

Impact of Political Identity and Past Crisis Experience on Water Attitudes

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Abstract: With stories of regional diminishing water resources and tainted municipal water supplies consistently populating the news, a nationwide survey was conducted to gauge overall concern and attitudes toward water scarcity and water pollution, as well as scientists and scientific information regarding water crises. Of particular interest was the question of how political ideology and past experience with scarcity and/or pollution impact pro-water attitudes and intention to exhibit positive water behaviors. Multivariate analyses of data suggest that Liberals are more concerned about water scarcity and pollution and more likely to conserve and combat pollution than their Conservative counterparts. People who have experienced a past water crisis are also more concerned and act more favorably toward water than those without crises experience. The interaction between political ideology and water crises experience is such that Conservatives with experience display more water concern than do Conservatives without experience. Liberals, regardless of experience, exhibit water concern and favorable action. Results offer direction to policy makers, water resource managers, and strategic communicators regarding how constituent audiences can be segmented.

Keywords: *scarcity, pollution, conservation, social science, survey, strategic communication*

Issues involving water scarcity and water quality in the United States are widespread. The U.S. Drought Monitor (2016) classifies multiple regions in the United States as “Long-Term” drought areas, with areas in southern California and central parts of Alabama and Georgia currently suffering from extreme drought conditions. Additionally, lead contamination in the drinking water supply of Flint, Michigan, has propelled water quality into the national media forefront (Maher 2016), pushing the U.S. Congress to pass a resolution that will provide \$170 million in aid to address water contamination in the city (DeBonis 2016). Likewise, authorities estimate that up to 40 percent of Western rivers are polluted (Finley 2016). While these issues provide exemplars as to how water scarcity and quality impact society, it should also be noted that these and other major events concerning water have created a foundation for social science research. Policy makers need greater knowledge of how the public views water issues in

order to successfully approach communities with solutions to drought and contamination crises. To develop strategic messages that will change the public’s attitudes and behaviors related to water issues, a clear understanding of the role that political ideology and water crisis experience play in water perceptions must be explored. Ultimately, an understanding of how individual traits can predict attitudes, behaviors, and possible reactions to water-positive messaging is crucial if the entities charged with overseeing U.S. water resources want to best develop public information messaging to protect the water supply.

Literature Review

There has been no shortage of research conducted across an array of academic disciplines focusing on how attitudes are formed and how they predict behavior (see Eagly and Chaiken 1993 for a comprehensive review). Any introductory text

in fields from rhetoric to social psychology will outline a variety of theories on how attitudes come into being, how they evolve (or not), and ultimately how they influence human behavior. Understanding the attitudes of constituent publics is especially important in designing strategic communication efforts aimed at diminishing crises as they develop or averting crisis altogether (see Dozier, Grunig, and Grunig 2013). To this end, successful campaigns to influence attitudes are advised to begin with focus groups, interviews, or surveys to determine the personal traits and characteristics that lie behind the attitudes (Rowe and Frewer 2000; Atkin and Freimuth 2001; Floress et al. 2015). Researchers have suggested an array of traits that may be tied to pro-environment attitudes and behavior change (Semenza et al. 2008; Quinn and Burbach 2010; Fielding et al. 2012; Warner et al. 2016). Among these, political ideology and past experience with the specific problem have emerged as two of the most studied of the possible predictors.

Political Ideology

The personal trait of ideology consistently impacts environmental attitudes. In their 2009 article titled “Political Ideology: Its Structure, Functions, and Elective Affinities,” Jost, Federico, and Napier offer an in-depth look at how ideology is defined, how it is formed, and the ways in which it is expressed. Ultimately, and somewhat reluctantly, they state it is possible to categorize people into groups that can be labeled as Conservatives and Liberals, and that even those “who are relatively uninterested or uninformed about politics do exhibit at least some understanding of the core aspects of Liberal-Conservative differences” (316). The authors go a step farther to say that this divide occurs along the line of preference for change (Liberals) or stability (Conservatives). When measured as a predictor in research settings, political ideology has been investigated in studies on everything from soccer team preference (Hoberman 1984) to the downfall of the modern university (Debray 2006). Common practice for researchers investigating environmental issues has been to make a point of gathering data on political ideology when polling the public.

Overall, research suggests people view environmental issues broadly and climate change

specifically through a political lens. A nationwide study showed that Democrats are more likely than Republicans to believe that climate change is real and to support action to mitigate its effects (McCright and Dunlap 2011). Other works suggest that individuals who identify as Liberal are more likely to engage in pro-attitudinal behavior in regards to environmental issues than their Conservative counterparts (Dunlap, Xiao, and McCright 2001; Jost, Nosek, and Gosling 2008; Hart and Nisbet 2011; Myers et al. 2013).

Research efforts to determine how ideology impacts environmental attitudes have not only shown the reliability of the finding that Conservatives seem less concerned with environmental issues, but have also demonstrated what may be driving the differences across political parties. When examining political ideology, researchers have found that Conservatives are more likely to question and lose trust in scientists than Liberals (Leiserowitz et al. 2013), while Democrats are the least likely group (compared to Republicans, Independents, other party affiliations, and those who have no party affiliation) to lose trust in scientists (Leiserowitz et al. 2013). Further, Democrats with more knowledge of science in general had increased concern for global warming compared to less knowledgeable Democrats, but Republicans did not report any increase in concern associated with science knowledge (Malka, Krosnik, and Langer 2009).

Personal Experience

In their 1991 book *Social Cognition*, Fiske and Taylor state that “direct experiences provide a great deal of information, so that attitudes that develop as a consequence may be better informed and more robust” (521). Given this assumption, when considering what personal traits may influence attitudes toward environmental issues, any experience a person possesses related to the topic area potentially becomes extremely impactful. While a broad array of work has looked at how experience influences attitudes generally (see Chaiken 1980), research has typically focused on global warming and climate change. Research pertaining to global warming attitudes has shown that people with direct experience with the topic have elevated assessments of the risks associated

with global warming compared to their less experienced counterparts (Akerlof et al. 2013). However, it should be noted that Akerlof et al. (2013) also found that more than a third of those surveyed responded “Don’t Know” to the prompt “I have personally experienced the effects of global warming.”

In light of the subtlety of observable manifestations of climate change, it stands to reason that respondents may have difficulty recalling specific experiences. It should be noted however that stimuli as subtle as slight variations in ambient temperatures can lead to public attitude shift concerning the existence of global warming, although the effect may be short-lived (Egan and Mullin 2012). The researchers here attribute the quick decay in attitude change related to the necessarily unstable phenomenon of temperature fluctuation. This idea that the issues of global warming and climate change are abstract, unstable and often seen as not requiring immediate contemplation or behavior change has gained traction through various studies (see Lorenzoni, Nicholson-Cole, and Whitmarsh 2007). More manifest, consistent, and longer-lasting climatic change impacts, such as extensive drought, may produce more robust attitude shifts (Egan and Mullin 2012; Huang and Lamm 2015), and behavior change should be more prominent among those who experience direct effects first hand (Lorenzoni, Nicholson-Cole, and Whitmarsh 2007).

Ultimately, pro-environmental attitudes and behaviors seem more directly influenced by a specific issue, such as drought, but impact is more indirect and less pronounced when generalized environmental issues served as the reference. Specific to overt water issues, research has shown that water crisis situations such as prolonged drought, directly influence water conscious attitudes and behaviors. Fielding et al. (2012), in their look into the determinants of household water use in drought-stricken regions of Australia, were able to link awareness of water crisis to adoption of conservation practices. Likewise, a Texas statewide study during the most severe single-season drought in the state’s history found that perceptions of the drought’s severity significantly impacted positive attitudes toward water conservation (Dascher,

Kang, and Hustvedt 2014). Furthermore, the researchers obtained empirical evidence that pro-environmental behavior was directly influenced by the specific issue of “drought,” but that the impact was more indirect and less pronounced when generalized “environmental issues” served as the reference. Again, this research lends additional support to the idea that personal experience with concrete and long-term consistent crises such as drought may lead to more pronounced and stable attitudes compared to the more fleeting attitudes associated with abstract phenomenon like global warming.

In sum, research uncovering how political ideology and water crisis experience influence attitudes toward climate change and global warming provide a foundation upon which to build more focused work on issues related to water. It should be noted, however, that fundamental differences between global warming/climate change and water crises make it difficult for strategic communicators or policy makers to predict public reaction to one based on the other. While the research literature suggests that Conservatives are less likely to have pro-environmental views, and those with direct experience with environmental issues are more prone to pro-environmental attitudes, there is scant data to show how political identity and experience separately and together impact water crisis attitudes broadly. The current research attempts to provide an outline of how personal traits align with water attitudes, specifically to fill this void in the literature.

Hypotheses

In the context of environmental issues, researchers have identified both political ideology and previous crisis experience as two personal traits that are particularly important in that both have been found to align with attitudes. Research has shown that the American public largely view environmental and scientific issues differently based on political identity (Dunlap, Xiao, and McCright 2001; Hart and Nisbet 2011; McCright and Dunlap 2011; Myers et al. 2013). Self-identified Democrats and Liberals express more pro-active attitudes toward environmental issues than self-identified Republicans and Conservatives (see Dunlap, Xiao, and McCright 2001). Based on

this information, the following hypothesis related to water consciousness, defined as the attitude that scarcity/pollution problems are important, worrisome, threatening, and that science surrounding the issues is valid (more detail in Method Section forthcoming), guided the research.

H1: Political ideology influences perceptions of water issues such that Liberals demonstrate stronger water consciousness (defined as belief that scarcity/pollution issues are important problems, are worrisome, are threatening, and that science surrounding the issues is valid) attitudes and intended behavior change than do Conservatives.

Water crisis experience has also proven to influence attitudes related to environmental issues. In fact, it has been suggested that personal experience may influence attitudes to a greater extent than other attributes (Fiske and Taylor 1991). Though research suggests that attitudes associated with weather in particular are not stable due to the changing nature of the referent (temperatures for example), a long-term event such as a prolonged drought may be steady enough for more deeply rooted attitudes to form (Lorenzoni, Nicholson-Cole, and Whitmarsh 2007; Egan and Mullin 2012). Researchers have found that participants residing in close proximity to drought will form pro-water conservation attitudes, but little work has been done to see how global water issue experience may impact how people feel about water scarcity and pollution. As such, the following hypothesis is forwarded.

H2: Personal experience with water scarcity or pollution influences perceptions of water issues such that those with experience demonstrate stronger water consciousness and intended behavior change than those with no experience.

Finally, little is known about how political ideology and personal experience with environmental crises interact. Past research findings suggest that group identification, such as political affiliation, more strongly influences attitudes toward global warming than does one's own personal experience with the issue (Akerlof et al. 2013). But this opinion contradicts that of social psychologists that state the most robust and

unwavering attitudes develop from experience and not from other traits (Fiske and Taylor 1991). To determine how personal experience and political affiliation work together to influence water attitude, the following hypothesis is tested.

H3: The interaction between political ideology and experience is such that Liberals, being inherently more water conscious, will be less impacted by experience with water issues than will be Conservatives, who will demonstrate a more pronounced level of water consciousness as a function of water issue experience.

Methods

Overview

Two brief reports regarding a water scarcity issue and a water pollution issue, professionally presented in a common news format, were shown to respondents. Respondents, after reading the reports, were surveyed and asked to indicate their attitudes toward the issues and how they might alter their future water behaviors as a result of reading the reports. Respondents also completed a series of items aimed at measuring political ideology and personal experience with water scarcity and pollution, among other traits. The items surveyed allowed for a statistical analysis of how measured individual traits and experiences may influence the reaction of persons to issues of water scarcity and pollution.

Procedure

Participants from across the U.S. were recruited using Amazon's Mechanical Turk (MTurk), an online opt-in platform that allows respondents to complete tasks for compensation. Past research has established that studies executed with MTurk respondents produce reliable and valid data (Mao et al. 2011; Mason and Suri 2011). U.S. members of Amazon's MTurk participant pool over the age of 18 were eligible to participate in the study. The study was created using Qualtrics software and was linked to MTurk using a unique web address.

MTurk directed U.S. participants to the Qualtrics online data gathering system, where they read a short synopsis of the study and agreed to participate. The 150-word stories were presented

in a format common to media news. Each participant saw one story on water scarcity and one on water pollution. The order of presentation was systematically varied so that half of the participants read the scarcity story first and the other half read the pollution story first. The stories were carefully crafted to not identify any real water event or to make it appear the story was taking place in any particular location. This kept the stories neutral and free from inherent biases that may result from referencing actual news or locations. All names and sources within the stories were fictional.

Participants completed the study either on a mobile device or using a desktop/laptop computer. Data were collected on July 8, 2016, from a total number of 498 participants. Each participant earned fifty cents upon completion. In order to prevent non-human ‘bot’ involvement, a random number generator was programmed into the end of the online participation experience (McCreadie et al. 2010). Participants were required to copy and paste the generated number into the data collection software in order to obtain the promised incentive.

Participants

Participant demographics were collected at the completion of the survey. A demographic analysis of the respondents revealed that 59% were male and 41% female. The average age of the participants was 35.8. Age intervals were created to provide testable age cohorts. Twenty-nine percent of participants were 18 to 28 years old, 43.8% were 29 to 39 years old, 14.1% were 40 to 50 years old, 10.7% were 51 to 60 years old, and 2.4% were 62 and older. In terms of political ideology, 21.2% reported as Conservative, 32.2% reported as Moderate, and 46.6% identified as Liberal. In terms of education, 8.4% attended high school, 29.9% attended some college, 44.4% received a college degree, and 17.3% received a post-graduate degree. Religion was also noted, with 22% identifying as Protestant, 16.9% as Roman Catholic, 8.5% as Hindu, 19.4% as Atheist, 21.6% as having no affiliation, and 11.6% as other. All demographics of participants were closely aligned with nationwide 2016 Census Bureau data suggesting that the study sample adequately mirrored that of the U.S. population.

Scarcity and pollution experience were considered separately, as a person could possibly

have a background with one or the other, both, or neither. Participants were asked to respond to the statements “Water scarcity (pollution) has personally affected me” on seven-point scales of strongly disagree (1) to strongly agree (7).

Attitude and Behavior Measures

Following exposure to the rotated news stories, each participant completed a series of attitudinal and behavioral measures. The measures were specific to each story and were rotated to match the order of the news story consumption by the participant. Participants were asked to report their attitudes toward both water issues using scales with ratings for each item ranging from 0 (not at all) to 10 (extremely). Items were as follows: “How important is the report?” “How newsworthy is the report?” “Water scarcity/pollution makes me feel worried/negative/anxious/concerned.” “The report made me feel threatened/unafraid/entertained/worried.” “How severe is the threat of water scarcity/pollution?” “How sure are you that water scarcity/pollution is one of the most important problems facing the country?”

For the skepticism and behavior change items, participants responded using scales of 1 (Strongly Disagree) to 7 (Strongly Agree). Individual items were: “Researchers don’t really know if there is a water scarcity/pollution crisis or not.” “Average citizens can gauge the likelihood of a water scarcity/pollution crisis just as well as a scientist.” “It is not possible for scientific data to demonstrate that water scarcity/pollution is a real threat.” “Scientists often make claims that are not supported by reality.” “Scientists often do not tell the whole story regarding the issues they study.” The statements “I plan to be more conscientious about my water usage” and “I will make an effort to use less water/avoid water pollution in the future” were used to gauge intended behavior change.

Results

Data Reduction

Scale items were analyzed using factor analysis with an orthogonal rotation. Six factors emerged from the analysis. The first factor, labelled *importance*, showed high loadings for important issue (0.927) and newsworthy (0.927). *Importance*

had an eigenvalue of 1.27, accounted for 85.92% of the overall variance, and registered a Cronbach's α of 0.835. The second factor, labelled *worried*, showed high loadings for worried (0.951), negative (0.878), anxious (0.925), and concerned (0.922). *Worried* had an eigenvalue of 3.38, accounted for 84.53% of the variance, and registered a Cronbach's α of 0.818. The third factor, labelled *scared*, showed high loadings for scared (0.931), threatened (0.904), and worried (0.876). *Scared* had an eigenvalue of 2.10, accounted for 26.24% of the overall variance, and registered a Cronbach's α of 0.829. The fourth factor, labelled *threatening*, showed high loadings for severe (0.894) and important threat (0.894). *Threatening* had an eigenvalue of 1.60, accounted for 79.96% of the overall variance, and registered a Cronbach's α of 0.740. The fifth factor, labelled *skepticism*, showed high loadings for "Researchers don't really know if there is a water scarcity/pollution crisis or not" (0.787), "Average citizens can gauge the likelihood of a water scarcity/pollution crisis just as well as a scientist" (0.660), "It is not possible for scientific data to demonstrate that water scarcity/pollution is a real threat" (0.760), "Scientists often make claims that are not supported by reality" (0.838), and "Scientists often do not tell the whole story regarding the issues they study" (0.758). *Skepticism* had an eigenvalue of 2.91, accounted for 58.20% of the overall variance, and registered a Cronbach's α of 0.818. The sixth factor, labelled *behavior change*, showed high loadings for "I plan to be more conscientious about my water usage" (0.927), and "I will make an effort to use less water/avoid water pollution in the future" (0.927). *Behavior Change* had an eigenvalue of 1.72, accounted for 86.00% of the overall variance, and registered a Cronbach's α of 0.836.

Data Analysis

Preliminary Analyses. First, high and low water crisis experience groups were created via median splits. For water scarcity, the low experience group had 247 members and an average score of 1.61 ($SD = 0.49$) while the high experience group had 248 members and an average score of 4.73 ($SD = 1.30$). A t -test distinguished these two groups as statistically distinct from one another ($t(315.56) = 35.28, p < 0.001$). For water pollution, the low

experience ($N = 232, M = 1.69, SD = 0.47$) and high experience ($N = 264, M = 4.59, SD = 1.22$) groups were also distinct ($t(346.46) = 35.88, p < 0.001$).

Initial data analysis considered participant gender, age, level of education, religion, political ideology, and past experience with both water scarcity and water pollution across the six water consciousness constructs (i.e., factors). All factors across item-type were subjected to parametric statistical analysis (Norman 2010). When combined through factorial design with the key variables of interest—political ideology and water issue experience—no consistent interactions or main effects emerged via ANOVA for gender, age, education, and/or religion. As such, and to produce more parsimonious tests of hypotheses, all four were dropped from future analyses.

Statistics of Hypotheses Testing. In testing of hypotheses, data were submitted to multifactor analyses of variance with post-hoc testing where appropriate. Fixed factors were political ideology (Liberal, Moderate, Conservative) and experience level (low, high), all within the scarcity and pollution contexts in isolation. As such, a 3 X 2 ANOVA was performed across all constructs. Statistics, including means, standard deviations, F values, estimates of effect size, and post hoc results, are all reported in Tables 1 through 3, for sake of efficiency.

Tests of Hypotheses. H1 posited that political ideology would influence water issue perceptions such that Liberals would report stronger water conscious attitudes and intended behavior change than would Conservatives. H1 was supported. Across both the scarcity and pollution scenarios respectively, Liberals were statistically more water positive in terms of pollution and conservation. Table 1 displays the sub group means, standard deviations, and reveals the results of ANOVA testing and appropriate post hoc tests as were needed. While political Moderates often aligned with one or the other politically extreme peer groups, Liberals saw water issues as more important, were more worried about water issues, were more scared after reading reports on water issues, felt more threatened by water issues, were less skeptical of the science related to water issues, and were more committed to changing their own

Table 1. Water consciousness across political ideology within issue.

| Water Consciousness | | -----Scarcity----- | | | -----Pollution----- | | |
|------------------------|------------------------|--------------------------------------|------------------------------|-----------------------------|--------------------------------------|-----------------------------|-----------------------------|
| | | Liberal | Moderate | Conservative | Liberal | Moderate | Conservative |
| Importance | <i>Means (SDs)</i> | 8.29 ^A (1.59) | 7.70 ^B (1.90) | 6.97 ^C (2.57) | 8.31 ^A (1.67) | 7.78 ^B (1.76) | 7.28 ^C (2.57) |
| Worried | <i>Means (SDs)</i> | 7.23 ^A (2.02) | 6.55 ^A (2.32) | 6.04 ^B (2.89) | 7.56 ^A (1.94) | 7.06 ^B (2.08) | 6.31 ^C (2.79) |
| Scared | <i>Means (SDs)</i> | 5.93 ^A (2.58) | 5.41 ^{AB} (2.53) | 4.88 ^B (2.81) | 6.08 ^A (2.44) | 5.52 ^A (2.44) | 5.06 ^B (2.73) |
| Threatening | <i>Means (SDs)</i> | 7.34 ^A (2.07) | 6.96 ^B (2.12) | 6.09 ^B (2.56) | 7.37 ^A (2.04) | 6.94 ^B (2.00) | 6.15 ^B (2.58) |
| Skepticism | <i>Means (SDs)</i> | 2.66 ^A (1.18) | 3.15 ^B (1.14) | 3.58 ^C (1.20) | 2.54 ^A (1.14) | 3.06 ^B (1.11) | 3.42 ^C (1.26) |
| Behavior Change | <i>Means (SDs)</i> | 5.32 ^A (1.17) | 4.95 ^A (1.34) | 4.77 ^B (1.47) | 5.25 ^A (1.25) | 5.04 ^B (1.33) | 4.62 ^B (1.57) |
| Importance | <i>Stats</i> | $F(2, 474) = 13.06, \eta_p^2 = 0.05$ | | | $F(2, 477) = 9.05, \eta_p^2 = 0.04$ | | |
| Worried | <i>Stats</i> | $F(2, 475) = 7.43, \eta_p^2 = 0.03$ | | | $F(2, 475) = 9.82, \eta_p^2 = 0.04$ | | |
| Scared | <i>Stats</i> | $F(2, 475) = 3.97, \eta_p^2 = 0.02$ | | | $F(2, 476) = 4.11, \eta_p^2 = 0.02$ | | |
| Threatening | <i>Stats</i> | $F(2, 476) = 8.65, \eta_p^2 = 0.04$ | | | $F(2, 477) = 9.68, \eta_p^2 = 0.04$ | | |
| Skepticism | <i>Stats</i> | $F(2, 475) = 23.63, \eta_p^2 = 0.09$ | | | $F(2, 477) = 22.16, \eta_p^2 = 0.09$ | | |
| Behavior Change | <i>Stats</i> | $F(2, 475) = 5.23, \eta_p^2 = 0.02$ | | | $F(2, 477) = 6.07, \eta_p^2 = 0.03$ | | |

Note: All horizontal means within scenario not sharing a superscript letter vary significantly ($p < 0.05$) by SNK post hoc tests. SD = standard deviation.

actions to help improve water problems than were their Conservative counterparts. These statistically robust differences did not deviate from this pattern on any single measure, and the pattern was consistent across both water scarcity and water pollution issues.

H2 forwarded that people who had experience with water scarcity or pollution would demonstrate stronger water consciousness and intended behavior change regarding water than those with no such experience. As can be seen in Table 2, this was almost universally the case, with experience having statistically significant influence across all measures save importance. A review of the associate means and ANOVA results shows that respondents who had indicated personal experience with either a water scarcity or water pollution situation were more worried about the prospect of water crises, were more scared after reading an article detailing

potential water issues, saw the issues as more threatening, were less skeptical of scientific data regarding water issues, and were more likely to state they would alter their future behaviors to help avoid future water problems. Despite the consistent and statically significant differences between those with water issue experience and those without across the two scenarios, the lone measure where the groups did not differentiate themselves was on the importance they ascribed to water issues. Both groups saw water concerns as equally important, statistically.

H3 predicted that experience with water crises would be more impactful for Conservatives than it would be for Liberals. This expectation was based on the premise that Liberals are inherently more water conscious and therefore would have less latitude of change available compared to Conservatives, assumed to be less water conscious

Table 2. Water consciousness across crisis experience level within issue.

| Water Consciousness | | -----Scarcity----- | | -----Pollution----- | |
|------------------------|--------------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|
| | | Low | High | Low | High |
| Importance | <i>Means</i> (<i>SDs</i>) | 7.74 ^A (2.18) | 7.89 ^A (1.80) | 7.88 ^A (2.11) | 7.95 ^A (1.82) |
| Worried | <i>Means</i> (<i>SDs</i>) | 6.36 ^A (2.52) | 7.17 ^B (2.13) | 6.73 ^A (2.37) | 7.49 ^B (2.05) |
| Scared | <i>Means</i> (<i>SDs</i>) | 5.09 ^A (2.68) | 5.99 ^B (2.52) | 5.03 ^A (2.58) | 6.25 ^B (2.36) |
| Threatening | <i>Means</i> (<i>SDs</i>) | 6.36 ^A (2.35) | 7.55 ^B (1.97) | 6.38 ^A (2.37) | 7.50 ^B (1.89) |
| Skepticism | <i>Means</i> (<i>SDs</i>) | 2.70 ^A (1.09) | 3.33 ^B (1.27) | 2.65 ^A (1.08) | 3.12 ^B (1.27) |
| Behavior Change | <i>Means</i> (<i>SDs</i>) | 4.90 ^A (1.39) | 5.27 ^B (1.20) | 4.78 ^A (1.54) | 5.29 ^B (1.14) |
| Importance | <i>Stats</i> | $F(1, 474) = 3.52, \eta^2_p = 0.01$ | | $F(1, 477) = 1.41, \eta^2_p < 0.01$ | |
| Worried | <i>Stats</i> | $F(1, 475) = 20.13, \eta^2_p = 0.04$ | | $F(1, 475) = 16.86, \eta^2_p = 0.03$ | |
| Scared | <i>Stats</i> | $F(1, 475) = 13.20, \eta^2_p = 0.03$ | | $F(1, 476) = 32.96, \eta^2_p = 0.07$ | |
| Threatening | <i>Stats</i> | $F(1, 476) = 43.60, \eta^2_p = 0.08$ | | $F(1, 477) = 38.60, \eta^2_p = 0.08$ | |
| Skepticism | <i>Stats</i> | $F(1, 475) = 27.56, \eta^2_p = 0.06$ | | $F(1, 477) = 13.88, \eta^2_p = 0.03$ | |
| Behavior Change | <i>Stats</i> | $F(1, 475) = 15.88, \eta^2_p = 0.03$ | | $F(1, 477) = 20.26, \eta^2_p = 0.04$ | |

Note: All horizontal means within scenario not sharing a superscript letter vary significantly ($p < 0.05$) by SNK post hoc tests. SD = standard deviation.

overall. H3 was supported. Across five of the six constructs on both scenarios, Conservatives saw the largest and most statistically significant increase in consciousness between those with low and high crisis experience, compared to their Liberal counterparts (see Table 3). A review of the means and test statistics show the average increase on the consciousness and behavior change scales, based on issue experience within the scarcity scenario, was 0.40 for Liberals and more than a full point higher at 1.43 for Conservatives. Similarly for the pollution scenario, the average increase on the consciousness and behavior change scales was 0.56 among Liberals and 1.52 among Conservatives. It should also be noted that the difference between low and high experienced Liberals was not statistically significant in the case of the construct *Importance* (for both water scarcity and pollution), *Worried* (for scarcity), *Behavior Change* (for scarcity), and *Scared* (for pollution). On the other hand, the

differences between low and high experienced Conservatives was significant across all measures other than *Scared* in the pollution scenario.

Despite the robust interaction of political identity and experience level overall, there was one measure where the data did not follow the established pattern. Experience level had little impact on Conservatives while it had significant impact on Liberals for the construct of Skepticism. A review of the means in Table 3 shows that Conservatives were more skeptical broadly, regardless of experience level with the water issues. Liberals with water issue experience, however, were more skeptical of the researchers and data associated with scarcity and pollution than were Liberals who had no experience with the issues. Generally speaking, across all the measures, even the most worried or scared Conservatives still did not reach the elevated levels of the least conscious Liberals.

Table 3. Interaction of political ideology and crisis experience level within issue on water consciousness.

| Water Consciousness | | -----Scarcity----- | | | | -----Pollution----- | | | |
|------------------------|------------------------------------|---|-----------------------------|-----------------------------|-----------------------------|---|-----------------------------|-----------------------------|-----------------------------|
| | | Liberal | | Conservative | | Liberal | | Conservative | |
| | | Low | High | Low | High | Low | High | Low | High |
| Importance | <i>Means</i> (<i>SDs</i>) | 8.36 ^A (1.61) | 8.22 ^A (1.57) | 6.44 ^A (2.96) | 7.64 ^B (1.70) | 8.22 ^A (1.74) | 8.39 ^A (1.65) | 6.90 ^A (2.91) | 7.65 ^A (2.10) |
| Worried | <i>Means</i> (<i>SDs</i>) | 7.05 ^A (2.07) | 7.42 ^A (1.98) | 5.27 ^A (3.11) | 7.06 ^B (2.17) | 7.26 ^A (1.97) | 7.84 ^B (1.89) | 5.55 ^A (3.05) | 7.10 ^B (2.22) |
| Scared | <i>Means</i> (<i>SDs</i>) | 5.58 ^A (2.67) | 6.33 ^B (2.45) | 4.27 ^A (2.90) | 5.66 ^B (2.47) | 5.71 ^A (2.49) | 6.47 ^B (2.36) | 4.02 ^A (2.78) | 6.15 ^B (2.20) |
| Threatening | <i>Means</i> (<i>SDs</i>) | 6.97 ^A (2.21) | 7.77 ^B (1.82) | 5.29 ^A (2.54) | 7.19 ^B (2.18) | 6.95 ^A (2.12) | 7.78 ^B (1.90) | 5.10 ^A (2.71) | 7.31 ^B (1.86) |
| Skepticism | <i>Means</i> (<i>SDs</i>) | 2.27 ^A (0.88) | 3.07 ^B (1.32) | 3.43 ^A (1.20) | 3.77 ^A (1.16) | 2.30 ^A (0.88) | 2.77 ^B (1.30) | 3.34 ^A (1.22) | 3.52 ^A (1.30) |
| Behavior Change | <i>Means</i> (<i>SDs</i>) | 5.23 ^A (1.15) | 5.43 ^A (1.19) | 4.38 ^A (1.65) | 5.26 ^B (1.01) | 5.00 ^A (1.39) | 5.48 ^B (1.08) | 4.17 ^A (1.81) | 5.13 ^B (1.06) |
| Importance | <i>StatsLib</i> <i>StatsCon</i> | $F(1, 227) = 0.43, p = 0.51, \eta_p^2 < 0.01$ $F(1, 102) = 5.94, p = 0.02, \eta_p^2 = 0.06$ | | | | $F(1, 228) = 0.56, p = 0.46, \eta_p^2 < 0.01$ $F(1, 102) = 2.25, p = 0.14, \eta_p^2 < 0.02$ | | | |
| Worried | <i>StatsLib</i> <i>StatsCon</i> | $F(1, 228) = 1.87, p = 0.17, \eta_p^2 < 0.01$ $F(1, 102) = 10.85, p < 0.01, \eta_p^2 = 0.10$ | | | | $F(1, 227) = 5.22, p = 0.02, \eta_p^2 = 0.02$ $F(1, 102) = 8.65, p < 0.01, \eta_p^2 = 0.15$ | | | |
| Scared | <i>StatsLib</i> <i>StatsCon</i> | $F(1, 229) = 4.93, p = 0.03, \eta_p^2 = 0.02$ $F(1, 101) = 6.54, p = 0.01, \eta_p^2 = 0.06$ | | | | $F(1, 227) = 5.59, p = 0.02, \eta_p^2 = 0.02$ $F(1, 102) = 18.46, p = 0.51, \eta_p^2 < 0.01$ | | | |
| Threatening | <i>StatsLib</i> <i>StatsCon</i> | $F(1, 229) = 9.09, p < 0.01, \eta_p^2 = 0.04$ $F(1, 102) = 16.19, p < 0.01, \eta_p^2 = 0.14$ | | | | $F(1, 228) = 9.76, p < 0.01, \eta_p^2 = 0.04$ $F(1, 102) = 23.13, p < 0.01, \eta_p^2 = 0.19$ | | | |
| Skepticism | <i>StatsLib</i> <i>StatsCon</i> | $F(1, 229) = 29.32, p < 0.01, \eta_p^2 = 0.11$ $F(1, 102) = 2.04, p = 0.16, \eta_p^2 = 0.02$ | | | | $F(1, 228) = 10.34, p < 0.01, \eta_p^2 = 0.04$ $F(1, 102) = 0.46, p = 0.50, \eta_p^2 < 0.01$ | | | |
| Behavior Change | <i>StatsLib</i> <i>StatsCon</i> | $F(1, 229) = 1.72, p = 0.19, \eta_p^2 < 0.01$ $F(1, 102) = 9.83, p < 0.01, \eta_p^2 = 0.09$ | | | | $F(1, 228) = 8.59, p < 0.01, \eta_p^2 = 0.04$ $F(1, 102) = 10.74, p < 0.01, \eta_p^2 = 0.10$ | | | |

Note: All horizontal means within scenario not sharing a superscript letter vary significantly ($p < 0.05$) by SNK post hoc tests. SD = standard deviation.

Discussion

In a 2015 article published in the *Journal of Contemporary Water and Education*, Floress et al. call for more social science-based research by outlining that behavior choices are “predicated on a variety of social, psychological, institutional, and economic factors that need to be understood” (85). While these authors addressed watershed projects specifically, they speak to the importance

of understanding how “attitudes, value orientation, perceptions of social capital, trust, risk, and awareness” (85) can influence perceptions and behavior change related to natural resources. To that end, the present study attempts to address the void by investigating how personal traits can predict water resource attitudes and behaviors.

The primary findings of this investigation show that personal traits have profound impacts

on how members of the public consider water issues and that these traits may impact behavioral changes related to use of the resource. In terms of enumerated hypotheses, the findings concerning the influence of political ideology on water attitudes and behavior are consistent with the greater body of research related to environmental issues in general. Hypothesis 1 predicted that Liberals would be more water conscious and more willing to make water positive behavioral changes compared to their Conservative counterparts. This expectation was confirmed across every measure employed and across both the scarcity and pollution scenarios. Liberals did in fact place more importance on water issues, were more worried, more scared, felt more threatened, were less skeptical of scientific data, and were more inclined to change their behaviors in a positive direction compared to Conservatives. Political Moderates oscillated between the two more extreme groups.

Findings here regarding the influence of political ideology thus align with past research focusing on the broader area of climate change and global warming (Dunlap, Xiao, and McCright 2001; Jost, Nosek, and Gosling 2008; Hart and Nisbet 2011; Myers et al. 2013). What is novel in the current study, however, is the discovery of this effect specific to water scarcity and pollution. The findings allow policy makers and strategic communicators to work within some level of certainty that the influence of ideology does in fact occur as would be expected, related to water. Ultimately, and practically, these data provide direction for any campaign effort aimed at addressing water issues. Because local population political identity can be ascertained by reviewing precinct voting records, any person or organization aiming to positively impact water issues should be able to predict support or resistance from constituent publics before formal efforts are launched. With the knowledge of public ideology in hand, messaging strategies can be adapted to target audiences.

Just as the current data offers little contradiction to previous work in political ideology, it is also supportive of foundational work in how previous experience impacts attitudes and expected behaviors. H2 stated that those persons with previous scarcity or pollution experience would be more water conscious and willing to support

behavior change regarding water conservation than those without experience. Overall, data aligned with expectations. In the case of both water crisis scenarios, those who had personally experienced a water scarcity or water pollution situation did have more water-positive attitudes and willingness to change behavior. As stated previously, research has generally suggested that personal experience with an issue is more impactful than other less concrete associations (Fiske and Taylor 1991). And while researchers have looked at how experience with environmental issues such as climate change influences beliefs, it is suggested that general climate change indicators are subtle and less influential upon attitudes compared to more visible environmental issues such as drought (Lorenzoni, Nicholson-Cole, and Whitmarsh 2007; Egan and Mullin 2012). Data here do not compare the influence of global warming/climate change experience versus water issue experience on attitude, but it does show that experiences related to water are impactful. Additionally, results do not offer insight into how firmly attitudes are held or how slowly they decay relative to water experience, but there is clear evidence that having a water scarcity or water pollution incident in one's background is influential upon attitudes about water issues and conservation.

In terms of pragmatic value of the findings, knowing what experiences a person can reference should allow for better messaging, as with political ideology. Clearly those with water issue experience should be more receptive to pro-water messaging while those without experience will be more difficult to influence. But unlike with ideology, where some attempt to gauge Liberal or Conservative affiliation must be taken, water issue experience can be easily determined simply by taking into account local weather and water purity information. Whereas ideology can change from house to house on the same city block, experience with water issues should be global within a community. Obviously, it is possible that members of the public could have gained water issue experiences in other locales or could be oblivious to their own current surroundings, but policy makers and campaigners could readily ascertain a good sense of the majority population's experience and resulting attitudes.

Finally, the current study allows an opportunity to determine how political ideology and personal experience interact. Hypothesis 3 predicted that Liberals would be less impacted by experience as a result of possessing a generalized higher level of water consciousness while Conservatives, who are less water conscious overall, would be more influenced by experience. Data analyses revealed just such an interaction where the mean score movement between low and high experienced respondents was much more pronounced among Conservatives than Liberals. A review of the effect size (partial eta squared) statistics in the testing of the first two hypotheses offers little to indicate which measure alone accounts for more influence. The key take away is that the influence of each is robust in and of itself but when considered simultaneously, a clear picture begins to form. Across the measures and issues, those Conservatives with issue experience possess attitudes and intentions that align them more closely to Liberals regardless of experience. The most pronounced exception to this finding centered on skepticism of the science associated with water issues. Conservatives, even those who had experiences with water scarcity or pollution, were skeptical of science behind either issue. Liberals, on the other hand, were less skeptical than Conservatives overall, but those Liberals with issue experience were even less skeptical than those Liberals without.

Practically, the interaction between political ideology and personal experience offers valuable insight into how to address water issues. In areas where the population has direct experience of either a water scarcity or water pollution issue, it could be expected that the public would be supportive via conservation or pollution prevention of messaging and campaign efforts regardless of the political ideology of individuals. In these locations, it may be possible to use broad-based efforts and not require audience segmentation. On the other hand, in areas where there may be a threat of water issues but none that have manifested themselves yet, Conservatives and Liberals can be expected to hold very different attitudes and have different behavior intentions related to water. In these markets, audience segmentation by ideology may be advisable. It should be noted, however,

regardless of experience, it would seem that citing science and scientists in any water messaging may yield few positive results.

Limitations and Future Research

While the current study does offer some insight into how water attitudes and behaviors may be influenced by personal traits, it nonetheless has several limitations. This research does not address granular specificity in regards to issue experience and behavior change. Respondents were asked only if they had been personally affected by scarcity or pollution. What the study does establish is that experience is impactful, but experience with either issue can vary from direct economic or health impact to more abstract psychological impact. Future studies should be more specific in measuring experience and take a deeper look at the types of experience possible. Likewise, the behavior measures employed in the current study asked only if respondents planned to be more conscientious with water and use less water/be more aware of pollution in the future. Behavior change can include anything from investigating the issues more deeply to volunteering time to make positive contributions. A more detailed and nuanced gauge of behavior change intentions would lend depth to the findings. Finally, future researchers should investigate strategic messaging techniques and practices to determine how the traits and attitudes uncovered here may influence the impact of campaign efforts. Knowing that political ideology and personal experience shape attitudes and intentions provides a solid foundation, but ultimately the research goal should be to offer evidence of best practice message construction.

Conclusion

With water scarcity and water pollution garnering more attention in the U.S., there is little doubt there exists an increasing need to build support for water issues across a variety of constituent publics. The changes in human behavior that will be required to avert much larger crises hinge on the formation of water-positive attitudes. The current study lends insight to how water attitudes are currently forged and how personal traits may predict tendencies to

conserve water and be mindful of water quality. This nationwide survey suggests that Liberals and those with personal water issue experience are more water positive than are Conservatives and those without water issue experience. At the intersection of these variables lie Conservatives with no previous water issue experience, a group that may prove to be the most resistant to adopting a water positive stance. Ultimately, researchers and managers alike should be able to use the findings here as a springboard to conduct future investigations and build more support for water issues among the general public. In particular, this research sets the stage for municipal water boards and other managers to develop strategic messaging that can target consumers based on district voter registrations as well as water issue experience levels determined by recent local droughts or pollution.

One example of how the findings might direct efforts centers on the data suggesting that experience with a water crisis partially negates the negative impact of Conservative political ideology. Regions that have experienced water scarcity, for example, may require only a single water conservation messaging strategy—Conservatives and Liberals alike have shown positive water attitudes when crisis experience is high. Messages should be more tailored along the lines of ideology, however, if a municipality is planning proactively, and hoping to influence a population before any water crisis experience has developed. In particular, message designers, considering the skeptical nature of Conservatives toward water science and scientists, would likely find more success by using a non-scientist spokesperson in any messaging. Care must be taken not to step outside of the research scenario employed, as a broad test of messaging techniques was not conducted here. Nonetheless, this study illustrates that efforts to impact water usage habits as well as pollution concerns stand a much better chance of positively affecting behaviors and attitudes when the political ideology and experience levels of a target audience are taken into account.

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