Political and Non-Political Belief Change Elicits Behavioral Change

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ABSTRACT

Beliefs have long been theorized to predict behaviors and thus have been the target of many interventions aimed at changing false beliefs in the population. But does changing beliefs translate into predictable changes in behaviors? Here, we investigated the impact of belief change on behavioral change across three experiments (N=659). Participants rated the accuracy of a set of health-related statements and chose corresponding campaigns to which they could donate funds in an incentivized-choice task. They were then provided with relevant evidence in favor of the correct statements and against the incorrect statements. Finally, they rated the accuracy of the initial set of statements again and were given a chance to change their donation choices. We found that evidence changed beliefs and this, in turn, led to behavioral change. In two pre-registered follow-up experiments, we replicated these findings with politically charged topics, and found a partisan asymmetry in the effect, such that belief change triggered behavioral change only for Democrats on Democratic topics, but not for Democrats on Republican topics or for Republicans on either topic. We discuss the implications of this work in the context of interventions aimed at stimulating climate action or preventative health behaviors.

Keywords: belief change, behavioral change, health beliefs; political beliefs

Introduction

The false belief that vaccines cause autism became widespread over two decades ago, decreasing parents' willingness to vaccinate their children, which led to an increase preventable hospitalizations and deaths (Poland & Spier, 2010; Ratzan, 2010; Larson et al, 2011). But was the false belief that vaccines cause autism responsible for the change in vaccination behavior? And could changing that false belief through belief targeting interventions increase vaccination behavior?

Understanding the factors that influence behavior is of critical concern to individuals ranging from public health officials interested in stimulating engagement in preventative health behaviors such as vaccinations, to policy makers interested in promoting pro-environmental behaviors. Accordingly, entire research fields have focused on documenting the predictors of behavior, to unveil ways in which individuals can be nudged towards behaviors beneficial to themselves and to society (Thaler & Sunstein, 2009).

Several models of behavior theorized that beliefs are a central psychological factor impacting behavior (Ajzen, 1991; Hochbaum, 1958). A belief is a mental acceptance of the truth of a statement (Schwitzgebel, 2010), beliefs being thought to provide the 'mental scaffolding' for appraising one's environment (Halligan, 2007), thus constructing the "mental architecture" for interpreting the world (Jha, 2005). Beliefs are different from knowledge in the conviction they are held with (Fishbein & Ajzen, 1975), and the self-referential element they contain (Connors & Halligan, 2015). Beliefs are also different from attitudes in that they lack the evaluative (e.g., good/bad) component of attitudes, being centered instead on the accuracy component (i.e., true/false) (Eagly & Chaiken, 1993). The theory of planned behavior (Ajzen, 1985, 1991; an extension of the theory of reasoned action, Fishbein & Ajzen, 1975), emphasizes intentions arising from beliefs, attitudes, and social norms as the main drivers of human behavior. Similarly, the health belief model emphasizes beliefs and attitudes as predictors of human decision making (Hochbaum, 1958; Rosenstock, 1960, 1974). Several studies provided empirical support for these theories, solidifying the relation between beliefs and behaviors (Sulat et al., 2018). For instance, individuals who believed they were susceptible to tuberculosis and believed in the benefits of early detection were more likely to have a voluntary chest X-ray (82%) than individuals who didn't hold these beliefs (21%) (Hochbaum, 1958).

Beyond using beliefs to *predict* behavior, a more relevant question from an applied perspective is whether beliefs can be used to *change* behaviors. In favor of belief change being a viable avenue for behavioral change, prior work suggests beliefs have a dynamic nature, being subject to change (Bendixen, 2002). For example, beliefs can be changed by leveraging fictional narratives (Wheeler, Green, & Brock, 1999), nudging accuracy goals (Pennycook et al., 2020), manipulating memory accessibility (Vlasceanu & Coman, 2018; Vlasceanu, Morais, Duker et al., 2020), appending emotional arousing images (Vlasceanu, Goebel et al., 2020), triggering prediction errors (Vlasceanu, Morais & Coman, 2021), or increasing the salience of social norms (Vlasceanu & Coman, 2020b). Moreover, beliefs have been found to predict behaviors – for

example, religious beliefs were found to predict crime rates (Shariff & Rhemtulla, 2012), and beliefs about intelligence were found to predict learning success (Mangels et al., 2006). Consequently, considering both beliefs' dynamic nature and their strong association to behaviors, changing beliefs might be a viable avenue for eliciting behavioral change.

However, the belief change literature suggests that some beliefs can be notoriously hard to change (Ecker, Lewandowsky, Apai, 2011; Ecker, Lewandowsky, Swire, Chang, 2011; Ecker, Lewandowsky, Tang, 2010). For example, prior work suggests that partisan identities can impair belief updating (Van Bavel & Periera, 2018). Similarly, extensive research suggests that evidence of fact checking is ineffective for political topics (for a review, see Van Bavel et al., 2021). And when social identities and social norms are salient, beliefs have been found to be an unreliable predictor of behavior (Paluck, 2009). Taken together, this literature suggests that changing beliefs might not trigger behavioral change in an ideological context.

Across three experiments, we study the impact of changing non-ideologically (Experiment 1) and ideologically (Experiments 2 and 3) charged beliefs on behavioral change. To test this effect, we designed an experiment composed of five phases. First, participants rated the accuracy of a set of statements (belief pre-test phase). In experiment 1, these statements were health-related (e.g., "*A child's untreated wandering eye can lead to permanent vision loss.*"), and in experiments 2 and 3 (i.e., pre-registered replications of experiment 1) they were politically charged (e.g., "*Millions of children in the US have witnessed a shooting in the past year.")*. In all experiments, half of the statements were accurate, and half were inaccurate. Participants were then directed to an incentivized choice task (behavior pre-test) in which they were told they would be able to donate funds allocated by our team (a fixed amount) to campaigns relevant to the issues discussed in the statements previously rated. Then, in the evidence phase, participants were shown the actual accuracy of the initial statements, as supported by scientific investigations into each matter. Finally, they were asked to evaluate each statement again (belief post-test) and were given the opportunity to adjust their fund allocation choices (behavior post-test).

Our first hypothesis is that beliefs at pre-test will predict behavior at pre-test. Our second hypothesis is that belief change from pre-test to post-test will trigger behavioral change from pre-test to post-test. More specifically, we hypothesized that an intervention aimed at increasing a statement's believability will lead to increased monetary support, and an intervention aimed at decreasing a statement's believability will lead to decreased monetary support allocated to the corresponding campaign.

Open science practices.

The materials and data can be found on our open science framework page (anonymized for blind review):
https://osf.io/6rqkn/?view_only=d8dfafbe24434e998c9d4316d2e4aa95
The data analysis (in python and R) can be viewed as a jupyter notebook on GitHub (anonymized for blind review):
https://anonymous.4open.science/r/BeliefBehavior-7AEF/Study_1.ipynb

The pre-registrations can be found here:
Experiment 2: https://aspredicted.org/blind.php?x=vp6sa6
Experiment 3: https://aspredicted.org/blind.php?x=6bu9jq

Experiment 1

Methods

Participants. We aimed for a sample size of 200 participants to achieve a 0.8 power for an effect size of 0.2 in a two tailed paired sample t-test at an alpha level of 0.05. A total of 200 participants were recruited for the experiment on Cloud Research, a participant-sourcing platform for online research providing immediate access to millions of diverse, high-quality respondents around the world (Litman, Robinson, & Abberbock, 2016). Participants were compensated at the platform's standard rate. Of the 200 total participants, 183 passed the pre-established attention checks and were included in the rest of the analyses (M_{age}=53; SD_{age}=17; 63% female). The experiment was approved by the Institutional Review Board at Princeton University.

Stimulus materials. We used a set of 16 statements (e.g., "*A child's untreated wandering eye can lead to permanent vision loss in that eye*"; Appendix 1), pretested by Vlasceanu and Coman (2020) on a Cloud Research sample (N=217; M_{age}=54.16, SD_{age}=16.3; 82% women). Believability ratings were collected (i.e., "*How accurate or inaccurate do you think this statement is*" on a scale from 0 = *Extremely Inaccurate* to 100 = *Extremely Accurate*) to ensure that all the statements are moderately believable (M=51.02, SD=24.6) which can avoid any floor or ceiling effects in belief change. Half of the statements were actually accurate, while the other half were inaccurate pieces of information, as determined by published scientific papers or other official sources.

For each of the 16 statements, we designed a corresponding donation campaign (e.g., "*Campaign for raising awareness about the danger of children's untreated wandering eyes"*), tailored to raise awareness about that specific topic.

Lastly, for each of the 16 statements, we also constructed a piece of evidence, arguing in favor of the accurate statements (e.g., "*Studies/reports show that a child's untreated wandering eye can lead to permanent vision loss in that eye"*) and against the inaccurate statements (e.g., "*Studies/reports show that allergy shots are not helpful for food allergies"*).

Design and procedure. Participants were told they would participate in an experiment about people's evaluation of information and were directed to the survey on the Qualtrics platform. After completing the informed consent form, participants were directed to the first phase (pre-test), in which they rated a set of 16 statements (one on each page) by indicating the degree to which they believed each statement (i.e., "*How accurate do you think this statement is*," from 1 =

Extremely inaccurate to 100 = *Extremely accurate*). In the second phase (behavior pre-test), participants were told they would be able to help address some of the issues brought up by these statements, by donating funds allocated by our team to campaigns corresponding to each statement (e.g., "*Campaign for raising awareness about the danger of children's untreated wandering eyes"*), designed to raise awareness (i.e., *"For each person completing this survey, our team will donate $100 to a campaign, (or will allocate the donation to multiple campaigns) according to each person's preference. In this phase, you will choose how to allocate the $100 donation"*).

In the evidence phase, participants were provided evidence in favor of the accurate information against the inaccurate information from the first phase, as denoted by scientific investigations into each matter. The evidence instructions were: *"You will now see which statements are accurate and which are not, based on scientific studies and official reports."* Then, participants were asked to evaluate each statement again (belief post-test) and were given the opportunity to adjust their fund allocation choices (behavior post-test). Finally, participants answered the demographic information questions and were debriefed. In the debrief, we informed participants the campaigns were not real, and their donations would not be carried through.

Results

To test our first hypothesis, that beliefs at pre-test will predict behavior at pre-test, we conducted a linear mixed model with behavior at pre-test as the dependent variable and belief at pre-test as the fixed effect, including by-participant and by-item random intercepts. We found a significant effect of belief at pre-test $\beta=0.17$, $SE=0.01$, $t(1449)=9.26$, $p<0.001$ on behavior at pre-test (Figure 1A). This result suggests that people's beliefs predict their corresponding behaviors.

For our second hypothesis, that belief change will trigger behavioral change, we ran a linear mixed model with behavior change as the dependent variable, belief change and behavior at pre-test as fixed effects, including by-participant and by-item random intercepts. In the second model we included behavior at pre-test as a fixed effect to observe the independent effect of belief change on behavior change while controlling for initial behavioral tendencies that could potentially confound the relationship of interest. We found a significant effect of belief change $\beta=0.08$, $SE=0.01$, $t(1308)=6.8$, $p<0.001$ on behavioral change (Figure 1B). This result suggests that belief change triggers behavioral change in a non-ideological context.

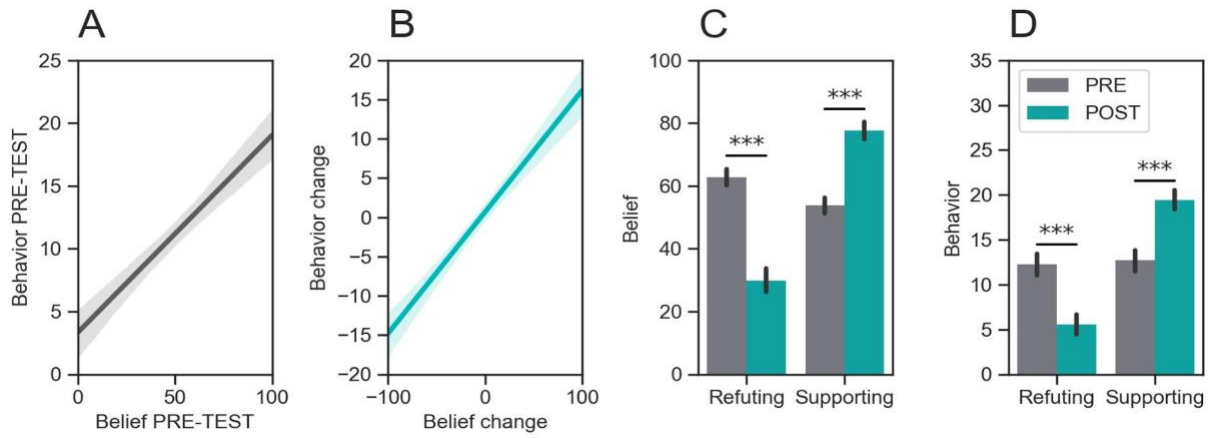

Figure 1. Behavior at pre-test as a function of belief at pre-test (**Panel A**). Behavior change as a function of belief change (**Panel B**). Belief (**Panel C**) and behavior (**Panel D)** data split by the evidence manipulation (refuting vs. supporting belief evidence) and by time point (pre-test in grey vs. post-test in green). The results suggest that beliefs predict behaviors, and belief change triggers behavioral change.

To assess whether the effect of evidence type (in favor/against) on behavioral change would be mediated by the degree of belief change, we ran a mediation model following guidelines and using the R mediation package published by Tingley and colleagues (2014). As Figure 2 illustrates, the regression coefficient between evidence type (in favor/against) and behavior change was statistically significant, as were the regression coefficients between evidence type and belief change and between belief change and behavior change when controlling for evidence type.

We tested the significance of the indirect effect using bootstrapping procedures. The indirect effect was computed for each of 10,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped indirect effect was 4.58, and the 95% confidence interval ranged from 2.48 to 6.71. Thus, the indirect effect was statistically significant, $p<0.001$ (Table 1; Table 2). This result suggests that the effect of evidence on behavioral change is partially mediated by belief change.

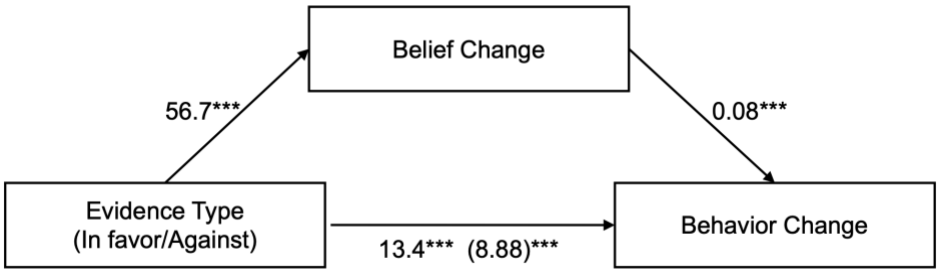

Figure 2. Regression coefficients for the relationship between evidence type (in favor versus against) and behavior change as mediated by belief change. The standardized regression coefficient between evidence type and behavior change, controlling for belief change, is in parentheses. This result suggests that the effect of evidence on behavioral change is partially mediated by belief change.

Table 1
Regression analyses associated with the mediation model.

Predictors	*b* (s.e.)	*t*	*F*	*df*	R^2	*p*
Model 1						
Evidence type	13.4 (0.95)	14.1***	200.7	(1, 364)	0.355	<0.001
Model 2						
Evidence type	8.88 (1.38)	6.40	115.2	(2, 363)	0.38	<0.001
Belief change	0.08 (0.01)	4.42***			0.38	<0.001

b = regression coefficients; s.e. = standard error
* p<0.05; ** p<0.01; *** p<0.001

Table 2
Causal mediation analyses: nonparametric bootstrap CI, with 10,000 simulations

	Estimate	95%CI lower	95%CI upper	p
Indirect Effect (ACME)	4.58	2.48	6.71	<0.001***
Direct Effect (ADE)	8.86	6.14	11.64	<0.001***
Total Effect	13.44	11.56	15.26	<0.001***
Proportion Mediated	0.34	0.17	0.50	<0.001***

ACME = average causal mediation effects; ADE = average direct effect

Discussion

In experiment 1, we found support for our two hypotheses: (1) that belief predicts behavior, and (2) that belief change predicts behavioral change in a non-ideological context. Moreover, when investigating the mechanism of the latter process, we found that evidence triggered belief change, which, in turn, triggered behavioral change. This experiment suffers however from two important limitations. First, contrary to real-world scenarios, participants' donation behavior came at no personal cost. And second, the health beliefs tested here were fairly neutral, thus moderately endorsed. In real-world circumstances, people's beliefs are typically ideologically charged.

To overcome these limitations, in experiment 2 we allowed participants to keep the funds to themselves if they did not want to engage in the donation behavior, increasing the ecological validity of the paradigm. Moreover, the beliefs tested in experiment 2 were partisan (i.e., Democratic or Republican). To increase the generalizability of our findings, we changed the population from which we sampled our participants, from Cloud Research workers to Princeton University students.

Experiment 2

Methods

Participants. To replicate experiment 1, we aimed again for a sample size of 200 participants. However, only a total of 90 Princeton University students signed up for the experiment and completed it before our data collection stopping date (i.e., the 2020 Presidential election), which decreased our power of finding an effect of 0.2 to 0.46. Participants were compensated with subject pool research credit. Of them, 83 passed the pre-established attention checks (M_{age}=19.45; SD_{age}=1.26; 68% female). The experiment was approved by the Institutional Review Board at Princeton University.

Stimulus materials. We used a set of 8 politically charged statements (Appendix 2), half accurate and half inaccurate as determined by published scientific papers or other official sources. These statements had been pretested in prior work by Vlasceanu, Morais, and Coman (2021) to ensure that half of them were endorsed more by Democrats than by Republicans (e.g., "*Millions of children in the US have witnessed a shooting in the past year")* and vice-versa (e.g., *"Hundreds of thousands of abortions in the US are paid for with public funds each year")*.

For each statement we constructed a corresponding piece of evidence, in favor of the accurate statements and against the inaccurate ones. An example of a piece of evidence is: "*Millions of children in the US have witnessed a shooting in the past year. Studies/reports show that 4% of children in the US (or 2.96 million children) have witnessed a shooting in the past year."* Moreover, for each statement we constructed a corresponding campaign (e.g., "*Gun Control Campaign for raising awareness that millions of children in the US have witnessed a shooting in the past year"*).

Design and procedure. The design and procedure were the same as in experiment 1 (i.e., five phases: belief pretest, behavior pretest, evidence, belief posttest, behavior posttest), with one exception - participants were now given the option of keeping the monetary donation allocated by our team for themselves, instead of donating it to one or more campaigns (*"For each person completing this survey, we will donate $10. You will decide where this donation will end up. You can allocate this donation to one or more of the following campaigns. You can also decide to keep part or all of it for yourself (in which case we will ask for your Venmo information to complete the transfer). In this phase, you will choose how to allocate the $10"*). After

completing the experiment, we sent participants the funds corresponding to their choice if they decided to keep part of or the entire amount. This addition to the design was made to increase the ecological validity of the donation behavior, which, in real life comes at a monetary cost to the individual.

Results

To replicate the results of experiment 1, we conducted a linear mixed model with behavior at pre-test as the dependent variable and belief at pre-test as the fixed effect, including by-participant and by-item random intercepts. Just like in experiment 1, we found a significant effect of belief at pre-test $\beta=0.009$, $SE=0.003$, $t(661)=2.87$, $p=0.004$ on behavior at pre-test (Figure 2A). Thus, we successfully replicated the first finding in experiment 1.

Moreover, we ran a linear mixed model with behavior change as the dependent variable, belief change and behavior at pre-test as fixed effects, including by-participant and by-item random intercepts, and again found a significant effect of belief change $\beta=0.005$, $SE=0.002$, $t(622)=2.49$, $p=0.013$ on behavioral change (Figure 2B). Thus, we also successfully replicated the second finding in experiment 1, suggesting that belief change triggers behavioral change, but this time in an ideological context.

We did not conduct ideological exploratory analyses given that only 7% of our sample identified as Republican.

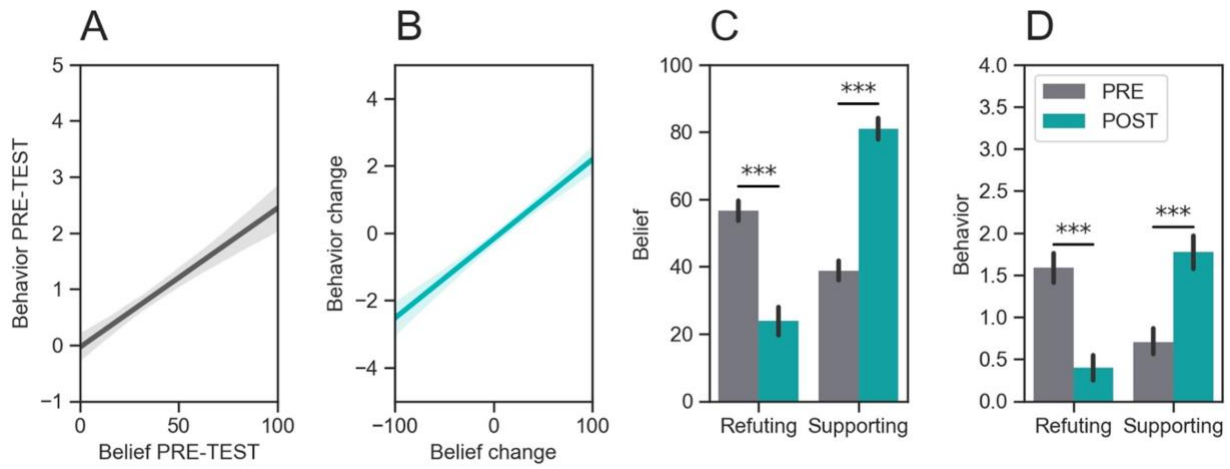

Figure 3. Behavior at pre-test as a function of belief at pre-test (**Panel A**). Behavior change as a function of belief change (**Panel B**). Belief (**Panel C**) and behavior (**Panel D)** data split by the evidence manipulation (refuting vs. supporting belief evidence) and by time point (pre-test in grey vs. post-test in green). These results replicate the findings in experiment 1.

Discussion

In experiment 2, we replicated the two main results we found in experiment 1: (1) that belief predicts behavior, and (2) that belief change predicts behavioral change, in a sample drawn from

a different population, this time with politically charged beliefs, and a more ecologically valid behavioral paradigm (i.e., donation behaviors came at a personal cost to participants). Thus, we extended both the generalizability and the validity of our findings. Next, we were interested in how these effects interact with participants' ideological leaning. Given that over 90% of the sample in experiment 2 identified as Democratic, we could not investigate such interactions in this dataset. Thus, in experiment 3, we recruited enough participants on both sides of the partisan divide to conduct these analyses.

Experiment 3

Methods

Participants. Given our interest in exploring partisan differences in the effects reported in the previous two studies, we preregistered our intent to collect a sample of 400 participants to detect an effect size of 0.09 in a within-between interaction of a Repeated Measures ANOVA with 80% power at a significance level of 0.05 (two-tailed). We recruited a total of 421 Americans from Amazon Mechanical Turk (MTurk; an online recruiting source that is not nationally representative but produces similar results to nationally representative samples in various experiments related to politics; Coppock, 2018). Of them, 393 (256 Democrats and 137 Republicans) passed the pre-established attention checks (M_{age}=37.8; SD_{age}=11.15; 59% female). The experiment was approved by the Institutional Review Board at Princeton University.

Stimulus materials. We used the same set of 8 politically charged statements from experiment 2 (Appendix 2), the same corresponding pieces of evidence, and the same corresponding campaigns.

Design and procedure. The design and procedure were the same as in experiment 2.

Results

To again replicate the results of experiment 1, we conducted a linear mixed model with behavior at pre-test as the dependent variable and belief at pre-test as the fixed effect, including by-participant and by-item random intercepts. Just like in experiment 1 and experiment 2, we found a significant effect of belief at pre-test β=0.05 SE=0.007, t(2440)=7.95, p<0.001 on behavior at pre-test (Figure 4A).

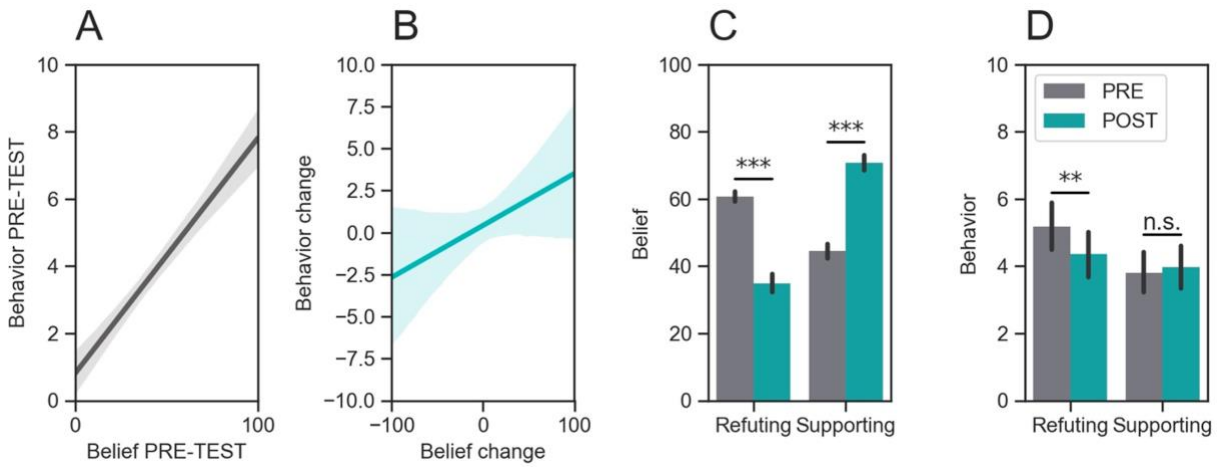

Figure 4. Behavior at pre-test as a function of belief at pre-test (**Panel A**). Behavior change as a function of belief change (**Panel B**). Belief (**Panel C**) and behavior (**Panel D)** data split by the evidence manipulation (refuting vs. supporting belief evidence) and by time point (pre-test in grey vs. post-test in green).

Moreover, we ran a linear mixed model with behavior change as the dependent variable, belief change and behavior at pre-test as fixed effects, including by-participant and by-item random intercepts, and found a significant effect of belief change $\beta=0.01$, $SE=0.004$, $t(396)=3.36$, $p<0.001$, on behavioral change (Figure 4B), successfully replicating the impact of belief change on behavioral change in an ideological context.

In exploratory analyses, we investigated the relationship between belief and behavior as it interacts with item and participant partisan identity. First, for belief at pretest and behavior at pretest, we conducted a linear mixed model with behavior at pretest as the dependent variable, belief at pretest as it interacts with item type (Democratic, Republican) and participant type (Democratic, Republican) as the fixed effect, including by-participant random intercepts. We found a significant main effect of belief at pretest on behavior at pretest $\beta=0.04$, $SE=0.01$, $t(3103)=3.84$, $p<0.001$, but no participant or item type interactions with this effect (Figure 5A, 5B). The results show that belief at pretest linearly predicts behavior at pretest in all of the four ideological conditions crossing participant identity and item identity (i.e., Democrats on Democratic and Republican items, as well as Republicans on Democratic and Republican items).

Second, for belief change and behavior change, we conducted a linear mixed model with behavior change as the dependent variable, belief change as it interacts with item identity type (Democratic, Republican) and participant identity type (Democratic, Republican) as the fixed effect, including by-participant random intercepts. We found a significant main effect of belief change $\beta=0.02$, $SE=0.005$, $t(3136)=4.73$, $p<0.001$ on behavioral change, and an interaction between the effect in Democratic participants on Democratic items with the effect in Democratic participants on Republican items $\beta=0.02$, $SE=0.009$, $t(3136)=2.74$, $p=0.006$, such that Democratic participants changed their behaviors as a function of belief change more for Democratic compared to Republican items (Figure 5C). The results also show that belief change linearly predicts behavior change only for the Democratic participants on Democratic items, and

not for the other three ideological conditions crossing participant ideology and item ideology (i.e., Democrats on Republican items, Republicans on Democratic and Republican items; Figure 5C, 5D).

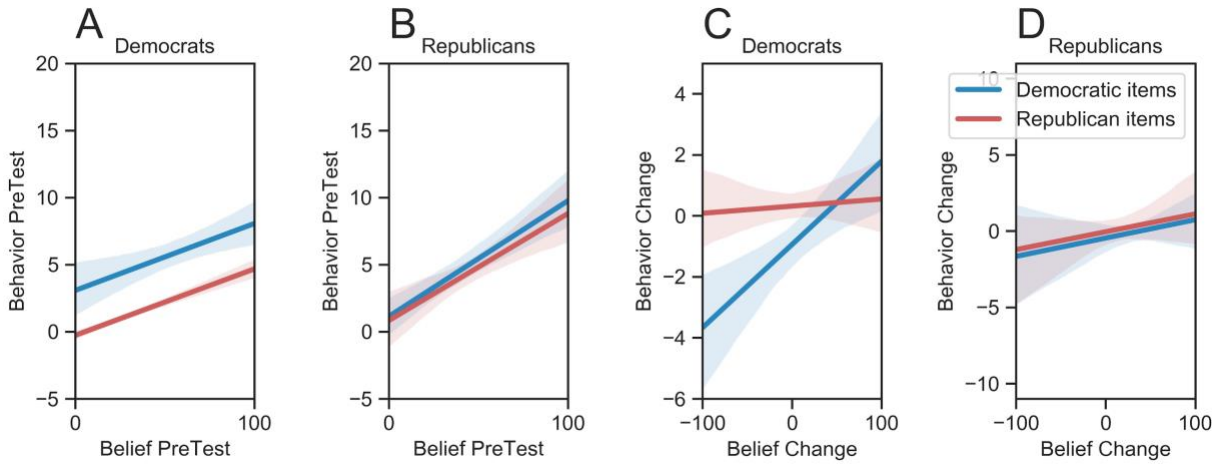

Figure 5 (N=393). Democratic participants'(**Panel A**) and Republican participants' (**Panel B**) behavior at pre-test as a function of belief at pre-test of Democratic statements (in blue) and Republican statements (in red). Democratic participants'(**Panel C**) and Republican participants' (**Panel D**) behavior change as a function of belief change of Democratic statements (in blue) and Republican statements (in red).

Discussion

In experiment 3, we replicated the main findings that belief predicts behavior, and that belief change elicits behavioral change in an ideological context. When investigating these effects' interactions with partisan identity, we found that beliefs' predictive power of behaviors universally holds across identity boundaries. However, belief change triggered behavioral change only for Democratic participants on Democratic topics. We also found that Democrats changed their behaviors as a function of belief change more for Democratic compared to Republican topics, but Republicans did not exhibit such a difference between Democratic and Republican topics, pointing to an asymmetric partisan bias in the effect of belief change on behavioral change.

General Discussion

In a series of 3 experiments including 2 pre-registered replications, we found that both health-related and politically charged beliefs predict people's donation behaviors in an incentivized choice task. More importantly from an applied, policy intervention perspective, we also found that changing these beliefs through evidence exposure triggers behavioral change. These findings are consistent with and further advance the literature on behavioral nudges (Thaler & Sunstein, 2009), as well as prior theoretical accounts of behavior (Ajzen, 1991; Hochbaum, 1958) by extending the investigation beyond the health domain, which was classically prioritized in past

accounts of behavioral influences by way of beliefs (e.g., theory of planned behavior, Ajzen, 1991; the health belief model, Hochbaum, 1958). Moreover, these effects are generalizable as they replicate across online platforms (i.e., Could Research, MTurk) and laboratory settings (i.e., Princeton student sample), and they are ecologically valid as they avoid experimenter demands (i.e., the donation behavior occurred at a personal cost to participants).

When testing interactions with identity, we found that beliefs' predictive power of behaviors universally holds across identity boundaries, consistent with prior work on belief change mechanisms (Vlasceanu, Morais, & Coman, 2021). However, belief change triggered behavioral change only for Democratic participants on Democratic topics, but not for Democratic participants on Republican topics or for Republican participants on either topic. This finding points to an asymmetric partisan bias in the effect of belief change on behavioral change, and it is consistent with prior work showing that partisan identities can impair belief updating (Van Bavel & Periera, 2018). This asymmetry may reflect the sociopolitical context at the time of data collection for experiment three (i.e., January 2021, days before the inauguration of a Democratic president), consistent with existing work on the impact of threat and uncertainty on political beliefs (Haas & Cunningham, 2014). While difficult to programmatically explore in a dynamic real-world situation (e.g., COVID-19 pandemic, nationwide anti-racism protests, pro-Trump rallies), further research clarifying how consequential events affect belief and behavioral change is worth pursuing.

In the present work, we use a controlled, experimental approach to studying the link between beliefs and behaviors. Constraining the investigation to these minimal conditions allows us to isolate the effect of belief change on behavioral change. It is important to note, however, that in real world situations, additional factors such as conversational interactions following exposure to evidence would likely affect the degree to which the people integrate evidence into their beliefs and adjust their behaviors. Therefore, while exploring the relation between beliefs and behavior at the individual level is essential from a theoretical perspective, understanding how communities of individuals synchronize their behaviors is urgent from an applied point of view, as these dynamics might reveal how to better promote desirable behaviors in the population, of particular interest to policy makers interested in impacting communities (Dovidio & Esses, 2007). Indeed, the dynamic information flow between community members has been shown to exert a strong influence on people, impacting their individual memories (Cuc, et al., 2007), their beliefs (Vlasceanu & Coman, 2020a), and their behaviors (Frankel & Swanson, 2002). It has also been found to affect collective-level phenomena, leading to the formation of collective memory (Coman, Momennejad, Drach, & Geana, 2016) and collective beliefs (Vlasceanu et al., 2020; Vlasceanu & Coman, 2020a). However, little is known about the impact of network structure on the formation of collective behavior, a construct of vital social importance. A growing body of work has been focusing on the cognitive and social processes involved in these collective phenomena (Vlasceanu et al., 2018; Borge, et al., 2018), revealing how individual level effects are amplified at the network level (Vlasceanu, et al., 2020), as well as the importance of network structure in their emergence (Vlasceanu & Coman, 2020a).

Therefore, future work should consider investigating the effects of beliefs on behaviors at a collective level, focusing on the impact of conversational interactions on the effect, as well as on the role of network structure in the formation of collective behaviors.

Other future directions prompted by the current research include the investigation of the effect of beliefs on behaviors as it interacts with other variables. Of particular importance is the interaction between the hereby unveiled effect and social norms (Cialdini & Goldstein, 2004). One hypothesis in this context is that beliefs might impact behaviors more when the behaviors are perceived as normative rather than non-normative. This hypothesis follows from seminal work showing that changing beliefs regarding outgroup members does not impact non-normative behaviors towards them (Paluck, 2009). Moreover, recent work shows that beliefs change more in line with normative compared to non-normative evidence (Vlasceanu & Coman, 2021), providing further insights into the mechanism of interest.

Another variable worth investigating as it interacts with the effect of beliefs on behavior is cultural tightness/looseness (Harrington & Gelfand, 2014). Such an exploration has the potential to reveal the effect's strength and boundary conditions across different groups and cultures, enhancing the generalizability to the wider human population. It would also add to the efforts to overcome one of the main shortcomings of psychological research to date, that most effects are based on a "small corner of the human population," an impediment to identifying universal principles of human psychology (Henrich et al., 2010; Arnett, 2016).

A third variable that might interact with the hereby explored effect is the source identity (Chung, Fink, Kaplowitz, 2008; Slater & Rouner, 1996; Vlasceanu & Coman, 2022). Prior work found that people are most influenced by others whom they share a common identity (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Centola 2011). Therefore, identifying with the source sharing the evidence might increase the likelihood of incorporating that evidence in changing beliefs and behaviors. However, recent work has shown that belief change by way of evidence incorporation from various sources along the ideological spectrum does not interact with individuals' own political ideology, although behavioral intentions as a function of belief change was displayed a partisan bias (Vlasceanu & Coman, 2022). Thus, empirically establishing whether the source identity interacts with the effect of beliefs on behavior is a future direction of high interest.

Beyond their theoretical importance, these findings are of particular relevance for targeted interventions aimed at promoting constructive behaviors in the population, such as engaging in climate action or employing preventative health measures. To enact real change in these crucial societal problems, policy makers must act in ways that are guided by recommendations supported by empirical research (Oxman et al., 2010; Snilstveit et al., 2013; Reimers & McGinn, 1997). Therefore, understanding the mechanisms by which behaviors can be changed is a crucial first step in informing such policies. For example, our results suggest that when targeting Democrats on Democratic topics (e.g., support for gun control, engagement in climate action or vaccination against COVID-19), belief change can be a viable strategy of achieving behavioral change. However, alternative strategies must be employed when targeting

Democrats on Republican topics (e.g., support for anti-abortion laws) or when targeting Republicans on either Democratic or Republican topics.

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Appendix 1. **Health-related statements**

	Accuracy	*Statement*
1	Accurate	Exposure to cockroach-infested buildings is a major cause of asthma in children.
2	Accurate	A child's untreated wandering eye can lead to permanent vision loss in that eye.
3	Accurate	Corporal punishment is associated with lower Intelligence Quotient in children.
4	Accurate	Herbal cold remedies are unsafe treatments for infants.
5	Inaccurate	Sitting too close to the TV damages children's vision.
6	Inaccurate	Reading in dim light can damage the eyes.
7	Inaccurate	Listening to classical music raises babies' Intelligence Quotient (IQ).
8	Inaccurate	Allergy shots are helpful for food allergies.

Appendix 2. **Politically charged statements**

	Accuracy	*Ideology*	*Statement*
1	Accurate	Democratic	Millions of children in the US have witnessed a shooting in the past year.
2	Accurate	Democratic	The Affordable Care Act saved the US trillions of dollars.
3	Inaccurate	Democratic	All US cities experience more extremely hot days compared to 5 decades ago.
4	Inaccurate	Democratic	Children raised by same-sex parents are just as likely to experience emotional problems compared to children raised by opposite-sex parents.
5	Accurate	Republican	Most non-citizen households in the US access welfare programs.
6	Accurate	Republican	Hundreds of thousands of abortions in the US are paid for with public funds each year.
7	Inaccurate	Republican	Hundreds of Americans in the US are killed by foreign born terrorists each year.
8	Inaccurate	Republican	Government regulations cost the US billions of dollars each year.