

Knowing is Half the Battle: How Education Decreases the Fear of Terrorism

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Abstract

Scholars and policymakers are divided over whether the threat of terrorism is overblown or underestimated. Both sides agree on one thing, however: If you only knew what they know—how few Americans die in terrorist attacks each year, or how many terrorist groups are trying to kill you—you would agree with them. We systematically test these competing assertions by conducting an extensive series of quasi- and true experiments. Evidence gathered from 393 students in 28 terrorism and non-terrorism related courses at 11 universities across the country—in addition to 1,017 respondents from massive open online courses (MOOC) and online surveys—reveals that the more individuals know about terrorism, the smaller they perceive the threat to be to themselves and to the United States, regardless of their demographic characteristics or political affiliation. In the fight against terrorism and the fear it inspires, knowing really is half the battle.

Is the terrorist threat underestimated, or is public fear of terrorism blown out of proportion? Politicians from both major U.S. parties have long identified terrorism as the biggest threat to the United States, including every Democrat and Republican nominee for president since 9/11 (Jackson 2010). In fact, even John Kerry, the only presidential nominee accused of suggesting otherwise, had his campaign respond to the claims that he wanted the terrorist threat to be reduced back to a “nuisance” by noting in 2004 that “John Kerry has always said that terrorism is the No. 1 threat to the U.S.” (CNN 2004). Soon after taking office in 2017, Donald Trump’s administration accused the media of downplaying the threat of terrorism and released a list of 78 terrorist attacks that occurred between 2014-2016. When questioned about the list, White House Press Secretary Sean Spicer said, “What we need to do is to remind people that the Earth is a very dangerous place these days” (Spicer 2017).

Many scholars are skeptical of these claims, but a small number including Graham Allison and Matt Mayer concur and argue that “the odds of a successful nuclear terrorist attack somewhere in the world before the end of 2024 are 51 percent or higher,” and that “The terrorist threat is higher than ever. It is only going to get worse” (Allison 2018, Mayer 2016). Most in this group agree that greater knowledge among the general public would lead to a heightened assessment of the terrorist threat, and therefore increase support for more aggressive counterterrorism measures that would improve the safety of the United States and its citizens.

On the other hand, many academics and a few policymakers have questioned the significance of the terrorist threat. As early as 2006, John Mueller argued that “Although it remains heretical to say so, the evidence so far suggests that fears of the omnipotent terrorist—reminiscent of those inspired by images of the 20-foot-tall Japanese after Pearl Harbor or the 20-foot-tall Communists at various points in the Cold War (particularly after Sputnik)—may have been overblown, the threat presented within the United States by Al Qaeda greatly exaggerated” (Mueller 2006). Risa Brooks is skeptical about the size of the “homegrown” jihadi terror threat, while Edward Herman and Gerry O’Sullivan claim that “the terrorism

industry” of politicians, experts, and the media overhype the threat of terrorism for their own ends (Brooks 2011, Herman & O’Sullivan 1989). A more circumspect assessment of the terrorist threat leads politicians like Rand Paul and Bernie Sanders to rail against “endless wars” that are “staggeringly wasteful,” and join scholars like Barry Posen and Stephen Walt in calls for a more restrained foreign policy (Friedersdorf 2017, Sanders 2019, Posen 2014).

Behind every argument by a scholar or politician concerning the threat of terrorism and the proper response to it is the claim that ‘If you knew more, you would agree with me.’ Although each side presents some evidence to support its claims, neither has conducted systematic assessments of the impact of knowledge on individuals’ attitudes about terrorism. Furthermore, existing scholarship on public opinion suggests that both sides may be wrong about the effects of learning. Some scholars argue that providing new information to individuals rarely changes their minds, and may even lead to a “backfire effect” where they are even more convinced of their previously held opinions (Nyhan & Reifler 2010). All of this begs the question, does increased knowledge lead people to believe that the size of the terrorist threat is larger, smaller, or does it have no effect?

We find that the more people learned about terrorism, the smaller the threat they believed it posed to themselves and the United States. This outcome was consistent whether subjects were American students in semester-long, in-person courses at prestigious universities, students from around the world in multi-week massive open online courses (MOOCs), or the general public observing 10-minute video lectures. The trends did not occur in multiple control groups, and these findings generally replicated across 31 classes, 16 professors, and 12 universities. The effect was most significant in the most controlled environments, with a true survey experiment and as-if randomized research design. Even in the noisiest samples, our results suggest that more knowledge on the topic led to decreased threat perception. Not a single finding across all four waves of the survey suggests that more subject knowledge leads to increased threat perception.

Our findings have significant implications for foreign policy, civil liberties, and public

health. Polling since 9/11 consistently reveals that about 75% of Americans believe that a large terrorist attack is likely to happen in the U.S. in the near future, which helped spur the U.S. to fight numerous costly, ineffective military wars across the Middle East and North Africa in the name of counterterrorism (Mueller & Stewart 2018). These wars, coupled with burgeoning domestic counterterrorism programs, have led to disproportionate government spending and ballooning deficits (Friedman 2011). A larger perceived terrorist threat has also driven a significant increase in restrictions on civil liberties and immigration, particularly for those of Middle Eastern descent (Hetherington & Suhay 2011, Malhotra & Popp 2012). Heightened fears of terrorism have caused widespread stress and anxiety in the public—sometimes leading to chronic PTSD—and made industries like travel and tourism suffer (Comer & Kendall 2007, Alderman 2016). Increasing knowledge about terrorism therefore may mitigate some of its most deleterious effects by inoculating the public against the fear that its perpetrators seek to inspire.

The rest of the article proceeds as follows. First, we present and analyze theories of information acquisition and attitude change to animate competing arguments on perceptions of the threat of terrorism. Next, we describe our four waves of studies—from quasi- to true experimental—which were designed to test the main predictions of the arguments. Then, we present our findings and discuss their interpretation. We conclude with an analysis of the significant scholarly and policy implications of our research.

Why People are Unlikely to Change Their Beliefs (Especially About Terrorism)

Both politicians and scholars want to change people’s minds about the threat of terrorism. Unfortunately for those on all sides of the debate, significant and sustained belief change is difficult to achieve. Beliefs often persist because individuals employ motivated reasoning and a variety of heuristics to maintain prior beliefs and discount new evidence. Due to cognitive

dissonance and confirmation bias, people selectively use and interpret new information as consistent with preexisting beliefs, so that “information acquired early in the process is likely to carry more weight than that acquired later” (Nickerson 1998, Taber & Lodge 2006). Individuals’ beliefs are often tied to prior knowledge and prominent examples through the heuristics of anchoring, availability, and representativeness (Blankenship *et al.* 2008). When faced with information that challenges their prior beliefs, people may react by becoming even more extreme and/or certain in their original attitudes—the “backfire effect”—especially with an emotional or partisan issue (Nyhan & Reifler 2010). “People set high thresholds of evidence to refute cherished points of view,” employing defensive motivations that generate attitude stability when focusing on an issue they care deeply about, like poverty or race (Albarracin & Shavitt 2018, Lawrence & Sides 2014).

There are few more salient, emotional, and politicized issues over the past two decades than terrorism. By the start of our data gathering in 2012, terrorism had been one of the most reported phenomena in the world for over a decade. The numerous prominent attacks provide examples for individuals to draw on via heuristics to create stable beliefs on the size of the threat and desired counterterrorism policies, which they are motivated to defend (Sunstein 2003). Subjects will thus rarely be uninformed, and if anything are likely to be misinformed given the media’s skewed portrayal of terrorism, which makes related opinions more resistant to change (Kuklinski *et al.* 2000). The imagery of planes crashing into skyscrapers and civilian bodies torn apart by suicide bombers inspires the most powerful of emotions. And although politicians from both parties have noted the significance of the terrorist threat, the issue has been increasingly politicized, with Republicans suggesting a higher threat level than Democrats (Malhotra & Popp 2012).

In a classroom environment with frequent two-sided presentations of information, scholars suggest that confirmation bias is even more likely, since individuals tend to latch onto new evidence that confirms prior beliefs and criticize contrary evidence.¹ Even those who are

¹Presenting competing pieces of information often makes people more committed to their initial views, due to motivated reasoning based on biased processing of new information (Taber & Lodge 2006).

skeptical of the backfire effect nonetheless agree that there is evidence of the phenomenon on highly salient policy issues like terrorism (Wood & Porter 2019). As for knowledge itself, the most relevant experimental study to our own supports the view that “data do not matter,” as the presentation of facts on the terrorist threat generally did not change individuals’ beliefs (Kearns, Betus & Lemieux 2019). Other scholars argue that the credibility of the information source (professor or media) and subjects’ education levels have no significant effect on assessments of the threat of terrorism (Nellis & Savage 2012).

When beliefs do change in response to new information, the size of the change is often small—one-third of a standard deviation or less, on average—and the least central parts of an individual’s opinion are changed first (Albarracin & Shavitt 2018). These small changes often don’t last, and even when they do, they rarely translate to changes in policy preferences (Lawrence & Sides 2014, Pierro *et al.* 2012). Nonetheless, exposure to new information can and has changed beliefs and even policy preferences on a number of key issues including immigration (Grigorieff, Roth & Ubfal 2018), free trade (Hainmueller & Hiscox 2006), prisons (Gilens 2001), and climate change (Ranney & Clark 2016). Can the same happen for terrorism, and if so, in which direction will individuals’ beliefs shift?

How Knowledge Can Change Beliefs and Policies on Terrorism

Given the absence of a theoretically clear, empirically powerful answer to this debate, we present and test two competing hypotheses concerning the impact of knowledge on individuals’ beliefs about the terrorist threat. A number of scholars and a few politicians implicitly suggest that increasing one’s knowledge by taking a semester-long course on terrorism will decrease one’s perceptions of the threat of terrorism. Nearly all studies on the perception of the terrorist threat have focused on the media, as it is by far the most common source of information on terrorism for the general public (Williamson, Fay & Miles-Johnson 2019).

Scholars consistently find that increased media consumption correlates with increased fear and perception of the size of the terrorist threat, as well as support for more hawkish policies (Matthes, Schmuck & von Sikorski 2019, Nellis & Savage 2012). These findings largely dovetail with those supporting the cultivation hypotheses from criminology: “Individuals adjust their perception of reality to fit the image of the world around them derived from media consumption” (Ridout, Grosse & Appleton 2008). Since the media disproportionately focuses on violent content, individuals assess the threat of terrorism as higher the more they follow the news.

Fear increases when individuals feel that they lack control or are uncertain. By learning extensively about terrorism’s causes, strategies, and effects, individuals transition from seeing terrorists as crazed and irrational to more comprehensible and less dehumanized, if still immoral (Fischer *et al.* 2011, Theriault *et al.* 2017). The unknown and scary becomes more known and categorized, giving individuals a greater sense of control regarding the probability that terrorism will affect them and their society, in line with Hogg’s uncertainty-identity theory (Hogg 2007).

The way in which college classes on terrorism are taught uniquely lends itself to this decoupling of fear and knowledge. Whereas the media generally presents them hand in hand—and indeed seeks out emotional, sensationalist stories—scholars generally aim to dispassionately and objectively analyze the definition, history, and impact of the phenomenon. Gadarian (2010) offers the most sophisticated study on media exposure, finding that the emotional nature (or lack thereof) of its delivery played the key role in shifting individuals’ policy preferences. She separated the two key elements the media provides—knowledge and emotion—and found that the former had little to no impact without the latter. Students in classes thus gain new knowledge without the same emotional baggage and learn how to systematically examine information separate from partisan media environments (Halperin *et al.* 2013).

The two-sided, analytical classroom environment shifts terrorism from a value-relevant

to outcome-relevant issue for students who care about getting good grades, making objective analysis and the search for accuracy more likely (Fishkin *et al.* 2010, Hart *et al.* 2009). In addition to gaining a new objective mindset and information from more credible sources over a series of months, students correspondingly learn to be more skeptical of their main source of terrorism knowledge (the media): “When an individual increases her political knowledge, she reacts less radically toward threatening news, and shows greater cynicism toward potentially biased news sources” (Carriere, Hendricks & Moghaddam 2019).

Even though individuals likely join college courses with extensive prior exposure to terrorism, their knowledge is likely not fairly representative of the phenomenon or the threat it poses. In addition to data-driven discussions of the likelihood of a terrorist attack (which is far less than suggested by media coverage), students will also be exposed to “hidden knowledge” of terrorist groups that are less threatening either because they don’t aim to kill (e.g. the Earth Liberation Front) or because they come from the student’s societal and demographic in-group (e.g. The Weather Underground), rather than the prolifically violent and foreign out-groups (e.g. ISIS) that dominate media coverage and individuals’ impressions of terrorism (Hammond & Axelrod 2006). This increases the chance that the heuristics used by students to assess the level of threat will no longer be the most violent and scary examples they previously utilized. This decrease in fear, emergence of an objective mindset, discounting of media accounts, and increase in hidden knowledge about lesser known groups will lead to a decrease in terrorism threat perceptions. All of these arguments yield our first hypothesis:

Hypothesis 1 *Taking a course on terrorism and increasing one’s knowledge will decrease one’s perception of the threat of terrorism.*

A number of politicians and a few scholars disagree with H_1 and suggest that increasing one’s knowledge by taking a course on terrorism will actually increase one’s perceptions of the threat of terrorism. Regardless of the perpetrator, the use or threat of violence by a non-state group against civilians to spread fear or alarm for political ends is a scary prospect.

Therefore, learning about more attacks by more groups who kill in more deadly and fear-inducing ways than most students previously knew (e.g. Sarin gas attacks by Aum Shinrikyo) will likely increase their perceptions of the size of the threat. From 2012-2015, when students were taking these courses, the number of terrorist attacks around the world significantly rose each year, meaning that objective teaching of the data should drive students to update their assessments of the total number of attacks that were based on prior years with lower totals (LaFree & Dugan 2007). The number of jihadi terrorist groups also consistently rose during this period, making systematic teaching of the most prolific terrorist groups and their burgeoning networks (e.g. Boko Haram and ISIS) likely to increase threat assessments (Jones 2014).

Rather than discount media coverage, some scholars find that more knowledgeable individuals are more likely to increase perceptions of the threat after consuming terrorism-related media (Ridout, Grosse & Appleton 2008). Others suggest that the cultivation hypothesis may not apply in this context: “Unlike the fear of crime literature where mastery of the topic or context reduces fear, in the context of terrorism, mastery may actually reinforce fear” (Williamson, Fay & Miles-Johnson 2019). The knowledge gained from classes may therefore exacerbate the effects of a sensationalist media, rather than inoculate students from it. Furthermore, as many professors push students to pay greater attention to relevant news stories during their course, students may consume even more terrorism-related media than usual as part of their “treatment.”

On top of this, college courses generally teach and push students to find the weaknesses in the theories and evidence of academic research. Students who previously may have sided with academic-led claims of a lower terrorist threat may therefore emerge from their courses with a more skeptical view of research they previously venerated. It is also wrong to describe the courses themselves as emotionless; courses on terrorism regularly include classes on the role of emotions, and students are not told to neglect or hide emotional reactions to the content. This increase in fear, exposure to new knowledge about increasing terrorist

attacks and jihadi groups, greater understanding and consumption of relevant media, and skepticism of academic research will also lead to increased terrorism threat perceptions (Davis & Silver 2004). This yields our second hypothesis:

Hypothesis 2 *Taking a course on terrorism and increasing one's knowledge will increase one's perception of the threat of terrorism.*

Existing Methodological Challenges: A Focus on Small, One-Sided Media Treatments

The studies referenced above have provided an excellent foundation for beginning to understand the connection between knowledge and beliefs concerning the threat of terrorism. However, they leave a number of empirical gaps that this project aims to address. Most are observational studies that cannot demonstrate causal links, and the treatments of the few (survey) experiments are generally single, isolated statements of fact or opinion without any contradicting information, followed immediately by an assessment of the subject's response. On the one hand, the one-sided nature of the treatments creates a 'most likely' scenario for knowledge and attitude change while raising questions of external validity, because, in reality, conflicting information is generally provided from multiple sources, be they media, friends, or otherwise. On the other hand, the small amount of information provided to subjects—a paragraph or two of information on terrorism—is often not enough to change minds. This can lead to the conclusion that knowledge does not matter for beliefs and policy preferences, when in fact it very well might, just not when it's a drop in the bucket compared to the ocean of preexisting knowledge to which individuals have already been exposed.

All of these studies focus on the media or embedded survey experiments, but one of the most common and powerful ways to increase one's knowledge is through formal education. Unlike one-shot information prompts, a semester-long course provides an opportunity for substantial, enduring changes in knowledge and attitudes (Pierro *et al.* 2012). A few studies

have analyzed the impact of college courses on political knowledge and attitudes, although none have focused on terrorism, specifically. Scholars have found that a single semester course in economics increased students' knowledge and made them more conservative on economic issues, meaning that they increasingly supported free markets and greater restrictions on workers' unions (Jackstadt, Brennan & Thompson 1985). A semester-long course on the death penalty also changed student attitudes, in line with the Marshall hypothesis that the more you know, the less you support it (Cochran & Chamlin 2005).

In these studies that have analyzed knowledge and attitudes at the beginning and end of a semester, the vast majority examine a single treatment class taught by a single professor. Most studies do not assess whether the findings replicate the following year with the same class, same professor, and new students. They do not analyze the same professor teaching multiple treatment and control classes, different professors at the same institution teaching treatment and control classes, or different professors teaching the same topic (i.e. terrorism) in different fields (i.e. history and political science). Additionally, most extant projects do not analyze different professors teaching treatment and control classes at different universities or compare small seminars, mid-size lecture classes, and Massive Open Online Courses (MOOCs). Perhaps most importantly, most previous studies do not employ random assignment, which is understandable given the institutional and ethical challenges of randomly assigning students to their college classes. Our multi-wave survey research design allows us to address each of these points.

Research Design

Survey Studies

To test the competing hypotheses relating to the effect of education on individuals' perceptions of the terrorist threat, we performed four survey studies with varying levels of randomization. In each of these studies, respondents answered a battery of questions relat-

ing to several aspects of terrorism before and after treatment—education on terrorism—was administered.²

The first study is an as-if randomized study that takes advantage of randomized course registration times for college courses.³ This survey wave was administered by one of the coauthors of this manuscript at their home institution during the Fall 2013 and Spring 2015 semesters. Each survey consists of two waves—pre-course and post-course—to determine how individual respondents’ attitudes changed following education provision. For this sample, students who successfully enrolled in a class on terrorism serve as the treatment group, while students on a wait-list for the class represent the control group.⁴ This treatment assignment avoids a potential selection bias inherent with using college students as convenience samples because all respondents attempted to take the course, but only those with sufficiently early randomized registration times were able to enroll. The sample for this study includes 35 students in the treatment group and 23 students in the control group.

The second survey expands the student study across a more representative sample of 28 classes in political science, history, and international studies from 11 universities in the United States. To establish a sample of classes, we solicited professors’ involvement from a coauthor’s home institution and members of the National Consortium for the Study of Terrorism and Responses to Terrorism (START) professional email list.⁵ Courses focusing on terrorism for more than three weeks were classified as ‘treatment’ classes, and all other courses were categorized as ‘control’ classes. Thus, students enrolled in classes specifically on terrorism make up the ‘treatment’ group and students in other courses serve as the ‘control’ group.⁶ In this wave, we surveyed 253 students in terrorism courses and 133 students in

²When using a student sample, institutional review board approval was obtained from each school, and informed consent was obtained from all participants in each of the four studies.

³We include descriptive statistics for all studies broken into treatment and control groups in Appendix A to show that groups are similar across pre-treatment covariates.

⁴Following the post-course survey, five randomly selected students received \$10 Amazon.com gift cards. Participants in the control group who completed both surveys received \$20 Amazon.com gift cards.

⁵Professors who completed the survey and administered it in their courses received a \$50 Amazon.com gift card.

⁶In all but one course, five students were randomly selected to receive \$10 Amazon.com gift cards after the final survey wave. In that one course, all students received gift cards due to a state policy on gambling

non-terrorism courses. The courses were taught between the Fall 2013 semester and Spring 2015 semester. Here, treatment assignment—education on terrorism—is not randomized. Given the non-random treatment assignment, we use coarsened exact matching (CEM) to achieve better balance on pre-treatment covariates (Iacus, King & Porro 2012). The matched sample results contains 209 treated respondents and 129 control respondents. We find no evidence that individual professors’ own threat perceptions drive student responses, as shown in Appendix D.

The third study repeats the student survey using a sample of students enrolled in Massive Open Online Courses (MOOCs) during the Spring of 2015. Here, students enrolled in a terrorism course administered by START serve as the ‘treatment’ group and students enrolled in an online course focused on either Chinese politics or qualitative research methods represented the ‘control’ group.⁷ Our MOOC sample consists of individuals from 98 countries and ranged in age from 15 to 79, with the median respondent being 35 years old. The majority of respondents came from outside of the U.S., with individuals residing in Europe (37%), North America (33%), Asia (14%), South America (8%), Africa (5%), and Oceania (3%). As in the third survey wave, we use CEM to achieve better balance given the non-random treatment assignment in this design. The trimmed sample contains a total of 253 treated respondents and 139 control respondents.

The fourth and final study is a survey experiment on a sample of US respondents contacted through Amazon’s Mechanical Turk (MTurk) platform. Individuals ranged from 19 to 82 years old, with the median respondent being 32 years old. The survey was conducted during May 2017. In this experiment, half of the respondents were randomly assigned to receive information on terrorism, and the other half received information on financial crises. Respondents in the treatment group were presented with a definition of terrorism, examples of a variety of terrorist groups, facts relating to the lethality of terrorism, and other

via random incentives.

⁷All online courses were administered on Coursera.

educational information.⁸ As in the courses described above, respondents in the treatment category were given key information on both sides of the debate over the size of the terrorist threat. Within this survey experiment, we disseminated information through video, audio, and written transcript across three separate samples. Our samples are comprised of 211 individuals who received information via video, 218 respondents who read the information in a transcript, and 196 individuals who received a solely audio treatment. Additionally, we recontacted the MTurk respondents one week after the original survey experiment was administered to analyze the persistence of the effect of information dissemination on terrorist threat perception.

In summary, our analysis consists of four waves of survey data. The first uses an as-if randomized design on a sample of college students; the second consists of an observational survey sample of hundreds of college students across several universities; the third is a sample of respondents from MOOCs; the fourth is a survey experiment of MTurk respondents. By analyzing these four disparate samples, we are confident that our results apply to a broad swath of society. In the case of MTurk survey experiments, previous research suggests that results generalize to nationally representative samples (Clifford, Jewell, & Waggoner 2015, Mullinix *et al.* 2015).

Measurement

We analyze two outcome variables relating to the threat of terrorism: one that measures individuals' perception of the terrorist threat to themselves (*Personal Threat*) and another that measures individuals' perception of the threat to the United States (*US Threat*). To measure these perceptions, subjects were asked to respond to prompts that asked them to rate the size of the terrorist threat to both their personal safety and to the United States on a seven-point scale that ranged from *Not a threat* to *A massive threat*. In the fourth wave survey, administered via MTurk, we measure respondents' threat perceptions following the

⁸We include a full transcript of the treatment and control scripts in Appendix B.

information dissemination. In the other waves, we measure the change in individuals' threat perception from the beginning to the end of the terrorism course.

Our primary explanatory variable of interest is a binary indicator of whether or not a respondent received the *Education Treatment* that takes on a value of 1 if an individual is in the treatment group and 0 otherwise. We estimate linear regressions of both threat measures on the *Education Treatment* to assess the role of terrorism education in changes to perceptions of the terrorist threat. In some models, we include various demographic controls including *Age*, a categorical measure of *Religion*, and a binary indicator that indicates whether a respondent is *Female*. Additionally, we control for an individual's *Political Orientation* using a seven-point scale ranging from *Very liberal* (-3) to *Very conservative* (3). We also include a categorical variable that measures *Education Status* for the models fit to the MTurk and MOOC samples because they are not restricted to college students. Finally, we include a measure of specific terrorism knowledge to attempt to isolate the mechanism by which individuals change their perceptions of the terrorist threat. We encode this variable by asking the respondent to name up to ten terrorist groups and classify them based on whether or not they fit the definition of terrorist groups.⁹ We sum the *Number of Correct Groups* to measure terrorism knowledge.

Results

We present our results in chronological order of data collection.¹⁰ First, we present the results of our analysis of individuals' threat perceptions using four waves of survey data as samples. Next, we explore the duration of the effects using respondents from the as-if randomized Study 1 as suggestive evidence and a follow-up survey with MTurk respondents to systematically analyze the staying-power of the treatment effects. Finally, we explore the

⁹Groups that appeared in the START Global Terrorism Database and/or carried out at least one attack against non-combatants for political ends were coded as "correct."

¹⁰Due to space constraints, we present coefficient plots with the main treatment effects to communicate the results of our linear regressions. Full regression tables are available in Appendix C.

potential mechanisms through which education provision affects terrorist threat perceptions.

Study 1: As-If Random College Student Survey

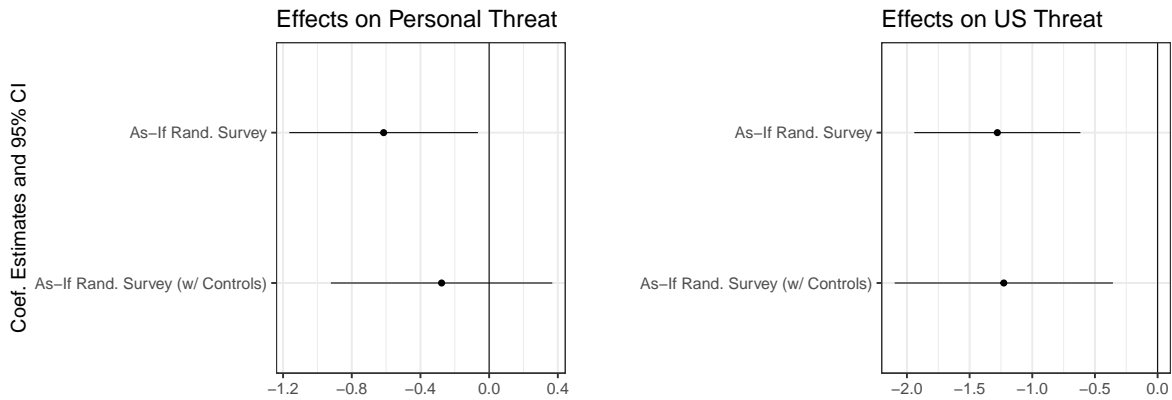


Figure 1: *Education Treatment* Effects on *Personal Threat* (left) and *US Threat* (right) from As-If Randomized Survey

We present the results of four linear regressions on the as-if randomized sample of college student respondents in Figure 1. As above, the plot shows the β coefficients and 95% confidence intervals for the *Education Treatment* indicator in models using the *Personal Threat* (left) and *US Threat* (right) outcome variables. Here, the models that use control variables include *Age*, *Female*, and *Political Orientation*. These models also include a variable that measures the change in the *Number of Correct Groups* to attempt to isolate the mechanism by which respondents updated their beliefs as a result of treatment.

The models fit to the as-if randomized sample present evidence in support of H_1 . The coefficients on the *Education Treatment* are negative and statistically significant at the .05 level with the exception of one model. The coefficient estimate on the treatment variable is indistinguishable from no effect in the model using *Personal Threat* as the outcome variable and including control variables. However, given the as-if randomized research design, the best estimate for the treatment effect is the bivariate regression which equates to the difference-in-means in *Personal Threat* between treatment and control groups. We choose to interpret the

bivariate model as the best estimate because appropriate randomization has been achieved, meaning that our treatment and outcome are not conditional on any of the factors for which we might like to control. This effect, shown in the top of the left panel of Figure 1, is negative and statistically significant. Here, the magnitude of the treatment’s effect is greater when estimating the level of *US Threat*. Thus, the quasi-experimental results from the first study strongly support the expectation of education leading to reduced threat assessment as specified in H_1 . Next, we examine these relationships in two observational surveys.

Study 2: Multi-University Student Survey

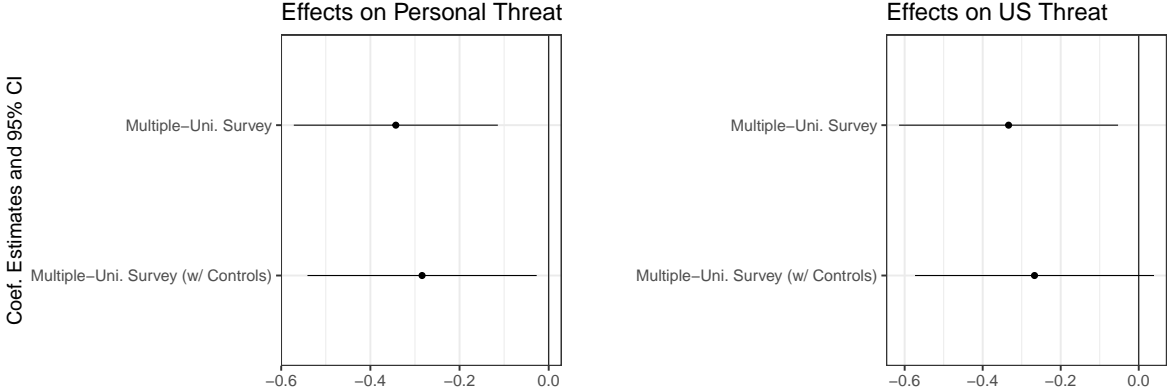


Figure 2: *Education Treatment Effects on Personal Threat* (left) and *US Threat* (right) from Multi-University Student Survey

Study 2 relies on a multi-university survey of students enrolled in college courses explicitly on terrorism (‘treatment’) and other social science courses (‘control’). Given the potential selection bias in this observational survey data, we employ CEM to obtain pre-treatment covariate balance. In this case, we match on age, gender, and political orientation. Figure 2 shows the ‘treatment’ effects and 95% confidence intervals from the linear regressions of *Personal Threat* (left) and *US Threat* (right). As in Study 1, the models overwhelmingly support H_1 .

The ‘treatment’ effects of the *Education Treatment* are negative and statistically signifi-

cantly different from 0 at the .05 level for three of the models and significant at the .10 level for the final model. While the effects are statistically significant, their substantive significance is substantially smaller than in the quasi-experimental study discussed above. Here, the models suggest that the *Education Treatment* leads to a decrease in threat perception at the personal and US levels of roughly .3 on the seven-point threat scale. Thus, while the effects are identifiable, they are noticeably weaker than in the as-if randomized survey (and in the MTurk survey experiment, discussed below). This finding reflects a weaker treatment than in the previous study, as some classes in the ‘control’ group may have slight topical overlap with the terrorism-focused classes in the ‘treatment’ group, and some ‘treatment’ group classes are not entirely focused on terrorism, as are the courses in Studies 1, 3 and 4. As a result, the difference in knowledge gained between these courses will be smaller than the difference between enrolling in a terrorism course versus remaining on the wait-list (Study 1) or the difference between a factual vignette on terrorism versus financial crises (Study 4).

Study 3: MOOC Survey

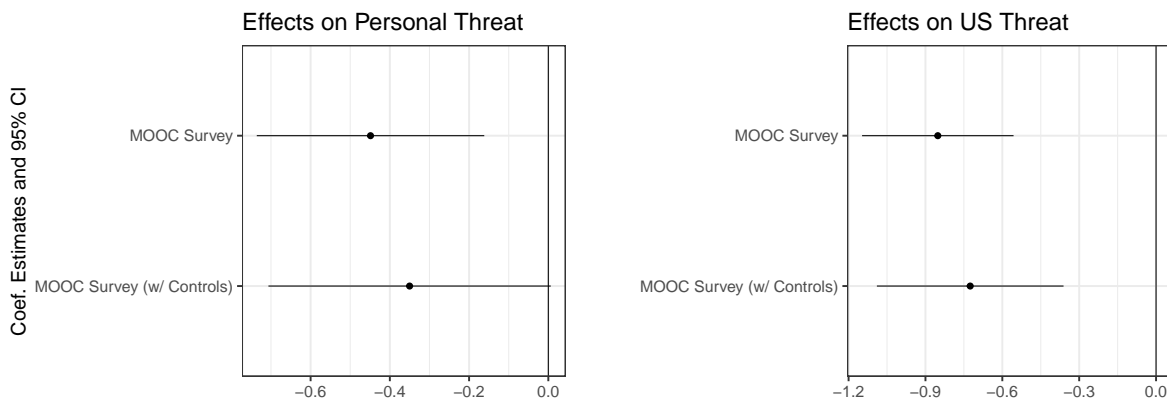


Figure 3: *Education Treatment* Effects on *Personal Threat* (left) and *US Threat* (right) from Multi-University Student Survey

Our third sample comes from a series of MOOCs in which individuals from the ‘treatment’ group are those from the terrorism course and ‘control’ respondents were enrolled in a course

on either Chinese politics or qualitative research methods. As in the multi-university study, we use CEM to obtain covariate balance by matching on age, gender, political orientation, and previous education. The results, shown in Figure 3, are consistent with those from the Studies 1 and 2, showing strong evidence in support of H_1 .

Three of the four models estimate ‘treatment’ effects that are negative and statistically significant at the .05 level, while the model of *Personal Threat* with controls is significant at the .10 level. The effects’ magnitudes are in line with the survey experiment and as-if randomized study presented above, as the effects of the *Education Treatment* on *US Threat* is greater than its effects on *Personal Threat*. Overall, these effects are weaker than those from the as-if randomized Study 1, but stronger than the effects identified in the multi-university Study 2.

Study 4: MTurk Survey Experiment

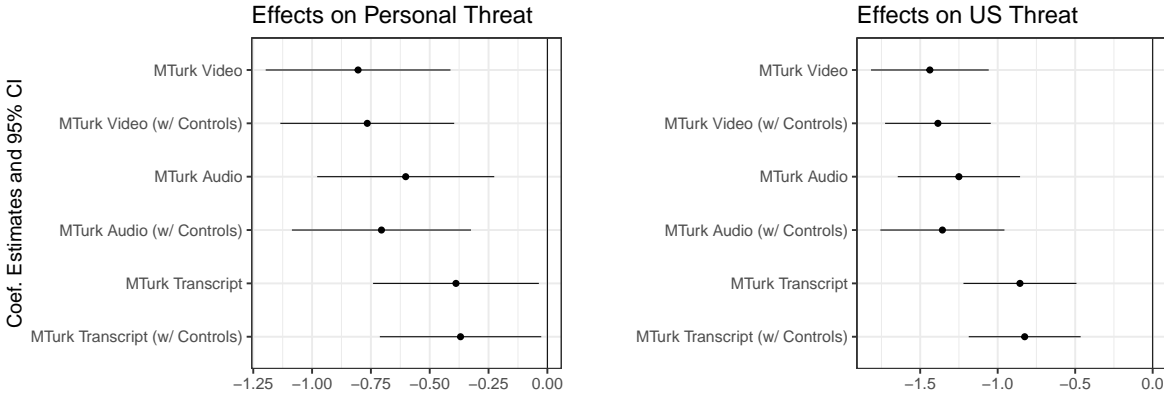


Figure 4: *Education Treatment* Effects on *Personal Threat* (left) and *US Threat* (right) from MTurk Survey Experiment

Finally, Study 4 features survey experiments on a sample of MTurk respondents in which treated individuals received a ten-minute vignette on terrorism via video, audio, or transcript. Respondents in the control group received information on financial crises through similar media. Figure 4 shows the point estimates and 95% confidence intervals for the terrorism

Education Treatment for both the *Personal Threat* outcome (left) and *US Threat* outcome (right). Each point and error bar represents the estimate from a linear regression model depending upon media through which information is disseminated and whether or not the model includes *Age*, *Female*, *Political Orientation*, *Education Status*, and the *Number of Correct Groups* as covariates.

Overall, the results strongly support H_1 , which suggests that education on terrorism will cause individuals to find terrorism less threatening. We find a strong negative effect for the terrorism *Education Treatment* on both *Personal Threat* and *US Threat*. For each of these outcomes, the effect of the treatment is significant regardless of whether the terrorism information was conveyed via video, transcript, or audio. The *Education Treatment* has a stronger effect on the perceived threat to the United States, with assignment to the treatment group leading to more than a one point decrease on the seven point threat scale for the video and audio treatment and a .86 point decrease for the transcript treatment. For both outcomes, the effect of the transcript treatment is the weakest, but it is still significant at the .05 level.

Duration of Effect

The previous analyses suggest very strong support for H_1 , which implies that when individuals learn more about terrorism they will find it less threatening. Our results provide clear evidence for this expectation for both threat to the individual and the United States. Indeed, of the 24 estimated *Education Treatment* effects presented above, 21 are negative and significant at the .05 level and 2 are negative and significant at the .10 level. The models identify negative effects in experimental, quasi-experimental, and matched observational survey data. We also consider the duration of the treatment effects in two ways. First, the results from Studies 1, 2, and 3 suggest that the effect has at least some staying-power because they rely on samples from semester-long and several week-long periods. Given that the final threat perception measure is elicited at the end of the semester or MOOC period

in these studies, the *Education Treatment* has potentially had some time to dissipate. Even in light of this fact, we find that sustained provision of terrorism information has lasting negative effects.

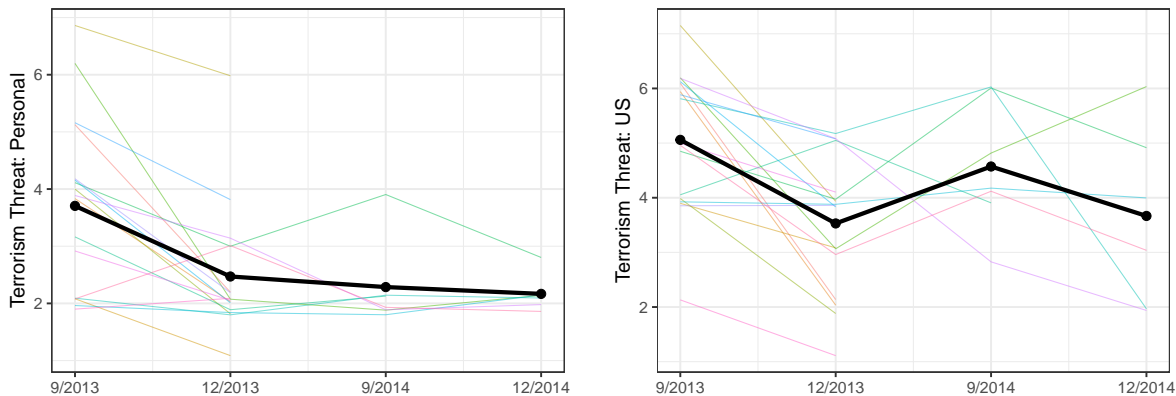


Figure 5: Threat Perceptions Over Time for Fall 2013 Respondents

Additionally, we recontacted individuals enrolled in the Fall 2013 terrorism course from the as-if randomized Study 1 at the beginning and end of the Fall 2014 semester. We plot these respondents' threat perceptions over time in Figure 5, with changes to *Personal Threat* in the left panel and *US Threat* in the right panel.¹¹ In each panel, the thicker black line shows the average level of threat perception, and the thinner lines represent individual students' responses. Here, we see that individuals' perceptions for both types of terrorist threat significantly decreased from the beginning of the Fall 2013 semester to the end of the course—the first two time periods—but the staying-power of this effect varied slightly between personal and US Threat. *Personal Threat* perceptions decreased during the semester-long course and the decrease remained relatively constant up to a year after the course's completion. However, though we also see a general drop in individuals' *US Threat* perception during the course, the duration of the effect is much more noisy, with some individuals increasing their threat response over time. This analysis provides suggestive evidence that the *Education Treatment* effects are durable.

¹¹Points over time are slightly jittered to avoid fully-overlapping lines.

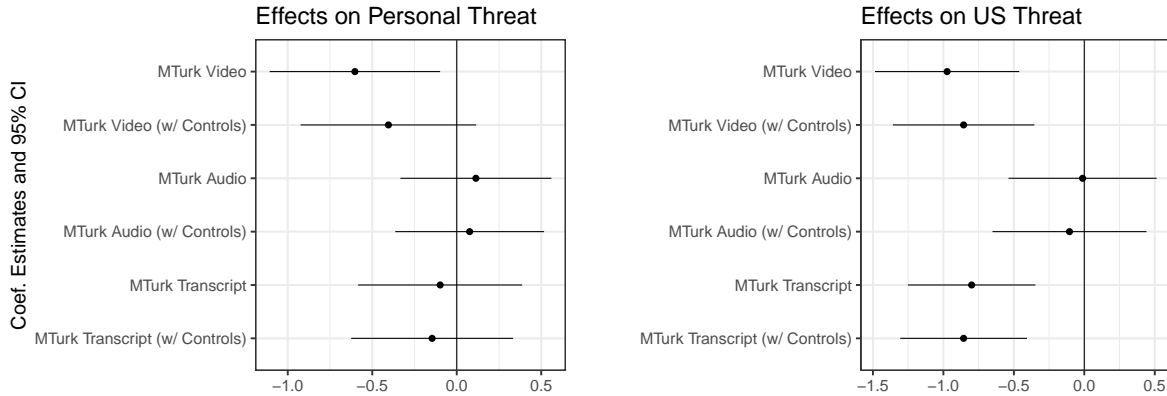


Figure 6: *Education Treatment* Effects on *Personal Threat* (left) and *US Threat* (right) from MTurk Survey Experiment Follow-Up (One Week Post-Treatment)

We also return to the experimental MTurk sample to observe the lasting effects of the treatment. We do so by surveying the individuals involved in the survey experiment one week after receiving treatment and recording their new perceptions of the terrorist threat.¹² The results of the follow-up analyses are shown in Figure 6. Here, we plot the terrorism *Education Treatment* effects on *Personal Threat* in the left panel and *US Threat* in the right panel. We find that the treatment effects on *Personal Threat* are less durable than those on *US Threat*. The results suggest a more-durable effect for the video and transcript treatments in the survey experiment on *US Threat*, as these coefficients are negative and statistically significant at the .05 level. Indeed, these effects remain substantively significant as well, with all treatment effects reaching at least .80 points on the seven-point threat scale.

Potential Mechanisms

What are the mechanisms behind the strong negative effects of the *Education Treatment* on terrorism threat perceptions? These results are likely due to a combination of fear reduction via the contextualization of terrorism and new associative psychological links to terrorists. Most subjects have already been exposed to a great deal of information about terrorism

¹²Not all respondents agreed to complete the follow-up survey. 55%, 56% and 62% of the respondents completed the follow-up questionnaire for the video, audio and transcript experiments respectively.

before taking a class, but their knowledge is generally a mile wide and an inch deep. Media coverage focuses on shocking images and basic information delivered in sound bites about individual terrorist attacks—often committed by ISIS and Al-Qaeda—most of which are replaced on the news ticker by another incident reported in the same way the following day or week. People therefore have lots of shallow, grisly information with little context to understand it, which is why many are fearful of terrorists they perceive as incomprehensible.

How did our treatments overcome the accompanying confirmation biases and change attitudes? First, the treatment classes provided context and frameworks for the broader phenomenon of terrorism. As course syllabi demonstrated, students analyzed systematic scholarship on the definition, causes, strategies, and effects of terrorism, such as in the work of Hoffman (2006) and Kydd & Walter (2006). Subjects could then mentally organize their knowledge of terrorism more effectively, making them feel more in control and less fearful.

Second, subjects updated their associative links with the concept of terrorism, making it seem less foreign and less deadly (Greenwald *et al.* 2002). Subjects learned about a wider variety of terrorist organizations in treatment classes, including a larger number a) from their own societies b) that kill few people. For a subject population that is mostly white and American, learning about the largely Caucasian and non-lethal Earth Liberation Front and Weather Underground likely helped drive subjects to form new, less threatening mental associations with what terrorism is. When asked, “Suppose you met someone belonging to a group that had carried out at least one terrorist attack,” subjects had a 14-34% increase after treatment in whether they thought that person was similar to them, that they would get along, and that they would want to interact with that individual—all suggesting less fear. We probed further, finding that subjects in the treatment group named significantly more correct terrorist organizations and more Western organizations after taking the classes. However, although we generally find a negative association between naming more correct groups and threat perceptions, the relationship is only significant at the more-lenient .10 threshold in four out of 12 models. The naming of Western groups was also not strongly associated with

a decrease in threat perception.

These mechanisms were likely enhanced by the two-sided, objective analysis of new information, which may have helped to avoid backfire and overcome confirmation biases. Professor attitudes did not drive perception change (see Appendix D), but the scholarship they taught at the core of each class may have, which in aggregate suggests a smaller terrorist threat than do the media and politicians. Instead of intentionally pushing counterprogramming, however, professors often set up multi-sided debates and allowed students to grapple with the information themselves in an objective setting less prone to emotional backlash (Gadarian 2010). By producing their own oral and written arguments, many subjects felt greater ownership of their opinions, which shifted towards the median position of the new debates they engaged with (Fishkin, He, Luskin & Siu 2010).

Summary of Results

We find strong, consistent support for the hypothesis that education on terrorism leads to decreased terrorism threat perceptions at an individual and US level. These results hold across an as-if randomized semester-long study, a larger sample of university courses on terrorism, a sample of MOOC participants, and a true survey experiment. We find that the the effect of the *Education Treatment* is generally stronger for *US Threat* perceptions than *Personal Threat* perceptions. In addition to the effects being statistically significant, their magnitudes are substantively significant. At the highest end, we find that education can lead to about a .8 standard deviation reduction in *Personal Threat* and about a .97 standard deviation decrease in *US Threat*.¹³ Even on the lowest end of magnitudes, we find that individuals decrease their threat perceptions about .25 standard deviations, which previous literature has identified as a significant shift in beliefs (Albarracin & Shavitt 2018, Jervis 2017). Generally, our effects suggest that the average respondent shifted their threat perception a full category—from ‘medium’ to ‘small’ or ‘small’ to ‘very small’ depending on

¹³These effects come from Study 4 (Video) and Study 1, respectively.

the sample. Additionally, our results provide suggestive evidence that in some cases, these effects are durable.

Conclusion

Terrorism is a difficult issue on which to change peoples' minds. It is a highly salient, emotional, and politicized topic on which everyone has an opinion because it has been one of the most reported phenomena in the world for decades. John Mueller, the most prominent proponent of the argument that the terrorist threat is overblown, nonetheless recently concluded that nothing can be done: "There seems to be little, if anything, policymakers can do to reduce the fear of terrorism—whether it is through shouting from the bully pulpit or through spending trillions of dollars to protect people from the feared hazard. If people want to be afraid, it seems, nothing will stop them" (Mueller & Stewart 2018). Existing research on attitude change further suggests that our treatments—exposure to multi-sided debates about terrorism with no planned, unified message in non-controlled environments—should, if anything, make changes in perception even less likely.

Instead, we found that in four waves of surveys that significantly varied a) the content, duration, and method of knowledge delivery b) the instructor, geographic location, and subject demographics c) and the general level of experimental control, the one constant was that the more subjects learned about terrorism, the less they perceived it as a threat to themselves and to the United States. Our findings were statistically and substantively quite significant regardless of subjects' demographics or political affiliation.

One fascinating implication of these findings is that they occurred even though the treatments—largely introductory classes on terrorism—were not designed to generate them. Most studies of attitude change are specifically set up to alter subject attitudes in a certain way, yet have far less substantively significant attitude changes on average than this one did. The vast majority of subjects in this study were in classes where the professors did

not even know the hypotheses being tested, and none were given any instructions on how to teach or what to teach. Professors simply administered the surveys to their students at the beginning and end of the semester. The fact that the multi-sided knowledge provided in the classrooms had this degree of impact supports the minority position that two-sided knowledge presentation may be as or more impactful than the one-sided information employed by most politicians and researchers, under certain conditions. When the media presents a sensationalized, one-sided narrative of a hyped terrorist threat, we found that deliberative, multi-sided discussion that decouples emotion and knowledge, avoids backfire, and focuses on objective analysis can change minds (Allen 1991, Fishkin et al. 2010).

The direction of this attitude change busts two other contradictory myths about professors: that they are part of a “terrorism industry” that hypes the threat for their own economic and professional gains, and that they are a bunch of left-wing ideologues indoctrinating students (Herman & O’Sullivan 1989). Contrary to the stereotypes, the most in-depth study on the impact of terrorism classes demonstrates that, if anything, these scholars are putting themselves out of business by teaching classes that leave students thinking the threat is less severe. Furthermore, student assessments of this issue are not driven by their professors’ attitudes (see Appendix D).

Scholars of terrorism should be happy to know that their research and teaching may be one of the more effective tools of counterterrorism. Terrorism’s greatest impact is not in the direct damage from its attacks, as Martha Crenshaw explained, “The political effectiveness of terrorism is importantly determined by the psychological effects of violence on audiences” (Crenshaw 1985, 400). The fear that terrorism causes can lead to widespread stress and depression, xenophobia, restrictions on civil liberties, support for authoritarian political leaders and systems, costly foreign interventions, and debt from massive government spending—all of which have occurred in the United States since 9/11 (Carriere, Hendricks, & Moghaddam 2019, Huddy *et al.* 2003, Huddy *et al.* 2005).

Despite these costs, many politicians and government officials have not wanted to lower

assessments of the terrorist threat. Government agencies have strong incentives to promote the threats they combat in order to increase their budgets, whether their focus is terrorism, drugs, or great power rivals (Friedman 2011). Politicians can use fear to gain support for policies at home and abroad—it was no coincidence that President Trump’s list of 78 “under-reported” terrorist attacks was presented just after his executive order banning immigration from seven Muslim-majority countries. Of course, politicians have more skin in the game than academics when it comes to terrorism, as they directly bear the weight of responsibility for keeping their constituents safe and so are likely to be more cautious. Nonetheless, a less fearful public—in addition to the direct benefits to mental health and societal harmony—could create less political demand for inflated threat assessments and excessive government spending. Politicians often utilize fear because it gets the public to take an issue seriously. Our study shows that, when it comes to terrorism, we can separate fear from knowledge and appreciation of an issue, like a military that can understand and respect the capabilities of an enemy without fearing it.¹⁴

Despite our strong findings on the impact of knowledge on threat assessment, questions remain on its mechanisms. We found clear evidence that treatment significantly increased subjects’ knowledge of terrorists groups—both overall and specifically from Western societies—and decreased their othering of terrorists. However, we did not find conclusive evidence that these factors—or the conceptual frameworks and objective context provided—drove a change in beliefs. Future studies could specifically vary the content taught and the pedagogical approach, although this would be logistically and ethically challenging in classroom environments. Anecdotal evidence from discussions with students suggest that targeted interviews on why opinions did or did not change could shed further light.

William McCants, one of the most prominent scholars of terrorism, is unclear on what can be done about the ubiquitous fear of terrorism: “As for how governments can calm their

¹⁴On average, individuals that received the *Education Treatment* showed a greater increase in interest in terrorism in Studies 1 and 2 and a smaller decrease in interest in Study 3. We show these distributions of change in interest in Appendix E.

citizens, I'm at a loss... Every attack is discussed endlessly on television and social media, which heightens fear of future attacks, [and] makes citizens scared of one another" (Mazzetti & Schmitt 2016). Our study suggests that knowledge can and does change attitudes on even the most serious and sensitive of subjects, and that politicians looking to "do something" to reassure their constituents in response to the threat of terrorism should consider public education campaigns. If terrorists' key strategy is to inspire fear, then education is a key antidote to it. Knowing really is half the battle.

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