Routledge
Taylor & Francis Group

Journal of Applied Communication Research

ISSN: 0090-9882 (Print) 1479-5752 (Online) Journal homepage: http://www.tandfonline.com/loi/rjac20

Towards an integrated model of strategic environmental communication: advancing theories of reactance and planned behavior in a water conservation context

Yuhua (Jake) Liang, Kerk F. Kee & Lauren K. Henderson

To cite this article: Yuhua (Jake) Liang, Kerk F. Kee & Lauren K. Henderson (2018): Towards an integrated model of strategic environmental communication: advancing theories of reactance and planned behavior in a water conservation context, Journal of Applied Communication Research, DOI: 10.1080/00909882.2018.1437924

To link to this article: https://doi.org/10.1080/00909882.2018.1437924

JOURNAL OF APPLIED COMMUNICATION RESEARCH, 2018
https://doi.org/10.1080/00909882.2018.1437924

Towards an integrated model of strategic environmental communication: advancing theories of reactance and planned behavior in a water conservation context

Yuhua (Jake) Liang[a], Kerk F. Kee[a] and Lauren K. Henderson[b]

[a]School of Communication, Chapman University, Orange, CA, USA; [b]Survata, Inc., San Francisco, CA, USA

ABSTRACT

This study demonstrates how communication research can be strategically applied to address environmental problems in modern societies. To accomplish this goal, this research advances an integrated communication model based on psychological reactance theory and the theory of planned behavior to explain negative attitude change that can occur when people are exposed to water conservation campaigns [Liang, Y. J., Henderson, L.K., & Kee, K. F. (2017). Running out of water! Developing a message typology and evaluating message effects on attitude toward water conservation. *Environmental Communication*. doi:10.1080/17524032.2017.1288648]. The data fit the hypothesized model, synthesizing message-, social-, and individual-based processes to predict their effects on behavioral intention towards water conservation. Interestingly, data show that (1) combinations of message strategies affect reactance differently, and (2) subjective norm and perceived behavioral control negatively correlated with threat to freedom. These results point to the practical implication that environmental communication to promote voluntary water conservation are effective when campaign messages are designed to reduce threat to freedom, induce social norms, and increase self-efficacy. We call the documented research process *strategic environmental communication,* which focuses on the joint application of evidence and theory towards addressing environmentally motivated problems.

ARTICLE HISTORY
Received 26 February 2017
Accepted 26 January 2018

KEYWORDS
Water conservation messages; psychological reactance theory; theory of planned behavior; strategic environmental communication

Introduction

Communication research can be strategically applied to address environmental problems in modern societies. Environmental crises, such as drought, climate change, air and water pollution, nuclear and radioactive waste, require strategic messaging to mobilize the masses to engage in pro-environmental behaviors. However, many efforts among environmental activists and campaign practitioners are guided by personal intuitions, individual preferences, and imitations of existing campaigns (Liang, Henderson, & Kee, 2017). While these efforts need to be acknowledged, especially in their attempts to address environmental crises within the constraints of time and resources, research-driven design can

CONTACT Kerk F. Kee kerk.kee@gmail.com

help these efforts to become more effective. To address this problem, we propose the integration of theories and practice to create the field of strategic environmental communication (SEC). We use the term SEC to refer to messaging and campaign efforts guided by an evidence-based approach. Such an approach can increase successful outcomes and minimize unintended message effects due to being un- or under-informed by empirical studies and tested theories. SEC presents a salient applied topic at the intersection of environmental communication, strategic communication, and persuasion research.

One of the prime examples of environmental crises is drought. The growing global drought is a critical environmental problem related to climate change. In the United States (U.S.), drought has intensified in recent history across numerous regions, with clear indications that it will expand and spread to other regions (National Integrated Drought Information System, 2016; National Resource Defense Council, 2016). The National Aeronautics and Space Administration recently projected that the Southwest region of the U.S. will experience longer and drier conditions when compared to the recent 1000 years (Shirah & Zhang, 2015). Not only does drought have a huge impact on the natural environment, it also presents harms to humankind (National Resource Defense Council, 2016) and the local economy (United States Department of Commerce, 2015). The need to promote water conservation presents an applied communication problem while water conservation campaigns present an illustration of how practitioners and researchers can use SEC to address real-world problems. Practitioners and researchers can use SEC to design persuasive messages and effective campaigns based on strategies guided by robust theories that have been tested with empirical data.

This research focuses on efforts to theorize and develop more effective water conservation messages, utilizing California as a case study given the recent drought and emergent efforts. The overarching problem investigated in this study is the strategic message design required to effectively promote voluntary water conservation in environmental campaigns. Successful environmental campaigns require well-designed messages and research-based strategies to be effective (Atkin, 1994). Furthermore, it is important that the design allows researchers to identify and avoid unexpected consequences (Harrison, 2014). More specifically, Gifford (2011) argues that effective messages need to address the psychological challenges unique to the environmental context, such as limited cognition, ideologies, comparisons with others, sunk costs, discredence, perceived risks, and limited behavior. Cantrill (1993, 1998) further elaborates that these barriers are wide ranging from cognitive barriers of information processing to deep-rooted existing beliefs about the environment and one's personal accountability to practice pro-environmental behaviors. Altogether, research suggests that messages targeting this specific outcome require unique and ongoing theoretical developments (Atkin, 1994) nested in the water conservation context (Syme, Nancarrow, and Seligman 2000) prior to dissemination. To make the matter more urgent, recent work by Liang et al. (2017) documented that water conservation messages can be ineffective and achieve the opposite intended effect. Therefore, the purpose of this article is to use water conservation messaging as an illustration of SEC processes and the contributions it presents when applied in practice.

To address the theoretical and empirical concerns regarding the documented negative message effects (Liang et al., 2017), this research focuses on developing an integrated model of SEC in the context of water conservation with new data. This model utilizes three explanatory mechanisms (i.e. message-, individual-, and social-based) guided by

two driving theoretical frameworks (psychological reactance theory [PRT] and the theory of planned behavior [TPB]). First, PRT (Brehm, 1966) suggests that a threat to personal freedom elicits a force to restore that freedom. Second, TPB (Ajzen, 1985) maintains that perceived behavioral control, subjective norm, and attitude jointly predict behavioral intention. By blending these two established persuasion theories, this model aims to explain and predict the effect of message exposure on receivers' behavioral intention to save water. The goal is to apply the findings to improve message effectiveness for SEC, an important applied communication problem.

In order to describe the integrated model, this article is organized in the following manner. First, we examine the definitions of strategic communication, environmental communication, and how they relate to the proposed field of SEC. Second, we discuss the theoretical grounding, including PRT and TPB, leading to the research questions and hypotheses. Third, we discuss the methodology of the current study, including participants recruited and measures employed. Fourth, the results are discussed, followed by the conclusion with implications and limitations.

Literature review

Strategic environmental communication

SEC can be understood as strategic communication theory and research applied to the practice and promotion of pro-environmental behaviors. The specific definition can be further unpacked based on existing literature. For example, Hallahan, Holtzhausen, Van Ruler, Verčič, and Sriramesh (2007) define strategic communication as 'the purposeful use of communication by an organization to fulfill its mission' (p. 3). They explain that the goals pursued by strategic communication efforts can include selling new products, building and fostering relationships with external audiences, and motivating donors and actions. Research practices applied include message design strategy, goal-setting, and tangible outcome assessment. They also argue that strategic communication practitioners can use informational and social marketing campaigns as a key vehicle for intervening in people's engagement in risky behaviors or initiate social causes to improve the society.

Pro-environmental behaviors and causes present a unique context for strategic communication research. More specifically, environmental problems can be viewed as a crisis, thus environmental communication as a 'crisis discipline' (Cox, 2007; Plec, 2007) that calls for partnerships with strategic communication. For example, Cox (2007) defines environmental communication as the efforts that seek 'to enhance the ability of society to respond appropriately to environmental signals relevant to the well-being of both human civilization and natural biological systems' (p. 15). Therefore, SEC applies strategic communication to enhance the efficacy and effectiveness of environmental campaigns in order to promote pro-environmental attitudes, behaviors, and investments with the goal to safeguard the well-being of human societies and natural systems.

However, SEC is different from strategic communication. Strategic communication focuses on intentional, purposeful, and persuasive storytelling through which the organization presents and promotes itself with the aim of achieving some rational economic goals (Hallahan et al., 2007). In contrast, we argue that SEC harnesses strategic

communication to promote pro-environmental causes and/or behaviors with goals that benefit the larger society rather than the sole organization. Furthermore, the motivation is to preserve the well-being of humankind and natural ecosystems, not economic gains. Therefore, if the focus of a campaign is to increase the visibility and reputation of a particular environmental non-profit organization to attract donations, it is simply strategic communication. If the focus of a campaign is to introduce an intervention to improve environmental sustainability, then it is SEC.

SEC research to date has shed light on the relationship between information seeking and pro-environmental behaviors. For example, Witzling, Shaw, and Amato (2015) report that information exposure is related to pro-environmental behaviors. However, Kahlor, Dunwoody, Griffin, and Neuwirth (2006) find that information seeking for impersonal risks (i.e. risks that do not directly threaten individuals, such as many environmental problems) is associated with the perceived social pressure to be informed. For personal risks, Ivanov et al. (2016) establish that information exposure can increase self-efficacy, reduce fear, and increase public confidence in governmental agencies' ability to handle crisis events, including environmental disasters and even terrorist acts.

Furthermore, SEC research has identified important correlates of environmental perceptions and behaviors. For example, Silk, Hurley, Pace, Maloney, and Lapinski (2014) find that for environmental initiatives to gain traction, campaign practitioners need to speak to stakeholders' values and needs. Corbett (2002) reports that stakeholders' intent to engage in pro-environmental behaviors is influenced by past conservation behaviors, self-efficacy, financial incentives, and governmental information. In another study, Corbett (2005) discovers that pro-environmental behaviors are guided by self-interest, desirable choices, social norms, altruism, and participatory problem-solving. In a study of recycling, Krendl, Olson, and Burke (1992) conclude that one's intention to recycle is related to being exposed to messages that promote perceived conveniences and provide practical information. Despite ample foci on correlates found within the literature, less work has examined the causal or explanatory mechanisms guiding these effects and how the different mechanisms can interact in an SEC context.

Water conservation as an illustration of SEC

To stress the need for persuasive messaging in a water context, Jöborn et al. (2005) report on Integrated Water Management efforts in Sweden and the lack of stakeholder (or water user) involvement as a major challenge in well-intended efforts. They argue that by involving stakeholders early, the campaign can gain legitimacy, improve quality of management scenarios, and increase ease of implementation. However, these researchers found that generally motivating stakeholders to learn the necessary behavior to meaningfully participate in water management efforts is a major challenge and sometimes can result in negative effects. We argue that the integration of SEC research with environmental campaigns can motivate more active participation when applied in contexts such as water management. This study aims to use water conservation as an illustration of SEC.

To understand the effect of persuasion strategy on behavior when implemented in a water management context, Mosler (2012) proposes the Risk, Attitude, Norm, Ability, and Self-Regulation (RANAS) model as an integrated approach to behavioral change. Risk factors include perceived vulnerability, perceived severity, and factual knowledge.

Attitude factors are instrumental and affective beliefs. Norm factors suggest the forms of descriptive, injunctive, and personal norms. Ability factors point to action knowledge, self-efficacy, maintenance self-efficacy, and recovery self-efficacy. Finally, self-regulation factors are related to action control/planning, coping planning, remembering, and commitment. The RANAS model sketches a robust conceptual framework, which provides many opportunities for empirical testing. We seek to test some of the factors, such as attitudes, norms, and self-efficacy in the current study of water conservation messaging.

In order to systematically summarize the scattered water conservation campaign efforts to address the enduring drought in California, Liang et al. (2017) introduce a typology of 12 persuasive message strategies. These strategies range from providing evidence of drought (ED), inducing loss aversion (LA), giving conservation tips (CT), to asking for commitments, goal-setting, and offering referrals and redirection to information resources. However, research findings are mixed with respect to how these message strategies affect receivers and how a message strategy works in conjunction with other message strategies. More specifically, Liang et al. experimented on the effect of three selected strategies of ED, LA, and CT. Overall, post-test results show that messages actually lead to a negative attitude change relative to a pre-test. Although attitude does not necessarily translate to conservation behavior (Dolnicar & Hurlimann, 2010), the findings by Liang et al. are note-worthy and counter-intuitive because they fly in the face of conventional wisdom and established practices. It is difficult to convert a positive attitude change to actions, let alone a negative attitude change in this case.

Gifford (2011) laments that there is a 'fabled gap between attitude ("I agree this is the best course of action") and behavior ("but I am not doing it") with regard to environmental problems' (p. 290). Applying TPB (Ajzen, 1991), for example, Syme et al. (2000) review existing research related to water conservation and suggest that subjective norm (a social-based mechanism) could be an effective predictor of behavioral intention. However, they also cite researchers who suggested attitude and perceived behavioral control (both individual-based mechanisms) as more relevant than subjective norm. Given the conflicted literature, Syme et al. conclude that advancing this line of work requires more theoretically based work on modeling the psychology behind conservation behaviors. In addition, they suggest taking an approach that considers elements of the communication model (i.e. source, message, channel, and receiver).

Given the need for empirical testing and theoretical integration, the current research focuses on modeling behavioral intention to conserve water by integrating PRT with TPB. These two theoretical frameworks each uniquely contribute to predicting and understanding how people intend to save water. But jointly, they facilitate a larger communication model related to water conservation, including individual-based (perceived behavioral control), social-based (subjective norm), and message-based (threat to freedom) elements. Unlike Mosler's (2012) conceptual model based on literature, this integrated communication model accounts for message processing effects emerged from recent controlled experiments and findings related to water conservation messages with empirical data. Combining these factors together yields a more unified model that can theoretically and practically inform ongoing and future water conservation campaigns and SEC. We discuss the theoretical grounding of the study in the next section.

Theoretical development and mechanisms

Psychological reactance theory

PRT provides an explanation for how messages can negatively affect attitude. Originally introduced by Brehm (1966), PRT posits that messages threatening a receiver's personal freedom elicit a force to restore that freedom. This restoration can manifest in negative attitude change toward the topic of discussion. For example, insisting that a student refrain from using a smartphone during class may threaten the student's sense of freedom and lead to a negative attitude change toward classroom technology policies (Kim, Levine, and Allen 2014).

Recent advancements in the measurement of reactance enabled researchers to test and model the reactance process (Dillard & Shen, 2005; Kim et al. 2014). PRT also provides the theoretical mechanism to explain how receivers react to messages based on message characteristics. To our knowledge, little to no research has yet to apply and model PRT to improve understanding of water conservation messages.

Dillard and Shen (2005) demonstrate that psychological reactance follows an intertwined process model. Put formally, messages affect reactance, which is measured by the perception of a personal threat to freedom. The intertwined model points to three outcomes of a threat to freedom: anger, negative cognition, and attitude change. However, anger and negative cognition are terminal outcomes and they do not affect the threat to freedom. The major premise is that a threat to freedom negatively and directly affects the corresponding attitude. This is a strategy that receivers utilize to restore personal freedom. Based on the intertwined model, Kim et al. (2014) replicate the effect with additional factors such as weak argument and personal insult. Recent meta-analytic results on reactance also support the intertwined model across the span of 20 studies and 4942 participants (Rains, 2013).

The messages utilized in the above studies involved issues such as advocating for flossing, reducing alcohol consumption, and prohibiting cell phone use in the classroom. Notably, these behaviors are voluntary; water conservation shares this similarity. The difference is that the previously tested reactance messages solely focus on outcomes related to receivers' personal benefit (e.g. oral health, liver health, and learning). Water conservation, on the other hand, results in both societal benefits (e.g. environmental and community impact) and personal benefit (e.g. saving money in utility bills). Applying PRT to the environmental context, it is important to establish that conservation messages actually elicit a threat to freedom. Therefore, we present the first research question:

RQ1: Do water conservation messages affect individuals' threat to freedom?

Assuming that water conservation messages do induce reactance through a threat to freedom, the first hypothesis is advanced given PRT:

H1: Individual responses to water conservation messages follow the intertwined reactance model, specifically:

H1a: Threat to freedom positively predicts anger.

H1b: Threat to freedom positively predicts negative cognition.

H1c: Threat to freedom negatively predicts attitude toward water conservation.

Theory of planned behavior

In addition to applying PRT to model message effects, we integrate TPB (Ajzen, 1985) to increase the predictability and to better understand how different mechanisms may affect each other. This approach also extends previous work on negative attitude change to ascertain if the effect on attitude persists to behavioral intention, a more proximal variable to actual behavior (Ajzen, 1991).

TPB posits that perceived behavioral control, subjective norm, and attitude jointly predict behavioral intention. Perceived behavioral control relates to self-efficacy, or the extent to which a person believes he/she can carry out a particular behavioral change (e.g. capable of conserving water). Subjective norm is a person's perceptual belief of whether important others are supportive or unsupportive of the given behavioral change. Attitude refers to the valence of a person's evaluation of the same behavioral change overall (e.g. bad or good).

TPB and the elements it is comprised of have previously been applied in the health context and have shown to be predictors of behavioral intention. Researchers attempting to gain compliance for a tobacco-free policy on a university campus with a campaign grounded in TPB find that messages that provided health facts, promoted self-efficacy and/or provided reason for the non-smoking norm are successful in significantly reducing smoking in non-smoking areas on campus (Record, Helme, Savage, & Harrington, 2017). In a study to understand students' engagement in risky drinking behaviors, Dorsey, Miller, and Scherer (1999) report that self-efficacy and communication with peers play a significant role in students' perceived ability to avoid risky drinking behaviors.

TPB has previously been applied in the water conservation context. For example, Trumbo and O'Keefe (2001) assess three different communities' water conservation intention in California and Nevada. They report that TPB explains behavioral intention to conserve in all three communities. In another study, Han, Hsu, and Sheu (2010) find that TPB yields higher predictability than the theory of reasoned action. Furthermore, Armitage and Conner's (2001) meta-analysis supports TPB's robust predictive power on actual behavior ($R^2 = .31$). Given the theoretical tenets of TPB, the second hypothesis is advanced:

> H2: Behavioral intention toward water conservation follow the theoretical constituents of the theory of planned behavior. Specifically:
>
> H2a: Perceived behavioral control positively predicts behavioral intention to conserve water.
>
> H2b: Subjective norm positively predicts behavioral intention to conserve water.
>
> H2c: Attitude positively predicts behavioral intention to conserve water.

Hypotheses H1–H2 are synthesized and presented as a single structural model. This model describes the hypothesized relationships and integrated the first RQ and the RQs asked below.

At first glance, PRT and TPB appear to work in a parallel fashion with regards to message-, social-, and individual-based processes. However, threat to freedom may relate to subjective norm (a social-based process) in interesting ways. Conceivably, how message receivers experience reactance to messages may follow their perceptions of how important others view the issue. For example, if receivers perceive that important others also view water conservation to be important, they may view a freedom threatening

message as less threatening because the sense of social norms may make water conservation more acceptable. This argument advances PRT and TPB. Specifically, this argument suggests that individuals rely on social-based information to make individual-based judgments about a message's threat to their sense of freedom. This argument is also practically important as threat to freedom directly induces anger and negative cognition. These two negative outcomes may carry long-term detrimental effects if message exposure does indeed generate reactance. Thus, we posit a second research question:

RQ2: What is the relationship between subjective norm and threat to freedom?

In contrast to subjective norm, perceived behavioral control refers to one's individual efficacy. This individual-based variable can connect to threat to freedom. Receivers of water conservation messages may experience reactance to the extent to which they view conservation as beyond their control. Indeed, some degree of water consumption and use are essential and less amenable to conservation (e.g. drinking water to survive). At the same time, people may attribute water conservation as a larger societal problem that warrants less of their personal-level intervention or view their own behavior as minimal in its ability to affect the greater conservation outcomes.

Recent media campaigns against high-end water wasters may cause such a disassociation between people's individual-based efficacy and the ability to impact water conservation. Some receivers may even view the drought as a natural and permanent phenomenon, lessening their self-efficacy and/or motivation to change the ultimate outcome. Given these arguments, the last research question is posed:

RQ3: What is the relationship between perceived behavioral control and threat to freedom?

Method

Participants

The data collected for the current study involved two separate samples. One sample occurred online through a Qualtrics (an online survey collection system) panel of randomly sampled California residents; the other sample utilized California undergraduate students in a laboratory setting. The online sample involved a paid panel with California residents ($n = 180$). The sample's average age was 49.24 ($SD = 11.34$) years old. It comprised of half female participants. In this sample, more participants reported an annual household income at or above $75,000 (32.2%), than between $50,000 and $74,999 (21.1%), between $30,000 and $49,999 (22.8%), and below $30,000 (23.9%). Most participants had a four-year college education (46.7%). Others had a post-graduate degree (10%), some college (33.3%), and high school or less (10%).

Based on inquiry with Qualtrics, each participant was compensated with $0.50 for their time. Data obtained from this sample, relative solely to the variable of attitude, were previously reported (Liang et al., 2017) to explore the effects of the message strategies on attitude. However, the data and the previous study did not address the theoretical explanations, variables, processes, and analyses introduced in the current study. The previous findings motivated the additional analyses and data collection reported in the current study.

Collected specifically for this study, the second sample were undergraduate students (n = 155) at a mid-size private university in California. In this sample, the participants' ages ranged between 18 and 22. They were mostly female (75.5%). The sample had more freshman (34%) than juniors (29%), seniors (21%), and sophomores (16%). Their household incomes were mostly higher than $75,000 (54%), followed by $50,000-$74,999 (21%), $30,000–$49,999 (9%), and less than $30,000 (16%).

Message strategies and stimulus material

The message strategies (i.e. ED, LA, and CT) tested in the current study were adopted from Liang et al.'s (2017). These messages were pilot tested in the previous study cited and their conceptual definitions are organized in Table 1 in this article. Briefly, ED messages 'offer some concrete evidence, often in data or pictorial elements, to encourage conservation behavior.' LA messages 'convey to the receiver that inadequate conservation efforts will result in a reduction in water supply and other related consequences.' CT messages 'directly provide the receiver with any type of content, tips, and strategies to save water.'

These water conservation messages were utilized for two reasons. First, they followed previous research documenting their frequency of application in conservation campaigns (Liang et al., 2017). Second, they reflected the most applicable strategies that environmental campaign practitioners can adopt without incurring changes in the state law or obtaining personal data of water use. In other words, these strategies can be easily, quickly, and independently implemented without changing policy or collaborating with relevant agencies to obtain data to establish a benchmark for social comparisons.

Procedures

The experiment reflected a 2 (ED: Present/Absent) × 2 (LA: Present/Absent) × 2 (CT: Present/Absent) factorial design. To provide an adequate control condition (i.e. when all three experimental conditions were assigned absent), all messages included a baseline message of 'Please Save Water.' When multiple message strategies were present (e.g. LA and ED), the messages were combined into one block of text and presented to participants as a single message. Therefore, participants viewed one of eight message conditions.

The online portion of the data collection utilized Qualtrics for the experiment and data collection. After providing informed consent, participants were randomly assigned by Qualtrics to view one of the eight experimental messages (see experimental induction section). Participants then completed a series of self-report measures assessing their threat to freedom, anger, negative cognition, attitude toward water conservation, perceived behavioral control, subjective norm, and behavioral intention toward water conservation (see measures section). Finally, the subjects provided demographic information and were thanked for their participation.

Participants in the laboratory study signed up for a departmental subject pool and received course credit for their participation. They arrived individually at a designated lab space and completed the same online questionnaire completed by the panel sample. The only differences between the two samples are the venue (various locations of Qualtrics recruited participants/a university laboratory) and sample characteristics. All analyses

Table 1. Conceptual definitions of message strategies and messages used for each strategy.

Message strategy	Conceptual definition	Message condition
Evidence of drought (ED)	ED offers some concrete evidence, often in data or pictorial elements, to encourage conservation behavior.	'In March 2015, snowpack was at 5% of average and January 2015 was one of the driest months on record here in California.'
Loss aversion (LA)	LA occurs when a message conveys to the receiver that inadequate conservation efforts will result in a reduction in water supply and other related consequences.	'Say goodbye to clean and safe water soon. As reservoir water levels get lower, water supplies, human health, and the environment are put at serious risk. For example, lower water levels mean higher concentrations of natural and human pollutants.'
Conservation tips (CT)	CT refers to messages that directly provide the receiver with any type of content, tips, and strategies to save water.	'If you accidentally drop ice cubes, don't throw them in the sink. Drop them in a house plant instead.'
Direct request (Control) This condition only applied when ED, LA, and CT are assigned to be absent.	The direct request strategy refers to water conservation messages that instruct the audience to conserve without any support for justification.	'Please save water.'

below included both samples, given that separating them did not yield differentiating results in the hypothesis tests. This combination increased the statistical power necessary for modeling the outcomes.

Experimental induction and induction check

A series of independent sample *t*-tests ensured that the messages successfully induced the respective strategy by asking participants to respond to single-item seven-point Likert-type measures gauging whether the message: (a) provides a conservation tip, (b) creates a feeling of loss if nothing is done, or (c) offers evidence of the drought. As expected, the CT present condition produced higher ratings for CT ($M = 6.04$; $SD = 1.00$) compared to the CT absent condition ($M = 3.38$; $SD = 1.86$), $t\,(333) = -16.3$, $p < .001$, $r_{\text{effect}} = .67$. The LA condition also led to higher ratings of loss ($M = 5.59$; $SD = 1.26$) compared to the LA absent condition ($M = 4.34$; $SD = 1.81$), $t\,(333) = 7.29$, $p < .001$, $r_{\text{effect}} = .37$. Finally, the ED present condition received higher ratings of evidence ($M = 5.66$; $SD = 1.36$) compared to the ED absent condition ($M = 3.69$; $SD = 2.00$), $t\,(333) = 10.52$, $p < .001$, $r_{\text{effect}} = .50$. It is important to note that the inductions focused on producing the three different message strategies, without a direct aim to induce reactance. The induction checks verified that the selected messages for LA, ED, and CT strongly invoked the respective strategies.

Measures

Attitude toward water conservation

Participants' attitude toward water conservation ($M = 6.40$; $SD = 1.05$) was measured using a 4-item, 7-point semantic differential measure. Participants responded to, 'Water conservation is … ' with polar adjectives such as *bad*/*good*, *unfavorable*/*favorable*, *unnecessary*/*necessary*, and *negative*/*positive*. The *negative*/*positive* item was dropped subsequently after an analysis of the measurement model. After dropping the item, the measure is highly reliable ($\alpha = .95$).

Threat to freedom

Participants' threat to freedom ($M = 2.87$; $SD = 1.51$) was measured using a 3-item, 7-point Likert scale ranging from strongly disagree to strongly agree (Kim et al., 2014). Participants responded to, 'After reading the message, please indicate the extent to which you agree or disagree with each of the statements regarding how you felt when you were reading the message … ' with items including *the message threatened my freedom to choose*, *tried to make a decision for me*, and *tried to pressure me* ($\alpha = .85$).

Anger

Participants' anger ($M = 2.2$; $SD = 1.45$) was measured using a 3-item, 7-point Likert scale ranging from strongly disagree to strongly agree (Kim et al., 2014). Participants responded to, 'After reading the message, please indicate the extent to which you agree or disagree with each of the statements regarding how you felt when you were reading the message … ' with items stating, *this message made me angry*, *irritated me*, and *made me annoyed* ($\alpha = .94$).

Negative cognition

Participants' negative cognition ($M = 2.94$; $SD = 1.44$) was measured using a 4-item, 7-point Likert scale assessing the degree of counter-arguing, ranging from strongly disagree to strongly agree (Kim et al., 2014). The items included *I found myself looking for flaws in the way the information was presented in the message*, *I couldn't help but to think about ways that the information being presented was inaccurate or misleading*, *I found myself thinking of ways I disagreed with what was being presented*, *I felt like I wanted to 'argue back' to what was going on in the message* ($\alpha = .87$).

Behavioral intention

Participants' behavioral intention ($M = 5.59$; $SD = 1.20$) was measured using a 3-item, 7-point Likert scale ranging from strongly disagree to strongly agree (Ajzen, 2006). Participants responded to, 'Please indicate the extent to which you agree or disagree with the statements below … ' with items such as *I plan to act in ways that conserve water as promoted by the message, I am going to make an effort to conserve water like the message has urged me to,* and *I intend to be consistent with this message and conserve water* ($\alpha = .92$).

Subjective norm

Participants' subjective norm ($M = 5.83$; $SD = 1.19$) was measured using a 3-item, 7-point semantic differential scale (Ajzen, 2006). Participants responded to, 'The next question asks about people who are important to you. Please respond to each of the statements below according to the adjectives that follow. Most people who are important to me … ' with polar phrases such as *think I should not save water/ think I should save water, do not want me to conserve water/want me to conserve water,* and *do not expect me to conserve water/ expect me to conserve water* ($\alpha = .85$).

Perceived behavioral control

Based on Ajzen (2006), participants' self-efficacy ($M = 6.18$; $SD = .92$) was measured using a 1-item, 7-point Likert measure ranging from strongly disagree to strongly agree. Participants responded to, 'The next question asks about you … ' with the item

I have control over my water use behaviors. All the measures employed in this study were averaged to form an index where a higher value reflected a higher degree of the respective concepts.

Results

Message strategies and threat to freedom

The first research question asked if the three message strategies affected threat to freedom. The data were analyzed using a factorial ANOVA examining the main and interaction effects of the water conservation message strategies on threat to freedom. The results showed a main effect of LA on threat to freedom. The LA present condition led to a higher threat to freedom ($M = 3.16$; $SD = 1.58$) compared to the LA absent condition ($M = 2.59$; $SD = 1.39$), $\eta^2_{\text{partial}} = .04$, $p = .0005$. Interestingly, CT approached a statistically significant reduction effect on threat to freedom. Specifically, CT present condition produced a lower threat to freedom ($M = 2.72$; $SD = 1.47$) compared to the CT absent condition ($M = 3.02$; $SD = 1.54$), $\eta^2_{\text{partial}} = .01$, $p = .06$.

The effects above are qualified by an interesting ED x LA interaction, $\eta^2_{\text{partial}} = .02$, $p = .02$. Specifically, when ED is absent, LA present condition ($M = 3.41$; $SD = 1.67$) amplified threat to freedom compared to the LA absent condition ($M = 2.47$; $SD = 1.40$). However, ED's presence suppressed the amplification effect. The LA present condition ($M = 2.90$; $SD = 1.45$) led to a higher threat to freedom compared to the LA absent condition ($M = 2.71$; $SD = 1.37$); however, the discrepancy was substantially less than when ED was absent. A three-way interaction almost emerged, $\eta^2_{\text{partial}} = .01$, $p = .07$. However, the interaction's interpretation is less clear. Table 2 contains the means and standard deviations for individual conditions on threat to freedom. Given the empirical basis that message strategies induced threat to freedom, the next set of analyses reflect a test of the overall structural model.

Measurement model

As a preliminary analysis, a global confirmatory factor analysis assessed the structural properties of all multi-item measures in the study. The measures received multiple validations from prior research and they derived from stable and well-tested concepts. Initial measurement model showed some measurement error produced by one of the attitude items asking participants if water conservation is *negative/positive*. A *post hoc* review suggested that this item did not fit the conceptual pattern presented by the other items (*bad/good, unfavorable/favorable, unnecessary/necessary*) of attitude in assessing general evaluations toward water conservation. Thus, the item was dropped from subsequent analyses. The data fit the final measurement model well, $\chi^2(137) = 323.421$, $p < .001$, RMSEA = .06, NFI = .94, CFI = .96. Given the support of the measurement model, the hypothesized model was tested next with each construct measured by their respective items (described in the measures section).

Hypothesized model and testing

The model was tested using AMOS 23.0 with maximum likelihood estimation. Kline's (2005) four model fit criteria assessed model fit. First, the χ^2 test should be statistically

Table 2. Means and standard deviations for message conditions, threat to freedom.

	Evidence				No evidence			
	Loss aversion		No loss aversion		Loss aversion		No loss aversion	
	Conservation tips	No conservation tips	Conservation tips	No conservation tips	Conservation tips	No conservation tips	Conservation tips	No conservation tips
Threat to freedom								
M	2.48	3.29	2.8	2.59	3.3	3.53	2.28	2.66
SD	1.30	1.49	1.44	1.30	1.64	1.71	1.33	1.46

significant at $p < .05$, or ideally even less. Second, the root mean square error of approximation (RMSEA) should be less than .08. Third and fourth, the normed fit index (NFI) and the comparative fit index (CFI) should be above .90. The model was tested as the hypotheses specified without making any modification (e.g. correlated errors or adding paths). Table 3 contains the descriptive statistics and zero-order correlations of study variables.

The model fit the data well according to the criteria above, $\chi^2(54) = 456.18$, $p < .001$, RMSEA = .07, NFI = .91, CFI = .94. The model accounted for a substantial amount of variability in behavioral intention ($R^2 = .34$), supportive of the overall theoretical combined model of PRT and TPB. The individual hypotheses and results are discussed below.

In terms of the PRT hypothesis, the data fit the prediction. Consistent with H1a and H2b, threat to freedom positively predicted anger (.47) and negative cognition (.65). Threat to freedom negatively associated with attitude (−.37), consistent with H1c. Relative to the TPB hypothesis, the results showed a significant positive path coefficient from perceived behavioral control (.27) and from subjective norm (.29) to behavioral intention, consistent with H2a and H2b, respectively. As predicted, attitude also had a positive path to behavioral intention (.34). In short, these findings are also consistent with TPB. All paths followed predicted directions.

Perceived behavioral control and subjective norm on threat to freedom

The two research questions explored the effect and linkages between the TPB concepts (i.e. perceived behavioral control and subjective norm) on reactance in terms of threat to freedom. The results showed a negative correlation overall. Perceived behavioral control correlated negatively with threat to freedom ($r = -.32$). Moreover, subjective norm also correlated negatively with threat to freedom ($r = -.27$). Figure 1 summarizes these results in an overall structural model.

Discussion and conclusion

The overarching goal of the current research is threefold. First, this research examined the theoretical mechanisms guiding how receivers process water conservation messages, in light of individual-, social-, and message-based mechanisms. We advanced an integrated model of SEC that accounts for perceived behavioral control (individual-based), subjective norm (social-based), and threat to freedom (message-based) in a coherent and multi-level framework.

Table 3. Descriptive statistics and zero-order correlation between study variables.

Variables	*M*	*SD*	1	2	3	4	5	6	7
1. Threat to freedom	2.86	1.51	1	.51	.57	−.25	−.27	−.20	−.37
2. Negative cognition	2.95	1.44		1	.47	−.27	−.29	−.25	−.42
3. Anger	2.20	1.45			1	−.23	−.36	−.29	−.43
4. Perceived behavioral control	6.18	.92				1	.32	.21	.41
5. Subjective norm	5.83	1.19					1	.32	.48
6. Attitude	6.40	1.05						1	.44
7. Behavioral intention	5.59	1.20							1

Note: All correlations achieved statistical significance at $p < .001$, two-tailed.

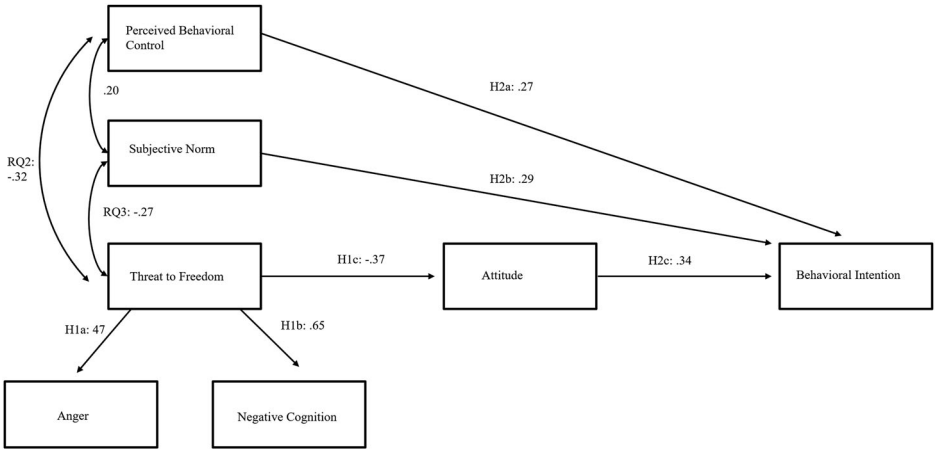

Figure 1. The structural model with hypotheses and path coefficients.

Second, we experimentally extended the aforementioned design to connect attitude to behavioral intention as a predictor of actual behavior (Ajzen, 1991). The statistical analyses provide ample support for the overall structural model without the need to make modifications, demonstrating the model's robustness. This model represents an effort to reconcile multiple components of the communication model by applying both PRT and TPB. The SEC model integrates aspects of the two theories. It is not a full treatment of the theoretical ideas from PRT and TPB.

Third, the model produced in this work offers practical guidance for environmental communication, so campaign practitioners can strategically design effective and persuasive messages. We discuss the implications and how they each uniquely inform the design of water conservation messages and environmental campaigns as an applied communication problem.

Implications for SEC

Results of RQ1 show that the LA strategy generally increases reactance; albeit the effects are reduced when an ED strategy occurs simultaneously. There is also a CT main effect and a three-way interaction among all three strategies that approaches statistical significance. These findings document that water conservation messages generate reactance. For SEC, it is important to note that well-intended water conservation messages can produce the opposite effect when messages convey a sense of loss because they induce psychological reactance among receivers. However, messages containing CT generally reduce reactance. In other words, strategic environmental messages would avoid generating psychological reactance that can boomerang.

Although they are not the focal points or predictors of behavioral intentions, the model suggests a clear effect of threat to freedom on increasing anger and negative cognition. The literature remains unclear whether these two outcomes predict future responses to messages. Still, it is unlikely that anger and negative cognition will produce positive outcomes in

a sustained water conservation campaign. The same argument is likely true for other environmental issues and controversies, and SEC efforts broadly.

Implications for theories

The findings yield contributions for PRT empirically. Recent tests of PRT (e.g. Dillard & Shen, 2005; Kim et al., 2014) rely on message characteristics that directly aim to produce perceived threat to freedom. This research demonstrates how message strategies designed for a well-intended goal could also produce reactance, besides obviously threatening messages. This finding is counter-intuitive at first glance, but it has important theoretical implications for PRT to continue testing the reactance effect of both positive and negative messages on receivers.

Moreover, combining different strategies (e.g. LA and ED) results in a neutralizing interaction effect. Notably, the reactance result shows a low overall mean for threat to freedom ($M = 2.86$). This result suggests that even though messages elicit a higher threat (LA only condition, $M = 3.56$), participants still reported a value generally below the theoretical mean of the measure. PRT can be extended to consider reasons (i.e. evidence for why a pro-water conservation message is introduced) as a moderating and/or mediating variable.

Additionally, perceived behavioral control, as an individual-based concept, directly predicts behavioral intention in water conservation context. Although this finding appears to validate TPB, it is important in demonstrating the application of TPB to environmental communication. TPB has been shown to have boundary conditions and limitations in its applicability (Ajzen, 1991). This finding suggests that messages heightening a person's ability to control his/her own water behaviors or self-efficacy can lead to more intention to save water. However, the high efficacy values ($M = 6.18$) also suggest a possible ceiling effect. Alternatively, with a slightly lower mean ($M = 5.83$), subjective norm and its ability to predict behavioral intention also suggest creating messages designed to increase the normative perception in order to increase water conservation.

Implications for water conservation campaign practitioners and message designers

According to the model, messages that can enhance a receiver's sense of personal freedom and minimize a threat to personal freedom are preferable. For example, a water conservation campaign practitioner can design messages that promote water conservation as a voluntary choice or a lifestyle a receiver can choose to adopt. A practitioner should consider avoiding messages that communicate to a receiver in a demanding, controlling, or moralizing way, that s/he must conserve water.

Second, messages that promote water conservation through suggesting CT are desirable. Suggesting CT is different from goal-setting, in which the receiver is asked to meet an expected target, such as reducing water usage by 10% in next month's water bill. By providing CT, the receiver is presented with a sense of personal freedom to choose, therefore, minimizing reactance. A practitioner would be strategic if the messages focus on providing simple tips the receiver can easily adopt and implement.

Third, messages that provide supporting reasons (e.g. including ED) for the advocated conservation actions are superior. When a campaign practitioner believes that it is necessary to convey to the receiver that inadequate conservation efforts will result in negative consequences, it is best to accompany the message with concrete evidence to minimize reactance. Examples of evidence include statistics or pictorial evidence, to form the belief that the drought is real, hence promoting conservation behaviors.

Fourth, when a practitioner disseminates water conservation messages with the possibility of an inherent threat, the best practice involves emphasizing water conservation as a normative behavior (subjective norm) and the individual's ability to affect conservation outcomes (perceived behavioral control). For example, a practitioner can design messages that invoke the notion that important others and/or near peers encourage water conservation and/or practice water conservation themselves. Therefore, the receiver, similar to the important others and near peers in his/her life, is also capable of doing the same.

Limitations

Despite having significant theoretical contributions and insightful practical suggestions, the results require a careful interpretation with consideration of the study's limitations. First, the study only utilizes three message strategies. Additional research may focus on broadening the scope of the messages investigated in this study to involve other conservation strategies (see Liang et al., 2017 for the full list of 12 strategies) and to document their effects on reactance. Future research can also examine reactance with other environmental topics, such as recycling and alternative transportations to reduce air pollution.

Second, partnering with local municipalities and water districts can provide data and yield a better field test of the messages. In fact, the next step in our research program is to design messages based on the study findings to assess their impact on behavioral intention. Third, the sample involves an online panel and students who are not entirely representative of all Californians or those in other drought-affected areas. Future research may utilize more diverse and larger samples to replicate the model in additional environmental contexts and issues.

Fourth, we use a single item to measure perceived behavioral control. Future research can employ a multi-item scale as a more robust measurement. Fifth, Inauen and Mosler (2014) distinguish social norms between descriptive and injunctive norms, where the former refers to the perception of typical behaviors and the later suggests typically (dis)-approved behaviors. Adapting from their study on well water consumption in Bangladesh, descriptive norms can be measured by asking participants to state the number of people outside their immediate social circle who conserve water. Furthermore, injective norms can be measured with an item such as 'Overall, how much would people who are important to you approve or disapprove of you conserving water.' Future research should employ a more sophisticated view on the notion of social norms, such as suggested by Inauen and Mosler.

Finally, the research model accounts for 34% of the variability in behavioral intention and participants reported an average of 5.59 (7 = max) in their intention to conserve water. The data still show a disconnect given that the participants, all Californians, are well aware of the need for water conservation and the ongoing drought. In fact, Stevens (2016) reported that Californians failed to meet the mandated goal of 25% water usage reduction

during the drought. Further work may focus on identifying the additional barriers preventing individuals from a higher level of water conservation.

To conclude, the overall findings presented in this research improve the understanding of message design in water conservation context as an applied communication problem. This research and its theoretical contributions create a model that integrates multiple processes, improving our understanding of water conservation from the communication perspective. Accumulated research in this area can yield a model that would advance SEC efforts across various issues beyond the water conservation context.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior*. New York, NY: Springer.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179–211.

Ajzen, I. (2006). *Constructing a theory of planned behavior*. Retrieved from https://people.umass.edu/aizen/pdf/tpb.measurement.pdf

Armitage, C. J., Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, *40*, 471–499. doi:10.1037/0033-2909.127.1.142

Atkin, C. (1994). Designing persuasive health messages. In S. Lee, T. E. Backer, E. M. Roger, T. F. Campbell, & M. L. Grady (Eds), *Effective dissemination of clinical and health information conference* (pp. 99–110). U.S. Department of Health and Human Services (AHCPR Publication No. 95-0015).

Brehm, J. W. (1966). *A theory of psychological reactance*. Oxford: Academic Press.

Cantrill, J. G. (1993). Communication and our environment: Categorizing research in environmental advocacy. *Journal of Applied Communication Research*, *21*, 66–95. doi:10.1080/00909889309365356

Cantrill, J. G. (1998). The environmental self and sense of place: Communication foundations for regional ecosystem management. *Journal of Applied Communication Research*, 26, 301–318. doi:10.1080/00909889809365509

Corbett, J. B. (2002). Motivations to participate in riparian improvement programs: Applying the theory of planned behavior. *Science Communication*, *23*, 243–263. doi:10.1177/107554700202300303

Corbett, J. B. (2005). Altruism, self-interest, and the reasonable person model of environmentally responsible behavior. *Science Communication*, *26*, 368–389. doi:10.1177/1075547005275425

Cox, R. (2007). Nature's 'crisis disciplines': Does environmental communication have an ethical duty? *Environmental Communication*, 1, 5–20. doi:10.1080/17524030701333948

Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, *72*, 144–168. doi:10.1080/03637750500111815

Dolnicar, S., & Hurlimann, A. (2010). Australians' water conservation behaviours and attitudes. *Australian Journal of Water Resources*, *14*, 43–53.

Dorsey, A. M., Miller, K. I., & Scherer, C. W. (1999). Communication, risk behavior, and perceptions of threat and efficacy: A test of a reciprocal model. *Journal of Applied Communication Research*, *27*, 377–395. doi:10.1080/00909889909365546

Gifford, R. (2011). The dragons of inaction. Psychological barriers that limit climate change mitigation and adaption. *American Psychologist*, *66*, 290–302. doi:10.0037/a0023566

Hallahan, K., Holtzhausen, D., Van Ruler, B., Verčič, D., & Sriramesh, K. (2007). Defining strategic communication. *International Journal of Strategic Communication*, *1*, 3–35.

Han, H., Hsu, L.-T., & Sheu, C. (2010). Application of the theory of planned behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism Management*, *31*, 325–334.

Harrison, T. R. (2014). Enhancing communication interventions and evaluations through communication design. *Journal of Applied Communication Research*, *42*, 135–149. doi:10.1080/00909882.2013.825047

Inauen, J., & Mosler, H.-J. (2014). Developing and testing theory-based and evidence-based interventions to promote switching to arsenic-safe wells in Bangladesh. *Journal of Health Psychology*, *19*, 1483–1498. doi:10.1177/1359105313493811

Ivanov, B., Burns, W. J., Sellnow, T. L., Petrun Sayers, E. L., Veil S. R., & Mayorga, M. W. (2016) Using an inoculation message approach to promote public confidence in protective agencies. *Journal of Applied Communication Research*, *44*, 381–398. doi:10.1080/00909882.2016.1225165

Jöborn, A., Danielsson, I., Arheimer, B., Jonsson, A., Larsson, M. H., Lundqvist, L. J., … Tonderski, K. (2005). Integrated water management for eutrophication control: Public participation, pricing policy, and catchment modeling. *Ambio*, *34*, 481–488.

Kahlor, L., Dunwoody, S., Griffin, R. J., & Neuwirth, K. (2006). Seeking and processing information about impersonal risk. *Science Communication*, *28*, 163–194. doi:10.1177/1075547006293916

Kim, S., Levine, T. R., & Allen, M. (2014). The intertwined model of reactance for resistance and persuasive boomerang. *Communication Research*, 1–21. doi:10.1177/0093650214548575

Kline, R.B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: The Guilford Press.

Krendl, K. A., Olson, B., & Burke, R. (1992). Preparing for the environmental decade: A field experiment on recycling behavior. *Journal of Applied Communication Research*, 20, 19–36. doi:10.1080/00909889209365317

Liang, Y. J., Henderson, L.K., & Kee, K. F. (2017). Running out of water! Developing a message typology and evaluating message effects on attitude toward water conservation. *Environmental Communication*. doi:10.1080/17524032.2017.1288648

Mosler, H.-J. (2012). A systematic approach to behavior change interventions for the water and sanitation sector in developing countries: A conceptual model, a review, and a guideline. *International Journal of Environmental Health Research*, *22*, 431–449. doi:10.1080/09603123.2011.650156

National Integrated Drought Information System (2016). *Current conditions*. Retrieved from http://www.drought.gov/gdm/current-conditions

National Resources Defense Council (2016). *Drought: Threats to water and food security*. Retrieved from http://www.nrdc.org/health/climate/drought.asp

Plec, E. (2007). Crisis, coherence, and the promise of critical rhetoric. *Environmental Communication*, *1*, 49–57. doi:10.1080/17524030701334235

Rains, S. A. (2013). The nature of psychological reactance revisited: A meta-analytic review. *Human Communication Research*, *39*, 47–73. doi:10.1111/j.1468-2958.2012.01443.x

Record, R. A., Helme, D., Savage, M. W., & Harrington, N. G. (2017). Let's clear the air: A campaign that effectively increased compliance with a university's tobacco-free policy. *Journal of Applied Communication Research*, *45*, 79–95. doi:10.1080/00909882.2016.1248471

Shirah, G., & Zhang, C. (2015, February 12). *Megadroughts in the U.S. west projected to be worst of the millennium*. Retrieved from http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=4270

Silk, K. J., Hurley, A., Pace, K., Maloney, E. K., & Lapinski, M. (2014). A diffusion of innovations approach to understand stakeholder perceptions of renewable energy initiatives. *Science Communication*, *36*, 646–669. doi:10.1177/1075547014549891

Stevens, M. (2016, February 2). California cut water use 18.3% in December, still barely meeting Gov. Brown's mandate. *The Los Angeles Times*. Retrieved from http://www.latimes.com/local/lanow/la-me-ln-water-conservation-20160202-story.html

Syme, G. J., Nancarrow, B. E., & Seligman, C. (2000). The evaluation of information campaigns to promote voluntary water conservation. *Evaluation Review*, *24*, 539–578. doi:10.1177/0193841X0002400601

Trumbo, C. W., & O'Keefe, G. J. (2001). Intention to conserve water: Environmental values, planned behavior, and information effects. A comparison of three communities sharing a watershed. *Society and Natural Resources*, *14*, 889–899.

United States Department of Commerce (2015). *Billion-dollar weather and climate disasters: Table of events*. Retrieved from http://www.ncdc.noaa.gov/billions/events

Witzling, L., Shaw, B., & Amato, M. S. (2015). Incorporating information exposure into a theory of planned behavior model to enrich understanding of proenvironmental behavior. *Science Communication*, *37*, 551–574. doi:10.1177/1075547015593085