

# Awe, Ideological Conviction, and Perceptions of Ideological Opponents

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Awe is an emotional response to perceptually vast stimuli that transcend current frames of reference. Guided by prior work documenting that awe promotes humility, increases perceptions of uncertainty, and diminishes personal concerns, across 3 studies ( $N = 776$ ) we tested the hypothesis that awe results in reduced conviction about one's ideological attitudes. In Study 1, participants induced to experience awe, relative to those feeling amusement or in a neutral control condition, expressed less conviction regarding their attitudes toward capital punishment. In 2 subsequent studies, we showed that experiencing awe decreased perceptions of ideological polarization in the U.S. vis-à-vis racial bias in the criminal justice system (Study 2) and reduced desired social distance from those with different viewpoints regarding immigration (Study 3)—effects that were partially mediated by reduced conviction. These findings indicate that awe may lead to uncertainty and ambivalence regarding one's attitudes, a form of epistemological humility, and that this in turn may promote reduced dogmatism and increased perceptions of social cohesion.

**Keywords:** awe, attitudes, conviction, polarization, social distance

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“I would rather have a mind opened by wonder than one closed by belief”

—(Spence, 1995, p. 98)

Awe is an emotional response to perceptually vast stimuli that transcend current frames of reference (e.g., Keltner & Haidt, 2003; Shiota, Keltner, & Mossman, 2007). Although feelings of awe are fleeting and often elicited by nature, music, and art, these experiences can transform the individual's beliefs about the world. Experiences of awe, as the quote above suggests, would appear to lead to an open rather than closed mind.

Given this, awe has been characterized as an epistemic emotion, one that has systematic influences upon cognition (e.g., Shiota et


al., 2017). One line of studies has documented how awe shifts patterns of sociality: Awe leads to increased humility, a diminished sense of self, an increased awareness of how one is embedded in social networks, and an awareness of shared humanity with others (e.g., Bai et al., 2017; Campos, Shiota, Keltner, Gonzaga, & Goetz, 2013; Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Shiota et al., 2007; Stellar et al., 2018). A complementary line of work has found that awe also shapes more purely cognitive tendencies and knowledge structures, including the analysis of arguments, pattern detection, and causal reasoning (Griskevicius, Shiota, & Neufeld, 2010; Rudd, Vohs, & Aaker, 2012; Valdesolo, Park, & Gottlieb, 2016; Valdesolo & Graham, 2014).

In the present investigation, we extend these complementary lines of inquiry on the more open-minded epistemic effects of awe to the study of ideological conviction. Guided by the aforementioned findings, we test the hypothesis that experiencing awe will reduce ideological conviction, which in turn will lead individuals to perceive ideological disputes in less polarized terms and to be less inclined to seek social distance from ideological counterparts. In pursuing this line of inquiry, we provide the first experimental evidence that documents the effects of awe upon ideological attitudes—specifically the clarity and certainty of such attitudes—and its attendant social outcomes, which to date have only been hinted at by the existing literature.

## Ideological Conviction and Its Social Consequences

Personal convictions are fundamental to social identity (Krosnick & Petty, 1995). The strength of convictions is typically assessed in terms of commitment to one's attitude (e.g., willingness to defend one's position in an argument), as well as attitude clarity and certainty (Holland, Verplanken, & van Knippenberg, 2003; McGregor, Zanna, Holmes, & Spencer, 2001; Pomerantz,

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Chaiken, & Tordesillas, 1995). Attitudinal conviction predicts the increased search for attitude-consistent information (e.g., Brannon, Tagler, & Eagly, 2007; Holbrook, Berent, Krosnick, Visser, & Boninger, 2005), the increased likelihood of attitude-consistent behavior (e.g., Visser, Bizer, & Krosnick, 2006), and resistance to attitude-inconsistent information (e.g., Pomerantz et al., 1995).

These processes have critical ramifications for attitudes and behavior toward others. Those with greater conviction regarding their position on a contentious issue perceive a greater degree of ideological polarization in society—operationalized as the distance between the two sides—exaggerating the magnitude of conflict between opposing sides of the issue as well as their opponents' extremism and bias (Chambers, Baron, & Inman, 2006; Chambers & Melnyk, 2006; Keltner & Robinson, 1996; Van Boven, Judd, & Sherman, 2012; Westfall, Van Boven, Chambers, & Judd, 2015). Greater conviction and expectations of conflict shape social behavior, as evidenced by research documenting associations between conviction and reduced tolerance for—and greater desire for social distance from—those with opposing viewpoints (e.g., Skitka, Bauman, & Sargis, 2005; Wright, Cullum, & Schwab, 2008; Zaal et al., 2017; Zaal, Van Laar, Ståhl, Ellemers, & Derks, 2011).

Why might greater conviction result in such outcomes? Attitudes held with strong conviction are experienced as absolutes, or universal standards of truth that others should also share (e.g., Skitka et al., 2005), which leads people to project the extremity of their attitudes onto others (e.g., Bartels, 1985; Van Boven et al., 2012). People assume that others, both those who agree and disagree with their views, approach contentious issues in a similar way, with similar levels of certainty and moral concern (Van Boven et al., 2012). This assumption implies that holding attitudes with strong conviction should lead to the belief that others hold similarly staunch positions. As a result of such absolutism, convictions are connected to intense emotional experiences. Those who hold an attitude with conviction experience intense negative emotions (such as anger) with regard to what they see as immoral (Haidt, 2003; Mullen & Skitka, 2006; Rozin, Lowery, Imada, & Haidt, 1999). These intrapsychic processes drive wedges between opposing individuals and groups, leading them to perceive ideological schisms, expect hostility from ideological adversaries, and, ultimately, structure their social worlds in ways that maximize separateness from those with opposing beliefs.

### Awe and Conviction

These insights about attitude conviction have prompted studies of the role of emotions in shaping attitudinal processes, including the certainty with which individuals adhere to their attitudes and social outcomes that follow (e.g., Briñol, Petty, & Barden, 2007; Clore & Huntsinger, 2007; Petty, DeSteno, & Rucker, 2001). Much of the existing literature has focused on the role of negative emotions (e.g., Bodenhausen, Sheppard, & Kramer, 1994; Huber, Van Boven, Park, & Pizzi, 2015); studies with positive emotions have generally found that they possess attitude-strengthening effects, perhaps due to the affective validation they provide (e.g., as is the case with happiness and pride; Bodenhausen, Kramer, & Süsner, 1994; Boezeman & Ellemers, 2007; Briñol, Petty, & Barden, 2007). However, social functional analyses of emotions suggest that there are important differences to be found in how

discrete positive emotions influence conviction in different ways (e.g., Lerner, Li, Valdesolo, & Kassam, 2015; Shiota et al., 2017). Given recent theoretical analyses and empirical evidence regarding the effects of experiencing awe on cognition and behavior (Stellar et al., 2017), we posit that this complex and transformative emotion should influence ideological conviction in systematic ways.

The experience of awe is associated with two intrapsychic processes that provide clues as to how this emotion might affect ideological conviction. The first is that awe leads to a feeling that one is in the presence of something vast, which results in a diminished sense of self vis-à-vis the awe-eliciting stimulus (Bai et al., 2017; Campos et al., 2013; Gordon et al., 2017; Shiota et al., 2007). Related research finds that experiences of awe produce increased humility, a realistic appraisal of the self and an openness to the contributions of others (Stellar et al., 2018). Compared with appropriate controls, individuals feeling awe are also more likely to report that their day-to-day concerns are less important in the grand scheme of things (Piff et al., 2015). That awe has been shown to increase humility and reduce focus on the self suggests that this emotion may give rise to the epistemic recognition of the limits of one's knowledge and a greater acknowledgment of the value of others' views, including those on the opposite end of any ideological continuum (e.g., Chancellor & Lyubomirsky, 2013; Roberts & Wood, 2003; Tangney, 2000). It would thus seem likely that awe would reduce the strength of one's convictions and, in turn, prompt individuals to perceive greater harmony between themselves and those with differing viewpoints. This prediction is indirectly supported by work demonstrating that being in self-diminished states (e.g., lower power), can lead people to report less conviction in their attitudes and attenuate the extent to which they perceive ideological conflict with others (Briñol, Petty, Valle, Rucker, & Becerra, 2007; Keltner & Robinson, 1996).

A second awe-related process relevant to the present investigation pertains to the notion that awe is a cognitively destabilizing emotion (e.g., Gottlieb, Keltner, & Lombrozo, 2018; Valdesolo & Graham, 2014). Awe stimulates the need for accommodation, a process in which existing mental schemata are revised to make sense of the awe-inspiring stimulus (Keltner & Haidt, 2003). People report that experiences of awe are associated with an epistemological openness—a willingness to take on new ways of looking at the world (Campos et al., 2013). Similarly, the trait tendency to experience awe has been shown to be negatively correlated with *need for cognitive closure* (Shiota et al., 2007; though see Valdesolo & Graham, 2014)—a personality trait that is predictive of rigid, dogmatic beliefs (e.g., Brandt & Reyna, 2010; Webster & Kruglanski, 1994).

There is reason to suspect that the need for accommodation accompanying the experience of awe might lead to reduced conviction as well. Several streams of research suggest that *processing fluency* is associated with conviction-related processes (e.g., attitude certainty; Tormala, Petty, & Briñol, 2002). Attitudes are generally held with greater certainty and perceived to be more accurate when they or the information on which they are based are brought to mind with ease (e.g., Alter & Oppenheimer, 2009; Kelley & Lindsay, 1993). Experiencing different emotions when evaluating attitude-relevant stimuli may affect processing fluency. Supporting appraisal theories of emotion (e.g., Smith & Ellsworth, 1985), Tiedens and Linton (2001) found that experiencing emotions related to uncertainty (e.g., sadness, surprise) reduced atti-

tude certainty and heuristic processing (e.g., reduced reliance on the expertise of a source of a persuasive message) compared with emotions related to certainty (e.g., happiness, anger; see also Petrocelli & Whitmire, 2017). Given that awe is posited to be a highly uncertainty-promoting emotion, it would be expected that experiencing it would similarly reduce processing fluency and lessen conviction in one's attitudes. Supporting this line of thought, Griskevicius, Shiota, and Neufeld (2010) showed that participants induced to experience awe processed information in a more deliberate, scrutinizing fashion.

If awe reduces ideological conviction due to its self-diminishing and cognitively destabilizing capabilities, we would also expect this emotion to directly affect social outcomes related to the conviction of personal attitudes. In the present investigation, we focused on two such outcomes—perceptions of political polarization and the desire for social distance from ideological opponents (Fiorina, Abrams, & Pope, 2005)—that are believed to be core psychological processes fueling ideological conflict between individuals and groups (Keltner & Robinson, 1996; Tagar, Morgan, Halperin, & Skitka, 2014), and that predict intergroup behaviors of different kinds, such as the likelihood of voting for or donating to outgroup members (Bilewicz, Winiewski, Kofta, & Wójcik, 2013; Westfall et al., 2015).

In light of how awe influences social-cognitive tendencies, as outlined above, we also expect this emotion to exert similar effects on perceived polarization and desire for social distance. More specifically, increased humility and reduced emphasis on the self—both outcomes of awe (Bai et al., 2017; Stellar et al., 2018)—are associated with increased tolerance of others and reduced anchoring on one's own perspective when making social judgments (e.g., Kross & Grossmann, 2012; Leary et al., 2017; Sibley, Harding, Perry, Asbrock, & Duckitt, 2010). Furthermore, the diminished sense of self elicited by awe can lead to attitudes and behaviors aimed at promoting social harmony, such as a greater willingness to help others and an expanded self-definition that includes universal social categories (e.g., an “inhabitant of the Earth”; Piff et al., 2015; Shiota et al., 2007). If awe is accompanied by the tendency to orient one toward a more universalist worldview, it stands to reason that it would lead individuals to see others—including ideological counterparts—in a less “us versus them,” polarizing fashion.

### The Present Studies

Following others, we reason that the experience of awe is self-diminishing and cognitively reorienting (Campos et al., 2013; Keltner & Haidt, 2003; Shiota et al., 2007), reducing the certainty with which one processes information and the importance one attaches to personal goals and opinions. Given these characteristics, we conducted three studies that tested the hypothesis that the experience of awe will lead to reduced ideological conviction. In Study 1, we tested whether experimentally induced awe decreases conviction vis-à-vis an ideologically entrenched social issue. In Study 2, we sought to replicate this finding as well as determine whether the reduced conviction generated by awe in turn reduces perceptions of ideological polarization in society (e.g., Van Boven et al., 2012; Westfall et al., 2015). Finally, in Study 3, we aimed to extend these findings to examine whether awe leads to a decreased desire for social distance from those with divergent

ideological views—an outcome that is more directly germane to actual polarization in society. Importantly, we induced the experience of awe through varied manipulations, including evocative videos and narrative recall. We also pitted awe against the effects of other positive emotions—amusement and pride—known to have systematic effects on cognition (e.g., Oveis, Horberg, & Keltner, 2010; Strohminger, Lewis, & Meyer, 2011; Williams & DeSteno, 2008), so as to establish the specific contribution of awe to conviction, independent of the valence of the state.

One important conceptual distinction concerns awe's effects on attitude conviction versus extremity. Conviction refers to a meta-attitudinal process (i.e., it is based on respondents' impressions of their own attitudes) pertaining to the clarity and decidedness of one's attitudes (e.g., Bassili, 1996; Holland et al., 2003; Pomerantz et al., 1995), whereas extremity refers to the extent that an attitude deviates from neutrality on an evaluative continuum that ranges from strongly negative to strongly positive, with a neutral midpoint (e.g., Abelson, 1995; Judd & Brauer, 1995). Attitude extremity has proven far more resistant to change than attitude conviction or perceptions of ideological disputes (Krosnick & Petty, 1995), and most studies of the influences of emotion upon attitudes have focused on attitude certainty or perceptions of others' attitudes as key outcomes and not the extremity of one's position on the ideological spectrum (e.g., Briñol, Petty, & Barden, 2007; Huber et al., 2015; Tiedens & Linton, 2001).

More specific to the current investigation, awe's unique appraisal structure sets the stage for our hypotheses regarding conviction versus extremism. Experiencing awe can reduce one's tolerance for uncertainty and lead to compensatory processes designed to restore one's sense of control (e.g., espousing supernatural beliefs to counter uncertainty; Valdesolo & Graham, 2014; Valdesolo et al., 2016)—a function served by adhering to ideological beliefs more broadly (e.g., Hogg, Kruglanski, & van den Bos, 2013). Though, as discussed above, awe's power to produce humility and self-diminishment guides us to the prediction that it should reduce conviction, lessen perceptions of polarization, and increase tolerance of opposing views, its tendency to promote the pursuit of meaning and sense of control should imply that awe will not shift one's position on the ideological spectrum altogether. Nonetheless, we examine three attitudinal outcomes in Study 1—conviction, extremity, and favorability—to attain a nuanced understanding of awe's effects on attitudes.

### Study 1: Awe Promotes Reduced Ideological Conviction

#### Method

**Participants.** A total of 215 participants (91 female, 124 male) were recruited to participate in the study via Amazon's Mechanical Turk (MTurk) in exchange for \$1. Five participants were excluded from all analyses for failing an attention check. Participants were randomly assigned to one of three conditions: neutral, amusement, or awe.

Our target sample size was determined using an a priori power analysis (G\*Power; Faul, Erdfelder, Lang, & Buchner, 2007), which assumed a medium effect size (characteristic of the literature on emotion and cognition). Specifically, with an assumed  $\eta^2$  of 0.05, our between-subjects design with three groups could

achieve 80% power with as few as 186 participants. We decided to target a sample of 210 participants to allow ample room for any exclusions due to failed attention checks or technical issues with our video induction. Five MTurk workers completed the survey after the study was closed, resulting in a final sample of 215 participants.

**Procedure.** Participants were told they would be taking part in a study investigating their “beliefs and attitudes about social issues” in which they would watch a 3-min video and complete a series of questionnaires. As with all studies reported in this article, this study received approval from the Committee for Protection of Human Subjects at the University of California, Berkeley. After providing consent, participants watched either a neutral clip (in which a man describes the construction of a kitchen countertop), a clip meant to elicit amusement (a montage of comedic nature clips from the BBC’s *Walk on the Wild Side*), or an awe-inducing clip (a time-lapse video of night skies). The neutral and amusement clips have been used in prior awe research (Piff et al., 2015; Valdesolo & Graham, 2014), and the awe clip was validated in a separate pilot study which is discussed in greater detail in the online supplemental materials.

After watching the video, participants completed our measures of attitude favorability, extremity, and conviction (McGregor et al., 2001). Participants reviewed a list of 14 statements about the issue of capital punishment and selected the single attitude position that they agreed with most. The opinion statements ranged evenly across the ideological spectrum, covering opinions that were mildly (e.g., “Capital punishment will do until something better is found”) to extremely (e.g., “A murderer deserves to die”) in favor of capital punishment, and mildly (e.g., “Life imprisonment is more effective than capital punishment”) to extremely (e.g., “Capital punishment is absolutely never justified”) against capital punishment. Extremity was also balanced, with four of the statements expressing mild opinions, six expressing moderate opinions, and four expressing extreme opinions. Two independent raters also rated the favorability of each of the 14 provided opinions from  $-3$  (*extremely unfavorable*) to  $-1$  (*mildly unfavorable*) or  $+1$  (*mildly favorable*) to  $+3$  (*extremely favorable*). The two sets of ratings correlated at  $r = .95$  and were averaged to yield a favorability rating for each opinion statement. Each opinion statement was then translated into an extremity rating (from 1 to 3), by taking the absolute value of the favorability rating. Among the statements coded as extreme were: “A murderer deserves to die,” and “Capital punishment is absolutely never justified.”

Participants then responded to eight items assessing conviction regarding the position statement they selected (e.g., “How firmly do you believe in this position”; McGregor et al., 2001). Participants responded to all items using an 11-point Likert scale. For analyses, we coded the items such that higher scores indicated greater conviction and aggregated all eight items to yield an overall index of conviction ( $M = 8.56$ ,  $SD = 2.11$ ,  $\alpha = .91$ ).

## Results

Based on the favorability and extremity ratings generated by our independent coders ( $-3 =$  extremely unfavorable toward capital punishment,  $+3 =$  extremely favorable toward capital punishment), participants endorsed opinions that were, on average,

mildly favorable toward capital punishment ( $M = 0.32$ ,  $SD = 2.20$ ) and moderately extreme ( $M = 2.08$ ,  $SD = 0.76$ ).

To examine our primary hypothesis, we tested the influence of emotion induction condition on our eight-item ideological conviction index. The results of this analyses are presented in Figure 1. A one-way ANOVA showed significant condition differences in conviction,  $F(2, 207) = 4.42$ ,  $p = .013$ ,  $\eta^2 = .041$ , 90% CI [.005, .088].<sup>1</sup> We conducted planned comparisons to test whether the awe induction led to reduced conviction ( $M = 7.95$ ,  $SD = 2.25$ ), relative to the amusement ( $M = 8.73$ ,  $SD = 1.98$ ) and neutral conditions ( $M = 8.96$ ,  $SD = 1.99$ ). Our “awe contrast” compared the awe condition with the neutral and amusement conditions (coded as awe = 2, neutral =  $-1$ , amusement =  $-1$ ), whereas the “control contrast” tested the residual difference between the neutral and amusement conditions (coded as awe = 0, neutral = 1, amusement =  $-1$ ). The awe contrast was significant,  $t(207) = -2.90$ ,  $p = .004$ ,  $d = -.43$ , 95% CI  $[-.73, -.14]$ , whereas the control contrast was not,  $t(207) = 0.65$ ,  $p > .250$ ,  $d = .11$ , 95% CI  $[-.22, .44]$ . Thus, the awe induction reduced ideological conviction relative to the amusement and neutral conditions.

We also tested the influence of emotion-induction condition on the extent to which participants selected favorable and extreme statements. A one-way ANOVA showed no significant difference between conditions in regards to the favorability,  $F(2, 207) = 1.19$ ,  $p > .250$ ,  $\eta^2 = .011$ , 90% CI  $[0, .040]$ , or the extremity,  $F(2, 207) = 0.63$ ,  $p > .250$ ,  $\eta^2 = .006$ , 90% CI  $[0, .028]$ , of the statement selected.

## Study 2: Awe, Ideological Conviction, and Belief Polarization

In Study 1, we found that awe did not change the favorability or extremity of attitudes, but did influence individuals’ convictions about their attitudes, in keeping with our hypothesis. In Study 2, we sought to replicate these results related to conviction and extend our thinking to a measure of perceptions of ideological disputes: the belief that the dispute is defined by polarization (i.e., marked by opposing partisans with extreme and opposing attitudes).

## Method

**Participants.** We recruited a sample of 281 participants (136 female, 142 male, three unreported) who participated in the study via MTurk in exchange for \$1.50. Seven participants were excluded from all analyses for failing attention checks. As in Study 1, participants were randomly assigned to one of three conditions: neutral, amusement, or awe.

Our target sample size was determined using an a priori power analysis based on the effect size from our key finding in Study 1. Specifically, with an  $\eta^2$  of 0.04, our between-subjects design with three groups could achieve 80% power with as few as 246 participants. We decided to target a considerably larger sample to allow ample room for any exclusions due to failed attention checks or technical issues. This resulted in a final sample of 281 participants.

<sup>1</sup> 90% confidence intervals are reported for effect size estimates for all  $F$  tests instead of 95% confidence interval in accordance with recommendations by Steiger (2004).

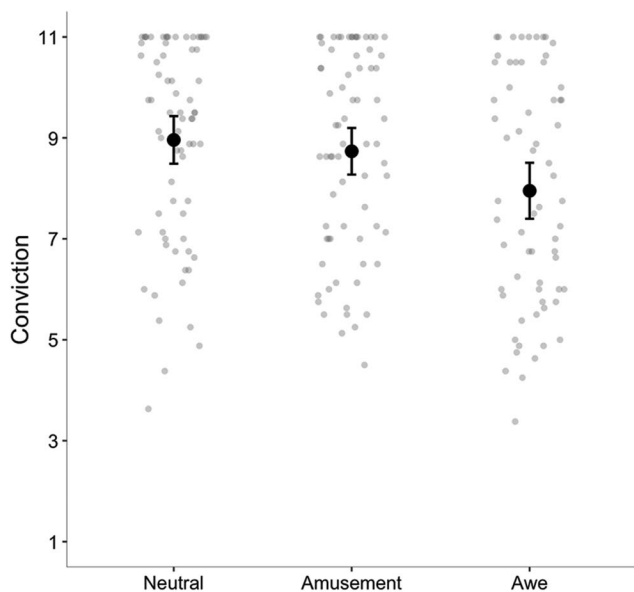


Figure 1. Results from Study 1: level of ideological conviction as a function of emotion induction condition. The small symbols represent individual responses on our conviction index. The large symbols indicate the overall means for each emotion induction condition; error bars represent 95% confidence intervals.

**Procedure.** The manipulation used in Study 2 was nearly identical to that of Study 1; the only notable difference was that in the present study the awe-inducing video consisted of nature clips from the BBC’s *Planet Earth*, which involved a series of grand, sweeping shots of scenic vistas, mountains, plains, forests, and canyons (see Piff et al., 2015; Valdesolo & Graham, 2014). The neutral and amusement clips were the same as in Study 1.

For our attitude measure, we used a similar procedure as in Study 1 but with a different social issue—racial bias in law enforcement. Participants were presented with four statements about the issue of racial bias in law enforcement and selected the attitude position that they agreed with most. The four statements were: “We as a society need to take more action to address the issue of racial bias in law enforcement, as racial minorities are frequently subjected to discrimination due to the color of their skin,” “We as a society do not need to take action to address the issue of racial bias in law enforcement, as race is not a factor in policing and criminal justice,” “We as a society need to do more to protect law enforcement in regards to altercations with racial minorities, as our society depends on police to keep us safe from criminal activity,” and “Don’t know.” Participants then responded to the same eight conviction items from Study 1 regarding the position they selected ( $M = 8.12$ ,  $SD = 2.11$ ,  $\alpha = .89$ ). Given that awe did not exert an influence on attitude extremity in Study 1, extremity was not assessed in this study.

To derive our measure of perceived attitudinal polarization regarding racial bias in law enforcement, we adapted a procedure used by Van Boven, Judd, and Sherman (2012), in which participants were asked to indicate the relative frequency of Americans (*few Americans*, *many Americans*) whom they perceived to agree or disagree with the position they selected, using an adjustable

slider. After being trained on the correct usage of this measure (Van Boven et al., 2012), participants estimated the relative frequency of Americans who held each of five viewpoints—*strongly agree*, *somewhat agree*, *neither agree or disagree*, *somewhat disagree*, and *strongly disagree*—with the statement the participant selected. In estimating this distribution, participants could adjust the sliders independently, and they were not given any numerical information about the height of each bar.

On the basis of each person’s estimated distribution, we were able to calculate the extent to which they perceived polarization regarding Americans’ agreement and disagreement with their selected statement (see Van Boven et al., 2012, for a detailed description of how this variable was computed). The standard deviation of each distribution was computed around the neutral scale midpoint (3 = *neither agree nor disagree*). Perceived polarization values could range between 0 and 2. Higher numbers indicate greater perceived polarization. The overall mean was 1.44 ( $SD = 0.15$ ), suggesting that participants perceived considerable polarization regarding the issue of racial bias in law enforcement.

## Results

In answering whether action is needed to address racial bias in law enforcement, the majority of participants (169; 62%) believed that action is needed, 40 participants (15%) believed that no action is needed, 49 participants (18%) believed that we need to do more to protect law enforcement in regards to altercations with minorities, and 16 participants (6%) selected “Don’t know.” A chi-square test of goodness-of-fit test showed that there was no effect of emotion-induction condition on position statement selected,  $\chi^2(6) = 3.66$ ,  $p > .250$ .

**Does awe lead to reduced ideological conviction?** A one-way ANOVA showed significant condition differences on our eight-item conviction index,  $F(2, 271) = 4.80$ ,  $p = .009$ ,  $\eta^2 = .034$ , 90% CI [.005, .072].<sup>2</sup> We conducted planned comparisons to test whether the awe induction ( $M = 7.56$ ,  $SD = 2.23$ ) led to reduced conviction relative to the amusement ( $M = 8.40$ ,  $SD = 2.00$ ) and neutral conditions ( $M = 8.38$ ,  $SD = 1.99$ ). Our “awe contrast” compared the awe condition to the neutral and amusement conditions (coded as awe = 2, neutral = -1, amusement = -1), whereas the “control contrast” tested the residual difference between the neutral and amusement conditions (coded as awe = 0, neutral = 1, amusement = -1). The awe contrast was significant,  $t(271) = -3.10$ ,  $p = .002$ ,  $d = -.40$ , 95% CI [-.65, -.14], whereas the control contrast was not,  $t(271) = -0.08$ ,  $p > .250$ ,  $d = -.01$ , 95% CI [-.30, .28]. Thus, the awe condition led to lower ideological conviction than did the amusement or neutral conditions, replicating our findings from the previous two studies.

**Does awe lead to reductions in perceived polarization?** Our analysis revealed significant condition differences in perceived attitude polarization,  $F(2, 271) = 3.78$ ,  $p = .024$ ,  $\eta^2 = .027$ , 90%

<sup>2</sup> For both Experiments 2 and 3, all analyses include participants who selected the response option “Don’t know” when asked to indicate their position on the relevant social issue. In response to reviewer comments, we included these participants in our analyses due to the ambiguity of this response option—it is unclear if these participants are unfamiliar with the social issue or are familiar but uncertain as to their stance. Excluding these participants does not significantly alter the results of any of our analyses.

CI [.002, .062]. Our planned comparisons revealed that our awe induction led to a reduction in perceived polarization ( $M = 1.41$ ,  $SD = 0.14$ ), relative to the amusement ( $M = 1.47$ ,  $SD = 0.13$ ) and neutral conditions ( $M = 1.45$ ,  $SD = 0.16$ ),  $t(271) = -2.67$ ,  $p = .008$ ,  $d = -.34$ , 95% CI [-.60, -.09], whereas the amusement and control conditions did not significantly differ,  $t(271) = -0.63$ ,  $p > .250$ ,  $d = -.09$ , 95% CI [-.38, .20]. Thus, the awe condition led to reduced perceptions of attitudinal polarization in the U.S. relative to the amusement or neutral conditions.

**Does ideological conviction mediate the effect of awe upon perceived polarization?** As reported above, the awe induction led to reduced ideological conviction and perceived attitudinal polarization. In addition, conviction was positively correlated with perceived polarization,  $r = .32$ ,  $p < .001$ . We performed a mediation analysis to test whether the awe induction decreased perceived polarization via ideological conviction. Figure 2 illustrates the mediation model and provides path coefficients. As shown, the negative effect of the awe induction (in contrast to the amusement and neutral inductions) on perceived polarization became only marginally significant ( $p = .077$ ) when conviction was included in the model. The bootstrapping procedure for mediator models (Preacher & Hayes, 2004, 2008) with 10,000 iterations yielded a 95% bias-corrected confidence interval that did not include zero (-.078 to -.013). Thus, conditional on the model assumption awe  $\rightarrow$  reduced ideological conviction  $\rightarrow$  reduced perceptions of polarization in society, our statistical test shows that a reduction in conviction can account for a significant portion of variance in the causal relationship between awe and perceptions of polarization. However, these results should be interpreted with caution because our outcome variables were measured at roughly the same time point; thus, alternative models cannot be excluded (Maxwell & Cole, 2007).

### Study 3: Awe and Tolerance for Opposing Political Views

In the first two studies, experiences of awe, relative to amusement and a neutral state, brought about reductions in individuals' convictions about their attitudes, which in turn predicted decreased perceptions of attitudinal polarization in society. In Study 3, we extended our findings to another social outcome related to conviction: desire for social distance from those with differing ideological attitudes. We also induced the emotional states using a differ-

ent method by having participants recall a prototypical experience of a target emotion—a well-validated technique for inducing specific emotions (e.g., Griskevicius et al., 2010; Piff et al., 2015). Finally, we compared the effects of awe to those of pride instead of amusement. Pride has been commonly used as a positive emotion with which to contrast the effects of awe (Piff et al., 2015; Shiota et al., 2007; Van Cappellen & Saroglou, 2012). More importantly, although both emotions are positive and arousing, awe differs from pride in terms of its elicitors and appraisals: whereas awe is externally elicited (e.g., triggered by natural vistas) and diminishes the self, pride is internally focused on personal accomplishment or abilities and may lead to self-enhancement (e.g., Tracy & Robins, 2004). Thus, awe and pride implicate the self-concept in contrasting ways, which may lead to downstream differences in the social expression of attitudes.

Following our reasoning and findings from Studies 1 and 2, we hypothesize that experiencing awe will lead to a reduced desire for social distance from ideological opponents compared to the pride and neutral conditions.

### Method

**Participants.** A total of 280 participants (126 female, 148 male, five trans woman, trans man, or gender nonconforming, and one declined to state) were recruited to participate in the study via MTurk in exchange for \$1.00. Eight participants were excluded from all analyses for failing attention checks.

Our target sample size was determined using an a priori power analysis based on the effect from Study 2 of emotion condition on conviction, given that it is smaller than that of Study 1 and thus represents a more conservative estimate. Specifically, with an  $\eta^2$  of .034, our between-subjects design with three groups could achieve 80% power with as few as 270 participants. Because the first two studies contained relatively few exclusions we targeted an only slightly larger final sample of 280 participants.

**Procedure.** Participants were randomly assigned to one of three narrative recall conditions by having participants recall and write about a time in which they were in a situation that is a prototypical elicitor of the target emotion (Griskevicius et al., 2010; Piff et al., 2015). We contrasted an awe induction with both a neutral induction and a pride induction. The awe induction by design prompted participants to think about an experience related to nature, to avoid thinking about awe-inspiring people, which could introduce problematic confounds. The specific instructions that participants received in each emotion condition are below (Piff et al., 2015):

**Awe.** Please take a few minutes to think about a particular time, fairly recently, when you encountered a natural scene that caused you to feel awe. This might have been a sunset, a view from a high place, or any other time you were in a natural setting that you felt was beautiful.

**Pride.** Please take a few minutes to think about a particular time, fairly recently, when you felt pride. This might have been being accepted to a university, winning an event or competition, or any other time that you achieved a personal accomplishment.

**Neutral.** Please take a few minutes to think about something you did fairly recently. This might have been riding a bike, studying for a test, or any other thing that happened during your day.

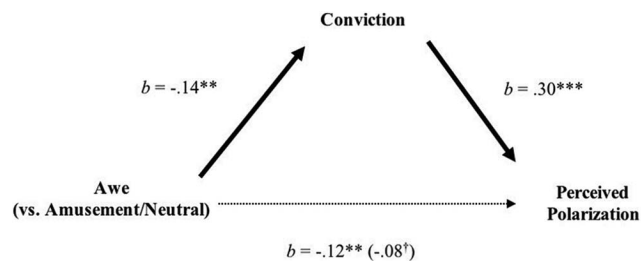


Figure 2. Mediation model for Study 2. The predictor variable compares the awe condition with the amusement and neutral conditions (awe = +2, amusement = -1, neutral = -1). Analyses control for the orthogonal control contrast (awe = 0, amusement = -1, neutral = +1). Unstandardized coefficients are shown. †  $p < .10$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

All participants were then asked to write at least five sentences describing the experience, their accompanying emotions, and what they were thinking about during the experience, providing as much detail as they could.

Ideological conviction was assessed with the same procedure as in Studies 1 and 2 (McGregor et al., 2001), but this time in reference to the issue of immigration. Participants were presented with three statements about the issue: "We should not restrict immigration to the U.S., as immigrants improve American society by bringing in new ideas and cultures and are generally good for the economy," "We should restrict immigration to the U.S., as immigrants increase crime rates and are generally bad for the economy, as they take jobs away from people who were born in the U.S.," and "Don't know." Participants again selected the position that they agreed with most. Participants then responded to the same eight conviction items from Studies 1 and 2 regarding the position they selected ( $M = 8.13$ ,  $SD = 2.34$ ,  $\alpha = .93$ ).

As our primary outcome measure in this study, we assessed tolerance for opposing points of view regarding the issue of immigration. We operationalized this construct as the desire for social distance from those with differing viewpoints. For our measure of social distance, participants were asked to indicate the extent to which they agreed or disagreed with 10 different completions to the sentence stem "I would be happy to have someone who did not share my views on immigration . . ." (Skitka et al., 2005). Sentence completions consisted of various relationship types (e.g., "as a neighbor," "as someone I would personally date"). Participants responded on 7-point Likert scales (1 = *strongly disagree*, 7 = *strongly agree*). All items were reverse-scored and averaged to create a global index of social distance,<sup>3</sup> with higher values reflecting greater social distance ( $M = 3.98$ ,  $SD = 1.54$ ,  $\alpha = .96$ ).

## Results

The majority of participants (150; 55%) had positive views toward immigration, 87 participants (32%) had negative views, and 35 participants (13%) selected "Don't know." A chi-square test of goodness-of-fit test showed no effect of emotion-induction condition on position statement selected,  $\chi^2(4) = 2.30$ ,  $p > .250$ .

**Does awe lead to reduced ideological conviction?** A one-way ANOVA showed only marginally significant condition differences in conviction,  $F(2, 269) = 2.43$ ,  $p = .090$ ,  $\eta^2 = .018$ , 90% CI [0, .047]. We conducted planned comparisons to test whether the awe induction led to reduced conviction ( $M = 7.69$ ,  $SD = 2.30$ ), relative to the pride ( $M = 8.38$ ,  $SD = 2.21$ ) and neutral conditions ( $M = 8.32$ ,  $SD = 2.45$ ). Our "awe contrast" compared the awe condition with the neutral and pride conditions (coded as awe = 2, neutral = -1, pride = -1), whereas the "control contrast" tested the residual difference between the neutral and pride conditions (coded as awe = 0, neutral = 1, pride = -1). The awe contrast was significant,  $t(269) = -2.20$ ,  $p = .029$ ,  $d = -.28$ , 95% CI [-0.54, -.03], whereas the control contrast was not significant,  $t(269) = -0.19$ ,  $p > .250$ ,  $d = .03$ , 95% CI [-0.32, .26]. A post hoc one-tailed Dunnett's  $t$  test that compared the awe condition to each of the other two conditions showed that conviction was significantly lower in the awe condition than the pride condition,  $p = .045$ , but there was only a marginally significant difference between the awe and neutral

conditions,  $p = .060$ . Thus, though these results replicate the overall pattern found in the previous two experiments, they provide weaker support for our hypotheses given the absence of a significant omnibus effect of emotion condition and a significant difference between the awe and neutral conditions in our post hoc analyses.

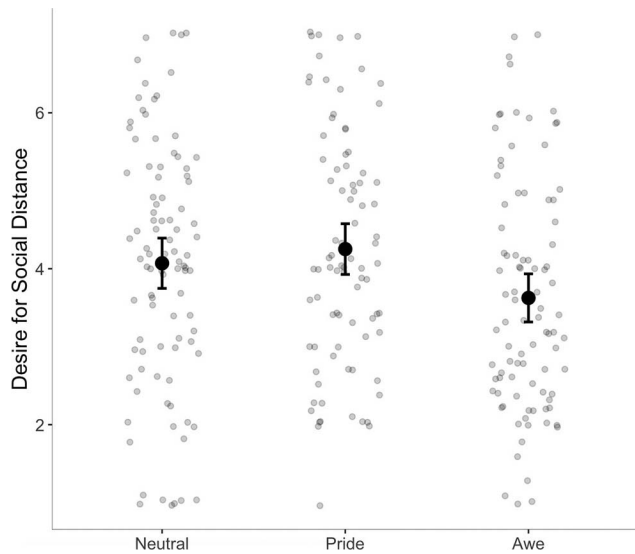
**Does awe influence desire for social distance?** We next tested the influence of emotion induction condition on desire for social distance from those with opposing views. The results of this analysis are presented in Figure 3. A one-way ANOVA showed significant condition differences in desire for social distance,  $F(2, 267) = 3.99$ ,  $p = .020$ ,  $\eta^2 = .029$ , 90% CI [.003, .065]. Planned comparisons revealed that our awe induction led to a reduction in desired social distance ( $M = 3.63$ ,  $SD = 1.48$ ), relative to the pride ( $M = 4.25$ ,  $SD = 1.51$ ) and neutral conditions ( $M = 4.07$ ,  $SD = 1.57$ ),  $t(267) = -2.73$ ,  $p = .007$ ,  $d = -.35$ , 95% CI [-0.61, -.10], whereas the pride and control conditions did not significantly differ,  $t(267) = -0.80$ ,  $p > .250$ ,  $d = -.12$ , 95% CI [-0.41, .17]. Thus, the awe induction reduced the desire for social distance relative to the pride and neutral conditions.

**Does ideological conviction mediate the effect of awe upon desire for social distance?** As reported above, the awe induction led to significantly reduced conviction compared to the pride induction (and marginally reduced conviction compared with the neutral condition), as well as significantly decreased desire for social distance. In addition, conviction was positively correlated with desire for social distance,  $r = .27$ ,  $p < .001$ . Given these results, we performed a mediation analysis to test whether the awe induction decreased desire for social distance via conviction. Though the negative effect of awe (in contrast to pride and neutral conditions) on desire for social distance remained significant when conviction was included in the model ( $p = .027$ ), the bootstrapping procedure for mediator models with 10,000 iterations yielded a 95% bias-corrected confidence interval that did not include zero (-0.05 to -0.002; Preacher & Hayes, 2004, 2008). Thus, conditional on the model assumption awe  $\rightarrow$  reduced ideological conviction  $\rightarrow$  reduced desire for social distance, our test shows that a reduction in conviction can account for a significant portion of variance in the causal relationship between awe and desire for social distance. However, these results should be interpreted with caution because (a) as discussed above, awe did not significantly affect conviction above and beyond our neutral condition; and (b) as in Study 2, our outcome variables were measured at roughly the same time point and thus alternative models cannot be excluded (Maxwell & Cole, 2007).

## General Discussion

In the current investigation, we examined whether the experience of awe can undermine cognitive processes that foster hostility and conflict between those on opposite sides of contentious ideological issues (e.g., Keltner & Haidt, 2003; Weber, 1968). Given

<sup>3</sup> In addition to our global 12-item index of social distance, in accordance with previous research (Skitka et al., 2005), we split this measure into two subscales: one assessing social distance in prospectively intimate relationships (e.g., friend, roommate) and one assessing social distance in prospectively distant relationships (e.g., neighbor, owner of a store one frequents). The results of our analyses do not differ as a function of relationship type, thus only the analysis using the global index is reported.



**Figure 3.** Results from Study 3: level of desire for social distance as a function of emotion induction condition. The small symbols represent individual responses on our social distance measure. The large symbols indicate the overall means for each emotion induction condition; error bars represent 95% confidence intervals.

that awe can trigger a relative diminishment of one's individual concerns (Bai et al., 2017; Piff et al., 2015), increased humility vis-à-vis one's own virtues and an appreciation of others' strengths (Stellar et al., 2018), and the need to revise mental structures (Griskevicius et al., 2010; Keltner & Haidt, 2003), we reasoned that awe should lead individuals to question their beliefs, thus expressing less ideological conviction and adopting attitudes that promote greater social harmony between opposing ideological partisans.

The results of the three studies reported here lend support to this central hypothesis. In Study 1, experimentally inducing awe caused individuals to express reduced conviction regarding the issue of capital punishment. In the subsequent studies, we documented the effects of awe upon consequent outcomes empirically established to result from conviction and potentially drive the relationship between conviction and ideological conflict (e.g., Keltner & Robinson, 1996; Skitka et al., 2005; Tagar et al., 2014; Van Boven et al., 2012; Westfall et al., 2015)—namely, perceptions of others' attitudes as extreme and polarized (Study 2) and prejudicial behavioral tendencies toward those with different ideological views (Study 3). Importantly, these findings were specific to awe, did not extend to other positive emotions (i.e., amusement, pride), and were not confounded by more general positive affect. Furthermore, we observed our results across both video inductions and narrative recalls of awe.

The results from the present investigation extend what is known about awe in substantial ways. First, they advance arguments about the epistemic functions of awe (e.g., Shiota et al., 2017), revealing how awe attenuates ideological conviction in ways that are keeping with its effects upon humility, openness, and orientation toward social harmony. More generally, these findings contribute to the growing literature documenting the centrality of emotions to moral judgment, in the present case revealing that emotions not

only shape specific moral judgments, but also metaperceptions of the polarized nature of moral conflicts (e.g., Haidt, 2001, 2003; Horberg, Oveis, & Keltner, 2011).

Before turning to the implications of these findings, it is important to consider some limitations of our methods. The three studies reported here do not allow us to test the boundary conditions of our effects. Notably, we studied one kind of awe: the awe elicited by viewing video clips of natural stimuli or recalling awe-inspiring experiences in nature. This raises the question of whether other elicitors of awe—for example, inspiring public figures, virtuous individuals within a community, or awe felt at a sporting event or political rally—or particularly extreme awe experiences would produce similar reductions in conviction. It is possible that such stimuli would *increase* conviction through feelings of enhanced group identity (Durkheim, 1912; Páez, Rimé, Basabe, Włodarczyk, & Zumeta, 2015) or, in the case of particularly intense experiences, through compensatory mechanisms meant to alleviate uncertainty (e.g., McGregor et al., 2001; Valdesolo & Graham, 2014). Similarly, in none of our studies did we assess conviction within a domain that was relevant to the content included in the manipulation. It is possible that if we measured conviction regarding a nature-relevant issue such as climate change, we would have seen the effect nullified or reversed.

Other limitations concern interpretability of the results. Though the results of our mediational analyses suggest that awe reduces perceived polarization and desire for social distance via diminished conviction, this conclusion is only speculative at this point given that our design does not allow us to establish a causal effect of conviction on our other outcomes (Maxwell & Cole, 2007). The mediation model in Study 3 is particularly difficult to interpret given the marginal effect of awe on conviction compared with that of our neutral condition. Finally, our data do not provide evidence for a mechanism driving the link between awe and conviction. Past theory suggests that awe might affect conviction through increased humility (e.g., Bai et al., 2017; Stellar et al., 2018) or increased uncertainty (Griskevicius et al., 2010). Future studies using longitudinal data—for example, tracking individuals for a period of time after a profound awe experience—would be able to provide more clarity on both of these issues.

Final limitations concern our dependent measures. Outcome measures in all three studies are limited to self-report, and while these measures have been shown to be predictive of real-world behavior (e.g., Skitka et al., 2005; Van Boven et al., 2012), future research would be well served by verifying that awe's influence on conviction extends to relevant behaviors (e.g., political activism, willingness to engage in conversation with ideological opponents). Additionally, our results indicated that experiencing awe had no effects on attitude extremity in Experiment 1 or favorability in any of the experiments, suggesting that awe's influence is limited to the conviction with which one holds their attitudes. While this is conceptually intriguing in terms of zeroing in on the specificity of awe's effects, it invites caution when considering the implications of our findings. As discussed in the introduction, our lack of evidence suggesting that awe can modify aspects of the specific position statements selected is hardly surprising. Much of the previous research on the influence of emotions on aspects of attitudes has converged on variables related to conviction, such as clarity and certainty (e.g., Bodenhausen, Kramer, et al., 1994; Briñol, Petty, & Barden, 2007; Clore & Huntsinger, 2007; Tiedens



& Linton, 2001), as it is notoriously difficult to directly alter people's views on various issues (e.g., Howe & Krosnick, 2017; Krosnick & Petty, 1995; Petty & Cacioppo, 1986). Furthermore, awe's uniquely dueling appraisals—decreased tolerance of uncertainty combined with increased openness and humility (e.g., Stellar et al., 2018; Valdesolo & Graham, 2014)—further support our pattern of results. However, while our findings may be expected, they limit our ability to make claims about awe's utility for reducing actual ideological polarization in society. It should be noted that our manipulations of awe were quite mild (i.e., internet videos, narrative recall). Future studies should examine if more intense experiences of awe, such as those provided by immersion in nature or virtual reality (e.g., Anderson, Monroy, & Keltner, 2018; Chirico, Ferrise, Cordella, & Gaggioli, 2018), might be more effective in reducing the extremity of one's attitudes.

Nevertheless, the findings reported here hint at significant relevance for political discourse. As reviewed earlier, the strength of one's convictions is predictive of resistance to attitude-inconsistent information and increased social distance from those with differing beliefs (e.g., Pomerantz et al., 1995; Skitka et al., 2005)—which are in turn predictive of reduced prosocial and affiliative behavior toward such individuals (e.g., Wright et al., 2008). Perceptions of polarization, though distinct from actual polarization, may give rise to the belief that political opponents are more unwaveringly oppositional and dissimilar, leading individuals to expect conflict and hostility in political discourse and reducing the likelihood of respectful engagement with political opponents (Fiorina et al., 2005). As such, while more data is needed to ascertain the extent of awe's effects on attitudinal variables, our experiments represent a substantial first step in explicating its possibilities.

Despite these limitations, our findings carry noteworthy implications for future research. Within the literature on discrete emotions and attitudes (Keltner & Lerner, 2010), our findings position awe as a unique emotion. Much of this literature has focused on the effects of emotions on attitudes and judgments within specific domains—for example, the role of compassion in attitudes related to harm (Goetz, Keltner, & Simon-Thomas, 2010), anger in attitudes related to violations of individual rights, or disgust in purity-related attitudes (Rozin et al., 1999). However, the distinctive appraisals of awe—feeling diminished in the presence of something greater than the self and the need for cognitive accommodation triggering a sense of uncertainty (Keltner & Haidt, 2003)—hint that awe might serve as an inhibitor of ideological conviction that is not domain-specific. Indeed, the fact that our findings generalized across three highly dissimilar issues—capital punishment, racial bias in law enforcement, and immigration—lend some preliminary support for this notion. More work is needed to determine if awe exerts a more powerful influence in certain attitude domains.

Our findings also dovetail in intriguing ways with other recent work documenting that experiences of awe prompt increased support for beliefs that maintain one's sense of order (Valdesolo & Graham, 2014; Valdesolo et al., 2016). The present two studies point to possible mechanisms and extensions of this finding. Namely, in our studies awe appears to increase attitudinal ambivalence, known to lead to a compensatory search for epistemological order which in turn augments perceived group cohesiveness regarding beliefs and attitudes (van Harreveld, Rutjens, Schneider, Nohlen, & Keskinis, 2014). It may be that the drop in perceived

polarization observed in Study 2 serves to restore the sense of order and certainty whose absence is often a source of awe—an interpretation supported by evidence suggesting that feelings of uncertainty enhance perceptions of group cohesion and identification (e.g., Van den Bos, 2009). Along these lines, it is possible that the cognitive upheaval brought about by experiences of awe lead to reduced conviction in the short term, but as the accommodation process unfolds over time, actually enhance group identity and solidify beliefs. This would explain how inspiring public figures and titanic collective events (e.g., Martin Luther King, Jr. and the massive demonstrations of the Civil Rights Movement) have been able to bring about social change—by eliciting awe among those bearing witness, they are able to create transformative experiences that break down existing belief systems and, ultimately, replace them with new, strongly held ones.

## Conclusion

Events that trigger awe are often among the most powerful and cherished emotional experiences. Our investigation adds to a growing literature demonstrating that awe's profundity is mirrored in its social-cognitive outcomes (e.g., Bai et al., 2017; Griskevicius et al., 2010; Rudd et al., 2012; Stellar et al., 2018; Valdesolo & Graham, 2014). The present investigation converges with other studies documenting the collective benefits of awe (Piff et al., 2015; Shiota et al., 2007). Here we find that awe can lessen conviction about one's ideological attitudes, promote a view of society as less polarized and more cohesive, and bring people closer to those with whom they disagree. Future research should build on these findings to further reveal the ways in which awe modifies cognition and social perception.

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