



Reports

False memories of fabricated political events

Steven J. Frenda ^{a,*}, Eric D. Knowles ^b, William Saletan ^c, Elizabeth F. Loftus ^a^a Department of Psychology and Social Behavior, University of California, Irvine, CA 92697, USA^b Department of Psychology, New York University, New York, NY 10003, USA^c The Slate Group, 1350 Connecticut Ave. NW, Suite 400, Washington, D.C., 20036, USA

HIGHLIGHTS

- ▶ Over 5,000 subjects were asked if they remembered fabricated political events.
- ▶ About half of the sample showed evidence of memory distortion.
- ▶ Political preferences appeared to guide the formation of false memories.
- ▶ Suggestions that are congruent with prior attitudes and evaluations can produce feelings of familiarity and recognition.
- ▶ These can in turn bias source judgments, leading to false memories.

ARTICLE INFO

Article history:

Received 1 March 2012

Revised 5 October 2012

Available online 19 November 2012

Keywords:

False memory

Source monitoring

Political preference

ABSTRACT

In the largest false memory study to date, 5,269 participants were asked about their memories for three true and one of five fabricated political events. Each fabricated event was accompanied by a photographic image purportedly depicting that event. Approximately half the participants falsely remembered that the false event happened, with 27% remembering that they saw the events happen on the news. Political orientation appeared to influence the formation of false memories, with conservatives more likely to falsely remember seeing Barack Obama shaking hands with the president of Iran, and liberals more likely to remember George W. Bush vacationing with a baseball celebrity during the Hurricane Katrina disaster. A follow-up study supported the explanation that events are more easily implanted in memory when they are congruent with a person's preexisting attitudes and evaluations, in part because attitude-congruent false events promote feelings of recognition and familiarity, which in turn interfere with source attributions.

© 2012 Elsevier Inc. All rights reserved.

Introduction

In May of 2010, Slate.com invited its readers to complete a survey about their perspectives on various political events. Those who volunteered read about five unrelated news events with accompanying photographs and were asked about their memories for them. Unbeknownst to the respondents, one of the five events they were asked about was a complete fabrication; it never happened at all. In effect, Slate readers became participants in the largest false memory experiment ever conducted.

The survey was posted in the weeks leading up to the publication of Slate's article on research into false memories (Saletan, 2010). Indeed, the idea that Slate's readers might come to remember whole events that never occurred is based on a voluminous literature suggesting just that. Since the mid-1990s, researchers have investigated the ways in which people come to have vividly detailed, emotionally laden

memories of entirely false events—what are known as “rich false memories” (see Loftus & Bernstein, 2005). Today, we know quite a lot about the situations that can give rise to rich false memories.

A central feature of the memory implantation experiments is the use of highly credible suggestive information. In several early studies (e.g., Hyman & Billings, 1998; Hyman, Husband, & Billings, 1995; Loftus & Pickrell, 1995), researchers obtained true childhood events from familial informants and asked participants to work at remembering them. A false event invented by the experimenters (with help from the family member) was embedded among the true events, often leading more than a quarter of participants to report false memories. Researchers in another unique study recruited a well-known psychologist and radio personality to help implant false childhood memories in subjects using bogus dream interpretations (Mazzoni, Lombardo, Malvagia, & Loftus, 1999). More recently, a number of studies (e.g., Bernstein, Laney, Morris, & Loftus, 2005; Sharman & Calacouris, 2010) have led participants to believe that a computer algorithm could, based on their responses to a battery of personality questionnaires, generate a personalized list of “likely” childhood events. Participants were then asked to try to remember events from the list, which consisted mostly of true events drawn from

* Corresponding author.

E-mail addresses: sfrenda@uci.edu (S.J. Frenda), eknowles@uci.edu (E.D. Knowles), will.saletan@slate.com (W. Saletan), eloftus@uci.edu (E.F. Loftus).URL: <http://Slate.com> (W. Saletan).

their earlier reports—plus one critical false event. While these studies involved diverse methodologies, they all made use of suggestions that appeared to come from a trusted, or expert source.

Visual images can also play an important role—a number of studies have shown that both real and doctored photographs can facilitate the creation of false memories. For instance, large proportions of participants who saw digitally doctored photographs of a childhood experience that did not happen (i.e., riding in a hot air balloon) ultimately reported false memories of the event (Wade, Garry, Read, & Lindsay, 2002). In certain contexts, even seeing true (unaltered) childhood photographs or generic images can facilitate the creation of false memories (Lindsay, Hagen, Read, Wade, & Garry, 2004; Strange, Hayne, & Garry, 2007). Moreover, research shows that photographs can substantially change our memories of news and political events; in one study, a doctored photograph caused participants to falsely remember a peaceful antiwar demonstration as violent and disruptive (Sacchi, Agnoli, & Loftus, 2007). In another, participants who saw an image depicting the aftermath of a hurricane were more likely to erroneously recall details of death and injury in a previously read news report (Garry, Strange, Bernstein, & Kinzett, 2007).

Much like photographs, mental imagery can also contribute to the development of false memories. Simply imagining a false event inflates people's confidence that they experienced it, a phenomenon now called "imagination inflation" (e.g., Garry, Manning, Loftus, & Sherman, 1996). Also, imagining events can lead to the development of false memories even in the absence of any suggestion (Mazzoni & Memon, 2003). Finally, a number of studies have used guided imagination to augment the effects of suggestion on memory (e.g., Hyman & Pentland, 1996). Further, a number of studies have successfully used guided imagination techniques to augment the effects of suggestion (e.g., Hyman & Pentland, 1996).

One way to understand these findings is to consider them in the context of the Source Monitoring Framework (SMF; Johnson, Hashtroudi, & Lindsay, 1993; Lindsay, 2008). According to the SMF, false memories are the result of misattributing the source of imagined, inferred, or suggested information to actual experience. More specifically, people rapidly—often unconsciously—diagnose the origins of their mental experiences by evaluating characteristics such as perceptual detail, vividness, and familiarity. Photographs, and our powerful ability to counterfactually imagine, may amplify these characteristics, making source misattributions and false memories more likely (see Nash, Wade, & Lindsay, 2009).

Much of the research on false memories has been conducted using relatively small samples of college students. Slate's experiment, in which people were shown digitally altered photographs of fabricated news events and asked about their memories for them, offers a unique opportunity to observe these phenomena on a large scale in a diverse population of people, and to investigate the possible routes to false memories in a new way. In revisiting the Slate experiment, we discovered patterns of results that shed new light on factors that can facilitate the creation of false memories.

Study 1

Method

Participants

Participants ($N = 5,269$) completed survey materials posted on Slate.com, an online publication offering reporting and editorials about news, politics, science, and culture. Two hundred eighty-five (5.4%) participants identified as conservative, 1,286 (24.4%) identified as moderate, 3,141 (59.6%) identified as progressive, and 557 (10.5%) reported that the labels were not applicable. Just under half of Slate's readership is male, half have at least a college degree, with a median age of 45 and a median income of about \$70,000.

Materials

True events. A series of events was assembled for use in the present study. Each stimulus included a brief description of a single event and an unaltered photograph of a public figure involved in the event.

Terri Schiavo controversy. In 2005, the U.S. House of Representatives passed a law aimed at preventing the death of Terri Schiavo, a 41-year-old woman in a persistent vegetative state. An unaltered photograph depicted House Majority leader DeLay at a podium, advocating passage of the law.

Bush's Florida victory. In 2000, Florida Secretary of State Katherine Harris dismissed ongoing ballot recounts and certified George W. Bush the winner of the presidential election in Florida. An unaltered photograph depicted Harris at a podium joined by then-governor Jeb Bush.

Powell's Iraq speech. In 2003, U.S. Secretary of State Colin Powell presented evidence (later discredited) of Iraq's nuclear weapons program to the United Nations Security Council. Participants saw an unaltered photograph of Powell giving his speech.

Fabricated events. Five fabricated events were created by pairing altered or out-of-context photographs with inaccurate captions (see Fig. 1).

Lieberman's impeachment vote. Participants saw a caption that read, "February 12, 1999: Speaking on the Senate floor at the conclusion of President Clinton's impeachment trial, Senator Joseph Lieberman, D-Conn, announces that he will vote guilty on the charge of perjury." A photo of Lieberman next to the Senate vote tally, broken down by party affiliation, was altered to make it appear that one Democrat had voted 'guilty.' In fact, Lieberman voted 'not guilty' along with every other Democrat Senator at the time.

Cheney/Edwards argument. Participants saw a caption that read, "October 5, 2004: During their televised debate, Vice President Dick Cheney rebukes Sen. John Edwards for bringing up the sexual orientation of Cheney's lesbian daughter. Moderator Gwen Ifill intervenes to remind the debaters of the ground rules." An unaltered photo of Cheney looking angrily at Edwards during their debate was presented. In fact, the moderator raised the issue of Cheney's daughter in the context of the same-sex marriage debate; Edwards praised Cheney for accepting his daughter's sexual orientation and Cheney thanked Edwards for the compliment.

Hillary Clinton's attack ad. Participants saw a caption that read, "April 14, 2008: Trailing in the delegate count for the Democratic presidential nomination, Sen. Hillary Clinton airs an ad in Pennsylvania linking Sen. Barack Obama to the Rev. Jeremiah Wright. Under criticism, she pulls down the ad but wins the primary." A still image from a Republican advertisement featuring Obama and Wright was doctored to look like Clinton had approved it. In fact, Clinton never aired such an advertisement.

Bush's Katrina vacation. Participants saw a caption that read, "September 1, 2005: As parts of New Orleans lie underwater in the wake of Hurricane Katrina, President Bush entertains Houston Astros pitcher Roger Clemens at his ranch in Crawford, Texas." An altered photograph depicted Clemens in a truck with Bush in Crawford. In fact, Bush was at the White House when Hurricane Katrina hit, and Clemens never visited Bush's Crawford ranch.

Obama's handshake. Participants saw a caption that read, "April 20, 2009: President Obama, greeting heads of state at a United Nations conference, shakes the hand of Iranian President Mahmoud Ahmadinejad. White House aides say the encounter was unplanned and the handshake was a formality." A photograph of Obama shaking hands with a man in a suit was altered to make it appear that the man was Ahmadinejad. In fact, there is no public record of the two men ever meeting or shaking hands.

Memory probe. After viewing each stimulus, participants reported whether they remembered the event by selecting one of the



Fig. 1. Original photograph materials (left) with digital alterations (right).

following options: “I remember seeing this,” “I don’t remember seeing it, but I remember it happening.” “I don’t remember it,” or “I have a different memory of how it happened.” Finally, participants freely responded to questions asking, “How did you feel about [this event] at the time?” and “Looking back, how do you feel about it today?”

Political orientation probe. Participants reported which of the following best described their political orientation: “progressive,” “moderate,” “conservative,” or “not applicable.”

Guess probe. Participants guessed which of the false event stimuli was false after being told, “[o]ne of the incidents we showed you was not true. We inserted it to see whether political memories can be altered by rewriting history as well as by the passage of time.” Participants then saw each of the four captions and selected the event they thought was false.

Procedure

Participants were invited to participate in a survey posted on Slate.com. The invitation read, “To find out how our perceptions

have evolved, we'd like your help with a short interactive experiment. We've selected some notable political moments from the last decade, going back to 1999. We'd like to show you four of them (the exact assortment will vary from person to person) and ask you how you felt about them at the time and how you look at them today." Participants were assured they were not being "quizzed" and that there were no "right answers," and were asked to not consult any other people or sources of information. Participants then reported their political orientation. Next, participants saw four events, each followed by the memory probe questions. First, two true events, Terri Schiavo controversy and Bush's Florida victory, were presented in fixed order. Participants then saw one randomly selected false event. Finally, participants saw a true event: Powell's Iraq speech.

After completing the guess probe, participants were debriefed, thanked for their participation, and asked not to warn other potential participants about the nature of the study.

Results and discussion

True events

We began our analysis by examining the extent to which respondents were generally familiar with news and political events. A large majority of the participants (82%) indicated that they remembered all three true news events by selecting either "I remember seeing it," or "I remember it happening," for each. Nearly everyone (98%) remembered at least two of the events. The Terri Schiavo controversy was remembered by 90% of the participants, slightly less than the Florida recount and Powell's speech, each remembered by 95% of participants. Interestingly, there were differences in true event memory between conservatives and liberals: conservatives remembered a smaller proportion of the true events on average, $t(3424) = 3.78$, $p < .001$. Nonetheless, these rates suggest that the respondents were generally familiar with current events.

False events

We next examined participants' memory for the false events. Recall that each participant saw one of five possible fabricated events. Across all false event conditions, 2,650 participants (50%) reported that they remembered the false event happening. Of those, more than half reported not only that they remembered the event, but that they saw it happening on the news (1,417 participants; 27% of the entire sample). The remaining participants reported that they did not remember the event (44%) or that they remembered it differently (6%). Participants in the Hillary attack ad condition showed the highest rate of false memory (68%), followed by the Cheney/Edwards debate (65%), the Obama handshake (47%), the Lieberman vote (40%), and the Bush vacation (31%). The rates of remembering having seen the event followed a similar pattern (see Fig. 2).

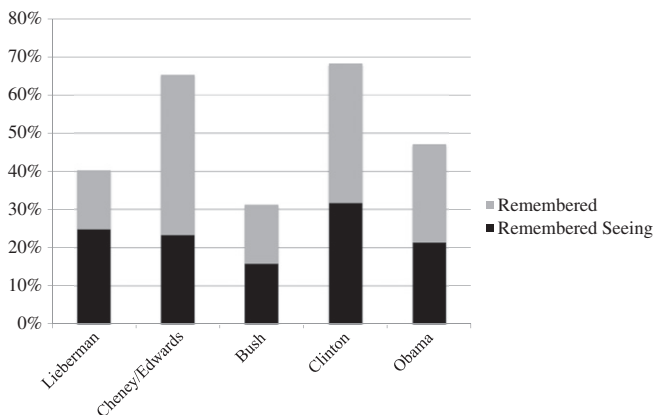


Fig. 2. False memory rates in five fabricated political events.

Many participants either declined to elaborate in the optional free response, or the brevity of their comments made it difficult to interpret the nature of their memories (e.g., "What a jerk"). However, for others, the content of their free responses shed some light on what their false memories were like. For example, of the Clinton campaign ad, one participant wrote, "I was torn because I think it is fair to ask Obama why he was associating with someone like Wright." A participant who remembered Lieberman's impeachment vote elaborated, "Mixed emotions... Lieberman seemed to vote his conscience at the time." Another participant who reported a memory of the Cheney/Edwards debate wrote, "I was a John Edwards supporter from the beginning, but I cringed a little when he brought it up." Responses like these suggest that many participants were experiencing what felt to them like real memories, situated in the context of other events and embellished with their preexisting impressions of the politicians. Interestingly, many people seemed to regard the false event as consequential for their own thoughts and feelings at the time. For instance, one participant who remembered Clinton's ad wrote, "I thought it was a desparate [sic] move and it solidified my disgust with Mrs. Clinton as a candidate."

After being told of the deception and asked to guess which event was false, 3,304 participants (63%) correctly identified the false event. However, only 53% of the participants who initially reported that they remembered the false event correctly identified it later as false. The remaining 1,256 participants (24% of the entire sample) reported that they remembered the false event and were unable to correctly identify it as false post-debriefing.

False memory by participant ideology

We next examined whether false memory rates varied by participant political ideology. To this end, we built logistic regression models for each event testing whether political orientation predicted false memory rates, controlling for true event memory counts. For the Lieberman vote, the Cheney/Edwards debate, and the Hillary ad, there were no differences in false memory susceptibility between conservatives and liberals. However, for the remaining two events, the Bush vacation and the Obama handshake, political differences emerged. In the Bush vacation condition, liberals were significantly more likely than conservatives to report that they remembered the event, $OR = 3.2$, 95% CI [1.4, 7.3], $p = .006$. In the Obama handshake condition, conservatives were significantly more likely than liberals to remember seeing the event, $OR = 1.9$, 95% CI [1.1, 3.3], $p = .021$ (see Figs. 3 and 4). It should also be noted that there were significant main effects of true memory counts. That is, people who correctly remembered more true events were more likely to falsely remember the false event.

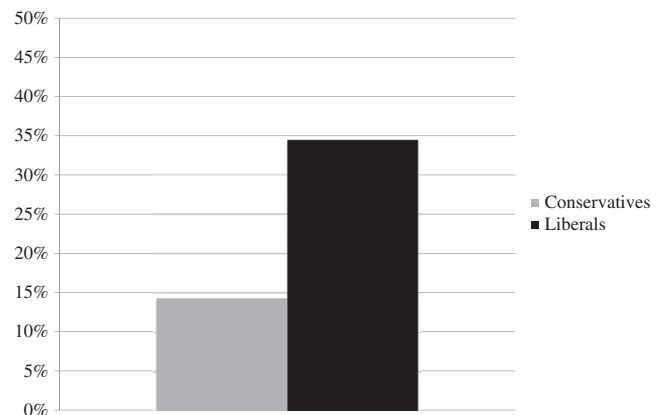


Fig. 3. False memory rates for Bush's Katrina vacation by political orientation.

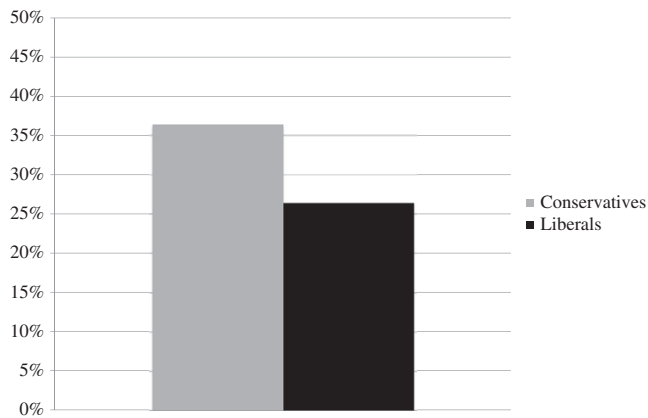


Fig. 4. False memory rates (remembered seeing) for Obama's handshake by political orientation.

Attitudinal congruence and false-memory formation

We observed political differences for two of the false events: conservatives were more likely to falsely remember seeing Obama shaking hands with the Iranian president, and liberals were more likely than conservatives to falsely remember Bush vacationing during Hurricane Katrina. In contrast, we observed no significant ideological differences for the remaining three events—the Lieberman vote, Clinton's anti-Obama advertisement, and the Cheney/Edwards debate.

We propose that the likelihood of false memory formation depends on the degree of “fit” between a person's attitudes toward the actor and their attitudes toward the behavior depicted in an event. That is, people will readily form memories of an event in which someone they dislike does something of which they disapprove, or in which someone they like does something of which they approve (high attitudinal congruence). But when perceivers are shown a disliked actor doing something “good” or a liked actor doing something “bad” (low attitudinal congruence), they will be less likely to falsely remember the event. This proposal is consistent with findings suggesting that one's prior knowledge, impressions, and judgments can strongly influence what people remember and misremember. For instance, people remember information that is consistent with their expectations better than information that violates expectations (Stangor & McMillan, 1992), and people tend to misattribute stereotype-consistent behaviors to members of stereotyped groups (e.g., mistakenly attributing a priest's “mean” behavior to a skinhead; Sherman & Bessenoff, 1999; also see Dodson, Darragh, & Williams, 2008). Positive or negative evaluations of a target or group may likewise shape people's expectations concerning others' behavior (Branscombe, Crosby, & Weir, 1993; Vescio & Biernat, 1999).

Variations in attitudinal congruence can help explain the pattern of findings in Study 1. Liberals might have found it easy to integrate a new memory of Bush's “bad behavior” into their negative evaluations of conservatives and Bush himself. In contrast, conservatives—who probably also disapprove of presidents vacationing during national emergencies—may have found it difficult to imagine that a politician they like would engage in such behavior. In just the same way, conservatives may have easily fit the notion of the President shaking Ahmadinejad's hand into their impression of Obama as “soft” and willing to bend to the will of a hostile foreign leader—whereas liberals might have found it difficult to square their positive evaluation of Obama with the notion that he would shake a repressive foreign leader's hand.

The logic of attitudinal congruence can be applied to events for which we observed no difference in false memory rates as a function of political orientation. For the Hillary Clinton attack ad, conservatives may disapprove of Clinton but approve of her condemnation of Obama (low attitudinal congruence), whereas liberals might approve of Clinton but disapprove of her efforts to subvert a fellow Democrat

(again, low attitudinal congruence). Likewise, in the case of the Lieberman vote, liberals may approve of Lieberman (who later became Al Gore's running mate in the 2000 general election) but disapprove of him voting to impeach President Clinton, while conservatives may disapprove of Lieberman but approve of his vote. Unlike the Obama and Bush scenarios, the Clinton and Lieberman stimuli would have elicited low levels of attitudinal congruence for liberals and conservatives alike.

The remaining event, the Edwards/Cheney debate, presents interpretive difficulties because there are two focal actors in the event, each representing a different political orientation, and there is more than one behavior to approve or disapprove of. Further complicating matters, the Cheney/Edwards condition differed from the other false events in that it did not present a digitally altered photograph, and the event itself is essentially a distortion of the truth rather than a complete fabrication (Cheney and Edwards really did discuss Mary Cheney's sexual orientation at the debate). Due to these complications, we elected not to pursue the Cheney/Edwards debate further in our investigation, leaving us with four events, each focusing on just one person and one behavior.

In Study 2, we test an attitudinal congruence account of political false-memory formation. Specifically, we sought (a) to confirm that liberals and conservatives differed in their evaluations of the focal actors in the Bush, Obama, Lieberman, and Clinton scenarios, (b) to assess participants' attitudes toward the focal behaviors depicted in these scenarios, and (c) to determine whether the congruence of these two attitudes might produce feelings of recognition and familiarity that can influence source monitoring processes (see Lindsay, 2008).

Study 2

Method

Participants

Two hundred five participants (49% female) ranging in age from 18 to 65 ($M = 35.1$, $SD = 11.5$) visited an online website containing survey materials. Eighty-seven participants (42%) identified as liberal, 79 participants (39%) identified as moderate, and 39 participants (19%) identified as conservative. Participants were recruited from Mechanical Turk, a “crowd-sourcing” platform maintained by Amazon.com (see Buhrmester, Kwang, & Gosling, 2011).

Materials and procedure

Participants were asked to evaluate a series of “images depicting political events that did not really happen.” They were then shown four of the captioned images from Study 1 in random order: Lieberman's impeachment vote, Hillary Clinton's attack ad, Bush's Katrina vacation, and Obama's handshake. After viewing the captioned photographs, participants were asked to rate how much they would approve or disapprove of the behavior depicted, how realistic the event seemed, how surprising the event would be if it had happened, and how easily they could imagine the event happening—each on a seven-point Likert scale ranging from “Not at all” to “Completely.” Following the photo ratings, participants were asked to provide general attitude ratings for “Democrats and liberals,” and “Republicans and conservatives.”

Results and discussion

Not surprisingly, liberals felt more positively toward liberals than did conservatives, and conservatives felt more positively toward conservatives than did liberals. For the four false political events, conservatives reported stronger disapproval of Obama's handshake than did liberals, and liberals reported stronger disapproval of Bush's Katrina vacation, Clinton's attack ad, and Lieberman's impeachment vote than did

conservatives. Mean ratings of approval for the political orientation groups and the behaviors depicted in the four false events are presented with statistics in Table 1.

For each participant and false event, an “attitudinal congruence” score was calculated. This was achieved by taking the absolute value of the difference between the participant’s attitude toward the relevant group (conservatives or liberals) and his or her approval rating of the behavior itself. This resulted in a score ranging from 0 to 6 that represented incongruence between the two attitudes that ranged from 0 to 6. This score was then reverse coded to create an index of attitude congruence. For example, a high attitudinal congruence score for Bush’s Katrina vacation indicated agreement between a participant’s attitude toward conservatives and their attitude toward the vacation itself. Results indicated that Obama’s handshake elicited greater attitudinal congruence for conservatives than for liberals, whereas Bush’s Katrina vacation elicited greater attitudinal congruence for liberals than for conservatives. For Clinton’s attack ad and Lieberman’s impeachment vote, there were no differences between conservatives and liberals in attitudinal congruence. See Fig. 5 for attitudinal congruence scores in each of the four false events, conditioned on political orientation.

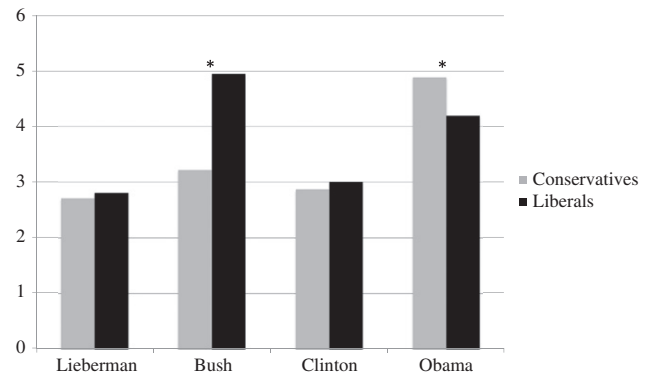
Finally, we tested whether attitudinal congruence was associated with higher realism and imaginability ratings, and lower surprisingness ratings. We used generalized estimating equations (GEE) to examine the relationship between these variables. GEE is a regression approach that allows for repeated measurements within participants (see, e.g., Hardin & Hilbe, 2003). As predicted, attitudinal congruence was associated with higher ratings of imaginability ($b = 0.17, z = -7.29, p < .001$), higher ratings of event realism ($b = 0.27, z = 6.89, p < .001$), and lower ratings of surprisingness ($b = -.29, z = -7.29, p < .001$).

The results of Study 2 are consistent with an attitudinal-congruence explanation for the patterns of political bias in false memories observed in Study 1. The two events for which political differences were observed in Study 1—Bush’s Katrina vacation and Obama’s handshake—were the only two scenarios for which liberals and conservatives differed in attitudinal congruence in Study 2. The remaining events—Lieberman’s impeachment vote and the Cheney/Edwards argument—exhibited equal levels of attitudinal congruence for liberal and conservatives. Further evidence for the attitudinal-congruence explanation for political false memory formation comes from the fact that measured levels of attitudinal congruence were associated with variables (e.g., realism, imaginability) that are known to influence false memory formation.

General discussion

A central question in Study 1 was whether digitally altered images, paired with bogus textual information, are sufficient to implant false political memories in a large and demographically diverse sample of laypeople. In this sense, the present work replicates previous research demonstrating people’s ability to confidently remember fabricated events, as well as the distorting influence of photographs (both altered and unaltered) on memory.

A second question concerned whether individual-level characteristics—in particular, political orientation—influence the likelihood of false memory formation for certain types events. Study 1 produced mixed results in this regard, with two of the fictitious events exhibiting



Note. Scores represent congruence between subjects’ attitude toward an event and their attitude toward the focal actor’s political orientation (Democrats/liberals for Obama, Clinton, and Lieberman; Republicans/conservatives for Bush). Means that are significantly different within event categories are indicated with an asterisk ($p < .05$).

Fig. 5. Mean attitudinal congruence scores by political orientation in four fabricated political events.

opposite patterns of susceptibility for liberals and conservatives: Liberals were more likely than conservatives to falsely remember George W. Bush vacationing during the Hurricane Katrina catastrophe and conservatives were more likely to falsely remember seeing President Obama’s shaking the hand of Iranian president Mahmoud Ahmadinejad. No effects of political orientation on false memory rates emerged for the remaining three events (Hillary’s anti-Obama attack ad, Dick Cheney and John Edwards’ arguing about Liz Cheney’s sexual orientation, and Lieberman’s vote to impeach President Bill Clinton).

Study 2 provided an initial test of an attitudinal-congruence model of political false memory formation. According to this explanation, perceivers are most likely to form false memories for fictitious events that engender high congruence between perceivers’ attitudes toward the focal actor and attitudes toward his or her behavior. Consistent with this notion, the Bush and Obama stimuli—the only events to yield ideological effects in Study 1—were the only events that showed differences in attitudinal congruence between conservatives and liberals in Study 2. Study 2 also demonstrates an association between attitudinal congruence and variables that are implicated in source judgments, such as subjective realism and imaginability.

Features of the present studies place certain limits on our conclusions. First, because Slate gathered little information about its participants other than political ideology, it may be that variables confounded with ideology—and not ideology per se—were responsible for the differences we observed between conservatives and liberals. The other piece of information we had about the Slate participants, their ability to remember true news events, differed between the ideological groups. Although we controlled for these differences in our analyses, the observed discrepancy in memory rates for actual events may hint at other variables that distinguish conservatives from liberals. An additional issue involves the sample of Slate readers used in Study 1, who are presumably an especially informed, politically aware group of people. On one hand, it is impressive that such people would be susceptible to these kinds of suggestions. Then again, we observed an association between remembering true political events and susceptibility to false memories, indicating that political awareness may paradoxically render someone more susceptible to political false memories. Thus, we might expect to see lower false memory rates in samples that reflect

Table 1
Mean group and event approval as a function of political ideology.

Political orientation	Positive attitudes		Event approval			
	Toward Democrats	Toward Republicans	Obama/Iran	Bush/Katrina	Clinton/Wright	Lieberman/Impeach
Liberal	5.43 _a (1.15)	2.43 _a (1.42)	4.59 _a (1.76)	1.79 _a (1.49)	2.67 _a (1.70)	2.40 _a (1.62)
Conservative	2.26 _b (1.25)	5.00 _b (1.29)	3.03 _b (1.99)	2.42 _b (1.83)	5.03 _b (1.87)	5.13 _b (1.89)

Note. Means sharing subscripts in columns are not significantly different ($p > .05$).

lower levels of political knowledge. Another limitation concerns the unbalanced sampling across groups. Although the sample was large, only about 5% of the participants identified as conservatives. We would encourage replications and extensions of these findings using a broader sampling of people across the political spectrum. A final concern is the possibility that participants used external sources of information (e.g., internet searches, friends or family) to help them answer the questions, despite being encouraged not to do so. Although possible, this concern is allayed by the fact that such behavior should lead to fewer false memories, not more. To the extent that participants consulted outside information sources, the present data may have underestimated participants' capacity to form false memories.

This present study is distinctive in its reliance on a diverse sample, use of real-world political content, and unique delivery method. Much of the false memory research conducted to date has used college student samples, and stimuli that have tenuous connections to real-world events and public figures. Moreover, apart from a handful of studies, little research has examined the consequences of suggestion and misinformation in the political arena. In this sense, the present findings are troubling. We are reminded of an incident in 2004 in which a photograph apparently depicting U.S. presidential candidate John Kerry appearing alongside Jane Fonda at a radical political demonstration in 1971 made the rounds in the political blogosphere (Marinucci, 2004). By the time it was discovered that the photo was doctored and Kerry had not attended the demonstration after all, the damage may already have been done. We hope that an understanding of the processes by which political false memories are formed will ultimately yield interventions that inoculate citizens against deliberate efforts to manipulate the content of their memories.

Acknowledgment

The authors wish to acknowledge Chris Wilson, whose determination and efforts on the initial study were indispensable and very much appreciated.

References

- Bernstein, D. M., Laney, C., Morris, E. K., & Loftus, E. F. (2005). False beliefs about fattening foods can have healthy consequences. *Proceedings of the National Academy of Sciences*, *102*, 13724–13731.
- Branscombe, N. R., Crosby, P., & Weir, J. A. (1993). Social inferences concerning male and female homeowners who use a gun to shoot an intruder. *Aggressive Behavior*, *19*, 113–124.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, *6*, 3–5.
- Dodson, C. S., Darragh, J., & Williams, A. (2008). Stereotypes and retrieval provoked illusory source recollections. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *34*, 460–477.
- Garry, M., Manning, C. G., Loftus, E. F., & Sherman, S. J. (1996). Imagination inflation: Imagining a childhood event inflates confidence that it occurred. *Psychonomic Bulletin & Review*, *3*, 208–214.
- Garry, M., Strange, D., Bernstein, D. M., & Kinzett, T. (2007). Photographs can distort memory for the news. *Applied Cognitive Psychology*, *21*, 995–1004.
- Hardin, J. W., & Hilbe, J. M. (2003). *Generalized Estimating Equations*. Boca Raton, FL: Chapman & Hall/CRC.
- Hyman, I. E., & Billings, F. J. (1998). Individual differences and the creation of false childhood memories. *Memory*, *6*, 1–20.
- Hyman, I. E., Husband, T. H., & Billings, F. J. (1995). False memories of childhood experiences. *Applied Cognitive Psychology*, *9*, 181–197.
- Hyman, I. E., & Pentland, J. (1996). The role of mental imagery in the creation of false childhood memories. *Journal of Memory and Language*, *35*, 101–117.
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, *114*, 3–28.
- Lindsay, D. S. (2008). Source monitoring. In J. H. Byrne (Series Ed.) & H. L. Roediger III (Vol. Ed.), *Learning and memory: A comprehensive reference*. Vol. 2: *Cognitive psychology of memory* (pp. 325–348). Amsterdam: Elsevier.
- Lindsay, D. S., Hagen, L., Read, J. D., Wade, K. A., & Garry, M. (2004). True photographs and false memories. *Psychological Science*, *15*, 149–154.
- Loftus, E. F., & Bernstein, D. M. (2005). Rich false memories. In A. F. Healy (Ed.), *Experimental cognitive psychology and its applications* (pp. 101–113). Washington, D.C.: American Psychological Association Press.
- Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals*, *25*, 720–725.
- Marinucci, C. (2004, February 20). Doctored Kerry photo brings anger, threat of suit. *The San Francisco Chronicle*, p. A4.
- Mazzoni, G. A. L., Lombardo, P., Malvagia, S., & Loftus, E. F. (1999). Dream interpretation and false beliefs. *Professional Psychology: Research and Practice*, *30*, 45–50.
- Mazzoni, G., & Memon, A. (2003). Imagination can create false autobiographical memories. *Psychological Science*, *14*, 186–188.
- Nash, R. A., Wade, K. A., & Lindsay, D. S. (2009). Digitally manipulating memory: Effects of doctored videos and imagination in distorting beliefs and memories. *Memory and Cognition*, *37*, 4.
- Sacchi, D. L. M., Agnoli, F., & Loftus, E. F. (2007). Changing history: Doctored photographs affect memory for past public events. *Applied Cognitive Psychology*, *21*, 1005–1022.
- Saletan, W. (June 4). The memory doctor. Retrieved from http://www.slate.com/articles/health_and_science/the_memory_doctor/2010/06/the_memory_doctor.html
- Sharman, S. J., & Calacouris, S. (2010). Do people's motives influence their susceptibility to imagination inflation? *Experimental Psychology*, *57*, 77–82.
- Sherman, J. W., & Bessenoff, G. R. (1999). Stereotypes as source-monitoring: On the interaction between episodic and semantic memory. *Psychological Science*, *10*, 106–110.
- Stangor, C., & McMillan, D. (1992). Memory for expectancy-congruent and expectancy-incongruent information: A review of the social and social developmental literature. *Psychological Bulletin*, *111*, 42–61.
- Strange, D., Hayne, H., & Garry, M. (2007). A photo, a suggestion, a false memory. *Applied Cognitive Psychology*, *22*, 587–603.
- Vescio, T. K., & Biernat, M. (1999). When stereotype-based expectancies impair performance: The effect of prejudice, race, and target quality on judgments and perceiver performance. *European Journal of Social Psychology*, *29*, 961–969.
- Wade, K. A., Garry, M., Read, J. D., & Lindsay, D. S. (2002). A picture is worth a thousand lies: Using false photographs to create false childhood memories. *Psychonomic Bulletin & Review*, *9*, 597–603.