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God May Save Your Life, but You Have to Find Your Own Keys

Religious Attributions, Secular Attributions, and Religious Priming

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Summary

Previous research has found that people make religious attributions under certain conditions. In this study, we used causally ambiguous vignettes to confirm some previous findings regarding religious attributions and extend these findings by testing: (a) whether implicit priming increased the odds of making causal attributions, and (b) whether atheists also exhibit an attribution bias. Like previous studies, we found that people who were less religious (i.e., atheists in our study) were substantially less likely to make religious causal attributions. Unlike previous studies, we found that atheists were more likely to attribute events to probability and/or luck. We also found, like previous studies, that religious people were more likely to make causal attributions when presented with vignettes involving health-related or life-and-death situations but not with quotidian events, like losing one's keys. Finally, we found no effect for implicit religious priming.

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religious priming – religious attribution bias – atheists – secular attribution bias – causal attributions

Introduction

Contemporary Americans regularly announce the presence of a god in their lives. From political speeches, to touchdown ceremonies, to prayers before family meals and civic meetings, to hit country songs, many Americans believe that a god is actively involved in their lives in extraordinary and mundane ways (Spilka, Shaver, & Kirkpatrick, 1985). Religious leaders and other societal spokespeople regularly suggest gods are active, omniscient, and important aspects in the lives of people and religions teach people to expect a god's influence in their daily activities, commonplace expressions, and emotional and physical well-being (Froese & Bader, 2010; Krause, Chatters, Meltzer, & Morgan, 2000; Sharp, 2013). This isn't all that surprising given that close to 70% of Americans are confident that God exists and about 75% of Americans report a religious affiliation (Pew Forum on Religion, 2012).

Echoing these sentiments, social scientists have demonstrated many ways Americans rely on personal relationships with deities. Researchers have found that religious Americans may utilize their relationships with deities to manage many negative emotional experiences (Pargament, 1997; Sharp, 2010), to motivate pro-social behaviors (Duriez, 2004; Uslaner, 2002; though see Galen, 2012), but also to establish boundaries between themselves and "lesser" others (Edgell, Gerteis, & Hartmann, 2006). Religious Americans may also experience significant emotional turmoil as a result of their personal relationships with a god (Wolkomir, 2006). Further, researchers have found that 75% of Americans pray regularly (Pew Forum on Religion, 2008), that almost half of Americans believe they receive "definite" answers from God (Pew Forum on Religion, 2008), and that a fundamental aspect of religious belief and practice lies in the ability to seek a god's help with real world problems, issues, and concerns (Bade & Cook, 2008; Baker, 2008; Sharp, 2013). Of course, not all Americans believe in a god, and Americans have varying conceptions of the gods they believe in (Jensen, 2009; Mallery, Mallery, & Gorsuch, 2000), but data suggest many Americans believe a god has a regular presence and influence in their lives.

In this article we examine some of the ways Americans conceptualize their deities by examining religious causal attributions. Prior research

examining religious causal attributions found that religious people are more likely to make religious causal attributions than are less religious or secular people (Loewenthal & Cornwall, 1993; Lupfer & Layman, 1996; Riggio, Uhalt, & Matthies, 2014; Weeks & Lupfer, 2000). We aimed to replicate this finding and extend it by investigating whether secular or nonreligious people are more likely to exhibit their own secular attribution biases, attributing causality to secular rather than religious phenomena. Another finding we aimed to replicate was whether there is a difference in making causal attributions depending on the scenario in question (Loewenthal & Cornwall, 1993; Miner & McKnight, 1999; Ray, Lockman, Jones, & Kelly, 2015; Riggio et al., 2014). Prior research has found that religious people are more likely to make religious causal attributions in life-and-death and health situations than in more quotidian, everyday situations (Loewenthal & Cornwall, 1993). Finally, we examined whether religious priming (Shariff, Willard, Andersen, & Norenzayan, 2015) increased the odds of making religious causal attributions.

Prior Research on Religious Causal Attributions

Research on religious causal attributions (Spilka et al., 1985) followed closely behind interest in causal attributions more generally (Weiner, 1985). The basic idea behind causal attributions is that people have a tendency to want to explain events (i.e., make causal attributions) when the outcome of an event is unexpected, life altering, or negative. In the context of religion, religious people draw upon their religious worldview, typically invoking deity or the supernatural, to explain events in their lives that are life-altering, negative, or unexpected (Riggio et al., 2014; Spilka et al., 1985). Initial research on religious attribution biases suggested that it was simply the availability of a belief in God or a higher power that facilitated making religious causal attributions (Spilka et al., 1985). However, the availability of supernatural beliefs may not be the only factor that contributes to making religious causal attributions; another factor may include whether God or a higher power is perceived to be a plausible alternative causal agent in a given scenario (Dijksterhuis, Preston, Wegner, & Aarts, 2008). Religious people also make secular causal attributions, even more so than religious causal attributions, depending on the circumstances (Lupfer, de Paola, Brock, & Clement, 1994). Precisely why religious people make religious causal attributions may not be entirely clear, but it is likely due to a combination of confirming existing beliefs and values (Guenther & Alicke, 2008), finding meaning in life (Spilka et al., 1985), perceiving God to be a causal agent in their lives (Dijksterhuis et al., 2008), and/or dealing with uncertainty and lack

or loss of control (Hogg, Adelman, & Blagg, 2010; Kay, Gaucher, McGregor, & Nash, 2010).

Prior research has established that more religious people are more likely to make religious causal attributions and that less religious people are less likely to make religious causal attributions (Loewenthal & Cornwall, 1993; Lupfer & Layman, 1996; Riggio et al., 2014). However, much of this research has used a single measure of religiosity, typically a question that asks about the importance of religion in participants' lives. That seems like a problematic choice for measuring participants' level of religiosity for two reasons. First, since interest in religious causal attributions is primarily related to whether or not people invoke the influence of a deity (or other supernatural force) in explaining unexpected or ambiguous but important life events, it would make more sense to distinguish between those who believe in a god (i.e., theists) and those who do not (i.e., atheists). Second, belief in God does a better job of distinguishing between those who are affirmatively secular and those who are religious (Hwang, Hammer, & Cragun, 2011), allowing for a more accurate comparison between those who are actually nonreligious and those who are religious, rather than comparing more and less religious individuals (Hill & Pargament, 2003). Some readers may wonder if it is even possible for atheists to make religious causal attributions. As previous research has noted, atheists, like theists, need not be uniform in their beliefs nor hold logically consistent beliefs. Some atheists report "hating God" (Exline, Park, Smyth, & Carey, 2011), which is clearly logically inconsistent. Individuals who self-report as atheists have also been shown to later report believing in a god or higher power in the same survey (Cragun, Kosmin, Keysar, Hammer, & Nielsen, 2012) and many atheists attend religious services (Sherkat, 2008). Thus, just as some people report a religious affiliation but never attend religious services or report believing in a god, but indicate that belief is not particularly important to them (Davie, 1994; Day, 2011), it is not unreasonable to believe that some atheists may make religious attributions, though of course they will be substantially less likely to do so (cf. Dijksterhuis et al., 2008). Thus, our first hypothesis is that there will be notable differences in making religious causal attributions between atheists and theists:

- Hypothesis 1 [H1]: Theists will be substantially more likely to make religious causal attributions than will atheists.

Another problem with prior research examining religious causal attributions is that many of the samples (though see Loewenthal & Cornwall, 1993) used

primarily religious participants and therefore created vignettes that did not have to be generic and ambiguous enough that nonreligious individuals could interpret the vignettes in a nonreligious or secular fashion (Mallery et al., 2000; Ray et al., 2015). Thus, the use of more generic vignettes that are suitable for nonreligious individuals or atheists in testing for religious causal attributions seems warranted.

While prior research has compared religious to less religious people (Loewenthal & Cornwall, 1993; Lupfer et al., 1994; Riggio et al., 2014), that research has not looked specifically at whether or not nonreligious people are more likely to make causal attributions that are secular, like advances in science or technology or mathematical probability. As it is clear from prior research that more religious people are more likely to make religious causal attributions, it would seem logical that nonreligious people would be more likely to make secular causal attributions or exhibit a "secular causal attribution bias." The secular causal attribution bias would be a bias toward explaining ambiguous events in a way that invokes supposedly non-supernatural forces, like "chance," "probability," or "luck." Given that atheists have been found to think about the world differently from theists, relying more heavily on analytic thinking rather than intuitive thinking (Gervais & Norenzayan, 2012), we hypothesized:

- Hypothesis 2 [H2]: Atheists will be more likely to make secular or scientific causal attributions than will theists.

Previous research has shown that religious people are more likely to make religious causal attributions in certain scenarios. Specifically, attributing causality to a deity is more common in life-and-death situations or in health-related situations (Loewenthal & Cornwall, 1993; Pargament & Hahn, 1986). Research has shown that this is likely the result of these scenarios involving a lower sense of control or autonomy for the actors involved (Hogg et al., 2010; Kay et al., 2010; Riggio et al., 2014). In contrast, we might expect a lower likelihood of making religious causal attributions in situations where human actors have higher levels of control, such as in more quotidian or ordinary aspects of one's daily life (e.g., food preparation, sending emails or text messages, etc.). Thus, it is less likely that religious people will make religious causal attributions when, for instance, they send a text message with a humorous typo (e.g., "I'm on my gay" rather than "I'm on my way") than when a life-altering event occurs (e.g., a serious car accident or a diagnosis of a chronic or terminal illness). In the interest of confirming this finding, we hypothesized:

- Hypothesis 3 [H3]: Theists will be more likely to make religious causal attributions when scenarios are related to health and/or life-and-death situations than when scenarios are more quotidian.

Another way in which prior research on religious causal attributions can be extended concerns the influence of priming. Priming research involves using a technique to present a stimulus in a passive fashion that affects processing or responses in a different domain. Religious priming involves passively stimulating religious concepts in the minds of individuals in order to determine whether or not the priming of religion influences other domains (e.g., Dijksterhuis et al., 2008). Given the many studies that have found that religious priming influences other domains (Shariff et al., 2015), we wondered whether priming participants—both religious and nonreligious—would increase the odds of participants making religious causal attributions. Some earlier research has done something similar. For instance, Ray et al. (2015) included a "contextual" factor that situated a vignette in a religious context. In that study, there was no evidence that situating a vignette in a religious context increased the odds of participants making religious causal attributions. However, that research was conducted with an almost entirely religious sample. Additionally, the religious context was not added in a subtle or passive fashion and was not varied systematically. In another study that looked at the influence of religious priming on religious attributions, Dijksterhuis et al. (2008) found that religious priming only influenced the causal attributions of theists, not atheists. Given the limited prior research examining whether religious priming influences religious causal attributions, we were interested in adding to this literature. Given that religious priming has been shown to be effective in influencing attitudes and behaviors in numerous other domains (Shariff et al., 2015), as well as influencing the odds of making religious attributions (Dijksterhuis et al., 2008), we hypothesized:

- Hypothesis 4 [H4]: Priming will increase the odds of people making religious causal attributions.

Data

Participants

While many psychology studies use college students as participants, we opted for a different approach that we thought might make our results more

generalizable[1] to the adult population in the US. The first author had the students in one of his courses on religion recruit participants for the study. Students were required to recruit participants who met two criteria: (a) they had to be over 18, and (b) they could not be college students. Each student was required to recruit 10 participants, but students were given extra credit if they recruited more than 10. The number of recruits per student ranged from a low of 9 to a high of 47. The total number of participants was 278.

Of the subjects, 62.5% were non-Hispanic White; the mean age was 38.9; 36% were Catholic; 31.4% were Protestants; 21.8% were nonreligious; 5.4% were Jewish; 5.5% were some other religion. The modal income category was between one hundred and two hundred thousand dollars per year (26.9% of respondents) and the modal educational attainment category was having a Bachelor's Degree (39.8% of respondents). For more information about the participants, see Table 1.

Method

Control Variables

We asked participants a variety of demographic questions, including their age, their state or country of residence, their relationship status, whether they were currently employed, whether they had children under 18, their race/ethnicity, their income, their educational attainment, and their political views.

Independent Variables

Our primary independent variable was a measure of belief in a god or higher power. There were six initial response options, including: "I do not believe there is a god" (i.e., "atheist"), "I do not know if there is a god and I do not believe there is a way to find out if there is a god" (i.e., "agnostic), "I believe in some form of higher power," "I believe in God sometimes," "I believe in God, but I doubt my belief sometimes," and "I am confident God exists." Given the small number of people who chose "I believe in God sometimes" and "I believe in God, but I doubt my belief sometimes," we collapsed those two together, resulting in five belief categories.

1 Given the sampling approach, we are not suggesting that our data are generalizable to the adult population in the US. We are just suggesting that a sample of non-students may be more generalizable to US adults, depending on the sample.

Dependent Variables

Most prior research on religious causal attributions has used vignettes, with various methods of responding to the vignettes (Loewenthal & Cornwall, 1993; Riggio et al., 2014; Weeks & Lupfer, 2000). We also used vignettes. The vignettes we used were carefully crafted such that they involved scenarios in which something happened to a person, but the reason why it happened could be ambiguously interpreted in both religious and secular ways.

The first author developed an initial version of the three vignettes we used and further refined the vignettes in light of feedback from the undergraduate students helping with the project and the second author. The vignettes were then pilot tested for clarity using undergraduates as test subjects. Based on the feedback, it was decided that the vignettes should be modified slightly to minimize any potential confounding effects. All of the subjects in the vignettes were depicted as female, with English-sounding names. We also constructed the vignettes in a fashion that implied that the subjects were all middle class and likely white, though we specifically did not mention age, race, geographic location, or sexual identity.

To test for priming, half of the participants were randomly assigned to read vignettes that did not mention religion and the other half were assigned to read vignettes that included words that would implicitly prime religion (Shariff et al., 2015). Below are the three vignettes we used; the priming word is in parentheses immediately following the text it replaced, which is italicized.

- Vignette 1: Emily was on her way home from *a meeting* (church) late one night when she saw headlights directly ahead of her. Since the other car was initially quite far away, she was not immediately concerned. However, as the other car got closer, Emily realized that the car was in her lane. She slammed on the brakes and tried to swerve out of the way, but just as she did so, the driver of the other car tried to swerve as well and they ended up colliding. Emily's car flipped over and landed on a fence on the side of the road. Emily survived the crash with just a few scrapes and bruises. However, when she later saw pictures of her car, she noticed that one of the fence posts had broken through the front window and punctured the passenger's seat. Had the car landed just a little differently, that fence post would have punctured the driver's seat. Please indicate which of the following you think helped Emily survive the car crash.
- Vignette 2: Samantha was in a rush to get to *an appointment* (church), but her 2-year-old child had misplaced her keys. She looked everywhere but could not find them. After a frantic 10 minutes of searching, Samantha decided to pause for a moment, hoping for some inspiration as to the loca-

tion of the keys. After she paused, she realized she had not looked behind the door in her child's room. She immediately looked there and found the keys. Please indicate which of the following you think helped Samantha find the car keys.

- Vignette 3: Rebecca had just started her career as a lawyer at the age of 30 when she was diagnosed with throat cancer. Even though her doctor had caught the cancer early in its progression, the cancer she had was very aggressive and the doctor indicated that there was a very good chance she would not be able to speak after the surgery. While the throat cancer and treatment would make it more difficult for Rebecca to practice law, she was even more upset about the consequences for her favorite hobby: singing in *a* (her church) choir. Rebecca underwent the surgery and follow-up treatment, and while her voice initially was affected, she eventually made a full recovery and was able to continue singing. Please indicate which of the following you think helped Rebecca make a full recovery.

We provided participants four possible responses options, similar to the four broad categories of causal attributions found by Lupfer and Layman (1996): "luck," "probability," "God or a higher power," and "science or modern technology." Participants were also shown an "other" option and, if they selected it, could write in their own attribution. We did not include "Satan" as an option, given how rarely individuals chose that option. Instead, we included an alternative category that would allow us to test for a secular attribution bias, "science or modern technology." Participants could choose as many response options as they felt were appropriate. In deciding on the possible response options, we recognized that some of these options made little sense for specific vignettes (e.g., "science or modern technology" makes little sense with Vignette 2). However, we decided to keep the response options consistent across the vignettes so as to reduce the odds that study participants would catch on to the aim of the study, which could have happened had we varied the response options, but consistently kept "God or a higher power" as an option.

Procedure

After obtaining IRB approval, students contacted individuals about participating in the survey then provided those individuals who agreed to participate with the URL of the survey. Upon clicking on the URL, participants were shown an informed consent screen. The purpose of the project in the informed consent was intentionally left vague so participants were unaware of the exact purpose of the study. Specifically, the study was described as follows, "The focus of this survey is on a particular social psychological phenomenon

that may influence how individuals interpret events in the world around them." Participants were debriefed after concluding the survey. Participants had to indicate their consent before participating in the study. They were first shown the three vignettes, one at a time, followed by the demographic questions and then the belief in a god or higher power question.

There was a slight difference in how many were assigned to the prime and no-prime conditions; 184 individuals started the prime version of the survey; 174 started the no prime version. Of those who started the prime version, 144 completed the survey; the balance either did not complete the survey or failed to answer an attention check question correctly. Of those who started the no prime version, 136 completed the survey; the balance either did not complete the survey or failed to answer an attention check question correctly. Combined, these totaled 280 responses. However, two participants were under 18 and were therefore dropped from the study. The final sample size was 278, though participants were not required to answer every question, so the number of responses on any given question varies.

Table 1 provides sample descriptive statistics for the prime and no-prime groups as well as combined sample characteristics. The random assignment of individuals to the different conditions worked well as there were no statistically significant differences between the prime and no-prime groups on any of the control variables or the independent variable.

Results

Table 2 presents the results for the three vignettes testing H1, H2, and H3. The columns are the various views toward the existence of a god participants could choose while the rows are the possible options participants could choose as things that helped the individuals in the vignettes. We have included the four options we offered participants but have omitted the "other" option in the table as responses on the other option varied; a relatively small percentage chose "other" for most of the vignettes.[2]

2 Just 4% of respondents chose "other" on Vignette 1; 6% chose "other" on Vignette 3. However, 29% of respondents chose "other" on Vignette 2. Most of the responses participants supplied on Vignette 2 were along the lines of "Samantha took some time to think" or "she concentrated."

TABLE 1 *Sample descriptives for prime, no prime, and combined*

	Combined		Prime		No Prime			
	N	% or mean (*SD*)	*N*	% or mean (*SD*)	*N*	% or mean (*SD*)	*t* or Chi-Square	*p*-value
Age	278	38.9 (15.1)	132	39.7 (15.3)	146	38.1 (14.8)	0.87	0.387
Location								
from US	253	91.7	121	91.7	132	91.7		
not from US	23	8.3	11	8.3	12	8.3	0.00	1.000
Relationship status								
single, never married	92	33.1	46	35.1	46	31.3		
married	115	41.4	55	42.0	60	40.8		
divorced	25	9.0	9	6.9	16	10.9		
widowed	5	1.8	3	2.3	2	1.4		
separated	4	1.4	4	3.1	0	0.0		
dating exclusively	13	4.7	4	3.1	9	6.1		
cohabiting	24	8.6	10	7.6	14	9.5	8.07	0.233
Currently employed								
yes	223	79.9	105	79.5	118	80.3		
no	56	20.1	27	20.5	29	19.7	0.02	0.880
Have children under 18								
yes	66	23.7	30	22.7	36	24.5		
no	213	76.3	102	77.3	111	75.5	0.12	0.729
Race/ethnicity								
Non-Hispanic White	165	62.5	77	61.6	88	63.3		
Non-Hispanic Black	24	9.1	10	8.0	14	10.1		
Hispanic White	47	17.8	23	18.4	24	17.3		
Hispanic Black	6	2.3	3	2.4	3	2.2		
Asian	10	3.8	7	5.6	3	2.2		
other	12	4.5	5	4.0	7	5.0	2.62	0.758
Income								
Under $10,000	19	6.8	12	9.1	7	4.8		
$10,000-$24.999	25	9.0	9	6.8	16	10.9		
$25,000-$49,999	50	17.9	23	17.4	27	18.4		
$50,000-$74,999	54	19.4	27	20.5	27	18.4		
$75,000-$99,999	31	11.1	13	9.8	18	12.2		
$100,000-$199,999	75	26.9	34	25.8	41	27.9		

TABLE 1 *Sample descriptives for prime* (cont.)

	Combined		Prime		No Prime			
	N	% or mean (*SD*)	*N*	% or mean (*SD*)	*N*	% or mean (*SD*)	*t* or Chi-Square	*p*-value
$200,000-$499,999	16	5.7	8	6.1	8	5.4		
Over $500,000	9	3.2	6	4.5	3	2.0	5.26	0.628
Education								
less than high school diploma	2	0.7	1	0.8	1	0.7		
high school diploma	30	10.8	17	12.9	13	8.8		
some college	49	17.6	29	22.0	20	13.6		
Associate's Degree	28	10.0	10	7.6	18	12.2		
Bachelor's Degree	111	39.8	49	37.1	62	42.2		
Master's Degree	38	13.6	17	12.9	21	14.3		
PhD	5	1.8	2	1.5	3	2.0		
Professional Degree (MD/JD)	16	5.7	7	5.3	9	6.1	6.08	0.531
Political views								
extremely liberal	12	4.4	5	3.8	7	4.9		
liberal	69	25.3	32	24.4	37	26.1		
slightly liberal	35	12.8	15	11.5	20	14.1		
moderate	83	30.4	42	32.1	41	28.9		
slightly conservative	28	10.3	15	11.5	13	9.2		
conservative	41	15.0	19	14.5	22	15.5		
extremely conservative	5	1.8	3	2.3	2	1.4	1.54	0.957
Religious affiliation								
Catholic	94	36.0	42	33.9	52	38.0		
nonreligious	57	21.8	29	23.4	28	20.4		
Protestant	82	31.4	37	29.8	45	32.8		
Jewish	14	5.4	9	7.3	5	3.6		
other	14	5.4	7	5.6	7	5.1	2.36	0.669

	Combined		Prime		No Prime			
	N	% or mean (*SD*)	*N*	% or mean (*SD*)	*N*	% or mean (*SD*)	*t* or Chi-Square	*p*-value
god								
don't believe	15	5.4	8	6.1	7	4.8		
don't know	32	11.6	13	9.9	19	12.9		
higher power	55	19.9	28	21.4	27	18.4		
believe sometimes or doubt	37	13.4	21	16.0	16	10.9		
confident god exists	137	49.6	61	46.6	76	51.7	2.83	0.588

TABLE 2 *Percentage selecting God or a higher power by vignette and belief in God or a higher power*

	N	atheist	agnostic	higher power	believe sometimes or with doubts	confident belief	Chi-square	*p*-value	Cramer's v
Vignette 1—car crash									
god or higher power	278	0.0%	0.0%	20.0%	50.0%	73.2%	95.878	.000	0.587
luck	278	66.7%	62.5%	67.3%	55.3%	23.9%	44.298	.000	0.399
probability	278	40.0%	46.9%	29.1%	23.7%	12.3%	23.020	.000	0.288
science/ technology	278	6.7%	6.3%	7.3%	15.8%	5.8%	4.402	.354	0.126
Vignette 2—lost keys									
god or higher power	278	0.0%	0.0%	1.8%	21.1%	31.2%	35.343	.000	0.357
luck	278	40.0%	6.3%	14.5%	23.7%	12.3%	12.234	.016	0.210
probability	278	46.7%	62.5%	50.9%	52.6%	42.0%	5.189	.268	0.137
science/ technology	278	6.7%	0.0%	1.8%	10.5%	2.2%	8.930	.063	0.179

TABLE 2 *Percentage selecting God* (cont.)

	N	atheist	agnostic	higher power	believe sometimes or with doubts	confident belief	Chi-square	*p*-value	Cramer's v
Vignette 3—cancer recovery									
god or higher power	278	0.0%	3.1%	18.2%	42.1%	65.2%	74.018	.000	0.516
luck	278	33.3%	6.3%	20.0%	10.5%	7.2%	14.274	.006	0.227
probability	278	26.7%	12.5%	12.7%	10.5%	2.9%	14.385	.006	0.227
science/ technology	278	80.0%	87.5%	67.3%	78.9%	44.9%	32.694	.000	0.343

Note. Columns for the vignettes do not sum to 100% as participants could select none of the options or multiple. Additionally, participants could select "other" and provide their own description, which we have excluded in the table above.

On all three vignettes, theists were more likely than any other group to indicate that "God or a higher power" influenced the outcome of the event (Vignette 1, 73.2% chose this option, $\chi^2 = 95.878$, $p < .001$; Vignette 2, 31.2% chose this option, $\chi^2 = 35.343$, $p < .001$; Vignette 3, 65.2% chose this option, $\chi^2 = 74.018$, $p < .001$) supporting H1. Additionally, none of the atheists attributed the outcome of any of the three vignettes to "God or a higher power," illustrating that the use of belief in god may be a better measure for capturing proclivity toward making religious causal attributions than is the importance of religion.

We found only partial support for H2 that atheists will be more likely to make secular or scientific causal attributions than will theists. Atheists were more likely to choose "luck" (66.7%; $\chi^2 = 44.298$, $p < .001$) or "probability" (40%; $\chi^2 = 23.020$, $p < .001$) on Vignette 1 than were theists ("luck," 23.9%; "probability," 12.3%), but several other belief groups were just as likely or more likely to choose these options, including agnostics and those who believe in a higher power but not a personal god. Additionally, there was no difference among the different groups in choosing "science or modern technology" as being influential in the outcome of the vignette ($\chi^2 = 4.402$, $p = .354$). On Vignette 2, there were no significant differences in the likelihood of choosing "probability" ($\chi^2 = 5.189$, $p = .268$) or "science or modern technology" ($\chi^2 = 8.930$, $p = .063$)

between atheists and theists. There was a significant difference, however, between atheists and theists (and the other groups) in choosing "luck" ($\chi^2 = 12.234$, $p = .016$). In Vignette 3, atheists were more likely to choose "luck" (33.3% of atheists chose this option, $\chi^2 = 14.274$, $p = .006$), "probability" (26.7% of atheists chose this option, $\chi^2 = 14.385$, $p = .006$), and "science or modern technology" (80.0% of atheists chose this option, $\chi^2 = 32.694$, $p < .001$) than were theists. Thus, our results do suggest partial support for a secular causal attribution bias.

We found clear support for H3, that theists will be more likely to make religious causal attributions when scenarios are related to health and/or life-and-death related situations then when the scenarios are more quotidian. Vignettes 1 and 3 involved health and life-and-death scenarios, and theists were substantially more likely to make religious causal attributions on Vignette 1 (73.2% did) and Vignette 3 (65.2%) than on Vignette 2 (31.2%), which involved a quotidian event like losing one's keys. In fact, very few people from any of the belief in God groups were likely to attribute causality to God or a higher power in Vignette 2, which involved finding lost keys. The Cramer's V that is included in Table 2 indicates the strength of the association in each of the analyses and helps illustrate that our data support H3.[3] With each vignette, the strongest relationship between participants' belief in a god or higher power and the option they chose as helping the individual in the vignette is with the "God or a higher power" response option. For Vignette 1, Cramer's V = .587, and for Vignette 3, Cramer's V = .516, suggesting a relatively strong association. In Vignette 2, Cramer's V = .357, suggesting a moderate association. In other words, theists are particularly likely to believe God may save someone's life or help out in a health emergency, but God is unlikely to help people find their keys.

Finally, to test H4, we examined the data to see if individuals who received the prime condition were more likely to choose the response option "God or a higher power" on each of the vignettes. Priming had no effect on whether or not participants chose "God or a higher power" in each of the vignettes (Vignette 1 $\chi^2 = 1.322$, $p = .250$; Vignette 2 $\chi^2 = .006$, $p = .970$; Vignette 3 $\chi^2 = .006$, $p = .740$). We did not find support for H4.

3 According to Rea and Parker (2014), a Cramer's V < .10 is a negligible association, between .10 and .19 is a weak association, between .20 and .39 is a moderate association, between .40 and .60 is a relatively strong association, between .60 and .80 is a strong association, and > .80 is a very strong association.

Discussion

Our findings provide clear support for two of our four hypotheses (H1 and H3), partial support for one of our hypotheses (H2), and contradict our fourth hypothesis (H4). In line with prior research (Loewenthal & Cornwall, 1993; Lupfer et al., 1994; Riggio et al., 2014), we found that theists were significantly and substantially more likely to make religious causal attributions (H1) than were atheists. Importantly, our findings suggest that prior research that has typically used a single-item measure of importance of religion for distinguishing between "religious" and "less religious" individuals when examining proclivities toward making religious causal attributions may have been underestimating the effect of religiosity. None of the atheists in our study made religious causal attributions in any of the three vignettes, and just one agnostic made a religious causal attribution on Vignette 3 involving recovery from cancer. Prior research has, like research on health (Hwang et al., 2011) and prosociality (Galen, 2012), used measures of religiosity that do not do a very good job distinguishing between those who are religious and those who are nonreligious or secular (Hill & Pargament, 2003). Our findings reveal that belief in God results in much stronger effect sizes when comparing atheists and theists in their proclivity toward making religious causal attributions.

While it may not be all that surprising that the atheists in our sample were particularly unlikely to make any religious causal attributions, it is possible for them to do so. As noted in the introduction, atheists, like theists, need not be logically or internally consistent in their beliefs (Exline et al., 2011). Prior research has even shown that some individuals who self-identify as atheists later report believing in a god or higher power in the same survey (Cragun et al., 2012). However, in our study, given the question we used for capturing participants' belief in a god or higher power, it seems particularly unlikely that those who indicated that they did not believe in a god or higher power would choose God or a higher power as being involved in the outcomes of the vignettes (though participants read and responded to the vignettes before reporting their belief in a god or higher power). In hindsight, our first hypothesis may have been an assertion of the obvious.

We found partial support for our second hypothesis that atheists would be more likely to make secular or scientific causal attributions than would theists. We found more support for this hypothesis in Vignettes 1 and 3, which were health or life-and-death related. In Vignette 3, which was about a woman recovering from cancer, atheists were almost twice as likely to attribute the outcome to science or modern technology (80%) than were theists (44.9%). Atheists were also more likely to attribute the more serious events to non-causal forces

in nature, namely "luck" and "probability" than were theists. This is likely due to the fact that most atheists do not believe in supernatural causality (though some might suggest that "luck" and "probability" are supernatural forces) and recognize the inherent lack of order and control people have in the world (Hunsberger, 2006; Kay et al., 2010; Kurtz, 2007). As a result, they are more likely to attribute seemingly "miraculous" events to luck or probability, recognizing that unusual things do happen simply due to the number of events that take place on a daily basis (Riggio et al., 2014). In short, atheists exhibit a secular causal attribution bias that mirrors the religious causal attribution bias of religious people and that similarity extends to context: the secular causal attribution bias is more likely to be invoked in more serious, life-altering situations.

In line with previous research (Loewenthal & Cornwall, 1993; Weeks & Lupfer, 2000), we found support for the finding that the nature of the event in question was a significant predictor of whether or not theists make religious causal attributions. Theists are much more likely to make religious causal attributions in life-and-death and health-related situations than they are when presented with more quotidian or ordinary events, like people finding keys they lost. This suggests support for the "god of the gaps" idea previous scholars have found (Lupfer, Tolliver, & Jackson, 1996). In other words, religious people are more likely to attribute the outcome of events to God or a higher power when the events do not have a ready secular explanation. Situations in which individuals make a "remarkable" or "miraculous" recovery or avoid serious injury or death are prime scenarios for invoking the causal influence of a deity, reinforcing theists belief in an interventionist God (Spilka et al., 1985).

While our findings do support the idea that those who believe in a higher power employ a "god of the gaps" to help them make sense of their world, our findings also suggest that nonbelievers employ a similar strategy, but invoke other "forces," like chance or probability. While this is the fundamental idea behind attributions—that people offer explanations for events that occur that do not have clear explanations—this could also be referred to as the "law of the gaps." In other words, whether or not one believes in a god or higher power, people have a proclivity to want to invoke impersonal "forces" to explain situations that are otherwise unexplainable. The "god of the gaps" idea would simply be a subset of the broader "law of the gaps," which describes the proclivity for humans to search for explanations or meaning when faced with the randomness of the universe.

Finally, we did not find support for our fourth hypothesis, that religious priming would increase the odds of people making religious causal attributions. In fact, religious priming had no effect on whether or not people made religious causal attributions at all, similar to what one other study found when it did

something similar (Ray et al., 2015). Given the robust effect religious priming has been shown to have in many other areas (Dijksterhuis et al., 2008; Shariff et al., 2015), this finding was somewhat surprising. One possible explanation is that the cognitive processes that lead individuals to make religious causal attributions are always on and attuned to opportunities to make religious causal attributions. Given the role religious causal attributions play in validating religious people's identity and worldview (Hogg et al., 2010; Spilka et al., 1985), it would make sense that such people are constantly scanning their environment for opportunities to validate their beliefs and worldview; in other words, they are constantly engaged in motivated reasoning (Kunda, 1990). This would also explain why priming had no effect on atheists, either, as they are likely engaged in a similar process—scanning their environment and the world around them for evidence that supports their beliefs and worldview. While this runs counter to prior research that did find an effect of religious priming on attributions (Dijksterhuis et al., 2008), our study differed from that study in numerous ways, including in the priming technique (subliminal versus latent), the methodology employed (a computer word recognition task versus the interpretation of ambiguous vignettes), and in the measures of attribution biases. It may be the case that religious priming can influence one's proclivity to make religious causal attributions, but we did not find that to be the case with our vignettes using the methodology we employed.

Limitations

While our study improves upon prior research on religious causal attributions in some ways, there are also some limitations. For instance, the way we conducted the priming component of our study may have been problematic. While we used implicit priming, there are other means of priming individuals that may result in different findings (Dijksterhuis et al., 2008; Shariff et al., 2015). Additionally, participants assigned to the prime condition saw three vignettes that all included religious words in them rather than a single vignette with a priming word in it. Future research should consider taking different approaches to priming subjects to see if alternative priming methodologies have different effects on religious causal attributions.

Another limitation of our study is that we did not include manipulation checks in order to determine whether or not participants were adequately primed (Bargh & Chartrand, 2000). This could help explain why we found no effect from religious priming. Future research should include manipulation checks to insure that the priming was effective. Additionally, an unfortunate

oversight in constructing our survey instrument resulted in a question about participants' gender not being included. This is why there is no discussion of differences in the results by gender. Future research should obviously include a question about gender.

Finally, our sampling approach was somewhat unorthodox. While prior studies of religious causal attributions have used convenience samples that included non-students (see Loewenthal & Cornwall, 1993), there are limits to the generalizability of our data.

Conclusion

While prior research has shown that religious people are likely to make religious causal attributions in situations that are significant and life altering, much of that research has compared religious people to less religious people. In our study, we compared theists to atheists. Our results were similar, but our findings suggest that comparing atheists to theists may result in larger effect sizes when examining who is likely to make religious causal attributions. We also found that atheists exhibit their own attribution biases, as they are more likely to attribute unexpected or life-altering events to secular, non-causal phenomena, like luck or probability, as well as science and modern technology in the case of remarkable health-related events. Similarly, theists are more likely to make religious causal attributions in life-and-death and health-related scenarios than in more quotidian situations. We also found that religious priming did not increase the probability of making religious causal attributions. Whether primed or not, theists were more likely to believe that God will help save peoples' lives than help them find their keys.

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