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The Wished-For Always Wins Until the Winner Was Inevitable All Along: Motivated Reasoning and Belief Bias Regulate Emotion During Elections

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How do biases affect political information processing? A variant of the Wason selection task, which tests for confirmation bias, was used to characterize how the dynamics of the recent U.S. presidential election affected how people reasoned about political information. Participants were asked to evaluate pundit-style conditional claims like "The incumbent always wins in a year when unemployment drops" either immediately before or immediately after the 2012 presidential election. A three-way interaction between ideology, predicted winner (whether the proposition predicted that Obama or Romney would win), and the time of test indicated complex effects of bias on reasoning. Before the election, there was partial evidence of motivated reasoning—liberals performed especially well at looking for falsifying information when the pundit's claim predicted Romney would win. After the election, once the outcome was known, there was evidence of a belief bias—people sought to falsify claims that were inconsistent with the real-world outcome rather than their ideology. These results suggest that people seek to implicitly regulate emotion when reasoning about political predictions. Before elections, people like to think their preferred candidate will win. After elections, people like to think the winner was inevitable all along.

KEY WORDS: motivated reasoning, belief bias, political reasoning, Wason selection task, emotion regulation

How do people gather information to reason about important elections? Do they assess information that is congruent with their ideology differently from information that they disagree with? Do patterns of reasoning change after an election, once a winner has been declared?

Prior work suggests that when outcomes are unknown, people seek to confirm propositions that support their beliefs (Nickerson, 1998; Wason, 1966, 1968; Wason & Johnson-Laird, 1972) and disconfirm propositions that conflict with their beliefs (Dawson, Gilovich, & Regan, 2002; Ditto &

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Lopez, 1992; Kunda, 1990). In other words, people are motivated reasoners who use different evidentiary standards to evaluate different kinds of information. In the context of a presidential race, Democrats may seek out evidence that suggests the Democratic candidate will win and avoid or scrutinize evidence that suggests the Republican candidate will win (and vice versa). Peoples' propensity to watch and read media that is ideologically consistent with their own views is one real-world indicator of this trend (Iyengar & Hahn, 2009).

The tendency to evaluate information differently depending on whether it is congruent with a person's ideology may result from the joint role of affect and cognition in information processing (Redlawsk, 2002; Zajonc, 1984): information that is incongruent with our beliefs makes us feel threatened, engendering feelings of anxiety, and promoting closer analysis of such evidence (Lodge & Taber, 2005; Marcus & Mackuen, 1993; Taber & Lodge, 2006). Redlawsk (2002) has found, for instance, that people take longer to process political information that is incongruent with a person's ideological position. That is, motivated reasoning is an implicit tactic for emotion regulation. Consistent with this view, Weston, Blagov, Harenski, Kilts, and Hamann (2006) found that motivated reasoning engages areas of the brain that are associated with implicit affective processing, including the ventromedial prefrontal cortex, anterior cingulate cortex, posterior cingulate cortex, insular cortex, and lateral orbital cortex. When an election outcome is unknown, it may be comforting to find evidence that supports our hopeful (wished for) candidate and to discredit discouraging information.

People can adopt different evidentiary standards for evaluating different kinds of information before an election in part because of the uncertainty associated with elections. Until a winner is decided, people can believe their preferred candidate has a shot. But what happens after an election, when a winner has been called?

If people continue to believe that their candidate should have won, they may perseverate as motivated reasoners. In extreme cases, researchers have found that people maintain ideologically grounded beliefs in the face of conflicting evidence (Nyhan & Reifler, 2010). Despite evidence to the contrary, many conservatives tested in 2005, after the United States invaded Iraq, believed that Iraq possessed weapons of mass destruction. Reading a report attesting to the fact that no such weapons had been found failed to persuade many of these participants and, in fact, strengthened misperceptions among some.

In the context of the 2012 election, this would mean that Romney supporters would perseverate in thinking their candidate should have won even after Obama was declared the winner. However, perseverating as a motivated reasoner after an election would be unlikely to serve as an effective means of emotion regulation. A Romney supporter would probably not find solace in thinking that Romney should have won once the election had been called for Obama. Instead, Romney supporters might find it reassuring to identify with evidence suggesting their candidate never had a chance at all: if Romney never had a chance, there is no reason to feel bad that he lost. On this view, the irrefutable fact that Obama won the election would trump their motivation to support Romney.

As a result, we may expect to see a shift in how people reason after an election. Everyone (including conservatives) may be influenced by a knowledge-based belief bias (Klauer, Musch, & Naumer, 2000) rather than an ideologically grounded motivational bias. Reasoning in retrospect about the 2012 election, people may endorse predictions that Obama would win and scrutinize predictions that Romney would win.

On this latter view, people maintain ideologically motivated false beliefs in situations where the outcome is ambiguous—either before the result is known or in cases where they can deny its validity (e.g., as in the case of Iraq's possession of WMDs when conservatives could question the quality of reporting or competency of the UN inspection team; see Gaines, Kuklinski, Quirk, Peyton, & Verkuilen, 2007) in order to implicitly regulate emotion. When an outcome is irrefutable, motivated reasoning does not help to reduce anxiety or regulate emotion. Instead, people find comfort in thinking an outcome was inevitable all along.

The Current Study

In the current study, we explore the relationship between peoples' knowledge of an election and their political ideology. We sampled one group of people immediately before the 2012 presidential election on Monday, November 5, 2012, when the winner was unknown, and another group immediately after the election, on Thursday, November 8, 2012, once the race had been decided. Both groups were asked to evaluate the validity of a specific kind of claim that is commonly made by political analysts. Despite the many complex and nuanced factors at play in a presidential race, pundits often seek to identify a single trend or variable to predict or explain an election outcome, as in "the incumbent always wins in a year when unemployment drops" or "the incumbent always loses in a year when gas prices rise." These kinds of simple conditional statements pervade coverage of presidential elections and are often highly speculative because the market for political punditry rewards eccentricity over genuine expertise (Tetlock, 2006).

In the run-up to the 2012 election, pundits identified specific trends in an attempt to predict who would win the presidency. For instance, many conservatives speculated that Obama's administration had conspired to manipulate unemployment numbers in the months leading up to the election because they felt this factor could be particularly influential (October 5, 2012, *ABC News*). Others speculated that a rise in gas prices would cause Obama to lose the presidency (March 28, 2012, *ABC News*). The prevalence of these kinds of claims led the satirical magazine *Cracked* to identify "6 bizarre factors that predict every presidential election" (November 1, 2012). Topping the list was whether the film that won the Best Picture Oscar in the pre-election year ends happily or sadly—films that end on a downbeat lead to an incumbent loss.[1]

Following presidential elections, political analysts continue to offer simple conditional propositions to describe the contest, albeit to explain rather than predict the outcome. Did Hurricane Sandy give Obama the decisive edge on Election Day (November 15, 2012, *Huffington Post*) or was his win the result of changing population demographics (November 6, 2012, *Politico*)?

We adapted these pundit-style conditional claims to a well-known paradigm for studying biases in reasoning: the Wason selection task (Wason, 1966, 1968). That is, we took advantage of the fact that these claims can be read as if-then conditional statements—for instance, "the incumbent always wins in a year when unemployment drops" can be read as "if unemployment drops before the election, the incumbent will win." After reading the conditional statement, people saw a pair of trends (e.g., "unemployment fell" and "unemployment rose") and a pair of election outcomes (i.e., "incumbent won" or "incumbent lost"; election outcomes did not reference specific candidate names but the more general labels "incumbent" and "challenger") that purportedly reflected past presidential races. They were asked to select which trends and outcomes should be checked to test the validity of the pundit's proposition.

As originally constructed, the Wason task asks people to consider a set of four cards said to have a number on one side and a letter on the other side. Participants can only see one side of each (e.g., "A," "B," "1," "2"), and they select the cards they think would need to be turned over to falsify a rule such as, "If a card has a vowel on one side, it has an even number on the other side." In this case, the correct set to turn over would be the one showing a vowel ("A") and the one showing an odd number ("1"). People often choose to turn over the card showing an even number ("2"); however, choosing to turn over this card does not falsify the rule because the rule does not specify that cards with an even number on one side have a vowel on the other. Regardless of what type of letter is on the other side

[1] *The Artist* won the Academy Award for Best Picture in 2011. Ironically, the author of the article decides not to make a prediction about the 2012 election given this trend: della Quercia (2012) writes, "So what does that mean for this election? The 2011 winner was *The Artist*, in which a struggling actor makes the transition from silent movies to talkies, thanks to the love of a good woman and the good graces of the people who always adored him. But in a shocking twist ending, he is also revealed to be French. We'll just come back and fill this one in after we see how the election turns out" (p. 2).

Table 1. Examples of Wason Rules and Responses

Rule	*p*	*not-p*	*q*	*not-q*
1. If a card has a vowel on one side, it has an even number on the other side.	A	B	2	1
2. All Irish are drunks.	Irish	not-Irish	Drunk	not-Drunk
3. If a person is drinking beer, then he must be over 21 years old.	Beer	Coke	25	18
4. The incumbent never wins when gas prices have risen significantly. . .	Gas prices rose	Gas prices fell	Incumbent lost	Incumbent won
5. The incumbent always wins in a year when unemployment drops.	Unemployment fell	Unemployment rose	Incumbent won	Incumbent lost

Note. Example 1 is a classic-style Wason trial. Examples 2 and 3 are modified-style Wason trials previously used to study the role of motivated reasoning and prior knowledge by Dawson et al. (2002) and Cox and Griggs (1982), respectively. Examples 4 and 5 are politically themed Wason trials from the current study. In every case the correct response pattern is to select the *p* and *not-q* cards.

of the card showing an even number, the truth of the rule is unaffected. The rules and cards are often described symbolically to abstract away from the specifics of a given trial (i.e., "If *p*, then *q*") and are correctly tested by turning over the cards showing *p* and *not-q* (see Table 1; see Evans, 1982 for a review of the task).

Prior work has found that people are most likely to select the *p* card, correctly, and the *q* card, incorrectly (Cox & Griggs, 1982; Wason, 1966, 1968), a response pattern that suggests people are oriented toward verifying rather than falsifying the rule on a general version of the task (Wason & Johnson-Laird, 1972).

The task has been adapted to study motivated reasoning. Dawson et al. (2002) found that manipulating the degree to which people were personally threatened by a rule strongly influenced their performance on the Wason task. In one study, people considered rules that highlighted negative stereotypes, as in "All Irish are drunks." The offensive nature of the claims motivated people who were implicated by the stereotypes (in this case the Irish American participants), making them more likely to correctly select items that could falsify the rule (i.e., in this case, select cards showing "Irish" and "Not a drunk") (see Table 1).

Performance on the task has also been shown to improve when people are more familiar with and knowledgeable about the target domain (Klauer et al., 2000). In one study, evaluating the rule "If a person is drinking beer, then he must be over 21 years old" led to a dramatic improvement in performance relative to the original Wason task (Griggs & Cox, 1982). People correctly chose to check the age of beer drinkers (the *p* card) and the drink of minors (the *not-q* card). In the context of the 2012 presidential election, belief bias would be evidenced after the election by a systematic increase in peoples' likelihood of falsifying claims that predicted Romney would win.

We adapted the Wason task to study political reasoning by constructing a set of politically themed Wason rules reminiscent of pundits' claims. Each rule referenced a real-world trend to make a prediction about who was more likely to win the 2012 presidential election: some predicted that Romney would win (e.g., "the incumbent never wins when gas prices have risen significantly since the previous election."), and others predicted that Obama would win (e.g., "the incumbent always wins in a year when unemployment drops."). Below each claim were four "cards" purported to show trends and outcomes of prior elections (e.g., for the first example: "gas prices rose," "gas prices fell," "incumbent won," "incumbent lost") (see Table 1 and Figure 1).

To evaluate the claim "the incumbent never wins when gas prices have risen significantly since the previous election," one should choose the cards showing "gas prices rose" and "incumbent won." Both of these cards can potentially falsify the rule. If the back of the "gas prices rose" card reads "incumbent won," the rule would be falsified; similarly, if the back of the "incumbent won" card

Some pundits claim that Romney will win the presidency in 2012 because "the incumbent never wins when gas prices have risen significantly since the previous election." Below are four cards that reveal relevant trends and outcomes from previous elections. Each card shows an outcome on one side and a trend on the other, although only one side of each card is showing. Which cards would you need to turn over to test the pundit's claim?

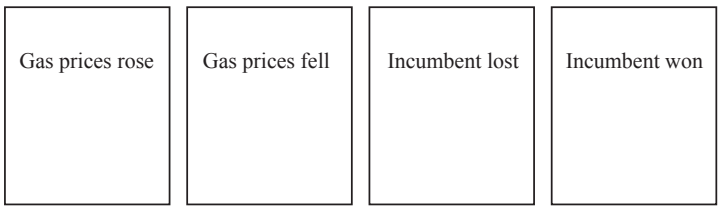

Figure 1. An example of a politically themed Wason trial. The logically correct answer for this trial would be to choose the cards showing "Gas prices rose" and "Incumbent lost" and to ignore the cards showing "Gas prices fell" and "Incumbent won."

reads "gas prices rose," the rule would be falsified. One should not choose the card showing "incumbent lost" because the rule does not say the incumbent will *not* lose in a year in which unemployment rose. In other words, even if the back of this card read "gas prices fell," the rule could still be accurate. Similarly, the rule does not specify who wins in a year when "gas prices fall," so choosing this card cannot falsify the rule.

Of note, while participants can select cards to potentially falsify the rule, they cannot choose cards to verify the rule. This is because the rule is a fairly general conditional statement. Participants cannot be sure if the four cards represent all of the cases in the set of the quantifier (Sperber, Cara, & Girotto, 1995). The instructions, for instance, do not explicitly say that the four elections shown below the rule are the only four elections that could be relevant to the rule.

Using the Wason task represents a novel approach for studying motivated reasoning and belief bias in a political context and can broaden our understanding of these important phenomena. Prior work has shown that people tend to remember and emphasize information that is consistent with their prior beliefs and ignore and discredit incongruent information (Lodge & Taber, 2005; Redlawsk, 2002; Redlawsk, Civettini, & Emmerson, 2010; Taber & Lodge, 2006; Weston et al., 2006). What is unique about the Wason task is that it allows us to look at what type of information people would seek out in order to test an idea. As a result, it allows us to examine a potentially more fine-grained aspect of the deliberation process: how do people gather new information to evaluate important claims?

We predicted that before the election, when the claims could be interpreted as indicators of the election outcome, people would be motivated to falsify propositions inconsistent with their beliefs and seek to confirm propositions that were consistent with their beliefs (Ditto & Lopez, 1992; Kunda, 1990). Obama supporters should perform worse on trials that predicted Obama would win by choosing cards that confirmed the conditional proposition and better on trials that predicted Romney would win by choosing cards that falsified the conditional proposition (and vice versa).

Further, we predicted a positive relationship between the degree to which people cared about the election outcome (e.g., how much they supported their preferred candidate) and their likelihood of engaging in motivated reasoning. The more strongly a person supports their preferred candidate, the more threatened they should feel by predictions that their candidate will lose. People who were especially supportive of Obama, for instance, should be especially likely to falsify claims that predicted Romney would win.

How will people perform after the election? One possibility is that the dynamics of the race will not influence performance: partisans may perseverate in thinking that their candidate should have won and seek to disconfirm evidence that conflicts with their ideology. This pattern would be consistent with prior work that has shown people often persist in believing ideologically consistent misperceptions even after they have been shown to be false (Nyhan & Reifler, 2010).

A second, and in our view more likely, possibility is that peoples' knowledge of the outcome of the election will override their motivational preference: once people know that Obama won, they should falsify predictions of a Romney victory, regardless of their personal preference. This latter possibility would represent a dramatic shift in reasoning over the course of an election: from a bias grounded in ideology to a bias grounded in knowledge of the actual outcome. This shift, importantly, would be consistent with the notion that these biases in reasoning are a mechanism for implicit emotion regulation.

Method

Participants

We recruited 700 people through Amazon's Mechanical Turk (www.mturk.com) and paid $0.65 in exchange for their participation in the five-minute survey. Mechanical Turk is an online interface for recruiting high-quality, low-cost participants for empirical studies in psychology (Buhrmester, Kwang, & Gosling, 2011) and political science (Berinsky, Huber, & Lenz, 2012). This pool of participants is often more representative of the general population than convenience samples but less representative than targeted panels in political science (Berinsky et al., 2012).

We restricted our sample to people living in the United States who had a good performance record on Turk tasks (a minimum 90% approval rating on previous tasks). We used Turk's exclusion capabilities and tracked IP addresses to ensure that no one participated in the task more than once. A small number of people (n = 16) filled out the questionnaire both before and after the election; we only included pre-election data from these participants. We omitted data from 28 participants who reported having heard of the Wason selection task and data from 18 participants who reported that English was not their first language. This left data from 638 participants for analysis, of whom 364 participated before the election and 274 participated after the election.

Of these participants, 278 identified as Democrats, 180 as Independents, 105 as Republicans, 35 as Libertarians, and 40 as "Other." Our sample tended to be slightly liberal on a continuous measure of ideology (that ranged from 0, very liberal, to 100, very conservative), with a mean ideology score of 39.65 ($sd = 26.06$) and a median of 40. The ideology of participants in the two samples (pre- and post-election) did not differ, $t[620] = .99$, $p = .32$. Most (65%) planned to vote or had voted for President Obama, but some (20%) planned to vote or had voted for Romney. The rest (15%) planned to vote for a different candidate or not at all.

Participants consisted of 307 females and 331 males who ranged in age from 18 to 75 (median = 25). Most participants had completed some college (91%; 42.3% completed a Bachelor's Degree), but the educational history of participants ranged from a small number who had not completed high school (1%) to a small number who had completed a doctorate degree (2%).

Materials and Procedure

We posted the study on Amazon's Mechanical Turk on Monday, November 5, the day before the 2012 election, and again on Thursday, November 8, two days after the 2012 election. Running the survey at these two points in time allowed us to test whether the temporal dynamics of a presidential election affect biases in political reasoning. The title of the "hit" on Turk was the same on both

days—Story Game—and the overarching description of the task did not reference politics or the election.

The study consisted of nine target questions, several questions about the 2012 presidential election, and several questions about participants' personal history. Target questions were shown on the screen one-at-a-time.

Target Questions

Of the nine target questions (see the appendix), two were catch trials, one was a classic Wason question, and six were political Wason questions. The two catch trials were presented first, followed by the classic Wason, followed by the six political Wason questions. The order of the six political Wason questions was randomized.

All of the target questions included a proposition (a rule or a question) and four randomly ordered response options. On a given trial, participants could select between one and four of the response options. We did not instruct participants to select a specific number of the response options.

Catch Trials. The purpose of the initial target trials was twofold: to acclimate participants to the style of the task and to screen out participants who did not read the instructions. These questions were relatively easy compared to the Wason questions (e.g., "Which cards show items which rhyme with the word 'knee'?").

Classic Wason. The classic Wason question asked people to consider a set of cards purported to have a vowel on one side and a number on the other. On this trial, two "cards" showed numbers (one odd and one even) and two "cards" showed letters (one a vowel and one a consonant). Participants were given the rule "If there is a vowel on one side, then there is an even number on the other" and instructed to select "cards" to evaluate the rule.

Political Wasons. The political Wason questions presented participants with a claim inspired by rhetoric common to political pundits. Three of these claims predicted that Romney would win the election, and three predicted that Obama would win the election (see the appendix). Below each claim were four "cards" purported to show trends and outcomes of prior elections. Participants were told that "One side of the card will show the winner of a presidential election (for instance, the incumbent or the challenger) and the other will show a "trend" of the time leading up to the election (for instance, whether gas prices have risen or fallen)." Participants could only see one side of each card and were instructed to select cards to test the pundit's claim. Note that specific names of candidates or election years were not identified on the cards.

Election Questions

We asked participants several questions about the 2012 presidential election. The first instructed people to rank the six politically themed Wason claims in order of importance based on their relevance and likelihood of impacting the 2012 election. In completing this task, the participant would have to consider, for instance, whether the fact that "gas prices have increased since the previous election" or that there has been a "decrease in unemployment leading up to the election" is or was more likely to affect the outcome of the election.

People who participated before the election were asked whether they had already voted (yes or no), whether they planned to vote (yes or no), how much they cared about the election (on a 4-point scale from "not at all" to "a lot"), and who they had voted for or planned to vote for (Obama, Romney, Neither). People who participated after the election were not asked whether they planned to vote, but they were asked each of the other election-related questions (i.e., whether they had voted and who they voted for). Of note, due to a coding error, some participants ($n = 173$) were not asked these four election-related questions (of whom all participated before the election).

Background Questions

We asked participants to report their age, sex, first language, political affiliation (Democrat, Independent, Republican, Libertarian, Other), political ideology (on a scale from 0, very liberal, to 100, very conservative), and educational background. Finally, we asked if participants had heard of the Wason selection task.

Results

In analyzing data from the target questions, we considered each card as a separate response that could be scored as correct or incorrect. Each trial, therefore, contributed four data points to the analysis for each participant. The most common response pattern on the classic Wason task, selecting the *p* and *q* cards, would yield two correct answers and two incorrect answers (selecting *p* and omitting *not-p* correctly; selecting *q* and omitting *not-q* incorrectly). Selecting the *p* and *not-q* cards (and no other cards) would yield four correct answers.

We used R (R Core Team, 2012) and lme4 (Bates, Maechler, & Bolker, 2012) to perform mixed-effect logistic-regression analyses. We treated "participant" and "item" as random effects and "time of test," "ideology," and "predicted winner" as fixed effects, unless otherwise noted. We fit the model with random intercepts for "participant" and "item" to account for baseline differences in performance across participants and by item. Since the effect of "predicted winner" may vary by "participant" and/or by "item," we also fit the model with random slopes for "predicted winner" by "participant" and "item." The random slope and intercept models allow us to detect the isolated influence of the fixed effects (Baayen, Davidson, & Bates, 2008). We also present data from linear-regression models in which performance is averaged over items by subject. The results of the linear regression models are consistent with the results of the mixed effects models and may be easier to interpret. However, it should be noted that they make the debatable assumption that the data points are independent (see Klauer, Stahl, & Erdfelder, 2007, for a discussion of whether participants select cards independently).

"Time of test" (−1 = pre-election; 1 = post-election) and "predicted winner" (−1 = Obama; 1 = Romney) were contrast coded. "Ideology" was a continuous variable with a 101-unit range that was centered such that a score of −50 represented a very liberal participant, 0 represented an ideologically moderate, and 50 represented a very conservative participant.

We report the results of stepwise comparisons between mixed-effect models—for instance, comparing a model that includes ideology as a predictor to one that does not. The amount of additional variance explained by including a predictor variable has a chi-square distribution with the number of added parameters as its degrees of freedom (Menard, 1995). We also report summaries of regression models in tabular form in Tables 2 through 5.

Table 2. Pre-Election Performance (Mixed-Effect Model)

Predictor	*B*	*SE*
Constant	–0.276***	0.031
Predicted Winner	–0.085***	0.023
Ideology	0.001	0.001
Predicted Winner * Ideology	0.002*	0.0008

Note. Table entries are unstandardized coefficients and standard errors for fixed effects.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 3. Pre-Election Performance (Linear Regression Model)

Predictor	*B*	*SE*
Constant	0.566***	.006
Predicted Winner	0.020***	.006
Ideology	−0.0003	.0002
Predicted Winner * Ideology	−0.0004*	.0002

Note. Table entries are unstandardized coefficients and standard errors.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 4. Post-Election Performance (Mixed-Effect Model)

Predictor	B	SE
Constant	−0.527***	0.089
Predicted Winner	0.281**	0.097
Ideology	−.0004	.002
Predicted Winner * Ideology	−.002	.002

Note. Table entries are unstandardized coefficients and standard errors for fixed effects.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 5. Post-Election Performance (Linear Regression Model)

Predictor	*B*	*SE*
Constant	0.603***	.008
Predicted Winner	0.023**	.008
Ideology	0.0003	.0003
Predicted Winner * Ideology	−0.0002	.0003

Note. Table entries are unstandardized coefficients and standard errors.
*$p < .05$, **$p < .01$, ***$p < .001$.

Catch Trials

Performance on the catch trials allowed us to screen out participants who were not seriously engaged with the questionnaire. We set a threshold of 37.5% correct (at least three of eight correct responses) on these two questions in order for a participant's data from the Wason trials to be included in subsequent analyses. We chose this threshold because answering only two questions correctly (25% correct) greater than three standard deviations below the mean ($M = .863$, $sd = .196$).

Overall, 86% of responses on the catch trials were correct; more than half of all participants (57%) answered all of the catch-trial questions correctly. There were, however, 16 participants who performed below threshold. We excluded data from these 16 participants before analyzing data from the Wason trials. However, the results of the analyses do not differ if we include these participants.

Classic Wason

We used performance on the classic Wason trial to test whether there was a general relationship between ideology and performance on the reasoning task. We fit two mixed-effect logistic-regression

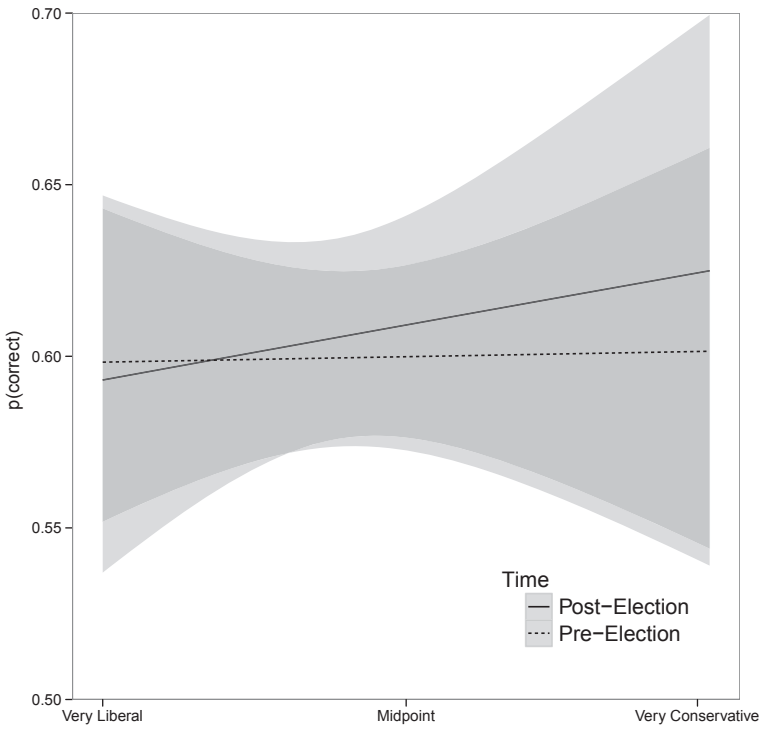

Figure 2. Results from the classic Wason trial with the proportion of correct responses plotted on the y-axis. Separate logistic regression lines reflect the pre- (dashed) and post-election (solid) samples with shading to reflect standard error.

models: one that included ideology as a predictor and one that did not. Including ideology did not significantly improve the model, $\chi^2[1, N = 622] = .13$, $p = .720$ ($B = -.0006$, $SE = .002$, $p = .720$), suggesting that neither liberals nor conservatives were better at an abstract version the task (see Figure 2). We also tested whether performance on the Wason question differed by sample (pre- versus post-election). We found that it did not, $\chi^2[1, N = 622] = .09$, $p = .768$ ($B = -.024$, $SE = .083$, $p = .768$) (see Figure 2).

Ideology

We collected three measures of ideology: participants reported who they planned to or had voted for, they identified a political party with which they affiliated themselves, and they positioned themselves along a 101-point ideology continuum.

We chose to use the continuous measure of ideology in the analyses below for two reasons. First, it was highly predictive of peoples' voting behavior and political affiliation. Using a series of logistic-regression models, we found that the more ideologically conservative a person, the more likely the person was to identify as a Republican, $B = .084$, $z[N = 622] = 10.55$, $p < .001$, and to vote for Romney, $B = .059$, $z[N = 622] = 9.78$, $p < .001$; the more ideologically liberal a person, the more likely the person was to identify as a Democrat, $B = -.064$, $z[N = 622] = -12.34$, $p < .001$, and to vote for Obama, $B = -.050$, $z[N = 622] = -11.31$, $p < .001$.

Second, the continuous measure of ideology was a more sensitive and nuanced measure of "political inclination" than either of the categorical measures. Not all people who vote for Obama (or Romney) are equally excited to do so, and it may be the case that the more liberal (or conservative)

a person is, the more likely they are to be biased by their ideology in a political reasoning task. To test whether people who reported more extreme ideologies were more invested in the election, we converted the 101-point ideology scale into a 51-point extremity scale (by taking the absolute value of the centered ideology score, so that scores close to 50 represented people who were strongly conservative or strongly liberal and scores close to 0 represented people at the midpoint of the ideology scale). We found that the more extreme a person's reported ideology, the more likely they were to say they planned to vote or had voted, $B = .048$, $z[N = 449] = 5.30$, $p < .001$ and to care about the outcome of the election, $B = .019$, $t[447] = 9.32$, $p < .001$.

Political Wason Questions

We were primarily interested in how the dynamics of a political election affected political reasoning. Does a person's ideology bias how they evaluate political claims? Does knowing the outcome matter? To answer these questions, we examined how three independent variables—ideology, time of test (pre- versus post-election), and predicted winner (Romney or Obama)—impacted peoples' performance on the politically themed Wason questions. As expected, we found a three-way interaction between these variables, $\chi^2[4, N = 622] = 10.047$, $p < .05$, and, for clarity, present results from the pre- and post-election samples separately below.

Pre-Election. We found no difference in overall performance on the political Wason questions as a function of political ideology, $\chi^2[1, N = 354] = 1.436$, $p = .231$, confirming that neither liberals nor conservatives were, in general, better at the politically themed Wason selection task (i.e., more likely to falsify the rule). However, we found a main effect of predicted winner, $\chi^2[2, N = 354] = 9.828$, $p < .01$: people performed better on trials that predicted Romney would win (see Tables 2–3). In addition, we found a significant interaction between the predicted winner and ideology, $\chi^2[1, N = 354] = 4.803$, $p < .05$: liberal participants performed especially well on trials that predicted Romney would win; we did not see evidence of the complementary effect—conservative participants did not perform better on trials that predicted Obama would win (see Figure 3).

To get a sense of the substantive size of this difference, we split the data by ideology at the midpoint. Everyone who reported an ideology score less than 50 was considered "liberal," and everyone who reported an ideology greater than 50 was considered "conservative." We found that liberals performed almost seven percentage points better on trials that predicted Romney would win (61.4% correct) than on trials that predicted Obama would win (54.9% correct). Conservative participants performed equally well on trials that predicted Romney would win (55.7% correct) as on trials that predicted Obama would win (54.2% correct).

Specific Response Patterns. We can look at which "cards" people chose to better understand the interaction described above. Clear evidence of motivated reasoning would be illustrated by an increased likelihood of correctly choosing the falsifying *not-q* card on trials that conflicted with a person's ideology (Dawson et al., 2002)—for instance, Romney supporters selecting "incumbent loses" to check the claim that "the incumbent always wins in a year when unemployment drops." Indeed, we found a significant interaction between ideology and predicted winner in a model specifically fit to test whether a person would correctly select the falsifying *not-q* card, $\chi^2[1, N = 354] = 6.559$, $p < .05$ ($B = -.013$, $z = -2.61$, $p < .01$). Liberals were more likely to choose the *not-q* card on trials that predicted Romney would win; again, conservatives were not more likely to choose *not-q* on trials that predicted Obama would win. This result suggests that liberals, but not conservatives, in our sample were motivated to falsify claims that conflicted with their ideology before the election, which reflects partial support for our motivated-reasoning hypothesis.

We found no interaction between ideology and predicted winner in testing whether a person selected the *p* ($\chi^2[1, N = 354] = 1.80$, $p = .18$), *not-p* ($\chi^2[1, N = 354] = 3.50$, $p = .062$), or *q* ($\chi^2[1,$

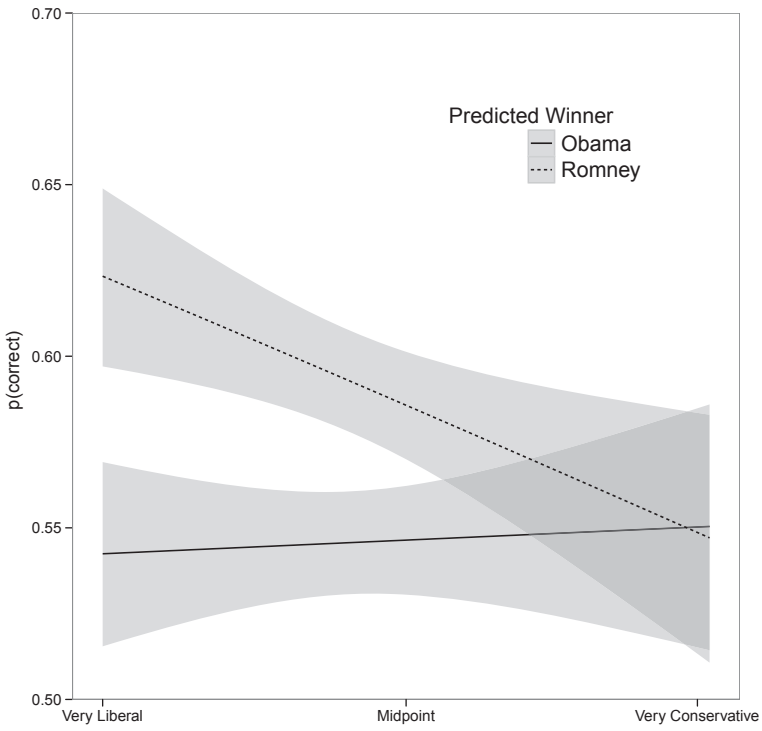

Figure 3. Results from the politically themed Wason trials for the pre-election sample with the proportion of correct responses plotted on the y-axis. Separate logistic regression lines reflect trials in which Obama was predicted to win (solid) and in which Romney was predicted to win (dashed) with shading to reflect standard error.

N = 354] = 2.02, $p = .15$) cards, further supporting the assertion that liberals performed better on trials that predicted Romney win because of motivated reasoning.

While we did not find support for the motivated-reasoning hypothesis among conservatives, it seems unlikely that conservatives are less inclined toward motivated reasoning in general. Previous work has found that conservatives engage in motivated reasoning (e.g., Jost & Amodio, 2012; Thorisdottir & Jost, 2011). The asymmetry between liberals and conservatives in our study may reflect liberals caring more about the election outcome than conservatives—liberals reported significantly greater interest in the outcome (3.53 on a 4-point scale) than conservatives (3.27 on a 4-point scale), $t[179] = 3.63$, $p < .001$. This may have been because Romney was a "weaker" candidate (only 21% of our pre-election sample reported that they had voted for or planned to vote for Romney) than Obama and/or because conservatives on Mechanical Turk are less representative of conservatives in the general population than liberals on Turk. One indication that our sample of conservatives may not be as representative is that it was much younger (median age = 35) than conservatives in the general population (median age = 50; Kohut, Doherty, Dimock, & Keeter, 2012).

Post-Election. As with our pre-election sample, we found no difference in overall performance on the political Wason trials as a function of ideology, $\chi^2[1, N = 268] = .661$, $p = .416$. Liberal and conservative participants performed equally well on these trials. However, we did find an effect of predicted winner, $\chi^2[1, N = 268] = 7.860$, $p < .05$, such that people were better on trials that predicted Romney would win. Importantly, unlike the pre-election sample, we did not find an interaction between predicted winner and ideology among people who participated after the election, $\chi^2[1, N = 268] = .406$, $p = .524$. The main effect of predicted winner and lack of an interaction between

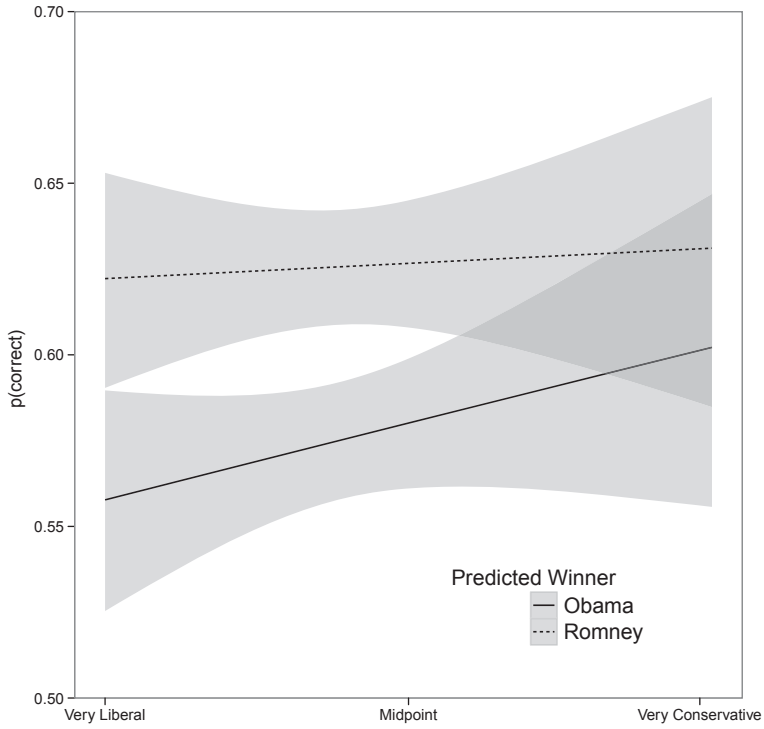

Figure 4. Results from the politically themed Wason trials for the post-election sample with the proportion of correct responses plotted on the y-axis. Separate logistic regression lines reflect trials in which Obama was predicted to win (solid) and in which Romney was predicted to win (dashed) with shading to reflect standard error.

predicted winner and ideology suggest a belief bias: people readily falsified claims that predicted Romney would win the election once they knew he had already lost the election. Falsification was fact dominated rather than ideology dominated (see Figure 4 and Tables 4–5).

Evaluating specific response patterns supports this interpretation: in contrast to what we found before the election, there was no interaction between ideology and predicted winner after the election in testing whether a person selected the falsifying *not-q* card ($\chi^2[1, N = 268] = 0.05$, $p < .82$), nor the *p* ($\chi^2[1, N = 268] = 0.44$, $p = .51$), *not-p* ($\chi^2[1, N = 268] = 0.47$, $p = .49$), or *q* cards ($\chi^2[1, N = 268] = 0.88$, $p = .35$).

To summarize, we found that people showed different kinds of biases before and after the election. Critically, we found an interaction between ideology and predicted winner before the election such that liberals performed especially well on questions that predicted Romney would win that suggested liberals were motivated reasoners. We found no interaction after the election; instead, people were better at falsifying questions that predicted Romney would win, evidence of a belief bias.

Background Measures

We tested whether participants' age, sex, or educational history impacted their performance on the political Wason questions beyond the effect of ideology, predicted winner, and time. We found no effect of age or sex, but we did find an effect of educational history, $\chi^2[1, N = 622] = 7.73$, $p < .01$: people with more education performed better on the political Wason trials, $B = .04$, $z = 2.80$, $p < .01$.

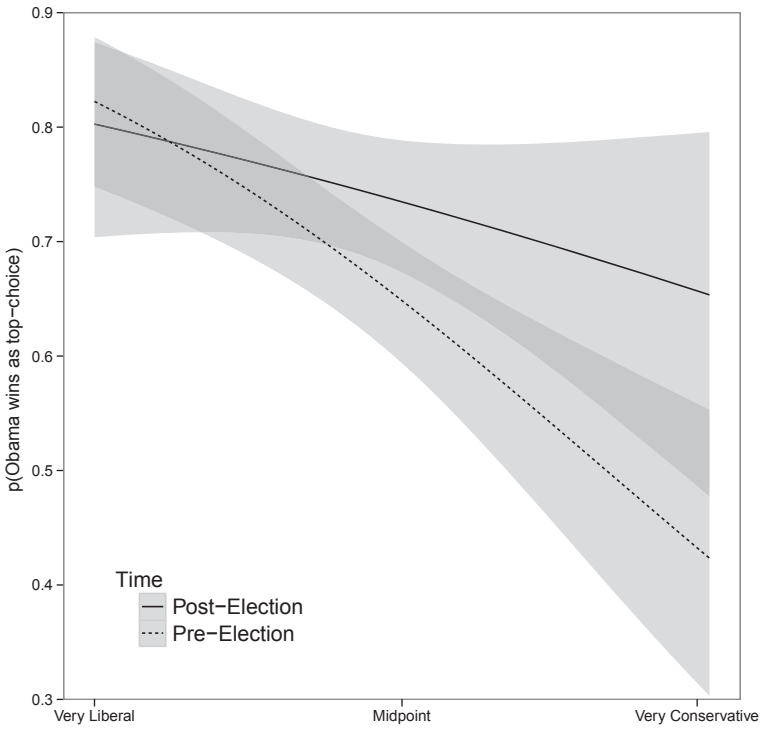

Figure 5. Results from the rank-order task. The proportion of trends that predicted Obama would win is plotted on the y-axis. Separate logistic regression lines reflect the pre- (dashed) and post-election (solid) samples with shading to reflect standard error.

Ranking the Claims

Participants were asked to rank-order the likelihood that the trends identified in the politically themed Wason claims would impact the election. The modal top ranking in both the pre- and post-election samples highlighted the decrease in unemployment (which predicted that Obama would win), garnering 48% of the top rankings before and 59% of the top rankings after the election. Overall, people were more likely to rank one of the claims that predicted Obama would win as most important both before (68%) and after (75%) the election. The increased likelihood of selecting a trend that predicted Obama would win after the election was marginally significant, $\chi^2[1, N = 622] = 3.495$, $p = .06$, and provides additional support for the view that people who participated after the election showed a belief bias (see Figure 5): once people knew that Obama won, they were more likely to select trends that predicted Obama would win.

Unsurprisingly, in both samples, the more liberal a participant, the more likely she was to rank a trend that predicted Obama would win as the most important, $\chi^2[1, N = 622] = 18.839$, $p < .001$ ($B = -0.018$, $z = -4.23$, $p < .001$) (see Figure 5).

Discussion

Using the politically themed version of the Wason selection task, we found that peoples' ideology and knowledge affected how they reasoned about predictive and explanatory political claims. Before Election Day, when the outcome was uncertain, liberals were motivated to falsify claims that were

inconsistent with their ideology—partial support for our motivated-reasoning hypothesis. After Election Day, when the outcome had been decided, we found a shift in how participants reasoned about the claims. People showed a belief bias rather than an ideologically motived bias, tending to falsify claims that were inconsistent with the real-world outcome rather than their own preference. Seeking to falsify a rule reflects correct performance on the Wason selection task (Wason, 1966).

These results help to explain how people reason about political information in the lead-up to and aftermath of real elections. Beforehand, people often conflate their preferences and expectations. In the case of the 2012 election, despite polling data that forecast Obama's reelection (e.g., Nate Silver's fivethirtyeight.com), many conservative politicians and pundits like Newt Gingrich, Dick Morris (2013), and Carl Rove predicted that Romney would win: the day before the election, Gingrich (2012) said, "My personal guess is you'll see a Romney landslide, 53 percent-plus . . . in the popular vote, 300 electoral votes-plus." While some pundits may have been posturing to mobilize voters, others seemed genuinely surprised when their preferred candidate lost.

This kind of wishful thinking is not restricted to conservatives or pundits. Since 1952, the American National Election Survey (ANES) has surveyed a cross-section of likely voters in the weeks before a presidential election, asking them to indicate who they intended to vote for and who they expected to win the election. Answers to these questions suggest that people across the political spectrum and at all levels of political engagement conflate their preferences and expectations. Overall, 70.9% of respondents reported that they expect that the candidate they intend to vote for will win the election. Table 7 of Rothschild and Wolfers (2012, p. 35; see also Granberg & Brent, 1983) shows that 73% of people who intend to vote Republican over these elections expect the Republican to win and 68.8% of people who intend to vote Democratic over these elections expect the Democrat to win.

Our findings suggest that this tendency results in part from an information-processing bias and an implicit desire to regulate emotion. When the outcome of an election is unknown, unfavorable predictions may engender feelings of anxiety and orient people toward falsification—an effective strategy for testing conditional claims; favorable predictions, on the other hand, may engender feelings of enthusiasm and orient people toward confirmation—an ineffective strategy for testing conditional claims (Lodge & Taber, 2005; Marcus & Mackuen, 1993; Taber & Lodge, 2006). In other words, when people evaluate predictive claims that make them anxious they may ask themselves, "Must I believe this?"; when people evaluate predictive claims that make them enthusiastic they may ask themselves, "Can I believe this?" (Dawson et al., 2002; Gilovich, 1991). Employing a relatively lax evidentiary standard for checking claims that support a person's ideology may lead them to think their preferred outcome is the more likely outcome.

After an election, when the outcome is known, people no longer differentiate between claims that support and conflict with their ideology. Partisans who lost the election do not perseverate in thinking their candidate should have won. Instead, everyone tends to falsify claims that conflict with the real-world outcome, a general belief bias (Klauer et al., 2000; Nickerson, 1998). This helps to explain why political narratives can change dramatically after an election. In 2012, for instance, many conservatives who predicted that Romney would win before the election changed their tune after the election, arguing that Obama's victory was inevitable and that Romney never had a real chance—a result, for instance, of the changing demographics of the country (November 6, 2012, *Politico*) or Hurricane Sandy (February 6, 2013, *CNN*).

Importantly, the patterns of results that we find before and after the election are consistent with the view that these biases serve to implicitly regulate emotion. Before elections, it is comforting to think that one's preferred candidate will win. After elections, it is comforting to think that the winner was inevitable.

One puzzle of our results is why we do not find evidence of motivated reasoning among conservatives before the election. It is unlikely that conservatives are less inclined toward motivated reasoning in general as previous work has found such trends among conservatives (e.g., Jost &

Amodio, 2012; Thorisdottir & Jost, 2011). We point to three possible explanations for not finding this effect among conservatives in our pre-election sample. First, we found that our sample of liberals cared significantly more about the outcome of the 2012 election than conservatives. Since the self-relevance of a claim is an important catalyst for motivated reasoning (Helzer & Dunning, 2012), this alone may explain the asymmetry: conservatives were not as invested in the election, making them less inclined toward motivated reasoning. A second possibility appeals to the demographics of the Mechanical Turk population: the service may disproportionately attract liberals—our sample showed a significant liberal bias; alternatively, liberals on Turk may be more representative of the typical American liberal than conservatives on Turk are representative of the typical American conservative. Our sample of Republicans was younger (Median = 35) than the general population of Republicans (whose average age is closer to 50; Kohut et al., 2012) and may have been more liberal. A third factor is particular to the 2012 election. Not only may Romney have been a "weaker" candidate, but many Republican pundits may have been regarded as having been deluded in their dogmatic prediction that Romney would win. As a result, our conservative partisans may have become more skeptical of partisan pundits.

Indeed, the 2012 election saw an unprecedented effort by news agencies and watchdog groups to hold pundits accountable for their on-air speculation. Fact-checking websites like politifact.com and punditttracker.com devoted significant resources to monitoring pundits and evaluating their rhetoric, services that were not available as recently as the 2008 presidential election. The increased attention on pundits' claims may be a lasting by-product of the 2012 election and may change how people reason about future elections (i.e., people may become increasingly skeptical of pundit claims).

Conclusions

People are fascinated by presidential elections. The reelection of Barack Obama was the single biggest event of 2012, garnering nearly twice as much attention as other notable events of the year like Hurricane Sandy, the opening ceremony of the London Olympics, or the Super Bowl (General Sentiment, 2013). The widespread interest attracts ubiquitous, but highly variable, coverage with pundits routinely identifying trends to try and predict or explain the contest. In a two-part study, we asked people to evaluate conditional statements that asserted the role of specific factors in the outcome of the 2012 election. We found partial evidence of motivated reasoning before the election—liberals (but not conservatives) performed especially well when reasoning about predictions that conflicted with their ideology. The asymmetry between liberals and conservatives may result from idiosyncratic features of our sample or particulars of the 2012 presidential race. After the election, we found evidence of belief bias—people falsified claims that were inconsistent with the real-world outcome regardless of their ideology. These results suggest that people seek to implicitly regulate emotion when evaluating political predictions. Before elections, people like to think their preferred candidate will win. After elections, people like to think the winner was inevitable all along.

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Appendix

1 Which cards show items which rhyme with the word "knee"?

3	B	Z	7

2 Which cards have a letter on the back?

5	9	T	V

3 If a card has a vowel on one side it has an even number on the other.

5	A	8	X

4 The incumbent never wins when gas prices have risen significantly since the previous election.

Gas prices rose	Gas prices fell	Incumbent lost	Incumbent won

5 The incumbent always wins in a year when unemployment drops.

Unemployment rose	Unemployment fell	Incumbent lost	Incumbent won

6 The incumbent always wins while we are succeeding in a war.

Succeeding in a war	NOT succeeding in a war	Incumbent lost	Incumbent won

7 The incumbent never wins in an election that immediately follows a significant natural disaster.

Election immediately follows a significant natural disaster	Election does NOT immediately follows a significant natural disaster	Incumbent lost	Incumbent won

8 The incumbent always loses when running against a former governor.

Challenger is a former governor	Challenger is NOT a former governor	Incumbent lost	Incumbent won

9 The incumbent always wins when the Summer Olympics preceding the election were held in Europe.

The Summer Olympics were in Europe	The Summer Olympics were NOT in Europe	Incumbent lost	Incumbent won