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YouTube, Social Norms and Perceived Salience of Climate Change in the American Mind.

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Abstract

This online experiment explored how contextual information embedded in new media channels such as YouTube may serve as normative social cues to users. Specifically, we examined whether the number of views listed under a YouTube video about climate change would elicit inferences regarding how "others" feel about the climate issue and, consequently, might influence perceptions of issue salience. Participants in this experiment were exposed to a YouTube video about climate change using two experimental conditions, one providing a small number of views under the video and the second listing a large number of views. Results suggest that the "number of views" cue did, indeed, influence participant perceptions of the importance assigned by other Americans to the issue of climate change. Further, compared to low self-monitoring participants, high self-monitoring participants registered an increase in their own judgment of issue importance.

Keywords

social norms, new media, climate change, self-monitoring

Introduction

Scholars and policy-makers alike signal the importance of influencing behavior change on a large scale in order to avoid some of the more deleterious impacts of climate change (Maibach, Roser-Renouf, & Leiserowitz, [45]; Moser & Dilling, [49]). Progress in understanding how best to influence climate change-related behaviors at the societal level has been slow, however (Maibach et al., [45]). For many Americans the climate change issue is characterized by perceived uncertainty, spurred by the low levels of knowledge that Americans commonly bring to the topic (Leiserowitz, Maibach, Roser-Renouf, & Hmielowski, [42]; Schweizer, Davis, & Thompson, [59]) and typically registers as an "impersonal" risk, i.e., one that does not seem to affect them personally (Griffin et al., [30]; Kahlor, [36]; Kahlor, Dunwoody, Griffin, & Neuwirth, [37]). At the same time, Americans rely more and more on new media to find out about complex scientific topics such as climate change (Brossard, [14]). Many Americans now routinely use online platforms, YouTube being just one example. These platforms help constitute how people understand the norms and values of pro-environmental living and environmental information exchange (Haider, [35]). Other recent evidence supports the notion that perceived social norms can act as determinants of individuals' motivation to engage in larger group actions related to climate protection (Rees & Bamberg, [55]). Whether certain aspects of new media contexts may serve as personal social cues, or cues regarding the salience of an issue such as climate change among the larger population, remain empirical questions we investigate here.

In this study we examine how people situate themselves and others in the context of public opinion about the importance of climate change. Specifically, we explore the possibility that social signals in a new media environment, just as in real-world social interactions, may serve as descriptive social norms with respect to this impersonal risk. We ask whether the cues of interest here, embedded in the social media channel YouTube, can affect individuals' perceptions of the climate of opinion regarding climate change and how that may, in turn, influence individuals' own importance evaluations.

Social Norms

Most social situations bring with them common and accepted behaviors, called social norms. Theory suggests that, when faced with uncertainty in a social situation, people look to the individuals, groups, and situations around them for context-appropriate attitudinal or behavioral cues. This scanning of one's social environment, whether through mediated sources such as television and advertising or via direct personal contact, leads to inferences about the behaviors and attitudes of others, a process that is often subconscious. People may then use these inferences to adjust their own behavior to fit the actions of those around them, either in the immediate social scene or in a larger cultural sense (i.e., most Americans think this way, so I should, too) in order to fit in with or avoid rejection by the larger group.

Normative beliefs, or perceived norms, are a function of what individuals *think* others believe and/or their perceptions of how others behave, rather than a function of what others *actually* believe or do. Perceived norms, then, lie at the root of a psychological social norms approach. As Berkowitz ([7]) suggests, social norm interventions in public health and other areas focus on the subtle and often subconscious effects of these perceptions. Because norms are not typically formalized in concrete terms, perceptions can differ widely from person to person in their degree of accuracy (Göckeritz et al., [28]). Also, in spite of the strength of empirical evidence for the impact of these norms, most people remain relatively unaware of the pervasive power that social norms exert over their own behavior (Griskevicius, Cialdini, & Goldstein, [31]).

Early work distinguished between normative and informational influence. The former was defined by Deutsch and Gerard ([18]) as influence to conform to the positive expectations of another, whereas the latter was articulated as influence stemming from accepting information obtained from another as *evidence* about reality. Many scholars have maintained this normative/informational distinction, yet the classic work of scholars such as Sherif ([60]), Asch ([4]), and Festinger ([20], [21]) argues that all norms have informational roots. In other words, employing the perceived attitudes and behaviors of others in service to calibrating one's own beliefs or in seeking a guide to action requires some kind of information seeking and processing. While some scholars have argued that the concept of social norms is simply too general to be useful (e.g., Krebs & Miller, [40]; Marini, [47]), Cialdini and colleagues have proposed refinements, described below, that they feel not only provide conceptual heft but also help resolve inconsistent findings from earlier studies.

One refinement has been to distinguish norms relative to the *nature* of the information sought or gained. Cialdini and colleagues divide social norms into two categories: descriptive and injunctive. Descriptive norms, informed by perceptions of how others behave, refer to judgments about what is "typically" done in a given social situation. Injunctive norms add a prescriptive element and are based on perceptions of desired behavior, or what others think one should or should not do (Cialdini & Goldstein, [16]). This distinction, argue the researchers, explains inconsistent results from previous studies by suggesting a reason why exposure to social norms could catalyze behaviors directly counter to those predicted, a so-called boomerang effect. For example, research has found that descriptive norms (in this case, sharing information about how much energy neighbors were using in their homes) produced an increase in energy usage in households that became aware that their personal usage was below that of their neighbors (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, [58]). This exemplifies

the "double-edged power of norms" related to promoting positive environmental change (Gifford, [27], p. 294). In the case of the energy study by Schultz et al. adding an injunctive message indicating that lower energy use was desirable all but eliminated the undesired change.

Cialdini and colleagues also suggest that the power of normative perceptions, particularly those of descriptive norms, varies to the extent that such information is perceived as salient to the attitudinal/behavioral issue at hand (Cialdini, Reno, & Kallgren, [17]). Others (Kallgren, Reno, & Cialdini, [38]; Reno, Cialdini, & Kallgren, [56]) have also found support for the importance of such contingencies. For example, Reno et al. ([56]) found that the ability of descriptive norms to minimize littering behavior diminished as participants got further from the specific environment that was the focus of the experiment; however, injunctive messages continued to be influential even in different environments.

For many scholars, subjective norms constitute a subset of injunctive norms. A formal component of both the theory of reasoned action (Fishbein & Ajzen, [23]) and the theory of planned behavior (Ajzen, [1]), subjective norms attempt to measure individuals' motivations to comply with the perceived expectations of respected others. More recently, Ajzen and Fishbein ([2]) recommended capturing both descriptive and injunctive norms under the subjective norm rubric. A recent meta-analysis of theory of planned behavior studies that employ one or the other type of norms found that, in some cases, descriptive subjective norms bore a stronger relationship to behavior than did the traditional injunctive form (Manning, [46]).

Social norms and norm perceptions have become a popular concept in studying behavioral responses to public health risks such as binge drinking (Borsari & Carey, [8]; Lewis & Neighbors, [44]) and smoking (Bruvold, [15]; van den Putte, Yzer, & Brunsting, [62]). Studies of the role of norms and norm perceptions in triggering environmental behaviors are becoming more common. Cialdini's use of littering and household energy use in his experiments certainly places his work in that domain. One recent meta-analysis covering 46 studies of determinants of pro-environmental behaviors published in the decade from 1995 to 2006 (Bamberg & Möser, [5]) found social norms to play an indirect role in catalyzing environmental behaviors, primarily working through individuals' feelings of strong moral obligations to engage in such behaviors. Moser ([48], p. 36) also suggests "unambiguous social norms" can be one type of signal to inspire environmental behavior and policy change related to the ongoing climate change debate. Many normative cues, relaying the tone and tenor of public opinion, come in the form of mediated reports via the complex and often contested modern media environment.

Media and Social Norms

Individuals' perceived norms regarding climate change are derived, in large measure, from the various communication channels they use. Electronic communication in its many forms is continually expanding the choices and control individuals have over exposure to information. Social content-sharing sites such as YouTube may be a source of important normative signals, what Boyd and Ellison ([11]) call "public displays of connection" (p. 2), helping individuals to navigate the increasingly networked social world by providing context in relation to an imagined audience and the attendant normative cues displayed by other content producers and consumers.

When issues are debated in the public sphere and while norms are still developing, as is the political (though not scientific) case for climate change in the USA, different actors use their discursive power to

influence the social construction of the issue (Pettenger, [53]). In such a case, the narrative frames and other rhetorical strategies used by different actors to establish or reinforce specific norms can be pervasive in media coverage (Payne, [52]), and media actors, thus, can become vital links in the norm-building process, or norm cycle (Pettenger, [53]). More particularly, various norms compete for space in mediated discourse at the norm-emergence stage, i.e., when policy regulations have not yet been widely adopted (Finnemore & Sikkink, [22]). It is in this situation, for American audiences at least, that we find the global climate change issue. Media consumers are continually exposed to these competing normative claims and are likely to employ that exposure in developing their own sense of the broader climate of opinion.

One example of competition in the norm-emergence stage is the effort to frame the climate debate by skeptic groups such as Americans for Prosperity (AFP), a pseudo-grassroots group backed by powerful interests in the oil and gas industry. As described by Boykoff ([12]), AFP has constructed a faux-social presence across various social and other media platforms in order to create the illusion of a larger, populist and oppositional voice regarding climate change policy efforts. In this way, normative influence regarding climate change can be positive or negative, depending on which political echo chamber reinforces the message. As new and social media actors engage in the dynamic, poly-vocal process of representing climate change—pushing and pulling the boundaries of who are (and are not) valid speakers for action one way or another—these voices will continually be interrogated and contested (Boykoff, [12]; Gieryn, [26]).

Traditional media can influence norm perceptions related to a specific issue or context by providing straightforward, descriptive normative information. In an experiment involving radio, for example, exposure to a reconciliation-themed soap opera changed respondents' perceptions of what constitutes typical behavior (i.e. descriptive norms) during a conflict, a finding later supported by longitudinal data (Paluck, [50]). In another experimental setting, messages emphasizing an expected low voter turnout were less effective at motivating voters than messages emphasizing an expected high turnout. This result led the authors to suggest that a media focus on low political participation may actually undermine turnout by allowing audiences to infer that low participation is the norm (Gerber & Rogers, [25]).

Beyond descriptive norms pertaining to behaviors, traditional media can also provide descriptive normative information regarding public attitudes. Following the above argument, and the AFP example in particular, one could propose that the tendency for the American media to discuss public skepticism regarding global climate disruption might lead individuals to conclude that skepticism is typical irrespective of actual levels of skepticism among scientists or among other Americans. Various theoretical frameworks in mass communication research indeed suggest that the news media can have a strong influence on audience perceptions of public attitudes about specific controversial issues (Priest, [54]), sometimes through what has been labeled the "persuasive press inference" (Gunther, [32]; Gunther & Christen, [33]), which posits that people tend to make inferences about public opinion based on their own perceptions of media coverage. Extensive media coverage that results when issues are controversial or are otherwise highly salient, therefore, can lead to perceptions of a deeply divided public even when that is not the case (Gunther, Christen, Liebhart, & Chia, [34]).

Researchers are beginning to ponder how normative influences may take place in social media environments with user-generated content such as Facebook, Twitter, YouTube, and blogs. These platforms have gained prominence in recent years with 72% of adults online using social networking sites (Brenner & Smith, [13]) and 52% of adults online now using two or more social media sites (Duggan, Ellison, Lampe, Lenhart, & Madden, [19]). Research examining the impact of these channels on perceptions of broader cultural issues, however, is still in its early stages.

Social and user-generated sites such as YouTube can be read as complex and dynamic media texts that do not easily disclose their varied forms of generating culturally relevant meaning (Pauwels & Hellriegel, [51]). In contrast to traditional media, users can infer what others think about an issue from discussions in blogs and via user comments (Thelwall, [61]). These cues, in turn, can influence readers' perceptions of reality (Lee, [41]). Users of social networking sites can, for example, see how many of their peers have joined online groups supporting particular causes. Users can also get information "directly" from opinion leaders, for example via videos on YouTube, from status updates on Facebook, or posts on Twitter. In this way, social networking sites afford users many opportunities to learn about and pass on cultural norms and social cues (Boyd, [9], [10]; Rosen, Barnett, & Kim, [57]).

As a hypothetical example, one individual might update her status on Facebook to "going to the rally—united against climate change." Her 463 friends will receive this prompt in their newsfeeds and be afforded the opportunity to click on a link for more information. There, they will see that the organization has more than 352,000 members and is growing, a set of informational cues that could, in turn, affect their perceptions of the extent to which others feel the issue is an important one. This scenario exemplifies how the perceptions of others' attitudes and behaviors can influence the attitudes and behaviors of individuals considering engaging in forms of group or collective action (Rees & Bamberg, [55]).

In the present study, we examine the role of social influence in the online, social media context of YouTube by examining aspects of one social cue, the "number of views," and one personality trait, self-monitoring. As social psychologists suggest, norm perceptions and social cue-taking may be as influential in the virtual sphere as they are in the offline world. Here we investigate whether a simple but ubiquitous cue of the YouTube platform, the "number of views" of a video, can act as such a normative social cue. To test the effect of exposure to the number of views cue in the experimental condition, we pose these two hypotheses:

H1a: Compared to those exposed to the low "number of views" condition, participants exposed to a high "number of views" condition will be more likely to perceive the issue of climate change as important to most Americans.

H1b: Compared to those exposed to the low "number of views" condition, participants exposed to a high "number of views" condition will be more likely to perceive the issue of climate change as more important to themselves personally.

Additionally, as perception and actual exposure to a social cue may be far from a perfect match, we seek to examine the effects of perceived number of views (i.e., whether the subject recalls having seen a high or low number of views, regardless of actual exposure) on respondents' attitude. Because there

is not enough existing empirical evidence to prompt a hypothesis about perceived recall, we pose the following research question:

RQ1: What is the effect of the perceived "number of views" on the subject's perceived importance of global warming to other Americans and self?

Some individuals scan the social environment more often or more thoroughly than others. In novel social situations, where some degree of uncertainty exists, people typically look to others for cues on how to act and then adjust their own behavior accordingly. This process of assessing the social environment and adjusting one's behavior, called self-monitoring, serves a self-diagnostic function (Bandura, [6]) for impression management in social situations (e.g., Goffman, [29]). Self-monitoring occurs to greater or lesser degrees across individuals and social situations, but the theory suggests that high self-monitors scan the environment and adjust their self-presentation to a greater degree than do low self-monitoring individuals. Put another way, the theory of self-monitoring addresses differences in the degree to which people possess a social orientation influenced more by situational (external) forces, as is the case for high self-monitors, or dispositional (internal) forces, characteristic of low self-monitors (Gangestad & Snyder, [24]). This leads to the following research question and hypothesis:

RQ2: Is there a relationship between self-monitoring and perceived importance of the global climate change issue to most Americans and to self?

H2a: Compared to low self-monitoring participants, high self-monitoring participants exposed to the high "number of views" condition will be more likely to perceive the issue of climate change as important to most Americans.

H2b: Compared to low self-monitoring participants, high self-monitoring participants exposed to the high "number of views" condition will be more likely to perceive the issue of climate change as important to them personally.

Methods

This study relied on data collected at a large public university in the American Midwest. Participants were students enrolled at the university who received extra class credit for participation. A total of 616 students completed the study. Mean participant age was 20.7 years and 73% of the sample was female.

The online experiment embedded an edited version of a preexisting YouTube video, originally created by American high school science teacher Greg Craven and titled "How It All Ends" (see http://www.youtube.com/watch?_l_v_i_=mF%5fanaVcCXg for the full video). The 10-minute video, originally posted on 10 October 2007, was edited down to four minutes with permission from the creator. The video was shortened in order to minimize subjects' time in the experiment and, thus, to maximize their attention. The edited video was embedded in a YouTube-like page that, for the purposes of this experiment, had all external links disabled. Participants could not forward the video or speed through it.

The manipulation examined here is the "number of views" associated with the video. The video excerpt was kept constant in the experimental setting and, thus, was not itself an experimental

manipulation. As with all YouTube videos, the "number of views" tally represents how many people have viewed a given video. It appears numerically in the "views" line right below the video segment of the screen. Participants were randomly placed in treatment conditions showing either "high views" (1,367,454 views) or "low views" (723 views). Approximately 52% of respondents were exposed to the "high views" condition. After being shown the video, participants were asked, among a series of other follow-up questions, if they could recall whether a high, low, or "in-between" number of views was associated with the video.

Measures

There were two dependent variables in this experiment: a measure of the perceived importance (salience) of climate change among "most Americans" and a measure of the importance of climate change to the participant. Importance measures were gathered twice using the same assessment scale, once before exposure to the YouTube video and again after the video. As seen in Table 1, respondent perceptions of the salience of climate change for most Americans were measured as a continuous variable ranging from 0 to 100, with 0 representing the topic as not at all important and 100 indicating a sense that it is very important for most Americans (pretest, high number of views: $M = 42.45$, $SD = 17.78$ and low number of views: $M = 43.29$, $SD = 18.58$; posttest, high views: $M = 46.23$, $SD = 18.83$ and low views: $M = 44.15$, $SD = 18.61$). Respondent perception of the personal importance of climate change employed the same type of 0–100 scale, where 0 means not at all personally important and 100 means it is among the individual's most important issues (pretest, high number of views: $M = 58.96$, $SD = 24.26$ and low number of views $M = 54.22$, $SD = 25.39$; posttest, high views: $M = 62.34$, $SD = 23.95$ and low views: $M = 57.79$, $SD = 25.16$).

Table 1. Pretest and posttest results measuring perceived salience of the climate change issue for "most Americans" (H1a) and personal importance of climate change (H1b) by treatment condition, high and low "number of views."

Salience of climate change among "most Americans"	Pretest	High	M= 42.45	SD = 17.78
		Low	M = 43.29	SD = 18.58
	Posttest	High	M = 46.23	SD = 18.83
		Low	M = 44.15	SD = 18.61
Personal importance of climate change	Pretest	High	M = 58.96	SD = 24.26
		Low	M = 54.22	SD = 25.39
	Posttest	High	M = 62.34	SD = 23.95
		Low	M = 57.79	SD = 25.16

1 Note: Response scale ranges from 0 (not important) to 100 (very important).

Independent variables

Recalled number of views was measured by asking respondents, "As best you can remember, did the video generate a lot of views, just a few, or somewhere in between?" The scale ranged from 1 (just a few) to 3 (a lot of views) with a mean of 1.39 ($SD = .49$). In subsequent analysis, a dichotomous variable was created by combining the "just a few" and "somewhere in between" responses relative to those who recalled "a lot of views" (39% of the sample recalled a high number of views). Respondents who

indicated that they could not recall the number of views was removed from analyses employing the low/high recall variable, for a total N of 520.

The self-monitoring scale used here was a modified version of Lennox and Wolfe's, ([43], p. 1362) "attention to social comparison information" subscale. Using a 5-point Likert-type scale ranging from "strongly disagree" to "strongly agree," subjects indicated how much they agreed with the following seven statements:

- It is my feeling that if everyone else in a group is behaving in a certain manner, this is probably the proper way to act.
- At parties I often behave in a manner that sets me apart.
- When I am uncertain how to act in a social situation, I look to the behavior of others for cues.
- I try to pay attention to how others react to my behavior in order to avoid being out of place.
- It's important to me to fit into the group I'm with.
- My behavior often depends on how I feel others think I should behave.
- When in a social situation, I tend not to follow the crowd but, instead, behave in a manner that suits my particular mood at a time.

After reverse coding the second and seventh items, all items were averaged to form a "self-monitoring index" ($M = 3.17$, $SD = .59$; Cronbach's $\alpha = .73$).

Analysis

This study used hierarchical ordinary least squares multiple regression to examine the research questions and hypotheses. Dependent variables were the perceived importance of global climate change (1) to most Americans and (2) to oneself. Independent variables entered in the first block include two pretest measures of perceived importance of climate change, to "most Americans" and to oneself; the experimental manipulation (number of views); recalled (perceived) number of views; and self-monitoring level. Both pretest measures of perceived salience of climate change, to "most Americans" and to oneself, were used as control variables in subsequent regression analyses.

One two-way interaction term was created by multiplying the standardized values of the two main effect variables. This approach was taken to avoid potential multicollinearity between the interaction term and its component. The interaction examined actual exposure to "number of views" and self-monitoring. The interaction terms were entered as the second block of variables in the regression.

Results

Overall, the regression models explain 57.8% and 79.5% of the variance in predicting perceived importance of climate change to most Americans and self, respectively (see Table 2). Not surprisingly, perceived importance of climate change measured before the manipulation accounted for most of the variance in the post-manipulation dependent variables of perceived importance to other Americans and self, respectively. Our analytical interest lies in whether additional variance is explained by (1) exposure to the "number of views" cue, (2) differences in perceptions (i.e., recall) of the number of views, and (3) interactions of these cues with self-monitoring level. The survey question asking

participants to recall the number of views associated with the video also served as a manipulation check for the experiment.

Table 2. Predicting perceived importance of climate change to most Americans and self.

	Dependent variables: Perceived importance of climate change to	
	Most Americans	Self
Independent variables		
Pretest perceived importance	.75***	.89***
Exposure to "number of views"	.09*	-.01
Recalled "number of views"	-.02	.00
Self-monitoring	.04	.04*
Incremental R ²	57.6***	79.5***
Interaction		
Exposure to number of views × Self-monitoring	-.04	.02
Total R ²	57.8	79.5

2 Note: Entries all are standardized regression coefficients for independent variables. For interaction terms, cell entries are before-entry standardized coefficients.

3 * $p < .05$; ** $p < .01$; *** $p < .001$.

Hypothesis 1a addresses the impact of exposure to either a high or low "number of views" on the perceived importance of global warming to "most Americans." As shown in Table 2, when controlling for respondents' pre-manipulation perceptions, those people exposed to the high "number of views" condition are significantly more likely to perceive that global warming is a salient issue to most Americans ($\beta = .09, p < .05$). This supports H1a. Results do not, however, show a significant relationship between the exposure to the number of views cue and the perceived salience of global warming to respondents personally, therefore leaving H1b unsupported. In addition, this analysis found no support for an effect of the perceived (i.e., recalled) number of views on participants' sense of importance of climate change to most Americans or oneself, the topic of our first research question.

The second research question asked whether level of self-monitoring would be related to the perceived importance of global warming to self or to Americans. Table 2 indicates that self-monitoring is indeed related to higher levels of importance assigned to the issue by participants. However, the variable is unrelated to perceptions of how other Americans feel about the topic.

Analysis related to H2a and H2b examines the interaction effects between self-monitoring and exposure to the number of views cue on perceived salience of climate change among most other Americans (H2a) and in relation to oneself (H2b). Results show no significant interaction effect between self-monitoring and actual "number of views" stimulus on the dependent variables, perceived importance of climate change to most Americans and oneself.

Discussion

Results of this online experiment suggest that people can indeed be influenced by informational cues in social media environments, cues that lead them to make inferences about the importance of an issue such as climate change among others. The primary variable studied here, exposure to the "number of views" associated with a YouTube video, may seem like a minor cue given the complexities of this social media platform. But even this modest piece of information, a descriptive normative cue, was influential. Results show a significant positive relationship between exposure to the high "number of views" cue and the perceived importance or salience of climate change to most Americans when controlling for respondents' pretest perceptions.

That cue proved insufficient in moving the experimental participants themselves toward assigning greater importance to the issue. While those high in self-monitoring did indeed increase their personal salience judgments as a result of exposure to the video, we found no effect of number of views on those high self-monitors, who should have been most sensitive to the normative cues provided by others.

Expecting individuals to modify their personal views in response to the experimental manipulation may have been premature on our part. Normative cues tell us what others are doing or feeling, so the first order impact should be on our judgments of the views or behaviors of those "others." That happened here. We do not know how strong or how long-lasting cues need to be in order to catalyze changes in individuals' personal attitudes or behaviors. Only future research can determine that.

However, we view this study as an important starting point for the examination of the power of normative cues embedded in social media. As noted earlier, social media platforms offer fertile ground for such cues, perhaps even more than mainstream media outlets of the past. It is not that traditional media sources did not or do not offer social cues, but that an inherent element of the Web 2.0 is sociality and a networked connectedness above and beyond the capabilities of traditional media. Social channels such as YouTube, Facebook, and Twitter certainly lead users to news and other factual information, like traditional media, but social channels also feature a heavy overlay of personal information that is saturated with normative potential—a distinction from media formats of the past. Even ostensibly neutral links to news stories in a tweet contain the normative message that someone you "follow," likely because you respect that individual, thinks others should attend to the topic. What impact will these layered cues have on our attitudes about important issues? And will those cues and their resulting inferences about "others" actually instigate changes in our behaviors?

An experiment such as this, which needs to tightly control its design and implementation, requires cautious interpretation. The information-rich milieu of social media contains myriad social cues that may influence user perceptions. We attempted to limit exposure to certain aspects of the normal user experience in a social media situation by, for example, holding constant the ratio of viewer "likes" to "dislikes" in relation to high and low number of views. Also, given that this was an online experiment where participants could respond amid any number of social environments (e.g., home, library, coffee shop, student union) it is possible that some of those surroundings distracted individuals from the task at hand. Time stamps suggested that some participants logged several hours between start and finish. Prior to analysis, we removed individuals from the sample if the total completion time was more than

two standard deviations above the mean completion time. Participants who began but did not complete the survey were also removed.

This study also uses participants drawn from a student population whose everyday experience typically includes active social media use. As test subjects, individuals from this age cohort, compared to older generations, may not only have a stronger interest in viewing other people's opinions—often subscribing to celebrity and peer social media feeds—but also may be more astute in picking up on subtle social cues, such as "number of views," particularly given situations when regular Internet users more heavily rely on a personally curated set of information sources. Future research would benefit from further analyses of such cues in social media contexts, particularly in light of recent findings from controversial studies like Facebook's attempt to manipulate viewers' emotions (Kramer, Guillory, & Hancock, [39]). Given that emotionally laden content in new media can influence user reactions, a question worth asking is: what is the extent to which normative cues in these channels will convey emotional—not just cognitive—information about the attitudes and behaviors of others?

Given those limitations, the results here still provide encouragement to scholars interested in catalyzing environmental behavior change, particularly with respect to "impersonal" environmental issues, those that do not seem—at first glance—to be relevant to the individual. Global warming is something of a poster child for this type of issue, and it has become critically important for American policy-makers to investigate all possible avenues for increasing the perceived salience of this issue among other Americans. Interestingly, this normative social influence approach has the additional attribute of serving as a non-price-based tactic that, in a time of budget constraints at all levels, may appeal to policy-makers and other opinion leaders (Allcott, [3]) by using a communications strategy harnessing the power of perceived social norms to provide "an effective and low-cost strategy" to help reduce global climate impacts (Griskevicius et al., [31], p. 6).

In conclusion, we argue that normative cues saturate the new media environment and can offer a useful route to influencing the perceived salience of large scale and impersonal risks such as global climate change. If such cues are sufficiently strong and recurring, they may also serve as effective catalysts for behavior change. We hope future scholars will explore this latter linkage, as policy decisions that would slow global climate change are needed now more than ever.

Disclosure statement

No potential conflict of interest was reported by the authors.

Footnotes

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