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#### **Authors**

Searle, Ellen

Vonk, Jennifer

Brothers, Brock

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# The Influence of Religious Beliefs on False Memory of Fabricated Events

**Ellen Searle (eksearle@oakland.edu)**

Department of Psychology, 2200 N Squirrel Rd  
Rochester, MI 48309

**Jennifer Vonk (vonk@oakland.edu)**

Department of Psychology, 2200 N Squirrel Rd  
Rochester, MI 48309

**Brock Brothers (brockrbrothers@gmail.com)**

Department of Psychology, 2200 N Squirrel Rd  
Rochester, MI 48309

## Abstract

Previous research has indicated that memories can be modified in conjunction with one's attitudes, in particular, political beliefs. The current study extended this finding by focusing on the relationship between differing religious beliefs and false memories for news events. We predicted that religious people would be more inclined to remember fabricated news events positively depicting religion and less likely to remember events negatively depicting religion compared to non-religious people. Opposite effects were predicted for events depicting atheism. In contrast, we found that religious people were more likely to falsely remember both events depicting religion positively and negatively compared to non-religious individuals. However, the extent to which individuals felt positively about the events interacted with religious beliefs to predict reported false memories. Religious individuals were more likely to remember events if they felt positively about them whereas atheists were more likely to remember events if they felt negatively about them.

**Keywords:** religiosity; false memory; beliefs

False memory refers to mistaken recollection of events or aspects of events that never occurred as if they actually happened. Elizabeth Loftus and colleagues have conducted numerous studies on this phenomenon. In one of the first studies to investigate false memory, Loftus and Palmer (1974) showed participants videos of a car accident and then asked them questions regarding the accident. More participants falsely remembered seeing broken glass when the verb "smashed" was used versus when the verb "hit" was used. This seminal study was one of the first to indicate how malleable memory can be, and how easily it is influenced by leading questions – a finding that has contributed to stricter guidelines for witness interrogations (Loftus, 1993).

Further research has identified many possible influences on false memory, such as plausibility of events (Pezdek, Finger, & Hodge, 1997) and prior expectations (Macrae, Scholterscheidt, Bodenhausen, & Milne, 2002; Vendetti et al., 2014). In addition, group identification can influence pre-existing beliefs and bias memory (Van Bavel and Cunningham, 2012). Beliefs regarding religion

and politics can contribute to group belonging and may also lead one to recall events in line with those beliefs.

Frenda et al. (2013) investigated the relationship between political beliefs attitudes toward events, and memory by presenting Democrats and Republicans with images depicting political events. Participants were then asked whether they remembered the event and how they felt about the event. They were not asked how strongly they remembered the event. Not only were participants more likely to recall a fabricated event consistent with their political views, but they also recalled feeling emotions consistent with their attitudes toward the party in question. For example, Democrats were more likely to falsely remember Bush vacationing during Hurricane Katrina and to report feeling more outraged about the event. Republicans, on the other hand were more likely to falsely remember events negatively depicting Democrats, such as Obama shaking hands with the Iranian president. On the other hand, fabricated events depicting Hillary Clinton airing an attack ad linking Obama to Rev. Wright or Joe Lieberman voting guilty during President Clinton's impeachment trial were not remembered because there was low congruence between their political attitudes and how they felt about the event. These findings support previous research suggesting that real memories are influenced by one's positive or negative attitudes toward an event, in addition to being influenced by one's beliefs about events. However, such research reveals mixed results and a recent study showed that people may remember positive and negative life events equally well (Waters et al., 2013). In addition, emotions toward events may promote memory for features of events, but not overall accuracy of the memories (Earles et al., 2016). Less is known about the role of affect on false memories.

In the present study, we were interested in examining the effects of religious affiliation and strength of religious beliefs on false memory for plausible news events some of which had actually occurred, and some of which had not. Although we expected participants to be more likely to falsely remember events consistent with their religious beliefs (or lack thereof), it is possible that, for example, some events portraying religion may be recalled by

nonreligious people if the religious event was similar to their experiences of religion (Pezdek, Finger, & Hodge, 1997).

It was expected that Christians, compared to atheists and agnostics, would be more likely to falsely remember an event that positively described a Christian or an event that negatively depicted nonbelievers, such as atheists. Similarly, nonbelievers were expected to falsely remember events that were consistent with their non-religious views, such as events depicting religion as causing harm rather than doing good. Because the role of religious beliefs and valence in predicting false memories had not previously been examined, our study was designed to investigate whether effects existed, not to reveal underlying mechanisms for such possible associations.

## Method

### Participants

599 participants (82% female, 84% religious) who received course credit for their participation were recruited from the psychology research pool at a Midwestern University in the U.S. and directed to a secure website (surveymonkey.com) where they completed the study online.

### Materials

To assess the strength of participants' religious beliefs, the religious fundamentalism (Altemeyer & Hunsberger, 2004) and true religious belief scales (Zeigler-Hill & Shackelford, unpublished) were administered

**The Religious Fundamentalism Scale** is a 20 item scale with a Cronbach's alpha typically ranging from .93 to .95. It measures the extent to which one views religion as a single, absolute truth. Like the dogmatism scale, it can be related to authoritarianism (Altemeyer & Hunsberger, 1992). The scale was revised in 2004. An example of an item is, "God has given mankind a complete, unflinching guide to happiness and salvation, which must be totally followed." The items are answered based on a 9-point Likert scale ranging from *very strongly disagree* to *very strongly agree* ( $\alpha = .95$ ).

**The True Religious Beliefs scale** is a 59 question compilation of items from several scales including six items from the Shortened Post-Critical Belief Scale (Duriez, Soenens, & Hutsebaut, 2004), ten items from the Beliefs and Values Scale (King et al., 2005), two items from the God Image Inventory (Lawrence, 1997), five items from The God Delusion (Dawkins, 2006, pg207-208), four items from the Literal, Anti-Literal, and Mythological Scales (Hunt, 1972), and additional measures as developed by Zeigler-Hill and Shackelford (Unpublished data). In the current study, we obtained a Cronbach's alpha of .98 for the complete scale.

To assess memory for false events, participants were given a memory task in which they were presented with eight images corresponding to news stories that depicted four actual events (one in which religion was depicted positively and one in which religion was depicted negatively, one in which atheism was depicted positively, one in which atheism was depicted negatively) and four that depicted fabricated events from the same categories.

### Procedure

Participants completed several online questionnaires via surveymonkey.com. Participants provided information about their sex, GPA, political, and religious affiliations. Participants who reported being affiliated with Christianity or other religions, or religious without any affiliation were coded as religious. Those who reported being atheist or agnostic were coded as non-religious. They were then administered the scales described above along with two additional scales that were not included in the analyses. After the questionnaires, the participants were presented with the memory task. Images of events were presented in the same pseudorandom order for all participants. For each image, participants responded as to how strongly they recalled the event on a four point Likert scale (not at all to very well) and how they felt about the event on a five point Likert scale (very negatively to very positively) with lack of memory at the middle point (valence).

## Results

Data was examined for normality and the memory scores were found to have a positive skew. Memory scores were therefore transformed using a logarithmic transformation in order to correct for this positive skewness. Memory and valence scores were then standardized before being entered into analyses. We conducted bivariate correlations between the predictor variables of religious category, memory for true events, and valence for the false events, and the outcome variable of memory for false events. Correlation results revealed a high positive correlation between false memory for the event negatively depicting religion and valence of this event ( $r = -.59, p < .001$ ). Religious category was highly correlated with our religiosity measure (described below),  $r = .62, p < .001$ .

We then performed hierarchical multiple regression analyses where we regressed each log-transformed and standardized false memory score on to strength of religious beliefs and valence (measure of positive regard) for the corresponding false event. Consistent with Frenda et al. (2013), the transformed memory score for the corresponding true event was entered into the regression at the first step as a control. In addition, religious category was added into this step to see if strength of religious beliefs accounted for any variability above and beyond what was accounted for by religious affiliation.

Correlation analyses between the True Religious Beliefs Scale and Religious Fundamentalism scores suggested a large correlation between the two scores ( $r = .81$ ). To eliminate the effect of multicollinearity, and because the two scales reduced to a single component using PCA, the scores were standardized and averaged to create a composite religiosity score. This score was entered into the second step of the regression model and allowed to interact with valence in the third step. Results of the regression analyses are displayed in Table 1.

### Memory for false positive religious events

Memory for the true event ( $\beta = .26, t = 6.59, p < .001$ ) and religious category ( $\beta = .08, t = 2.11, p = .04$ ) were positively associated with false memory for the event positively depicting religion. After controlling for religious category and memory for the true event, valence of the false event was positively associated with false memory ( $\beta = .46, t = 13.13, p < .001$ ).

A significant interaction was found between strength of religious beliefs and valence of the false event ( $\beta = -.08, t = -2.24, p = .03$ ). Predicted values for this interaction are presented in Figure 1. Simple slopes tests were conducted for individuals who were high and low in religiosity. For both those lower in religiosity ( $\beta = .55, t = 10.53, p < .001$ ), and those higher in religiosity ( $\beta = .40, t = 8.93, p < .001$ ), valence was positively associated with false memory. Participants were more likely to falsely remember events positively depicting religion if they felt positively about them.

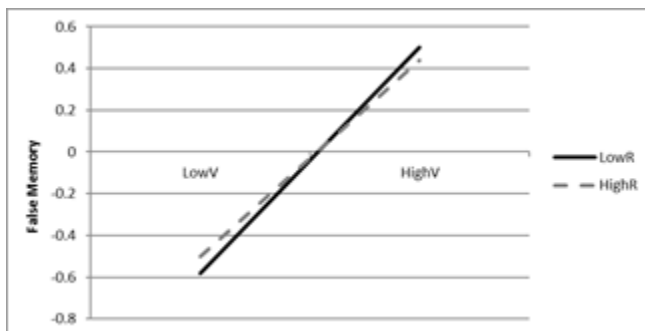


Figure 1.

Predicted values for false memory for positive religious events are presented illustrating the interaction of religiosity and valence at values that are one standard deviation above and below their respective means.

### Memory for false, negative religious events

Memory for the true event ( $\beta = .21, t = 5.12, p < .001$ ) and religious category ( $\beta = .12, t = 3.00, p = .003$ ) were positively associated with memory for the false event.

After controlling for religious category and memory for the true event, valence for the false event ( $\beta = .28, t = 7.39, p > .001$ ) was positively associated with memory for the false event.

Religiosity interacted with valence to predict false memory ( $\beta = .12, t = 2.96, p = .003$ ). Predicted values for this interaction are presented in Figure 2. To further understand this interaction, simple slopes tests were conducted for individuals high and low in religiosity. For both participants high ( $\beta = .37, t = 7.75, p < .001$ ) and low in religiosity ( $\beta = .16, t = 2.71, p = .007$ ), valence was positively associated with false memory. Participants were more likely to falsely remember events negatively depicting religion if they felt positively about them.

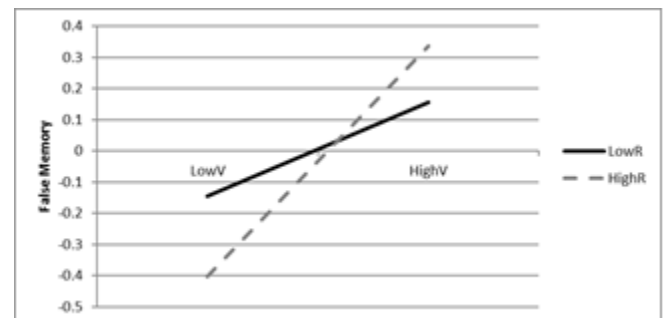


Figure 2.

Predicted values for false memory for negative religious events are presented illustrating the interaction of religiosity and valence at values that are one standard deviation above and below their respective means.

### Memory for false, positive atheist events

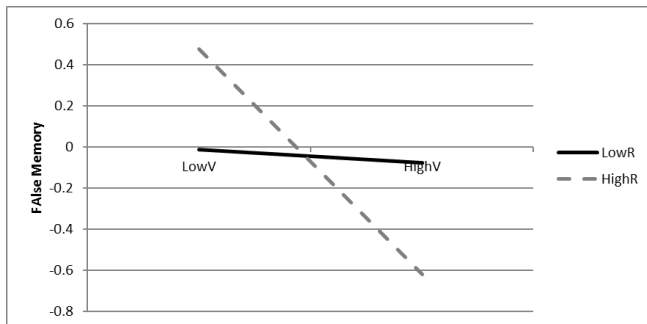
Memory for the true event ( $\beta = .33, t = 8.27, p > .001$ ) was positively associated with memory for the false event. After controlling for religious category and memory for the true event, valence for the false event was negatively associated with false memory for the negative religious event ( $\beta = -.19, t = -4.69, p > .001$ ).

Religiosity interacted with valence for the false event to predict memory for the false event ( $\beta = -.35, t = -8.89, p < .001$ ). Predicted values for this interaction are presented in Figure 3. To further understand this interaction, simple slopes tests were conducted for individuals high and low in religiosity. For participants high in religiosity, valence was negatively associated with false memory ( $\beta = -.55, t = -9.92, p < .001$ ), but valence did not significantly impact false memory for participants low in religiosity ( $\beta = -.04, t = -.87, p = .39$ ). Only participants high in religiosity were more likely to falsely remember events positively depicting atheism if they felt negatively about them.

*Table 1: Regression of False Memory Scores on to Memory for the true Event, Religious Category, and Strength of Religious Beliefs and Valence toward the false event.*

	<u>Memory False Positive Religious</u>			<u>Memory False Negative Religious</u>			<u>Memory False Positive Atheist</u>			<u>Memory False Negative Atheist</u>		
	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\beta$
<u>Step 1</u>	.08***	.08***		.06***	.06***		.11**	.11***		.07***	.07***	
<u>Memory for real event</u>			.26***			.21***			.33***			.22***
<u>Religious Category</u>			.08*			.12**			-.03			.14***
<u>Step 2</u>	.29***	.21***		.14***	.08***		.14***	.03***		.38***	.31***	
<u>Memory for real event</u>			.22***			.21***			.34***			.17***
<u>Religious Category</u>			.05			.11*			-.07			.08*
<u>Strength of religious beliefs</u>			.04			-.03			.003			-.03
<u>Valence for false event</u>			.46***			.29***			-.19***			-.57***
<u>Step 3</u>	.30*	.006*		.15**	.01**		.25***	.10***		.38	.001	
<u>Memory for real event</u>			.22***			.21***			.32***			.16***
<u>Religious Category</u>			.06			.12*			-.02			.07*
<u>Strength of religious beliefs</u>			.04			-.02			-.01			-.03
<u>Valence for false event</u>			.47***			.26***			-.29***			-.57***
<u>Religious Category * Valence</u>			-.08*			.12**			-.35***			.02

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.



**Figure 3.**

Predicted values for false memory for negative religious events are presented illustrating the interaction of religiosity and valence at values that are one standard deviation above and below their respective means.

### Memory for false, negative atheist events

Memory for the true event ( $\beta = .23, t = 5.72, p > .001$ ) and religious category ( $\beta = .14, t = 3.58, p < .001$ ) were positively associated with memory for the false event. After controlling for religious category and memory for the true event, valence for the false event was negatively associated with false memory ( $\beta = -.57, t = -17.04, p > .001$ ). That is, people who had stronger negative feelings about the event and those who were more religious were

more likely to falsely remember an event that portrayed atheists in a negative light. The interaction between strength of religious beliefs and valence for the false event was not significant ( $\beta = .02, t = .69, p = .49$ ).

## Discussion

The results of our regression analyses support the notion that religious beliefs interact with regard for the events to impact false memory formation. Religious participants and non-religious participants falsely remembered the fabricated events consistent with their religious beliefs, but differently as a function of how they felt about various events. Religious participants were more likely to remember religious events if they felt positively about them and atheist events if they felt negatively about them. Of particular interest is the finding that both religious and nonreligious participants were more likely to remember the event negatively depicting religion if they felt positively about it.

The latter finding could be explained by features of the events themselves. Because only a single event was used for each category of events, it is possible that idiosyncratic features of the individual events had unexpected influence on participants' valence ratings and memories. For instance, the image of the Pope (Figure 5), while telling a negative story, may have been more salient than the caption itself. The event depicts a cover-up of child sexual abuse by Pope Francis (when this was in-fact

done by a previous pope). We intend to address this possibility in a future study.



**Figure 5.**

The false negative religious event depicted Pope Francis covering up child sexual abuse.

Another possible explanation for the finding is that negative events are in themselves more salient than positive events. Pratto and John (1991) suggested that people automatically attend to negative more than positive stimuli. Other studies, however, also point to the impact of emotion. Laney, Campbell, Heuer, and Reisberg (2004) found that participants remembered emotionally-arousing information better than more neutral information. Kensinger and Corkin (2003) reached a similar conclusion in finding that memory was greater for events that were both negative and emotional. It is possible that both religious individuals, and atheists, who identify as being non-religious (which is defined more by the absence than presence of a particular belief system), feel more strongly about events aligned with the presence rather than the absence of religion. The results of the regression analysis are consistent with this literature given that there was a large effect of valence on memory for the false negative atheist event, which depicted atheists burning a church. This finding may result from participants both having strong negative feelings for the events and strong memories for the events. This event, as well as the true event involving the Westboro Baptist Church, can be considered to be both negative and emotionally-arousing.

Whereas negative events may be salient, it is also possible that religious people tend to evaluate events more positively. Vishkin et al. (2015) found that religious people were more likely to effectively reappraise negative information in more positive light. This finding could explain why religious people generally remembered events depicting religion if they felt positively about

them. Perhaps religious people were able to reappraise the negative religious events as more positive.

The finding that false memory is moderated by valence is consistent with Frenda et al. (2013). For example, Republicans in this study were more likely to falsely remember events positively depicting Republicans if they felt positively about the event. Conversely, if such participants felt negatively about an event negatively depicting democrats, they were more likely to remember it. This finding, as well as the findings from our study are consistent with the positive correlation between conservatism and religious attitudes found by Pennycook et al. (2011).

The current study is the first study to directly address the relationship between religiosity and false memory. Further research can focus on investigating the interaction between religious affiliation and attitudes towards the event. In addition, future research could investigate how different religious viewpoints may influence false memory (i.e. Christian events versus Jewish or Muslim events).

Our study is limited by the use of a college sample. Data from college students may not necessarily be generalizable to the overall population particularly with regards to beliefs and memory for public events. In addition, our sample was predominately Christian and female. Because our population included a disproportionate amount of religious and nonreligious participants, the small amount of nonreligious participants may not be truly representative of the atheist population. We are currently addressing this limitation with a second study using a community sample.

Our results suggest that religiosity may influence false memory for religious events. This further adds to the literature suggesting that memory may be biased by prior expectations and attitudes. In addition, our research provides further evidence that prior beliefs may interact with attitudes towards an event to predict false memory. By expanding the existing literature, we have shown that memory can be influenced by more ways in which we imagined.

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