6, Model 3), and was also statistically significant (F = 35.80, p = 0.000), predicting 27.5% of the variance in intentions. The third model was the most effective at predicting self-reported intent to engage in water conservation behaviors as the change in R^2 from Model 2 to Model 3 was significant. Similar to the first and second models, other political affiliation, no political affiliation, and Very Liberal political ideology significantly predicted self-reported intent to engage in water conservation behaviors. In addition, attitude, subjective norms, and perceived behavioral control significantly predicted self-reported intent to engage in water conservation behaviors.

4. Discussion and Recommendations

This study added to the literature by determining if political affiliation, political ideology, and TPB variables related to water conservation predicted intent to engage in water conservation so that water conservation messaging can be further tailored to specific audiences. Several limitations of this study should be acknowledged prior to the interpretation of the results; including the measurement of political affiliation and ideology. The geographic location of respondents may have altered how political ideology and affiliation were reported. For example, the principals, beliefs, and values of a liberal-minded individual may differ in the state of California as compared to the state of Georgia. In addition, respondents may be apolitical or not have the capability to critically evaluate the sources they use to inform their political stance. Another limitation was the unknown influence of the COVID-19 pandemic on the respondents participating in the survey given the pandemic was present at the time of data collection. The COVID-19 pandemic may also exacerbate the limitations of online surveys because only residents with internet access

at home or work (if they were able to go to work) had the ability to participate in the study [59,60]. In addition, the survey items were directed at water conservation behavior in the home rather than water conservation behavior of a political nature (i.e., voting on water policy), which may account for the discrepancy between the present study and recent literature [44,61].

Despite these limitations, the results do have implications for environmental communicators trying to effectively disseminate information concerning water conservation. The results indicated political affiliation, political ideology, attitude, subjective norms, and perceived behavioral control predicted respondents' self-reported intent to engage in water conservation behavior. Similar findings were reported by [29] that found attitude, subjective norms, and perceived behavioral control had a positive effect on intent to engage in water conservation. In addition, these results are in line with [14] that demonstrated additional variables (e.g., personal norms and demographic factors) used in conjunction with TPB variables increased the ability to predict respondents' intent to engage in water-saving irrigation practices. Thus, similar to previous studies, the TPB variables with additional predictors were effective at predicting intended behavior.

The final regression model that examined how political affiliation, political ideology, attitude, subjective norms, and perceived behavioral control predicted self-reported intent to engage in water conservation explained the largest degree of variance. While the findings indicated political affiliation predicted self-reported intent to engage in water conservation behavior, they do not align with the literature which has revealed Democrats are more likely to engage in water conservation behaviors than Republicans (Pew Research 2013). It is possible that the year the study was conducted or additional demographic variables moderated the relationship with political affiliation, which has been found in previous studies on environmental concern [44]. Considering the politically contentious nature of events in 2020 [62], future studies may benefit from including political affiliation and ideology in their analysis to determine if the relationship shifts. The findings support the historical assertation that liberalism is consistently a positive and significant predictor of concern for the environment [44]. Future studies will benefit from determining reasons why members of each political affiliation and ideology did not have the same levels of intent to engage in water conservation behaviors as Very Liberal individuals did [21]. Perhaps focus groups should be conducted to determine barriers to water conservation among individuals who identify as liberal, moderate, or conservative and also Democrat, Republican, and Independent to broaden the literature base in this area.

Although the final regression model that examined how political affiliation, political ideology, attitude, subjective norms, and perceived behavioral control predicted self-reported intent to engage in water conservation explained 27.5% of variance in the outcome measure, the increased variance accounted for was attributed to TPB variables. Thus, future studies should determine additional predictors for respondents' intent to engage in water conservation behaviors. Environmental communicators should work with individuals regardless of political affiliation and ideology to increase intent to engage in water conservation behaviors because the mean intent to engage in water conservation behaviors score can be improved. Volunteer opportunities that benefit water resource protection, such as stream or wetland cleanups, engage individuals in the natural environment while also providing educational opportunities [63]. It is important that volunteer events incorporate educational opportunities for participants to increase awareness of current issues and maximize positive environmental outcomes. In addition, volunteer opportunities offer experiences that may increase an individual's subjective norms around water conservation as volunteers meet new people and work with friends who are also engaged in the environment [63]. Moreover, emphasis on economic impacts from utilizing water saving behaviors via basic communication may need to be addressed across all political affiliations and ideologies to promote water conservation behaviors [21].

The mean attitude and perceived behavioral control exhibited by respondents indicated agreement; thus, communicators need to focus on presenting information that

increases subjective norms because there is more room for growth. Perhaps subjective norms may be influenced by opinion leaders who "tend to have more influence on peoples' opinions, actions, and behaviors than traditional forms of media" [34] (p. 1109). Environmental communicators should work with opinion leaders to target subjective norms towards water conservation by initiating conversations, ultimately playing a role in an individual's intent to engage in water conservation behaviors [64]. Another way to increase subjective norms is to encourage these opinion leaders to engage in mentor/mentee relationships where they, as individuals who participate in water conservation programs or have knowledge about water conservation practices, mentor individuals who do not typically engage in water conservation behaviors. Environmental communicators may want to target individuals who have a Very Liberal political ideology by training them as an opinion leader so they are prepared to engage in relationships to foster subjective norms towards water conservation behaviors [65].

In addition, environmental communicators should work with homeowners' associations (HOA) to influence subjective norms by increasing signage or enacting programs about water conservation behaviors [3]. For example, a homeowner within an HOA that abides by a certain number of best management practices that conserve water would receive a sign they can put in their yard that indicates they are water conscious or water friendly. Neighbors would see this sign and make them more aware of their own behaviors. The reciprocal effect could create a large amount of change. Future research could examine how different types of signs or verbiage influence the intensity with which a subjective norms campaign obtains traction within a community.

5. Conclusions

In order to effectively engage individuals in water conservation behaviors, environmental communicators must disseminate specific and appropriate information to their clientele [21,22]. This study revealed political affiliation, political ideology, attitude, subjective norms, and perceived behavioral control predicted 27.5% of variance in respondents' intent to engage in water conservation behaviors; however, the variance accounted for was mostly attributed to TPB variables. Gaining knowledge of how political affiliation and ideology offer opportunities and create barriers to water conservation is one step in gaining a perspective on how environmental communicators can use targeted efforts with specific groups to encourage water conservation. The results of this study, however, are preliminary and additional psychographic predictors (i.e., shared values) should be explored in conjunction with the TPB. Testing tailored messages and creating experiences based on political ideologies may capitalize on the power of subjective norms and assist in securing water for future generations.

Author Contributions: Conceptualization, K.E.G., A.J.L., K.M.W. and D.B.C.; Methodology, K.E.G. and A.J.L.; Software, K.E.G. and A.J.L.; Validation, K.E.G. and A.J.L.; Formal Analysis, K.E.G.; Investigation, K.E.G. and A.J.L.; Resources, K.E.G. and A.J.L.; Data Curation, K.E.G. and A.J.L.; Writing—Original Draft Preparation, K.E.G.; Writing—Review and Editing, K.E.G., A.J.L., K.M.W. and D.B.C.; Visualization, K.E.G.; Supervision, A.J.L., K.M.W. and D.B.C.; Project Administration, K.E.G. and A.J.L.; Funding Acquisition, A.J.L. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the USDA National Institute of Food and Agriculture, Hatch project 1021735. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the National Institute of Food and Agriculture or the United States Department of Agriculture.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board of The University of Georgia (IRB #00001893, 30 March 2020 date of approval).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are currently embargoed. Data will be released if the article is accepted and to reviewers upon request.

Conflicts of Interest: The authors declare no conflict of interest.

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