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Issue Importance and the Correction of Misinformation

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ABSTRACT

The study of misinformation – and its correction – has proliferated in recent years. Yet the empirical record includes instances where corrective messages do and do not work, even on similar issues. Despite intense scholarly attention to this topic, it remains unclear when people will revise false beliefs. Our study examines a factor with a long history in the study of public opinion: the importance a person attaches to an issue. The subjective state of issue importance has complex effects. It can increase an individual's motivation to engage in effortful information processing while also leading them to defend existing beliefs and opinions. In a series of experiments administered in national surveys, we examine whether issue importance is implicated in the failure to correct false beliefs. The analyses show that on the topic of GM foods, the effects of a corrective message are smallest among misinformed people who rated the issue as personally important. By contrast, framing GM foods in terms of partisan identity engendered little resistance to a corrective message. Our findings illustrate the value of adopting a broader perspective on misinformation because people may resist corrections for reasons that are unrelated to their partisanship.

KEYWORDS

Misinformation; public opinion; issue importance

Misinformation threatens democracies around the world, and this challenge has spurred an extensive literature on correcting false beliefs. However, it has proven easier to identify the causes of misinformation than the conditions under which this problem can be ameliorated. Depending on where one looks in the literature, corrections both are and are not effective (e.g., contrast Haglin, 2017; Weeks, 2015, or Johnson, 2017 with Nyhan & Reifler, 2010 or Zhou, 2016). In the words of one review: "It is clear that corrections work in some circumstances but not others. What is not apparent is why or how corrections succeed or fail . . . " (Weeks, 2018, p. 148).

Our study investigates how *issue importance*, or the subjective sense of caring about a topic (Krosnick, 1990a), affects a person's willingness to revise false beliefs. Important issues are central to a person's self-concept (Lavine et al., 2000), and it is well-established that this kind of "involvement" influences how people process new information. For example, important attitudes are highly stable over time (e.g., Krosnick, 1990a) and resistant to persuasion (e.g., Zuwernick & Devine, 1996). One might suppose, then, that misinformation would be difficult to correct when someone has false beliefs on a personally important

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issue. Despite the plausibility of this claim, misinformation has been viewed almost exclusively through the lens of partisan directional reasoning. That focus is understandable, especially for research conducted in the United States, but belief in misinformation results from a general set of mental processes: namely, a defensive style of reasoning that promotes consistency (reaching a particular conclusion) over accuracy (reaching a conclusion in an unbiased manner). Our study explores what happens when false beliefs support an attitude on an important issue (that was, by design, orthogonal to partisan identity). We find greater adherence to misinformation among people who identify an issue as personally important. Our findings are valuable for clarifying the psychological forces that contribute to misinformation as well as the potential for combatting this problem.

Issue Importance, Motivation, and Misinformation

The research on misinformation is vast, but "the empirical patterns point in many directions" (Jerit & Zhao, 2020, p. 82; also see, Walter et al., 2019). Early studies highlighted the difficulty of correcting misinformation (Kuklinski et al., 2000; Prasad et al., 2009) and the potential for backfire effects (Nyhan & Reifler, 2010; Zhou, 2016). However, as scholars examined a broader set of issues (Wood & Porter, 2019), outcome measures (Nyhan et al., 2020; Thorson, 2016), and the duration of correction effects (Berinsky, 2017; Carnahan et al., 2020), a "perplexing" array of findings has accumulated (Wittenberg & Berinsky, 2020, p. 183). It is difficult to generalize about the correction of misinformation.

We contribute to this literature by broadening the explanatory narrative. Existing research focuses on partisan explanations rooted in biased information processing, without considering the extent to which people *care* about the underlying issue. This is a crucial limitation because decades of studies show that people process information differently when they are invested in an issue.[1] According to the literature on this topic, a person will care deeply about an issue "to the extent that it is seen as relevant to his or her tangible or material goals (*self-interest*), to the extent that people and groups that are important to the person are seen as caring about or affected by the issue (*social identification*), and to the extent that the issue is viewed as being linked to the attainment of cherished values (*value relevance*)" (Lavine et al., 2000, p. 84, emphasis original).

From this perspective, partisan identity can be the source of issue importance. For example, specific issue positions can become central to the party's identity (as is the case with the pro-life/pro-choice positions on abortion). Party elites also can link issue positions to core values (as occurs on topics like health care, immigration, or taxes). In these situations, partisan political identity signals what is important. Yet people can perceive an issue as personally important for reasons that have little to do with partisan attachments (Krosnick, 1990a). Issue motivations also may *conflict* with partisanship, such as when one's stance on an important issue is different from the position held by their party (Hillygus & Shields, 2014; Mullinix, 2016).

Important attitudes – whether they stem from a political identity or some other source – are central to an individual's self-concept. Yet this kind of involvement has complex effects: it may increase a person's motivation to engage in systematic information processing, but it also can lead one to defend existing beliefs and opinions (Thomsen et al., 1995, p. 200). Thus, identifying an issue as "important" does not necessarily promote accuracy goals, and can instead result in a style of thinking that bolsters existing beliefs (Mullinix, 2016, p. 387).

This tension was noted in early research by Krosnick (1990b), who observed that issue importance could lead people to be *more or less* accurate in their perceptions of candidate issue stands.[2]

Once a person forms an attitude on an important issue, the natural tendency is to defend it (Lavine et al., 2000, pp. 84–85). Indeed, in studies of polarization (Leeper, 2014), framing (Lecheler et al., 2009), and cue taking (Mullinix, 2016), issue importance motivates the protection of existing attitudes (e.g., increasing resistance to contrary information). A nascent literature suggests that a similar phenomenon may take place with misinformation. Ecker and Ang (2019) argue that when misinformation has implications for a strongly held identification, a person will resist correction. In that study, misinformation varied in its centrality to subjects' partisan attachments.[3] Ecker and Ang (2019) observed the expected pattern: it was more difficult to correct misinformation when false beliefs were central to a person's partisan identification (i.e., the general claim about party corruption). Analogously, it should be difficult to correct false beliefs that are related to an important attitude. To be clear, the subjective state of issue importance does not, by itself, predispose a person to be misinformed. But when a person acquires false information to support an important attitude, those beliefs will resist change.

Testing Our Hypothesis: The Issue of GM Foods

We expect that a corrective message will be less effective in changing false beliefs among people who view the issue as personally important relative to those who do not view the issue as important (Issue Importance Hypothesis). We test this claim using the issue of genetically modified (GM) foods. The topic is ideal for two reasons described below: the substantial level of misinformation about GM food safety and the absence of partisan divisions.

Scientific evidence indicates that GM foods are safe and have the same nutritional content as conventionally grown foods, but laypeople have concerns about GM food products. A 2015 Pew survey illustrates the expert-mass gap. Whereas 88% of members of the American Association for the Advancement of Science (AAAS) say GM foods are safe, the comparable figure for the mass public is 37%. According to McFadden (2016), this 51-percentage point difference was the *largest* elite-mass gap among biomedical issues in the 2015 Pew study.[4] Elder, Greene, and Lizotte write that there is a, "stark divide between the views of the scientific community and the general public on the issue of whether GM foods are safe or not" (Elder et al., 2018, p. 501). The authors say that knowledge of GM foods is minimal, "despite the reality that GM foods are widespread in the U.S. marketplace" and likely are consumed every day (Elder et al., 2018, p. 502). Clearly, wide swaths of the public are misinformed about GM foods.[5]

A second reason to examine GM foods is because the issue is not polarized by party (e.g., Clifford & Wendell, 2016), making it possible to isolate the relationship between issue motivations and misinformation. In an era marked by partisan polarization, GM foods stands apart from other issues: "there is no consistent divide between partisans [at the mass level] in the United States in doubts about the safety of GMOs" (Nyhan, 2021, p. 5). This claim is supported by nationally representative opinion surveys. For example, in the October 2019 wave of the Pew American Trends Panel, there are few differences between Democrats and Republicans on a variety of items measuring perceptions of GM foods.

Mass opinion on GM foods reflects an information environment in which political elites have not staked out visible positions (McFadden, 2016), possibly because of cross-pressures (Elder et al., 2018). The pro-business/anti-regulation aspect of the Republican platform leads conservatives to favor the unfettered development of the GM food industry, but this position is countered by skepticism of scientific expertise (which endorses the safety of GM foods). Democratic elites are torn between their endorsement of the scientific consensus and concern for environmental impacts from the GM food industry (Elder et al., 2018, p. 506). GM foods thus represents the rare topic that does not divide the major parties in the United States.

Media coverage of GM foods may not be tainted by partisan rancor, but there is a different problem: journalists do not accurately portray the scientific consensus on this issue (Merkley, 2020). The dearth of policy-relevant information, combined with the "informal" sources people turn to on GM foods (e.g., the Internet, blog posts, conversations; see, Bode et al., 2021 or Wunderlich & Gatto, 2015) has resulted in a familiarity with the issue that contradicts scientific understanding. This paradoxical situation reflects the pattern for many prominent misperceptions. According to Thorson (Forthcoming), when journalists do not provide policy-relevant information, people come up with their own ideas about how the world works, often through bias-laden inferential processes.

Scholars speculate that in the coming years, "the debate surrounding the safety of GM foods is likely to achieve even higher levels of national attention" (Elder et al., 2018, p. 507). Thus, GM foods is an ideal topic – both in terms of the level of misinformation among citizens, the analytic leverage it offers for exploring issue motivations (apart from partisanship), and the topic's growing significance in the policy space.

Overview of Studies

We tested our hypothesis in three experiments embedded in national opinion surveys during the spring and fall of 2020.[6] Each study involved a similar procedure: participants read an excerpt of a fictional news story about GM foods. The excerpt provided background information and highlighted common misperceptions about the issue. Later, all participants were shown an authoritative correction, but depending on treatment assignment, respondents answered outcome questions either before or after viewing the correction. Differences in the level of misinformation across conditions estimate the causal effect of the corrective message. Respondents who answered outcomes *before* the correction are labeled the "No Correction" group while those who answered outcomes *after* the correction are the "Correction" group. We predict that people will cling to misinformation when those beliefs are central to an important attitude. Thus, we evaluate our hypothesis by examining whether a specific subgroup (i.e., high importance respondents) exhibit smaller correction effects. In the first and second studies, we measure issue importance; in our third study, we attempt to manipulate this psychological state.

Study 1 Design and Measures

Study 1 featured a between-subjects experiment embedded in a survey of U.S. adults (N = 4,334) that was administered by Dynata from May 14–20, 2020. The key experimental manipulation is the placement of the corrective message in relation to the outcome

measures. In the guise of describing new legislation at the state level, participants read an excerpt from a news story that primes misinformation related to GM foods. The text describes state-level legislation designed to increase GM food production in the U.S. (suggesting it lags other countries) and notes the concerns of opponents regarding GM food safety. In actuality, the U.S. is the largest producer of genetically modified foods and numerous scientific organizations have endorsed their safety and nutritional value. A subsequent corrective message graphically depicts the increase in GM food adoption in the United States and says that the U.S. is the largest producer of GM foods in the world. There is an additional paragraph which invokes the National Academies of Science, Engineering, and Medicine in describing GM food products as safe.[7]

After the story, a manipulation check tested respondents' knowledge about where the policy change was occurring ("In the story you just read, policy change on genetically modified foods was taking place in … " with response options for "state legislatures" (correct), "the U.S. Supreme Court," "the U.S. Congress," and "a state-level ballot proposition"). Approximately two-thirds of respondents provided the correct response, indicating a substantial level of attention to the treatment.[8] The dependent measures consisted of three factual questions about GM foods and four items about general political facts. Respondents were asked to indicate whether statements were true or false and given six choices without a "Don't Know" option ("Definitely True," "Very Likely True," "Probably True," "Probably False," "Very Likely False," and "Definitely False"). The statements for GM foods read, "Genetically modified foods have the same nutritional value as non-GM foods" [true], "China has become the largest producer of genetically modified crops in the world in recent years" [false], and "The number of genetically modified crops in the adopted in the U.S. has declined in the last decade" [false]. The nutrition fact is central to GM food misperceptions and attitudes; the other two facts constitute background information about the topic. All three items are coded so that higher values represent the misinformed response.[9]

Prior to the experiment, we measured the personal importance of GM foods and four other issues (abortion, nuclear power, immigration, poverty). Using standard wording (Boninger et al., 1995), respondents were asked, "How important are the following issues to you personally?" and rated the topics in a grid format, with the order of issues randomized. In Study 1, the distribution of importance for GM foods was: 16% ("Extremely Important"), 18% ("Very Important"), 26% ("Moderately Important"), 21% ("Slightly Important"), 18% ("Not at all Important"). We recode importance to a dichotomous variable, with the "High Importance" category representing people giving an "Extremely" or "Very" response. People giving any other response ("Moderately," "Slightly," or "Not at All") are coded to 0. Several questions on other topics separated the issue importance battery from the experiment. Prior to the treatment we measured Need for Cognition (NC) and Need for Closure (NCL), two traits that relate to the tendency to revise false beliefs (Wittenberg & Berinsky, 2020; Leding & Antonio, 2019).

Study 1 Empirical Results

The analyses examine whether correction effects are smaller for people who self-report the issue as important. In presenting the results, we focus on mean differences across conditions (i.e., no covariates) and describe auxiliary models that control for potential confounders.

We report the results of our Difference-in-Difference (D–i–D) tests in the text (and present them in tabular form in the Online Appendix).

We begin with descriptive patterns, using observations from a different part of the survey to examine baseline levels of misinformation on GM foods (see note 7). Overall, approximately 44% of respondents give an incorrect answer to the nutrition question (i.e., they gave one of the "false" responses). Those who rated GM foods as "Very" or "Extremely" important had higher levels of misinformation about that topic compared to other respondents (a mean of 2.6 on a six-point scale compared to 2.3; $|t| = 3.8$; $p < .001$). Thus, the factual beliefs of high importance respondents were distinctive, in the direction of being inaccurate.[10]

According to the Issue Importance Hypothesis, people who rate GM foods as personally important will be less likely to heed the corrective message and to revise their (largely inaccurate) beliefs. Thus, we should observe smaller correction effects for high importance respondents compared to low importance respondents on the nutrition fact.[11] The other facts (trends in adoption and the worldwide leader in GM food production) are less central to GM food safety, meaning that the motive to resist new information about these topics (among high importance respondents) is weaker. Accordingly, our expectations regarding the size of correction effects for the adoption and world leader facts are unclear.

Figure 1 presents levels of misinformation about the three facts, by condition and importance status. Across the three panels, High Importance respondents are more likely than Low Importance respondents to give a misinformed response. There also is a decrease in misinformation, post-correction, for both types of people, as indicated by the black bars. However, High Importance respondents experience a *smaller* change on the nutrition fact compared to Low Importance respondents (.55 versus .71). This difference in the size of the correction effect across the groups is substantial, though not statistically significant in a D–i–D model (analyses reported in the Online Appendix). When it comes to the other topics, the opposite pattern appears: High Importance people experience a *larger* decline in misinformation than Low Importance people (.91 versus .80 for largest producer and .75 versus .52 for adoption trends; these differences are not statistically significant in D–i–D models).

Overall, people who identify GM foods as an important issue exhibit smaller correction effects on the nutrition fact than individuals who rate the issue as unimportant (the comparison in Panel A between Low and High Importance groups). Additionally, people who identify GM foods as an important issue are more resistant to correcting misinformation about nutrition compared to other, less central facts (.55 compared to either .91 or .75, which can be seen in Panels A through C, focusing on the High Importance group). We confirmed the robustness of Study 1′s results in models with controls for NC (six-item scale), NCL (three-item scale) and general political knowledge (four-item scale). This is a crucial precaution given that importance is measured (Kam & Trussler, 2017).[12] Finally, there is no moderating effect by partisanship: self-reported Democrats and Republicans react similarly to the corrective message.

The patterns in Study 1 were consistent with our hypothesis but the D–i–D analyses leave some doubt about the role of issue importance. In a second study, we replicate the basic design from Study 1 but investigate factual beliefs in two areas, nutritional content and safety. Study 2 also includes items that solicit respondents' concern with GM foods and favorability, allowing us to probe whether GM food attitudes change in response to corrective messages (Thorson, 2016). Lastly, given the plethora of studies showing the

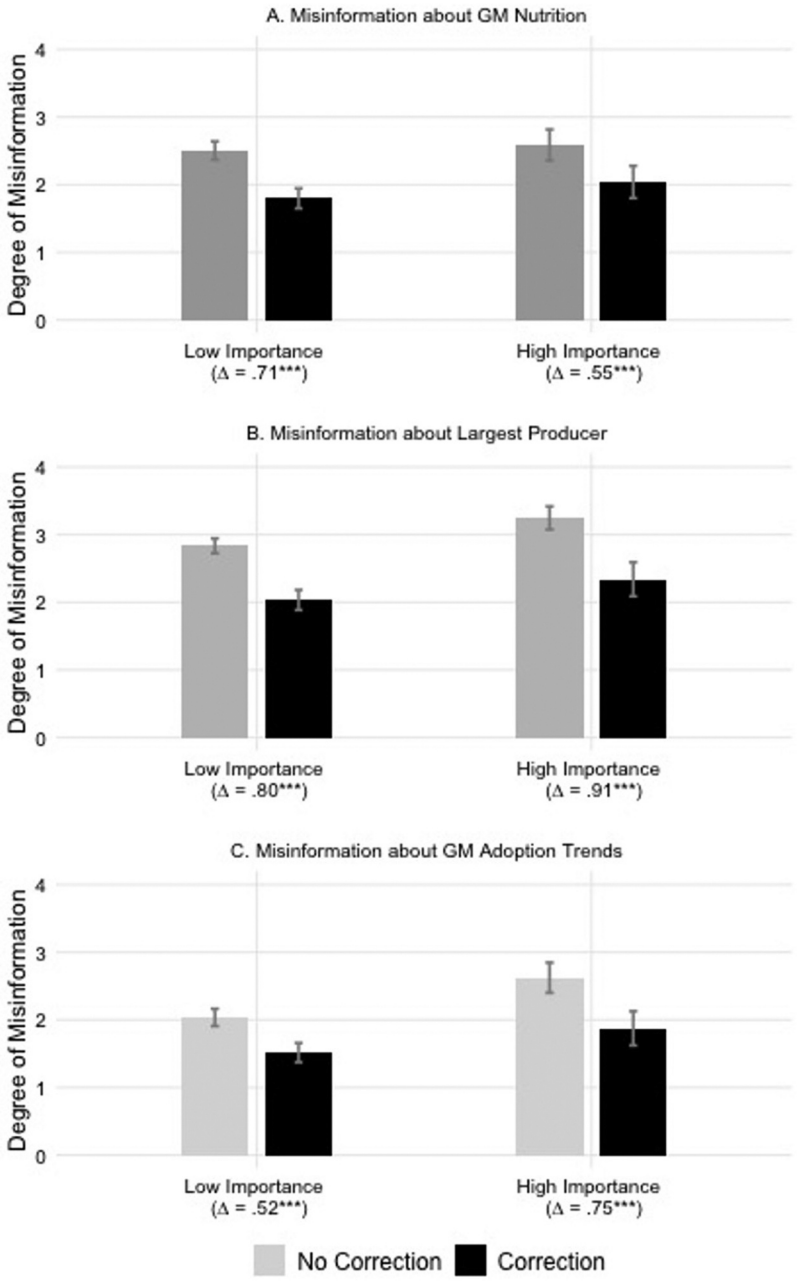

Figure 1. Decrease in misinformation across facts, by importance (Study 1). *Note*: Height of column represents response on 6-point factual belief question, where high values signify incorrect beliefs. *** $p < .001$ Difference-in-Difference (D-i-D) insignificant for all three facts.

biasing impact of partisan cues on decision making (e.g., Cohen, 2003; Petersen et al., 2013), we manipulate the degree of partisan polarization surrounding GM foods. This design feature will allow us to examine the relative impact of partisanship and issue motivations on the take-up of corrective information.

Study 2 Design and Measures

Study 2 featured an experiment embedded in a survey of U.S. adults (N = 2,347) administered by Dynata from March 9–23, 2020. The experiment involved the same design as Study 1. All participants viewed a three-paragraph news story that repeats common but inaccurate information about the safety and nutritional value of GM foods. Later, respondents saw a corrective message invoking the U.S. Department of Agriculture as well as the National Academies of Science, Engineering, and Medicine. The first manipulation relates to the timing of the correction. A random half of subjects receive the correction before they answer outcomes regarding factual beliefs and attitudes (correction/treatment group), while the other half see the correction after (no correction/control group).

The second manipulation concerns the degree to which the issue is politicized. Numerous studies have shown that partisan primes can affect information processing, and the design of Study 2 is modeled after that work. In the non-politicized conditions, the final paragraph of the story conveys a non-ideological argument against GM foods (e.g., about ethical concerns). In the politicized conditions, the final paragraph presents political arguments against GM foods: references to environmental damage on the liberal side or claims about regulations for agricultural businesses on the conservative side. Following Chong and Mullinix, we accentuated partisan motives "by identifying the values at stake and the segments of society that will be helped or hurt by it" (Chong & Mullinix, 2019, p. 1212). We also manipulated the image that appeared alongside the story. In the politicized conditions, labels for either "Democrats" or "Republicans" appeared on a protester sign; in the non-politicized condition, there are no cues to partisanship. We conducted extensive pretesting of the stimuli, the results of which are discussed later.

After reading the story on GM foods, respondents answered a manipulation check and three demographic questions (passage rate on the check was 57%). Dependent measures consisted of two factual items about the safety and nutrition of GM foods. The statement for nutrition read, "Genetically modified foods have the same nutritional value as non-GM foods," which is true according to the best available scientific evidence. The statement for safety read, "Genetically modified foods pose a health hazard to consumers," which is false. Respondents were asked to indicate whether statements about both topics were true or false and shown a 100-point sliding scale with five labeled response options ("Definitely True," "Probably True," "Probably False," "Definitely False," and "Don't know," which was in the middle of the slider). In the analyses, both items were coded so that higher values indicate an incorrect response.

Attitudes were measured with an item asking respondents how much they agree with the statement, "I am concerned about the health effects of genetically modified foods." Subjects indicated their concern on a seven-point scale that ranged from strongly disagree to strongly agree. In addition, respondents were asked, "Overall, how favorable or unfavorable is your opinion toward genetically modified foods?" and gave a response on a seven-point favorable-unfavorable scale. Higher values on the attitude items indicate more concern/more unfavorable attitudes. Finally, issue importance was measured prior to the experimental manipulations in the same manner as the first study (i.e., in a grid format along with immigration, poverty, abortion, and climate change).[13] A series of personality questions as well as a placebo news story separated the issue importance battery from the experimental treatment.

Study 2 Empirical Results

Approximately 40% of respondents said that the GM foods issue was "Very" or "Extremely" important to them. Like Study 1, people who gave this response tended to have inaccurate beliefs about GM foods (e.g., in a direction that would lead them to oppose GM foods). The Issue Importance Hypothesis predicts these individuals will be less likely to heed the corrective message that GM foods are safe (i.e., there should be smaller correction effects for high importance respondents, relative to other respondents).[14] For ease of presentation in showing the results, we collapse the non-politicized and politicized conditions though we observe identical patterns when we disaggregate the analysis across that factor.

Figure 2 compares the correction effect across importance groups. Misinformation regarding nutrition and safety drops among both groups (indicated by the height of the black columns), but the decrease in the percentage giving the incorrect answer is *halved* among respondents who rate the issue as personally important. On the nutrition fact, High Importance respondents experience a 7 percentage-point drop in misinformation (49% vs. 42% in the right-most of columns). This change, while statistically significant, is dwarfed by the analogous shift among

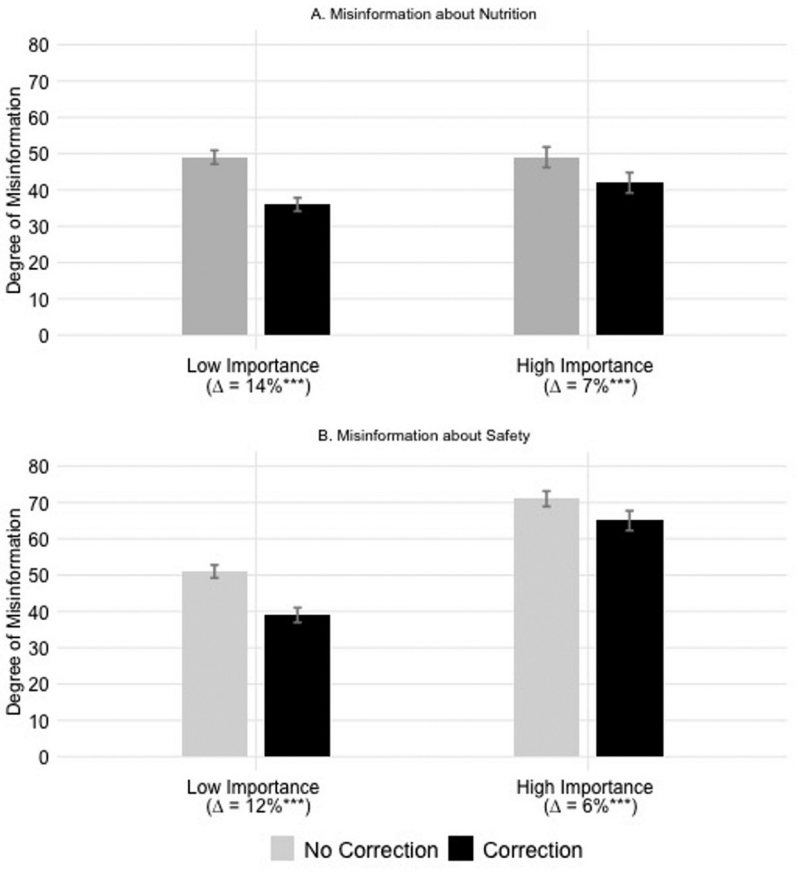

Figure 2. Decrease in misinformation across facts, by importance (Study 2). *Note*: Height of column represents response on 100-point factual belief question, where high values signify incorrect beliefs. *** $p < .001$ Difference-in-Difference for both outcomes significant at $p < .05$.

people who do not rate the issue as important (49% vs. 35% on the left). A similar pattern is observed for beliefs about safety, but baseline misinformation is greater among the High Importance group (Brody, 2018). In both comparisons, the D–i–D (i.e., the difference in the size of correction effect across importance groups) is statistically significant ($p < .05$).

Issue importance also moderates the effect of the corrective message on attitudes, measured in terms of safety concerns or overall favorability. High Importance respondents report feeling more concerned about GM foods than other respondents ($p < .01$). Those concerns moderate somewhat in response to the corrective message, but there remains a substantial gap across High and Low Importance groups (with a significant D–i–D; $p = .05$). A similar pattern is observed for overall favorability toward GM foods, with high importance people being significantly less likely to change their opinion in response to the corrective message ($p < .05$ for the D–i–D). As with our first study, we confirmed the robustness of the analyses for Study 2 in models that control for NC (six-item scale), NCL (three-item scale), and general political knowledge. Study 2 included a 7-point measure of a person's attitude about risk (high values indicating risk aversion) but controlling for this factor did not alter the results.

Next, we examine whether people resist a corrective message in a situation where opposition to GM foods becomes linked to partisan identity. Numerous studies illustrate how the mere presentation of a partisan cue affects the values people endorse (Goren et al., 2009), attributions of blame (Healy et al., 2014), and perceptions of the economy (Bisgaard & Slothuus, 2018), to name just a few examples. This body of work, combined with past research on correcting misinformation (e.g., Prasad et al., 2009), suggests that people will be more likely to resist correction on GM foods when doing so involves a conflict with their partisanship. We explore this idea in Study 2 by manipulating the degree to which GM foods is linked to traditional partisan cleavages. As described earlier, the news story contained arguments that were either politicized in the liberal or conservative direction, or non-politicized.

We conducted extensive pretesting to ensure that the stimuli had the expected effects. Those analyses indicate several key patterns. First, the paragraph conveying misinformation regarding safety and nutrition makes respondents less likely to think GM foods are safe relative to those reading a placebo story ($|t| = 2.16$; $p < .05$). Second, the manipulation in the third paragraph is effective in changing perceptions of the issue. Respondents reading the politicized arguments were significantly more likely than respondents who read a non-politicized critique of GM foods to state that the topic of GM foods is, "an issue where liberals and conservatives would disagree" ($|t| = 4.52$; $p < .01$). Crucially, however, the liberal and conservative arguments were statistically indistinguishable on other dimensions related to argument strength (e.g., believability, clarity, novelty, being informative). Finally, a separate pretest confirmed the effectiveness of the correction. People reading the corrective message were more likely to state that GM foods were safe relative to those in a placebo condition, who read about a nonpolitical topic ($|t| = 2.88$; $p < .01$). Overall, the stimuli prime misperceptions about GM foods, politicize this issue (in selected conditions), and then correct beliefs with a strong information treatment.

The key question is whether partisans resist the corrective message in conditions where GM foods has become linked to partisanship (i.e., in the politicized liberal and politicized conservative conditions). Those results are presented in Table 1.

The first row of entries shows mean values on the two factual belief items (*Nutrition* and *Safe*) among all respondents in the No Correction group. The columns correspond to patterns in the non-politicized, politicized-liberal, and politicized-conservative conditions. In the first

Table 1. Misinformation about GM Foods across Politicized and Non-Politicized Conditions (Study 2)

	Nutrition			Safe		
All Respondents	Non-Politicized	Politicized Liberal	Politicized Conservative	Non-Politicized	Politicized Liberal	Politicized Conservative
No Correction	49.85	50.04	48.39	59.81	60.32	57.76
Correction	39.23	39.66	36.71	49.13	50.04	48.61
Difference	10.62***	10.37***	11.67***	10.68***	10.27***	9.15***
N	785	787	775	785	787	775
	Nutrition			Safe		
Democrats	Non-Politicized	Politicized Liberal	Politicized Conservative	Non-Politicized	Politicized Liberal	Politicized Conservative
No Correction	49.13	49.84	48.78	60.54	61.98	58.06
Correction	36.36	38.19	38.87	48.36	51.10	50.15
Difference	12.77***	11.66***	9.91***	12.18***	10.87***	7.92**
N	305	332	352	305	332	352
	Nutrition			Safe		
Republicans	Non-Politicized	Politicized Liberal	Politicized Conservative	Non-Politicized	Politicized Liberal	Politicized Conservative
No Correction	49.88	49.27	48.94	60.68	60.07	58.27
Correction	39.91	37.90	33.20	49.87	48.71	46.74
Difference	9.97***	11.37***	15.75***	10.81	11.36***	11.53***
N	319	306	266	319	306	266

Note: Cell entries indicate mean values on Nutrition and Safe variables, which range from 0 to 100. High values signify incorrect beliefs. Reported differences come from t-tests; *** $p < .001$ ** $p < .05$

row, the level of GM food misinformation is similar across the non-politicized and politicized conditions for either outcome. Thus, the news story was effective in priming misperceptions about safety and nutrition, irrespective of whether partisan differences were mentioned. The second row of Table 1 presents mean values for respondents in the Correction group. There is a substantively large and statistically significant correction in both the non-politicized and politicized conditions (from 9 to 11 points and shown in the row labeled "Difference").

One might expect that Democrats would be less willing to correct their views on GM foods after being exposed to politicized rhetoric that highlights liberal concerns (e.g., harm to the environment) relative to the ideologically neutral rhetoric in the non-politicized condition. For Republicans, the relevant comparison is the degree of correction in the condition with politicized rhetoric featuring conservative concerns (e.g., regulations on farmers) versus the corresponding change for Republicans in the non-politicized condition. The relevant results are presented in the middle ("Democrats") and bottom ("Republicans") sets of rows in Table 1. Despite being exposed to an ideological rationale for opposing GM foods, Democrats and Republicans were just as likely to heed the corrective message in the politicized conditions as in the non-politicized condition. For example, in the bottom right part of Table 1, Republicans in the Politicized-Conservative condition experience a 11.53-point corrective effect regarding GM food safety, which is similar to belief change in the Non-Politicized condition (10.81-point difference). None of the D–i–D tests involving partisanship are statistically significant, which is in line with the uniform correction effects in Table 1.[15]

Overall, Studies 1 and 2 provide evidence in favor of the Issue Importance Hypothesis: correction effects were smaller for people who self-reported that an issue was important to

them. This pattern is consistent with past theorizing about issue involvement; namely, that it can provide the motive to resist information that counters existing beliefs (Lavine et al., 2000). Yet there has been scarce attention to this dynamic in the context of *misinformed* beliefs. Study 2 also revealed that manipulating the ideological slant of the issue (in a manner comparable to past research) engendered little partisan-based resistance to a corrective message.

Study 3 Design and Measures

Our third study includes a pre-registered (https://osf.io/dashboard) experiment embedded in a survey of U.S. adults (N = 2,229) administered by Qualtrics from October 21–November 4, 2020. Although past literature confirms the validity of measuring importance as a subjective state (Boninger et al., 1995), the use of a measured moderator (in Studies 1 and 2) raises questions about causal identification. Thus, in Study 3 we attempt to manipulate issue importance.

The study is a 2 (correction/no correction) X 2 (high/low importance) between-subjects experiment that was administered in a split ballot format with respondents randomly assigned to read about GM foods (N =912) or fracking (N =918). Additionally, a different group (N =399) was randomized into an untreated control group that answered outcomes but did not read about either issue. We selected topics that were not aligned with partisanship at the time of the study's design. The rationale for investigating GM foods is strong, given existing misinformation on this topic. As for fracking, existing surveys show that the public is unfamiliar with the topic and that people willingly admit their lack of knowledge about the issue (e.g., Bolsen & Druckman, 2015). That said, the malleability of opinion on fracking (Christenson et al., 2017, p. 409) could result in a weaker role for issue motivations. It is only once an attitude becomes "connected with the self" that the biasing effect of issue involvement becomes apparent (Lavine et al., 2000, p. 85).

We estimated the effect of a corrective message in the same manner as Studies 1 and 2. When it came to manipulating issue importance, we followed previous research (Mullinix, 2016). Importance is a multifaceted concept, but scholars theorize that people develop a sense of involvement when they have a stake in the issue. We primed importance with (1) language about personal relevance and impending government action on the issue, and (2) a writing task. We illustrate our manipulation for GM foods and show the text for fracking in the Online Appendix.

In the High Importance condition, respondents saw a screen that read, "Next you will read part of a news story. The issue in the story has personal relevance for almost everyone in the US: the country's diminishing food supply. This directly affects the price and quality of the food we eat." After reading about GM foods (e.g., background information and a reference to safety and nutrition concerns), respondents in the High Importance condition viewed these instructions:

> "There are pros and cons to this issue. But politicians on both sides agree that important decisions about genetically modified food products will need to be made soon.
>
> Now imagine that you wanted to convince someone of the importance of genetically modified foods, given the likelihood of policy change in this area. In just a few words, please let us know what you might say."

In the Low Importance group, the instructions read, "Next you will read part of a news story. We are interested in how the media get information out to the public on different topics." After the passage on GM foods, they viewed the following language:

> "There are pros and cons to this issue. But policymaking in the area of genetically modified foods seems to be on the back burner for a few more years.
>
> Now imagine that someone asked if the news excerpt you read was clear or if there is a better way for the media to convey information. In just a few words, please let us know what you might say."

The language of the High Importance condition stressed the significance of GM foods and characterized policy action as imminent. The language of the Low Importance condition gave the opposite impression, describing the issue as being on the "back burner."

We measured the length of time it took for respondents to complete the writing task and obtained a record of what they wrote.[16] After the writing task, participants rated the importance of GM foods, fracking, unemployment benefits, free college tuition, and immigration (as one of our manipulation checks). The dependent measures consisted of two factual items about the safety and nutrition of GM foods and a favorability question (response options were the same as those from Study 2). Need for Cognition was measured prior to the treatment.[17]

Study 3 Empirical Results

We begin with the manipulation checks for GM foods. The key question is whether the High Importance treatment induced a greater sense of involvement with the topic, relative to respondents in the Low Importance condition. A useful metric is time spent on the free response since the purpose of the writing task was to increase cognitive elaboration. As expected, people in the High Importance condition spent significantly longer on the writing task than people in the Low Importance condition (approximately a 20-second difference; $|t| = 4.05$; $p < .001$). Insofar as the primary effect of issue involvement is to increase the amount of *effort* that a person expends processing information about the topic (Thomsen et al., 1995, p. 197), the manipulation worked as intended. In open-ended remarks respondents in the High Importance condition rehearsed reasons for the importance of GM foods (e.g., "I would mention the price and how it is healthier"), while their counterparts in the Low Importance condition focused on aspects of the story (e.g., "more explanation would have been helpful"). Additionally, a coder (blind to our hypothesis) analyzed the comments according to whether a respondent offered reasons for the topic's importance. As expected, people in the High Importance condition were more likely than those in the Low Importance condition to provide a substantive rationale for the importance of the topic, either related to a food crisis ($|t| = 13.32$; $p < .001$) or food quality ($|t| = 5.7$; $p < .001$).[18]

Our primary analyses in Study 3 concern the size of the correction effect for respondents in the High and Low Importance conditions: Did beliefs and attitudes move in the direction of the corrective message, and was that change *smaller* for people who had been primed to think about the importance of GM foods? The results are presented in Table 2a where we

show correction effects for people assigned to the Low and High Importance groups. Factual beliefs and attitudes were measured in the same manner as Study 2: two items about the safety and nutrition of GM foods and a favorability item (higher values represent unfavorable attitudes).[19]

For factual beliefs (top two rows) and attitudes (third row), the correction effects were smaller for people in the High Importance group, which is consistent with the pattern observed in Studies 1 and 2. We cannot estimate correction effects among control group respondents because they did not read anything, but their level of misinformation was on par with the No Correction group. In D–i–D tests that control for previously-noted condition imbalances, the difference in the size of the correction effect across importance groups in Table 2a is significant at $p = .10$ (nutrition), .39 (safety), and .09 (favorability).[20] In a model that combines the three items into a reliable scale ($\alpha = .77$), the D–i–D test is significant at $p = .07$.

When it came to fracking, unanticipated developments in the fall election campaign vaulted the issue into the national spotlight (Worland, 2020), increasing the partisan salience of fracking as our survey was in the field. Throughout October of 2020, the candidates sparred over their positions on fracking in both the Presidential and Vice-Presidential debates. Additionally, in campaign appearances Trump frequently charged that Biden would ban fracking with disastrous consequences for energy prices (e.g., Friedman, 2020).[21] The effects of this real-world treatment can be seen by examining opinion toward fracking in the control group, which provides a snapshot of "baseline" opinion in the fall of 2020.[22] Among control group respondents, Democrats express more negative views than Republicans by almost a full point on a 6-point scale (4.0 versus 3.1; $p < .01$). In a multivariate model predicting opposition to fracking, partisanship was strongly related to attitudes ($p < .001$).[23] In the end, our manipulation was successful at increasing the self-reported importance of fracking, but events outside the survey conspired to make partisanship an even stronger treatment.[24]

In our analyses of correction effects in the fracking condition, support for the Issue Importance Hypothesis was mixed (Table 2b). The High Importance group displayed the expected pattern (i.e., smaller correction effects) only for attitudes. In non-registered analyses of partisans in the fracking condition, there is further evidence that the issue became politicized. Democrats were more likely than Republicans to have misinformed beliefs and to report lower favorability (ps $< .01$). Nevertheless, and like Study 2 where we experimentally politicized the issue of GM foods, both Democrats and Republicans

Table 2a. Changes in GM foods beliefs and attitudes, by importance condition (Study 3).

	Correction Effect Low Importance	Correction Effect High Importance
Misinformation about Nutrition	-0.88***	-0.60***
	(.12)	(.12)
Misinformation about Safety	-0.77***	-0.61***
	(.13)	(.13)
Favorability toward GM Foods	-0.53***	-0.21
	(.13)	(.14)
Three-item scale ($\alpha = .77$)	-0.73***	-0.47***
	(.10)	(.10)

Note: Cell entries indicate correction effect (i.e., the difference in outcomes across the Correction and No Correction groups). Entries in parentheses are standard errors. *** $p < .001$ ** $p < .05$

The D–i–D (i.e., the difference in the size of the correction effect across importance groups is significant at $p = .10$ (nutrition), .39 (safety), .09 (favorability), and .07 (3-item scale).

Table 2b. Changes in fracking beliefs and attitudes, by importance condition (Study 3).

	Correction Effect Low Importance	Correction Effect High Importance
Misinformation about Harms to Water	-0.29**	-0.38**
	(.12)	(.12)
Misinformation about Energy Prices	-0.23**	-0.33**
	(.10)	(.10)
Favorability toward Fracking	-0.29**	-0.15
	(.13)	(.13)
Three-item scale (α = .65)	-0.28**	-0.30**
	(.09)	(.09)

Note: Cell entries indicate correction effect (i.e., the difference in outcomes across the Correction and No Correction groups). Entries in parentheses are standard errors. *** $p < .001$ ** $p < .05$
The D–i–D (i.e., the difference in the size of the correction effect across importance groups) is nonsignificant.

corrected their beliefs and attitudes about fracking (i.e., partisanship does not have a moderating effect in D–i–D analyses).

Overall, Study 3 provides only suggestive evidence for the role of issue importance. Each of the issues we examine were problematic, but for different reasons. On fracking, the manipulation increased a sense of importance among study participants, but an even stronger real-world treatment interfered with our experimental design. For GM foods, the expected pattern was observed (high importance respondents less likely than low importance respondents to revise false beliefs), but there remain some questions about the treatment's effectiveness.

One lesson from Study 3 pertains to the challenges of manipulating importance – a topic that has received its own share of scholarly attention. For example, Thomsen et al. (1995, p. 199), note differences in the absolute level of involvement triggered by experimental treatments (weaker) versus observational studies (stronger). This difference underscores that importance is a personal, and subjectively determined, psychological state. In experimental studies, researchers have been most successful at inducing importance in nonpolitical situations with homogeneous study populations. In the typical design, students in a "high involvement" condition are informed about changes in college policies related to tuition or coed visitation (Petty & Caccioppo, 1986, p. 146). Study 3 differed from the canonical setting in *both* respects: we featured a political issue and had a heterogeneous sample. Thus, while many people identify GM foods as a personally important issue, the rationale suggested by our stimulus (food supply, prices) may not have triggered the "right" active ingredient. Treated individuals could nonetheless be motivated to resist correction, owing to their *own* reasons for the importance of GM foods. We acknowledge that this account is post-hoc. Considering the challenge of studying psychological concepts with substantial "bandwidth" (Bakker 2018, p. 388), a more fruitful path might involve experiments on homogenous groups who mobilize around specific topics (e.g., parents or the elderly).

Conclusion

We have argued that a complex set of motivational dynamics is at work when people resist corrections – forces that often involve partisan identity, but sometimes stem from other

convictions.[25] Our goal was to explore what happens when false beliefs support an attitude on an important issue (that was orthogonal to partisan identity). Past work implies that the subjective sense of importance can provide the motive to resist the correction of false beliefs on a cherished topic. Consistent with this view, we consistently observed smaller correction effects for the "high" versus "low" importance groups (though the difference in effects was sometimes statistically insignificant). The smaller correction effects for high importance respondents, coupled with consistently null moderating effects for partisanship (measured or experimentally primed), should compel researchers to think differently about the problem of misinformation.

Once one recognizes the role of issue importance, it becomes clear why corrections work in some situations but not others. The ease with which people correct false beliefs in particular instances likely reflects topics that are psychologically uninvolving (e.g., Wood & Porter, 2019). Even partisans have been shown to correct misinformation that is not central to their political identity (e.g., Ecker & Ang, 2019). At the other end of the spectrum, notable examples of misinformation involve topics that people care about, but those misperceptions do not originate from the partisan political environment (Thorson, Forthcoming, p. 18). Finally, for several high-profile examples (e.g., Obama's religion, the safety and effectiveness of Covid-19 vaccines), importance may in fact derive from partisan identity. On this latter set issues, the prospects for correction are especially dim. Indeed, one commonly noted remedy – i.e., messages from like-minded political elites – seems to have only tepid effects.[26]

Our study has several limitations, especially as they relate to the potential endogeneity of issue importance in Studies 1 and 2. The strongest evidence in favor of the Issue Importance Hypothesis comes from those two studies, but here importance was a measured variable. We controlled for a range of covariates that might plausibly be associated with resisting correction, but some other factor might cause resistance to corrective messages. One possibility relates to a person's pre-treatment exposure to misinformation (i.e., resistance is not caused by importance, per se, but by exposure to misinformation prior to our study).

We are sympathetic to concerns regarding endogeneity (as evidenced by our attempt to manipulate importance). Yet mere exposure to (mis)information about GM foods in the media environment does not, by itself, generate the motivation to counterargue corrective messages. People are exposed to false, misleading, or otherwise low-quality information in the media on a regular basis (e.g., Jerit & Barabas, 2006). In the present case, we suspect that many respondents in our surveys had seen false information about GM food safety in the media. The psychological state of *caring* about the issue is what generates the motive (among some people) to resist correction. That proposition is consistent with an extensive literature documenting how the subjective sense of issue importance leads to selective information seeking (e.g., Kim, 2007) and attitude protection (e.g., Lavine et al., 2000). That said, we recognize that the research design in Studies 1 and 2 does not support causal claims about the impact of issue importance. We believe that the descriptive claim – issue involvement is associated with smaller observed correction effects – nevertheless remains a valuable contribution to the literature.[27]

For decades, scholars have cataloged how issue involvement matters. It can compel information seeking, learning, and political action – all in service of belief protection. Our study is the first to explicitly link this motivational drive to the belief in

misinformation. Unfortunately, in situations likely to have the most political impact – when people are invested in an attitude – it may be more difficult to correct false beliefs than previously realized.

Notes

1. Psychologists call this mental state "involvement" (e.g., Petty & Caccioppo, 1986). Political scientists use the label "importance" (as in "issue importance" or "attitude importance"; Miller & Peterson, 2004).
2. "On the one hand," Krosnick writes, "projection is most likely to occur among people for whom an attitude is important. . . [leading] to lower levels of accuracy. . .On the other hand, [these people] would seem especially likely to attend carefully to issue-relevant information. . . [making them] more accurate in their perceptions" (Krosnick, 1990b, p. 165). Krosnick's investigation of the 1984 U.S. presidential election supported the latter view (i.e., importance was associated with accuracy). Subsequent studies have shown evidence of bias (e.g., Leeper, 2014).
3. The authors manipulated whether a false corruption claim was general (i.e., it implicated the *entire* party) or specific (i.e., it pertained to an *individual* party member). The general claim posed a greater threat to partisan identity because it could not be disregarded as easily as the specific claim (Ecker & Ang, 2019, p. 249).
4. By contrast, the elite-mass difference on climate change was smaller, at 37 percentage points.
5. In the 2019 American National Elections 2019 Pilot Study, more people were misinformed about GM food safety than were misinformed about COVID-19, the link between autism and vaccines, and the rise in average global temperatures (Jerit et al., 2020).
6. The survey organizations maintain panels of respondents who agree to take surveys in exchange for modest compensation (i.e., they are nonprobability surveys). Studies and pretests were approved under IRB2020-00210 and IRB2019-00615 at Stony Brook University and STUDY00032170 at Dartmouth College. Stimulus materials and demographic characteristics of the samples are presented in the Online Appendix.
7. We also varied the topic for an unrelated study. Two other conditions feature a parallel news story and correction for different topics (abortion and nuclear power). Respondents assigned to read about the other topics also answered factual questions about GM foods. We use those observations to document baseline levels of misinformation regarding GM foods.
8. Manipulation checks are used to gauge attentiveness to the treatment. Respondents are not excluded based on their answers (Berinsky et al., 2014). Thus, the causal effects we report represent the effect of treatment assignment.
9. The questions measure the direction of beliefs as well as self-reported confidence (Lee & Matsuo, 2018). The general political knowledge statements read, "A majority vote (one-half) is required for the U.S. Senate and U.S. House to override a presidential veto" [false], "Foreign Aid is the area that the U.S. federal government least spends money" [true], "Under the U.S. Constitution there are no term limits for members of the U.S. Congress" [true], and "The Republicans have a majority of seats in the U.S. House of Representatives" [false].
10. In analyses examining the correlates of GM food importance, females, younger respondents, and people high in NC were more likely to state that the issue was important ($ps < .05$). Partisanship was insignificant (p values on dummy terms for Republican and Democrat were .54 and .85, respectively). All statistical tests reported in this paper are two-tailed.
11. There will be "noise" in our analysis because some respondents name GM foods as important but *favor* them. These people should have correct beliefs, blunting the impact of the treatment.
12. The questionnaire contained a measure of trust for an unrelated study ("How much of the time do you think you can trust the government in Washington to do what is right?). Since our correction references the U.S. Department of Agriculture, we also confirmed that the patterns in Figure 1 hold when we control for a person's level of trust.

13. The distribution of importance for GM foods was as follows: 20% ("Extremely Important"), 21% ("Very Important"), 24% ("Moderately Important"), 19% ("Slightly Important"),16% ("Not at all Important"). Importance is dichotomized in the same manner as Study 1.
14. As with Study 1, partisanship is unrelated to issue importance ($p = .27$ and .24 on indicators for Democratic and Republican identifiers in a multivariate model).
15. A parallel set of results appeared on the attitude items, described here to conserve space. Overall, people who were exposed to the corrective message become less concerned about safety of GM foods and more favorable to them ($p < .05$). Even in conditions where opposition to GM foods is linked to partisan cleavages, Democrats and Republicans change their attitudes to the same degree as their counterparts in the non-politicized condition (i.e., no significant D–i–D).
16. Respondents completed different tasks to manipulate involvement with the issue (an approach used in studies that manipulate processing style; see, Chong & Druckman, 2010).
17. Respondents were randomly assigned to condition (fracking, GM foods, control) but groups became imbalanced due to the survey organization's efforts to meet demographic quotas. We note where imbalances occurred and control for them in Tables 2a and 2b.
18. Unexpectedly, people in the High Importance condition reported a lower level of importance for GM foods than those in the Low Importance condition. This pattern may stem from psychological reactance (if the rationale suggested by the treatment conflicted with a person's reasons for GM food importance; Brehm & Brehm, 1981), or if the reference to impending government action reduced the sense of urgency related to this issue (Butler & Hassell, 2018; Miller & Krosnick, 2004). We observed the expected pattern for timing and importance ratings on fracking ($p < .01$; $p = .06$), which lends more credence to the reactance account.
19. We did not preregister expectations regarding attitudes (i.e., those analyses are exploratory).
20. Condition imbalances appeared on partisanship, gender, attitudes toward scientists. Findings are robust in models controlling for Need for Cognition, the only personality trait we measured.
21. These conclusions are based on a content analysis of newspapers, magazine articles, and newswire reports appearing in Nexis Uni from September 1, 2020 to November 5, 2020.
22. These analyses were not pre-registered because we did not expect fracking to become a partisan issue. Attitudes were measured with an item that read, "Overall, how favorable or unfavorable is your opinion toward fracking?" The belief statements read, "Fracking contaminates the water supply with harmful chemicals," [false] and "Fracking can reduce energy prices" [true]. Response options are identical to those in Study 2.
23. These analyses regress favorability on a dichotomous measure of party identification (Dem =1; Rep = 0), with controls for gender, age, being white, and attitudes toward scientists. By contrast, a similar analysis of GM food attitudes shows *no* effect for partisanship.
24. A comparison of standardized effect sizes is instructive. The effect of treatment assignment on the manipulation checks (time spent writing/self-reported importance) was significant but small, ranging from a Cohen's d of .12 to .23. By contrast, the aforementioned effect of partisanship on favorability was substantial and statistically significant (Cohen's $d = .60$, a medium-sized effect).
25. Scholars debate whether misinformation, as measured in surveys, represents partisan cheerleading, genuine beliefs, or something else (e.g., a miseducated guess; see Graham, Forthcoming). This is an important area of research, but our studies were not designed to address that question.
26. Regarding Covid-19, studies show that like-minded cues can increase vaccination intentions among Republicans (Pink et al., 2021). As of this writing, however, the real-world impact of such messages appears limited, as there remain substantial partisan differences in vaccine take up (Bump, 2021) despite attempts by Republican elites to deliver pro-vaccine messages.

27. We remind readers of the scope conditions of the findings in Studies 1–3, where we used nonprobability samples. While all three surveys were large and national in scope, replication with a probability sample is valuable for generalizing the findings to the U.S. population.

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No potential conflict of interest was reported by the author(s).

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Data availability Statement

The data described in this article are openly available in the Open Science Framework at https://doi.org/10.1080/10584609.2022.2123580.

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