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Believing in climate change, but not behaving sustainably: Evidence from a one-year longitudinal study

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ABSTRACT

We conducted a one-year longitudinal study in which 600 American adults regularly reported their climate change beliefs, pro-environmental behavior, and other climate-change related measures. Using latent class analyses, we uncovered three clusters of Americans with distinct climate belief trajectories: (1) the "Skeptical," who believed least in climate change; (2) the "Cautiously Worried," who had moderate beliefs in climate change; and (3) the "Highly Concerned," who had the strongest beliefs and concern about climate change. Cluster membership predicted different outcomes: the "Highly Concerned" were most supportive of government climate policies, but least likely to report individual-level actions, whereas the "Skeptical" opposed policy solutions but were most likely to report engaging in individual-level pro-environmental behaviors. Implications for theory and practice are discussed.

1. Introduction

Although 97 percent of scientists believe in anthropogenic climate change (Cook et al., 2013), not all Americans agree; depending on the study, only 54–65% of Americans believe in climate change (Hornsey, Harris, Bain, & Fielding, 2016; Leiserowitz, Maibach, Roser-Renouf, & Hmielowski, 2012; Saad, 2017a). This skepticism has motivated researchers and policy-makers to study these beliefs because of the assumption that the Americans who believe in anthropogenic climate change should be most likely to engage in pro-environmental behaviors (Hornsey et al., 2016; Lorenzoni & Pidgeon, 2006; Pidgeon, 2012; Read, Bostrom, Morgan, Fischhoff, & Smuts, 1994). Indeed, a large body of research has focused on increasing climate change beliefs in hopes of increasing pro-environmental behavior (for recent review, see Hornsey et al., 2016). In this paper, we ask whether that assumption is supported by behavioral evidence in order to better identify psychological predictors of environmental behavior (Stern, 2011). Specifically, we conducted a longitudinal study to measure Americans' climate change beliefs, their support for pro-environmental policies, and their self-reported engagement in pro-environmental behaviors seven times over the course of one year. This allows us to examine whether beliefs correspond to behavior over time, and whether the relationship between belief and behavior varies as a function of individual differences.

Prior research yields different predictions about whether people's beliefs about climate change should correlate with sustainable behavior. Some researchers have argued that pro-environmental behavior requires that citizens believe that climate change is real (Krosnick, Holbrook, Lowe, & Visser, 2006; Schuldt, Konrath, & Schwarz, 2011). The underlying idea is that if climate change does not seem real, then people should be reluctant to think about it or take action (Akerlof, Maibach, Fitzgerald, Cedeno, & Neuman, 2013). Other research suggests that even when Americans believe in climate change, they are reluctant to take action (Hornsey et al., 2016). This apathy ostensibly occurs because they do not perceive climate change as an urgent problem (Gifford et al., 2009; Leiserowitz, 2006; Lorenzoni & Pidgeon, 2006; Pidgeon, 2012), and thus prefer to "wait and see" (Sterman & Sweeney, 2007). More generally, whether beliefs predict behavior is an ongoing, multi-decade debate in psychology (Glasman & Albarracin, 2006; Hornsey et al., 2016; Stern, 2011).

One explanation for these disparate findings is that researchers have actually been studying different people, and there is some

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evidence that this may be so. For instance, a common finding is that climate change beliefs are divided by political party and ideology (e.g., Democrat/Republican, liberal/conservative; Hornsey et al., 2016; Kahan, 2013). When examined closely, however, it seems that these dichotomized differences may be insufficient. For instance, one group of researchers argues that when it comes to climate change there are effectively four political groups in the U.S.: Democrats, Independents, Republicans, and Tea Party-Republicans, with Tea Party-leaning Americans endorsing the most distinctive views on environmental issues, including climate change (Hamilton & Saito, 2015). Another research group suggests that Americans are segmented into six distinctive groups: These Americans range from the "Alarmed" (i.e., highest belief in climate change and most concern about the issue) to the "Dismissive" (i.e., lowest climate change belief and least concern), with four intermediate groups between these extremes who vary in their endorsement of the existence of climate change, concern about the issue, and motivation to engage with the issue (Leiserowitz et al., 2012). A third typology proposes three groups - "Concerned Believers," the "Mixed Middle," and the "Cool Skeptics" (Saad, 2017b).

There is clearly considerable heterogeneity in Americans' climate change beliefs, and there seem to be somewhere between three and six different "types of Americans" - the literature has not yet reached consensus on exactly how many. Moreover, the existing typologies are all based on cross-sectional data in which participants were asked about their beliefs at a single time point. Such data is useful for beginning the process of categorizing Americans by their beliefs, but is limited in its ability to predict beliefs over time. This is in part because attitudes and beliefs may be malleable and context sensitive (Schwarz, 2007); how a person answers a question like "To what extent do you believe in climate change?" might be different in June than in January. Therefore, if we want to understand people's belief trajectories and whether they fall into some number of clusters as previous research suggests they might, it is important to take a grounded, data-driven approach, in which the same people's beliefs are measured multiple times over a long period, allowing us to examine how those beliefs naturalistically unfold over time.

To understand the implications of those belief trajectories, it is also important to measure people's behaviors over time. Due to the same methodological limitations described above, we have a limited understanding of how differences in climate change beliefs correspond to engagement in different pro-environmental behaviors. Although prior research has examined pro-environmental behaviors, this has largely been studied by measuring single-shot behaviors in laboratory settings or participants' future behavioral intentions - measures that do not always correspond to actual behaviors (Webb & Sheeran, 2006). To better understand pro-environmental behavior, more research is needed to (a) measure a broader range of behaviors, (b) measure everyday behaviors that are relevant to sustainability, and (c) assess how well those behavioral patterns correspond to individual differences, time, and other situational factors (e.g., geographic location, weather fluctuations, etc.), as decades of research from social psychology suggest they might (Ross & Nisbett, 2011).

1.1. Current study

We conducted a longitudinal study in which we measured American participants' climate change beliefs and self-reported engagement in various pro-environmental behaviors seven times (every eight weeks) throughout one year. A longitudinal approach is critical for answering several theoretical and practical questions about the relationship between climate change beliefs and pro-environmental behavior. First, it allows us to assess whether and how people's climate change beliefs change over time. To date, the literature has not shed much light on this topic, even though evidence suggests that beliefs that people report in one context are often not predictive of what they report in other contexts (Schwarz, 2007), which has important theoretical and practical implications (Schwarz & Oyserman, 2011). Longitudinal measurement can inspire greater confidence in one's results, as they are the result of repeated (and not single-point) measurements; this benefit is particularly helpful when using self-report measures, as in this study and many prior studies of climate change beliefs (e.g., Leiserowitz, 2006; Myers, Maibach, Roser-Renouf, Akerlof, & Leiserowitz, 2013).

Second, a longitudinal approach can assess whether there are individual differences in belief trajectories. Prior research has shown that climate change belief varies by individual differences (e.g., political ideology) when belief is measured at one time; however, it is possible that those individual differences have differential impacts on beliefs at different times. For example, since climate change is often associated with cues of warmth (Schuldt et al., 2011), some people may experience an unusually cold winter and interpret it to mean that climate change is a hoax (e.g., Inhofe, 2012)—thereby decreasing their belief in climate change—whereas for others the same cold weather may amplify their belief in climate change. In modern life we often observe such differences in response to climate change, but those differences are only observable when we take repeated measurements.

The third benefit of a longitudinal approach is that it allows us to assess whether pro-environmental behaviors change over time, and whether such changes follow changes in beliefs. In the same way that the beliefs observed in one context do not necessarily predict beliefs in another context (Schwarz, 2007), behavior has a similar tendency - it is heavily influenced by situational forces (Ross & Nisbett, 2011). Without longitudinal research, it is unclear whether the behaviors or behavioral intentions measured in single-shot climate surveys reflect broader patterns of behavior in society, or what influences patterns of behavior.

As outlined in the preceding paragraphs, these questions are important for advancing our understanding of psychological processes that underlie sustained engagement in pro-environmental behaviors. In addition, they are potentially informative for interventions and policies to address one of the most pressing issues of the 21st century. There is great scientific consensus on the existence of climate change (Cook et al., 2013) and the need for individuals and policymakers to take action to mitigate or adapt to its effects. What is less clear is how to successfully elicit the sustained behavioral changes necessary to achieve these broader social goals. One place to start is to measure beliefs and behaviors over time, and to allow the longitudinal data to reveal naturally occurring patterns. To do this, we used a data-driven approach of latent class growth analysis (LCGA; Jung & Wickrama, 2008; Muthén, 2001) to examine longitudinal associations between climate change beliefs and pro-environmental behaviors, then compared those patterns to patterns found in the existing literature.

2. Method

2.1. Participants

We conducted a geographically representative longitudinal study of American adults ($N = 600$; 61.67% male) recruited via Amazon Mechanical Turk (MTurk). The study—conducted from July 2014 to July 2015—assessed participants' beliefs about climate change and related factors seven times, approximately every eight weeks. Sample size was determined by funding constraints of our grant to conduct the present study, which provided us with enough