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BRIEF REPORT

The Effects of Belief in God and Science on Acute Stress

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It is widely assumed that belief in God allows people to better cope with life's stresses. This stress-buffering effect is not limited to religion; when faced with stress, nonreligious people cling on to other belief systems, notably belief in science. We report an experimental test of whether people are able to down-regulate an acute stress experience by reflecting on their beliefs. We used the Trier Social Stress Test to induce stress in religious and scientist participants from the United Kingdom by having them discuss arguments for and against the United Kingdom leaving the European Union ("Brexit"). Prior to stress induction, participants were or were not reminded of their belief in God or science. We included subjective, cardiovascular, and cortisol stress measures at multiple time points. At both subjective and cardiovascular levels, participants reliably experienced stress. However, considering one's belief in God or science did not mitigate stress responses. Religious participants were somewhat less reactive to stress induction than scientists. Despite the large correlational literature on the stress-buffering effects of faith, under acutely stressful circumstances, reflecting on one's beliefs may not confer immediate benefits.

Keywords: stress, coping, belief, religion, science

Why do people believe in God(s)? One explanation is that faith allows people to cope with life's stresses by providing meaning to their circumstances. Knowing that the world is organized and commanded by a powerful, benevolent being can comfort the believer (Kay, Gaucher, Napier, Callan, & Laurin, 2008). Indeed, correlational studies suggest a negative association between religious faith and stress-related illness, including cardiovascular disease and high blood pressure (BP; Chida, Steptoe, & Powell, 2009; Gartner, Larson, & Allen, 1991; Koenig, 2008; Powell, Shahabi, & Thoresen, 2003), and a positive association with psychological adjustment to stress (Ano & Vasconcelles, 2005). Moreover, experimental studies indicate that exposure to stressful stimuli leads religious individuals to strengthen their belief in God (Norenzayan & Hansen, 2006; Vail, Arndt, & Abdollahi, 2012). Intriguingly, the stress-buffering effect of faith is not limited to religion: When faced with stress and uncertainty, nonreligious people also cling to meaningful belief systems, notably belief in science (Farias, Newheiser, Kahane, & de Toledo, 2013; Rutjens, van Harreveld, van der Pligt, Kreemers, & Noordewier, 2013).

Despite these suggestive findings, a key question remains unexplored: Does belief in God (or science) in fact allow people to better regulate acute stress? We examined this question experimentally by using an acute stress induction task in which participants are asked to engage in public speaking in front of a panel that will

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judge their performance (i.e., the Trier Social Stress Test; Kirschbaum, Pirke, & Hellhammer, 1993). Fortuitously, we conducted the study a few months before a sociopolitical situation that affected an entire nation—Brexit, the June 2016 referendum in which the United Kingdom voted to leave the European Union. Thus, we asked participants to prepare their public speaking task focusing on arguments for or against Brexit. We hypothesized that religious belief, and possibly also belief in science, would offer individuals a way of regulating their stress responses, such that believers in religion and science would experience less acute stress when prompted (vs. not prompted) to reflect on their beliefs. We measured stress at both subjective and physiological levels.

Method

Participants and Design

All data were collected before the Brexit vote took place. We recruited 51 religious individuals (all were students) and 49 nonreligious scientists (all were postgraduate-level students in a science discipline) from two British universities (total $N = 100$; 52 women; $M_{age} = 25.67$, $SD = 5.62$, range = 19–56[1]) and measured their responses during a stress induction task (the Trier Social Stress Test; Kirschbaum et al., 1993). The study received university ethics approval under the title "The Role of Belief in Coping With Social Stress." To recruit two relatively homogeneous groups of religious and science believers, we advertised an experiment entitled "Individual Differences in Stress Responses" for "Religious Believers" and "Scientists" separately (*Looking for Religious Believers* or *Looking for Scientists*). We then prescreened participants via e-mail by asking them to answer questions about their beliefs and religious practices. To be included in the religious sample, participants had to score 5 or higher on a single item assessing religiosity ("How religious do you consider yourself to be?"; 1 = *not religious at all* to 7 = *very religious*), to report belief in God or something divine ("To what extent do you believe that God, deities, or something divine exists?"; 1 = *not at all* to 7 = *very much so*), and to report praying and attending religious services regularly (at least one to three times per month). To be included in the scientist sample, participants had to be postgraduate-level students in a science discipline and score 3 or lower on the religiosity item, to score *not very much* or *not at all* on the belief in God/divine being item, and to report *rarely* or *never* attending religious services or praying. Further eligibility criteria for all participants included not taking heart medication or any other medication that might affect cardiovascular or salivary cortisol responses (e.g., antidepressants) and having no BP or heart problems. Finally, all participants were instructed to refrain from smoking, consuming alcohol and caffeine, and vigorous exercise for at least three hours prior to participation.

Prior to undergoing stress induction, participants were randomly assigned to the belief or control conditions, and completed a brief writing task. In the belief condition ($N = 51$), participants were instructed as follows (with the bracketed text varying between religious vs. scientist participants): "Write about what [your religion/science] personally means to you . . . focus on a moment or event in which [your religion/science] has been particularly meaningful to you. Please try to convey the impact of this experience" (adapted from Inzlicht & Tullett, 2010). In the control condition ($N = 49$), participants were instead instructed to write about their favorite season. As an example, a religious participant in the belief condition wrote,

> Religion has always been a very big part of my life, especially coming from a religious family. This is particularly reflected when I am undergoing stress, downfall in my life or sadness. During these times, my first source of comfort would be my religion. Going to church to pray and ask for help from God has always made me feel better instantly.

A scientist participant in the belief condition wrote,

[1] We examined age distributions across the religious and scientist samples. In the religious sample, we observed two outliers (z scores of 4.51 and 5.40) based on participants who were 51 and 56 years old. When these two participants were excluded from analysis, we observed no reliable age difference between the two samples, $t(96) = 1.43$, $p = .156$. Religious participants, with the two outliers included, were on average 26.8 years old (range = 19–56), whereas scientist participants were on average 24.5 years old (range = 19–33).

I find learning about science relaxing, especially about animals, dinosaurs or fossils. This year's New Year resolution was when stressed or depressed to start at the bottom of the tree of life and work up it, learn a little bit until I feel a bit better and then stop. I'm not sure what it is about zoology in general that I find so calming.

Procedure and Measures

The study was conducted by two research assistants who advertised the study, prescreened and recruited all participants, and conducted all procedures. One of the research assistants met each prescreened participant at the reception of the psychology department and escorted the participant to the testing room. Participants were randomly assigned to one of the two conditions, with the experimenter remaining blind to condition. Random assignment was implemented by having survey packets for the belief and control conditions intermixed in separate piles for religious and scientist participants. We followed the standard procedure for the Trier Social Stress Test (Kirschbaum et al., 1993), and included subjective measures of affect (Watson, Clark, & Tellegen, 1988), stress (Cohen, Kamarck, & Mermelstein, 1983), and state anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) that have been well validated and are used frequently with both general and clinical populations.

The procedure consisted of the following steps: (a) Upon arrival, heart rate (HR) and systolic and diastolic BP were measured; these data were not analyzed, as the purpose was simply to familiarize participants with cardiovascular measurement. (b) Participants watched a 10-min nature video to induce relaxation. HR and BP were assessed at 8 and 10 min (averaged into baseline cardiovascular function). At 10 min, participants provided a saliva sample (for baseline cortisol). (c) Participants completed the 20-item State Anxiety Inventory (Spielberger et al., 1983; e.g., "I am tense"; $\alpha = .93$ in the present sample at this baseline measurement) and the 10-item Perceived Stress Scale (Cohen et al., 1983; e.g., "I feel unable to cope with all of the things I have to do"; $\alpha = .85$ in the present sample at this baseline measurement), using scales anchored at 1 (*not at all*) and 6 (*very much*) and answering in terms of how they felt "at this moment." (d) Participants spent 5 min writing about their belief in science/religion or favorite season, depending on condition, after which we measured HR and BP (cardiovascular function during writing). (e) Participants completed the 20-item Positive and Negative Affect Schedule (Watson et al., 1988). Neither positive ($\alpha = .91$ in the present sample) nor negative mood ($\alpha = .78$ in the present sample) differed as a function of experimental condition, participant type, or their interaction, *p*s $> .15$. (f) Participants were informed they would have 5 min to prepare a speech in which they were to discuss arguments for and against the United Kingdom leaving the European Union (i.e., stress induction). They were told the speech would be given in front of three judges and that they would be audio-recorded for later analysis (see the Appendix for full text of the instructions given to participants). (g) While participants prepared for the speech, we measured HR and BP at 0.5, 2.5, and 4.5 min (averaged into cardiovascular function during stress); at the end of this period a second research assistant knocked on the door and announced that the judges would be ready in 15 min. (h) Participants gave a 2-min practice speech, after which HR and BP were measured (cardiovascular function during practice). (i) Participants recompleted the State Anxiety Inventory ($\alpha = .96$ in the present sample at this poststress measurement) and Perceived Stress Scale ($\alpha = .88$ in the present sample at this poststress measurement) from Step 3. (j) Participants waited for 10 min; HR and BP were measured at 8 and 10 min (averaged into cardiovascular function after stress) and participants provided a saliva sample at 10 min (cortisol after stress). (k) Participants were debriefed and informed they would not need to give the speech. Finally, participants completed two 10-item measures assessing belief in science (e.g., "Science is the most efficient means of attaining truth"; $\alpha = .91$ in the present sample) and religious belief (e.g., "Without religion my life would have little meaning"; $\alpha = .97$ in the present sample; with 1 = *strongly disagree* and 6 = *strongly agree*; from Farias et al., 2013). Variation in degrees of freedom reported below is due to missing data.

Results

Participant Characteristics

As part of a demographic questionnaire completed at the beginning of the study, participants reported their religious affiliation (free-response item). All 51 participants in the religious sample reported having a religious affiliation (29 participants reported being Christian, seven reported being Catholic, one reported being or-

thodox Christian, one reported being Buddhist, six reported being Hindu, and seven reported being Muslim). Among the 49 scientist participants, 15 (31%) reported being atheist and 22 (45%) reported having no religious affiliation. Three scientist participants reported being Christian, 2 reported being Catholic, four reported being Hindu, one reported being spiritual, one reported being both Christian and atheist, and one did not respond to this item.

Given that self-reporting a religious affiliation does not necessarily denote being religious, we next examined responses to the measures of belief in science and religion completed at the end of the study. A 2 (Participant: religious vs. scientist) × 2 (Condition: belief vs. control) × 2 (Belief Measure: science vs. religion) mixed-model analysis of variance (ANOVA), with repeated measures on the last factor (i.e., treating level of belief in science and religion as outcome measures), revealed a main effect of participant, $F(1, 94) = 47.45$, $p < .001$, $\eta_p^2 = .34$, a main effect of belief measure, $F(1, 94) = 18.57$, $p < .001$, $\eta_p^2 = .17$, and the anticipated Participant × Belief Measure interaction, $F(1, 94) = 169.04$, $p < .001$, $\eta_p^2 = .64$. All other effects (each of which involved effects of condition) were nonsignificant, $ps > .08$ (see Table 1 for all means and standard deviations). Follow-up tests showed that the simple main effect of belief measure was reliable among both scientists, $F(1, 46) = 184.02$, $p < .001$, $\eta_p^2 = .80$, and religious participants, $F(1, 48) = 32.35$, $p < .001$, $\eta_p^2 = .40$. Alternative simple main effects (using a heterogeneous error term that adjusts the degrees of freedom to account for repeated measures; Howell, 2002) revealed that religious participants scored higher than scientist participants on religious belief, $F(1, 152.46) = 216.03$, $p < .001$, and scientists scored higher than religious participants on belief in science, $F(1, 152.46) = 59.17$, $p < .001$. Overall, whereas scientists reported strong belief in science ($M = 4.70$, $SD = 0.87$) and very low religious belief ($M = 1.84$, $SD = 0.98$), religious participants reported strong religious belief ($M = 4.68$, $SD = 1.08$) and moderate belief in science ($M = 3.22$, $SD = 0.96$). Together with data on participants' self-reported religious affiliation, these results confirm that the two participant groups differed in intended ways in terms of their belief systems.[2]

Table 1
Means and Standard Deviations on Measures of Belief in Science and Religious Belief Reported by Scientist and Religious Participants in the Belief and Control Conditions

Measure	Participant type	Condition	*M* (*SD*)
Belief in science	Scientist	Belief	4.55 (0.88)
		Control	4.89 (0.83)
	Religious	Belief	3.25 (0.95)
		Control	3.18 (0.99)
Religious belief	Scientist	Belief	2.17 (1.19)
		Control	1.44 (0.39)
	Religious	Belief	4.66 (0.93)
		Control	4.70 (1.24)

Note. Possible scale for both measures is 1–6, with higher scores indicating greater belief strength. All effects of experimental condition were statistically nonsignificant.

State Anxiety and Perceived Stress

A 2 (Participant: religious vs. scientist) × 2 (Condition: belief vs. control) × 2 (Time: baseline vs. after stress task) mixed-model ANOVA on state anxiety revealed a main effect of time, $F(1, 96) = 65.64$, $p < .001$, $\eta_p^2 = .41$, and a Participant × Time interaction, $F(1, 96) = 4.18$, $p = .044$, $\eta_p^2 = .04$. All other effects were nonsignificant, $ps > .10$. State anxiety was higher after the stress task than at baseline; this difference was greater among scientists than religious participants (see Figure 1). The same analysis on perceived stress revealed only a main effect of time, $F(1, 89) = 11.53$, $p = .001$, $\eta_p^2 = .12$. All other effects were nonsignificant, $ps > .13$. Perceived stress was higher after the stress task than at baseline (see Figure 1).

[2] Forty-nine percent of the scientists and 55% of the religious participants were female, suggesting a balanced gender representation. A 2 (Participant Gender) × 2 (Belief Measure: religion, science) mixed-model ANOVA with repeated measures on the belief measure factor (i.e., treating these measures as outcomes) revealed no main effect of participant gender), $F(1, 96) = 0.24$, $p = .623$, $\eta_p^2 = .00$, and no interaction, $F(1, 96) = 0.00$, $p = .973$, $\eta_p^2 = .00$. Thus, we observed no gender differences in belief in science (women: $M = 3.91$, $SD = 1.07$; men: $M = 3.98$, $SD = 1.29$) or religious belief (women: $M = 3.26$, $SD = 1.72$; men: $M = 3.31$, $SD = 1.85$).

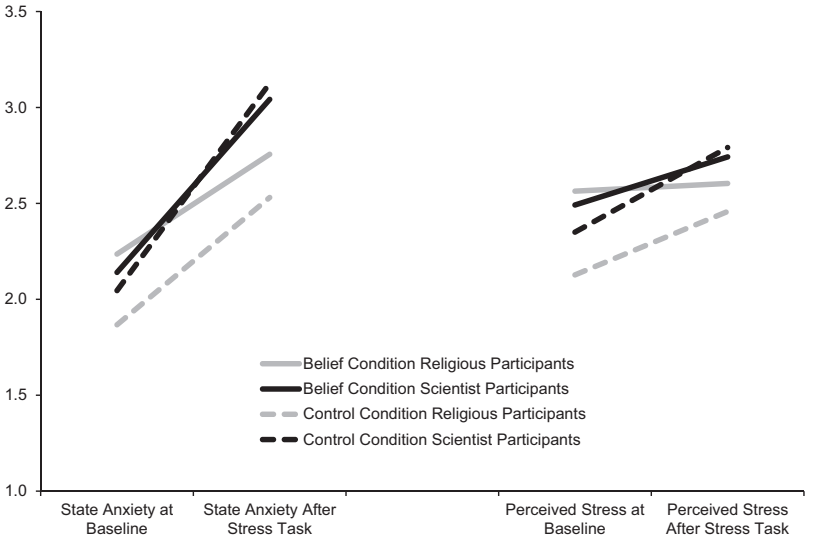

Figure 1. Levels of state anxiety (on the left) and perceived stress (on the right) reported by religious and scientist participants in the belief and control conditions at baseline and after the stress induction task was completed. Possible range = 1–6.

Cardiovascular Responses

A 2 (Participant: religious vs. scientist) × 2 (Condition: belief vs. control) × 5 (Time: baseline, during writing, during stress induction, during practice speech, after stress) mixed-model ANOVA on HR (see Figure 2) revealed a main effect of time, $F(4, 368) = 23.26$, $p < .001$, $\eta_p^2 = .20$, and a Participant × Time interaction, $F(4, 368) = 2.86$, $p = .023$, $\eta_p^2 = .03$. All other effects were nonsignificant, $ps > .20$. The main effect of Time was reliable among all participants but was stronger among scientists ($\eta_p^2 = .29$) than religious participants ($\eta_p^2 = .12$). Follow-up paired-samples t tests revealed that HR decreased from baseline to during writing among scientists, $t(48) = 2.73$, $p = .009$, but did not change among religious participants, $t(50) = 0.35$, $p = .729$. HR increased from writing to during stress induction among all participants ($ts > 4$, $ps < .001$) and decreased from stress induction to practice speech among all participants ($ts > 4$, $ps < .001$). HR remained stable between practice speech and after stress among all participants ($ts < 1$, $ps > .37$).

For systolic BP (see Figure 3), the same analysis revealed a main effect of time, $F(4, 364) = 34.23$, $p < .001$, $\eta_p^2 = .27$. All other effects were nonsignificant, $ps > .09$. Systolic BP increased from baseline to during writing, $t(99) = 3.40$, $p = .001$, increased from writing to during stress, $t(99) = 6.66$, $p < .001$, was stable between stress induction and practice speech, $t(94) = 0.42$, $p = .678$, and decreased from practice speech to after stress, $t(94) = 4.52$, $p < .001$.

For diastolic BP (see Figure 3), we observed a main effect of time, $F(4, 364) = 21.26$, $p < .001$, $\eta_p^2 = .19$. Diastolic BP increased from baseline to during writing, $t(99) = 2.60$, $p = .011$, increased again from writing to during stress, $t(99) = 6.01$, $p < .001$, was stable between stress induction and practice speech, $t(94) = 0.67$, $p = .504$, and decreased from practice speech to after stress, $t(94) = 2.33$, $p = .022$. We also observed a marginal Condition × Time interaction, $F(4, 368) = 2.21$, $p = .068$, $\eta_p^2 = .02$. All other effects were nonsignificant, $ps > .16$. The marginal interaction was driven by diastolic BP dropping between stress induction and practice speech, $t(46) = 2.58$, $p = .013$, and remaining stable between practice speech and after stress, $t(46) = 0.06$, $p = .951$, in the control condition, whereas in the belief condition diastolic BP was stable between stress

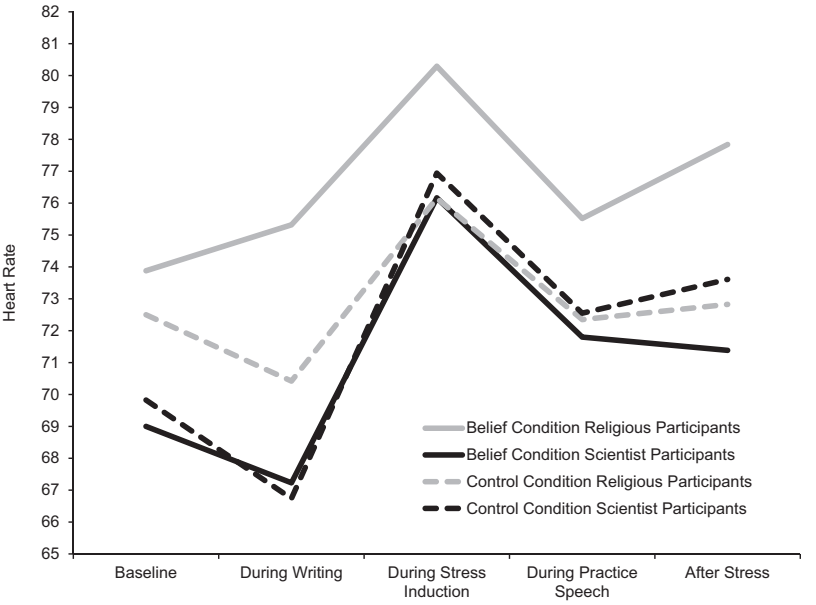

Figure 2. Religious and scientist participants' heart rate in the belief and control conditions at all five measurement points.

induction and practice speech, $t(47) = 0.74$, $p = .465$, and dropped between practice speech and after stress, $t(47) = 3.09$, $p = .003$.

Cortisol

A 2 (Participant: religious vs. scientist) × 2 (Condition: belief vs. control) × 2 (Time: baseline vs. after stress induction) mixed-model ANOVA on salivary cortisol revealed a main effect of condition, $F(1, 85) = 4.84$, $p = .031$, $\eta_p^2 = .05$; cortisol was higher in the control (vs. belief) condition. This effect was not qualified by time, $F < 1$; thus, cortisol levels did not vary due to stress induction. All other effects were nonsignificant as well, $ps > .11$.

Exploratory Analyses

Twelve of the 49 scientist participants reported having some type of religious affiliation (the remaining 37 scientist participants reported being atheist or nonreligious). To bolster the interpretation of our results and provide a stronger distinction between the religious and scientist samples, we reconducted all analyses reported above after excluding these 12 scientist participants. In each case, the pattern was unchanged: On state anxiety, we observed only a main effect of time, $F(1, 84) = 77.49$, $p < .001$, $\eta_p^2 = .48$, and a Participant × Time interaction, $F(1, 84) = 7.28$, $p = .008$, $\eta_p^2 = .08$; state anxiety was higher among all participants after the stress task (vs. baseline). On perceived stress, we observed only a main effect of time, $F(1, 79) = 14.65$, $p < .001$, $\eta_p^2 = .16$; perceived stress was higher after the stress task (vs. baseline). On HR, we observed only a main effect of time, $F(4, 324) = 24.32$, $p < .001$, $\eta_p^2 = .23$, and a Participant × Time interaction, $F(4, 324) = 3.67$, $p = .006$, $\eta_p^2 = .04$; the pattern was identical to that reported above. For systolic BP, we observed only a strong main effect of time, $F(4, 324) = 30.39$, $p < .001$, $\eta_p^2 = .27$, and a weak main effect of participant type, $F(1, 81) = 5.16$, $p = .026$, $\eta_p^2 = .06$ (scientists' systolic BP was overall higher than religious participants'); the pattern across measurement points was identical to that reported above. For diastolic BP, we observed only a main effect of time, $F(4, 320) = 17.51$, $p < .001$, $\eta_p^2 = .18$; the pattern across measurement points was identical to that reported above, except that the increase from baseline to during writing was now only marginally significant ($p = .064$). Finally, on

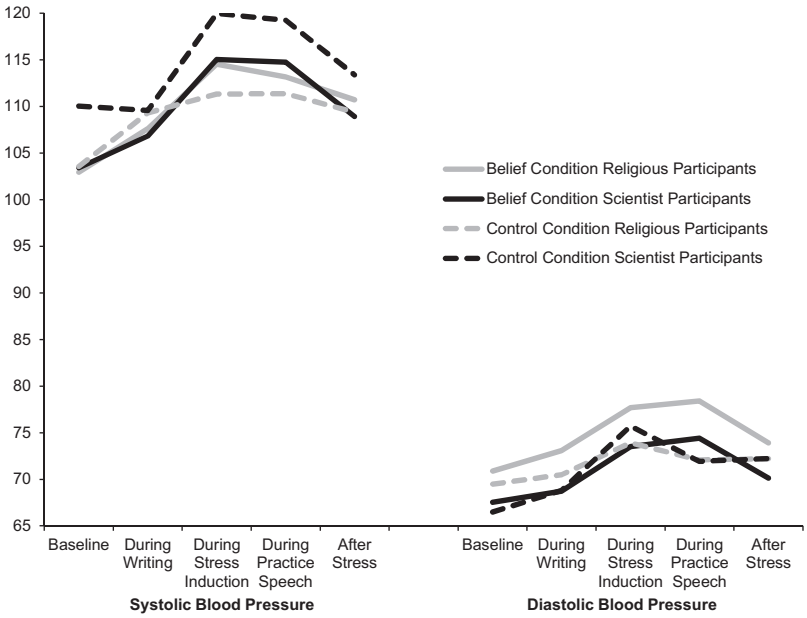

Figure 3. Religious and scientist participants' systolic (on the left) and diastolic (on the right) blood pressure in the belief and control conditions at all five measurement points.

cortisol, we observed a main effect of condition, $F(1, 73) = 4.55$, $p = .036$, $\eta_p^2 = .06$; cortisol was higher in the control (vs. belief) condition but did not vary due to stress induction, $F < 1$.

Discussion

For over a century, psychologists have argued that religion provides people with meaning and can thus help alleviate everyday stress. More recently, it has been suggested that science can also be an effective source of meaning, serving as a surrogate belief system for nonreligious individuals (Farias et al., 2013; Sagan & Druyan, 2006). Here, we tested for the first time whether believers in God or science can use their faith to down-regulate acute stress. We found strong evidence that our stress induction procedure was successful: Subjective measures of state anxiety and perceived stress increased reliably during stress induction, as did cardiovascular indexes of stress. Contrary to predictions, however, we found no differences between participants in the belief condition, who had been prompted to reflect on their belief in God or science, and those in the control condition. This pattern remained the same when we excluded data from scientist participants who also reported having a religious affiliation, providing a cleaner separation of our two participant samples and bolstering the interpretation of the null effect of experimental condition. We did observe that religious participants as a whole (i.e., regardless of which experimental condition they were in) were somewhat less reactive to stress induction than were scientists. Specifically, increases in HR and state anxiety were sharper after the Brexit-related stress induction among scientists (vs. religious participants).

We acknowledge that a key limitation of studies of this kind, in which the goal is to compare two separate groups of participants with contrasting belief systems, is that belief systems are not tight physical entities. To recruit a homogeneous group of religious believers who would not believe in science at all, we would have had to look for Christian religious fundamentalist and antiscience types of believers, a rather difficult task in contemporary Western Europe. In fact, our sample of religious believers had a moderate level of belief in science, which is to be expected given that they were university students. Another methodolog-

ical limitation concerns the use of a societally relevant political topic for the public speaking (i.e., stress induction) task, which to the best of our knowledge has not been done before. Although we believe that the greatest stressor in the present study was the expectation of having to complete a public speaking task, we were not able to assess potential individual differences among our participants on how strongly they felt about the topic of Brexit, nor did we measure individual differences in terms of public speaking skills or stress related to public speaking in general. However, it is plausible that the random assignment to conditions we employed would have alleviated the impact of otherwise potentially significant individual differences.

Despite people's inclination to seek out faith especially during stressful times in their lives, our study showed no evidence that activating belief in God or science allowed participants to down-regulate stress at either subjective or physiological levels. This null effect in our experimental design contrasts with large correlational and quasi-experimental literatures describing the stress-buffering effects of religious belief (Edmondson et al., 2005; Lawler & Younger, 2002; Masters & Knestel, 2011). Perhaps it is not religious belief per se, but rather the larger complex of religious practices, affect, and social support that helps believers cope with stress. Alternatively, the stressor we used, preparing to publicly address the complex sociopolitical issues surrounding Brexit, may have had a particularly depleting effect on participants. Future work will be able to shed light on whether belief may have a more potent buffering effect on different stressors. Another possibility is that whereas momentary activation of belief did not mitigate acute stress in our study, having faith or participating in faithful practices may provide people with resources to cope with ongoing, chronic everyday stress.

Additionally, we note that belief in science and religious belief both represent multifaceted, complex belief systems. Specific elements of each belief system may be differentially relevant to acutely stressful situations that involve uncertainty and uncontrollability, like the situation in which our participants found themselves. That is, perhaps it is not a general belief system that enables down-regulation of acute stress, but rather it may be that more specific elements of one's beliefs serve this function. For example, threats to perceived control have been shown to increase belief in a controlling god (but not in a god as a creator), perhaps allowing people to thereby compensate for their personal lack of control (Kay et al., 2008). Analogously, scientific theories that postulate the existence of stages of development may more effectively compensate for perceived lack of personal control, relative to scientific theories that do not involve steps or stages (Rutjens et al., 2013). It is therefore possible that, had our participants been given the opportunity to reflect on their beliefs after (rather than before) stress induction, they might have been able to selectively consider dimensions of their beliefs that would have more directly helped alleviate the form of stress they were experiencing. Future research may productively consider the effects of changing the order of the tasks employed in the present paradigm to assess whether participants indeed can and do draw on distinct aspects of their belief systems when they are aware of the exact nature of the acute stressor they are facing, and whether that specificity allows them to better down-regulate their responses.

With a variety of intriguing questions remaining unanswered, the present study suggests that when people are not able to exactly anticipate the specific nature of an upcoming acute stressor before it is encountered (arguably the way in which the majority of acute stressors are experienced in everyday life), having reflected on their beliefs immediately prior to stress induction does not appear to buffer them against the subjective and physiological impact of the stressful experience. Do the faithful truly have an advantage over those without faith, or does belief provide a mere semblance of meaning and control? We encourage additional research on these important questions.

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Appendix

Participant Instructions for the Public Speaking Task (i.e., Stress Induction)

Your task in this experiment is to do a presentation in front of a committee of three judges. You will have 5 min to mentally prepare for this. You will have to present three different arguments for and against the following question: "Should the United Kingdom leave the European Union?" You will start with the reasons for this to happen and move on to reasons against. You should articulate your reasons to the committee of judges in a clear and convincing way. The members of the committee will analyze your speech and behavior and will take notes while you speak, judging on fluency, effectiveness of arguments, and confidence of delivery. Your voice will also be recorded by microphone for later analysis. The committee will then ask questions about your arguments. Your presentation will last no longer than 5 min; after this time, you will be asked to stop.

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