The challenge of false beliefs[*]
Understanding and countering misperceptions in politics and health care

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Abstract

Misperceptions about politics and health can undermine public debate and distort people's choices and behavior. Why do people hold these false or unsupported beliefs and why is it so difficult to change their minds? An emerging literature examines the difficulty of correcting false or unsupported beliefs and the reasons for this resistance, but relatively little is known about the sources of misperceptions, the psychology of misperception belief, or how to most effectively counter these false claims. In addition, most studies focus on the mass public's beliefs in well-known misperceptions; the mechanisms by which false beliefs become politicized, disseminated, and integrated into individual belief systems and the role of elites and the media in that process are less well understood.

Scholars have long feared public ignorance about politics and health, but misperceptions may be an even greater concern, undermining public debate and distorting people's choices and behavior. Why do people hold these false or unsupported beliefs and why is it so difficult to change their minds? An emerging literature examines the difficulty of correcting false or unsupported beliefs and the reasons for this resistance, but relatively little is known about the sources of misperceptions, the psychology of misperception belief, or how to most effectively counter them. Moreover, most studies focus on well-known misperceptions; the process by which false beliefs become politicized, disseminated, and integrated into individual belief systems is less well understood. In particular, elites and the media seem to play a critical role in this process, but receive relatively little scholarly attention.

The psychology of misperceptions

Belief in misperceptions is widespread (e.g., Ramsay et al. 2010) and plays an important role in political and policy debates on issues ranging from the economy (e.g., Bartels 2002) to foreign policy (e.g., Kull, Ramsay, and Lewis 2003). For instance, Nyhan (2010) traces the rise of the "death panel" myth and its influence on the debate over the Affordable Care Act (ACA). This myth, which continues to persist (Nyhan 2014), warped the debate over end-of-life care, delaying Medicare coverage of voluntary consultations with doctors for years (Pear 2015). Beliefs about controversial health issues have been similarly distorted by misinformation. One of the most destructive health myths is the false claim that the measles, mumps, and rubella vaccine causes autism, which has influenced perceptions of vaccines for years despite overwhelming scientific evidence to the contrary (Willingham and Helft 2014).

The causes of misperception belief

Despite the importance of misperceptions, we know relatively little about how or why people acquire these beliefs or hold on to them so tenaciously (Lewandowsky et al. 2012; Nyhan and Reifler 2012). Research suggests some of these beliefs are the byproduct of the vulnerabilities of human psychology (Marsh, Cantor, and Brashier 2016). For instance, we instinctively process and accept information to which we are exposed and have to actively resist believing such information when it is false (Gilbert, Tafarodi, and Malone 1993). Similarly, we tend to believe that information is familiar is likely to be true, which may lead us astray if false claims are widespread or if attempts to correct them have made the myths salient (Schwarz et al. 2007). In other cases, people trying to make sense of the world may form false beliefs by making incorrect inferences from available information (Prasad et al. 2009; Thorson 2015b).

Motivated reasoning — the tendency to interpret information in a manner that is consistent with our predispositions (e.g., Kunda 1990; Lodge and Taber 2013a) — seems to be an especially important factor in the prevalence and persistence of misperceptions about controversial issues. For example, belief in political misperceptions is closely associated with partisanship and ideology on many salient issues (Ramsay et al. 2010; Nyhan and Reifler

2012). These beliefs thus seem to be closely linked to people's worldviews and may be accordingly difficult to dislodge without threatening their identity or sense of self (Nyhan and Reifler N.d.*b*). People may also resist acknowledging factual evidence if the policy response in question seems to contradict their preferences (Campbell and Kay 2014; Kahan et al. N.d.).

Social category differences also appear to contribute to misperception belief. For instance, Kosloff et al. (2010) find that reminding people of differences in racial identity or age from the presidential candidates in the 2008 election increased smear acceptance, especially among undecided voters. These factors may have helped fuel widespread belief in misperceptions about Barack Obama such as the claim that he is Muslim or not born in this country, which are closely associated with measures of ethnocentrism and racial resentment among whites (e.g., Kam and Kinder 2012; Barreto, Redlawsk, and Tolbert N.d.; Klinkner N.d.).

The difficulty of correcting misperceptions

Unfortunately, it is not clear how to most effectively counter highly salient misperceptions. For instance, greater public knowledge or higher levels of education may not necessary promote more accurate or open-minded views. In some cases, people with higher levels of subject matter knowledge are better able to align their factual beliefs about controversial issues with their predispositions (e.g., Nyhan and Reifler 2012; Kahan 2015; Carey et al. N.d.). In addition, corrective information often fails to reduce high-profile misperceptions among susceptible groups and can in some cases make them worse (Kuklinski et al. 2000; Nyhan and Reifler 2010; Nyhan, Reifler, and Ubel 2013). Other studies have similarly found that empirical claims are not more persuasive when made in sworn testimony (Nyhan 2011), that affirming the truth is not necessarily more effective than denying a false claim (Nyhan and Reifler 2013), and that people have difficulty accurately updating their beliefs after finding out that information they previously accepted has been discredited (Bullock 2007; Cobb, Nyhan, and Reifler 2013; Thorson 2015a). Reminders of social difference or cues about outgroup membership may reduce the effectiveness of corrections about myths such as the supposed "Ground Zero mosque" (Garrett, Nisbet, and Lynch 2013). These findings help explain why belief in the most significant misperceptions is often quite stable over time (Nyhan 2012).

As in politics, research indicates that corrective information about health care issues does not necessarily have the intended effect. Nyhan, Reifler, and Ubel (2013) observed motivated resistance to corrections of the "death panel" myth among supporters of Sarah Palin with higher levels of political knowledge. In the realm of vaccines, Nyhan et al. (2014) find that corrective information about the autism myth reduced false beliefs but also *decreased* intention to vaccinate among parents with the least favorable attitudes toward vaccines, which they interpret as suggesting motivated resistance to a pro-vaccine message rather than the correction itself. Similarly, Nyhan and Reifler (2015b) show that debunking the myth that the flu vaccine gives you the flu reduced false beliefs but also *reduced* intent to vaccinate among people with high levels of concern about vaccine side effects. Further research is necessary to determine what approaches might be more effective (neither Nyhan et al. 2014 nor Nyhan

and Reifler 2015b found positive effects from the disease danger messages they tested).

However, alternative approaches to presenting corrective information have shown more success. For example, corrective information may be more persuasive to skeptical groups when it originates with ideologically sympathetic sources (Nyhan and Reifler 2013; Berinsky 2015) or is presented in graphical rather than textual form (Nyhan and Reifler N.d.*b*). In addition, providing an alternate causal account for events has been found to be more effective than simply refuting an unsupported claim (Nyhan and Reifler 2015a). Fact-checks have also been found to be effective in some studies (e.g., Fridkin, Kenney, and Wintersieck 2015; Nyhan and Reifler N.d.*a*), though their effectiveness may vary based on the public profile of the target politician and the salience of the claim in question.

Open research questions

I list several of the most important current research questions in the field below. Each is critical to our scientific understanding of misperceptions and can also help us more effectively address those false beliefs in practical terms.

- *What role does anxiety play in acceptance of corrective information?*

  Affect seems to play a critical role in political attitudes and beliefs. In many cases, it may undermine critical thinking and promote motivated reasoning about salient and controversial issues (e.g., Lodge and Taber 2013b). For instance, Weeks (2015) finds that an anger induction makes people more vulnerable to misinformation from their party. By contrast, anxiety may instead promote greater reflection over one's views and attention to surprising political stimuli (Marcus, Neuman, and MacKuen 2000, though see Ladd and Lenz 2008, 2011). In particular, Redlawsk, Civettini, and Emmerson (2010) propose that respondents who repeatedly encounter disconfirming information in politics may reach an "affective tipping point" in which they become increasingly anxious and willing to reconsider their views. Less is known, though, about the conditions under which people respond in this way or why individuals do so rather than engaging in further motivated resistance. In addition, the effects of anxiety are not necessarily positive. Weeks (2015) finds that feelings of anxiety can make people more likely to accept false claims from the opposing party, overcoming the effects of motivated reasoning but in a manner that reduces the accuracy of their beliefs.

- *Can affirming people's self-worth make them more open-minded?*

  People do not always reject unwelcome information. However, they may be especially inclined to do so when that information is threatening to their worldview or self-concept (Steele 1988), which could include evidence debunking political misperceptions. To test this explanation for the resistance to corrective information that is often observed in politics, Nyhan and Reifler (N.d.*b*) tested whether affirming respondents' self-worth would buttress their sense of self and thereby make them more willing to acknowledge

otherwise uncomfortable or threatening facts. However, this approach, which is based on prior research in social psychology (Cohen, Aronson, and Steele 2000; Correll and Spencer 2004), relies on a stylized essay-writing paradigm and found suggestive but only partial empirical support. Future research should consider how the insights provided by this research literature could be adapted into effective messaging strategies.

- *Will messages from or information about in-group members help reduce misperceptions?*

Evidence is mounting that humans are heavily influenced by their peers and social contacts (e.g., Gerber, Green, and Larimer 2008; Gerber and Rogers 2009; Paluck 2011; Meer 2011; Bollinger and Gillingham 2012; Bond et al. 2012; Kast, Meier, and Pomeranz 2012; Paluck and Shepherd 2012). One especially influential approach applies this concept to promote social and behavioral change using messages that make explicit behavioral comparisons to social reference groups (e.g., Cialdini, Reno, and Kallgren 1990; Cialdini and Goldstein 2004; Goldstein, Cialdini, and Griskevicius 2008; Cialdini 2008; Ayres, Raseman, and Shih 2013).

However, no one has yet tested whether the beliefs of people's political or cultural/social in-groups might be more credible or influential than corrective information from expert or media sources. In politics, such a message might, for instance, remind Democrats that most party identifiers think the Bush administration had no role in the 9/11 attacks (Scripps Survey Research Center 2006).[1] A similar approach could be developed in health. Attwell and Freeman (2015), for instance, describe an innovative pro-immunization campaign intended to signal in-group identification and shared values to parents who practice alternative lifestyles. Scholars might also evaluate the effects of messages correcting vaccine myths from parent advocates who were previously anti-vaccine before their children became ill with a preventable disease (e.g., McNeal 2016).

- *Do people seek out favorable fact-checks and/or avoid unwelcome ones?*

Previous research suggests that selective exposure and avoidance can be a significant concern when individuals are choosing what news to consume (e.g., Taber and Lodge 2006; Iyengar et al. 2008; Iyengar and Hahn 2009; Garrett and Stroud 2014). In many cases, people may tend to prefer pro-attitudinal information and/or avoid counter-attitudinal information. These tendencies could contribute to misperceptions by causing individuals to be more likely to choose to read false claims that are consistent with their partisan or ideological preferences or avoiding corrective information about those claims. However, observational data from the real world suggests that the extent of the selective exposure problem is more limited than many assume (Gentzkow and Shapiro 2011; Bakshy, Messing, and Adamic 2015; Flaxman, Goel, and Rao 2016). Many people lack the motivation to engage in selective exposure and/or the political knowledge required to do so effectively. Future studies should thus consider the extent to which people

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[1]See Nyhan and Reifler 2013 and Berinsky 2015 for versions of this approach using in-group elites.

select pro-attitudinal corrective information or avoid counter-attitudinal corrections under realistic conditions or with ecologically valid data, including both search websites (Ruiz and Bell 2014) and on social media platforms where rumors and misinformation circulate widely (see, e.g., Friggeri et al. 2014; Resnick et al. 2014; Del Vicario et al. 2016; Shin et al. 2016; Zollo et al. N.d.).

- *To what extent do people actively counter-argue against unwelcome corrections?*

  Previous research on motivated reasoning (e.g., Lodge and Taber 2000; Redlawsk 2002; Taber and Lodge 2006) and misperceptions (Prasad et al. 2009; Nyhan and Reifler 2010; Nyhan, Reifler, and Ubel 2013; Nyhan et al. 2014) suggests that people often actively counter-argue unwelcome information, derogating its source or claims and buttressing their existing beliefs. As a result, people with strong directional preferences may come to believe even more strongly in the belief or attitude in question when challenged (Redlawsk 2002; Gollust, Lantz, and Ubel 2009; Nyhan and Reifler 2010; Nyhan, Reifler, and Ubel 2013). Nyhan and Reifler (2010) found evidence of this effect in two cases. However, studies conducted with less well-known figures and misperceptions and more one-sided coverage have typically not observed backfire effects (e.g., Weeks 2015; Nyhan and Reifler N.d.*a*; Wood and Porter N.d.), suggesting that this response is most likely for highly salient misperceptions when people receive conflicting cues.

- *Are misperception beliefs strongly held and sincere?*

  Debate continues about the extent to which misperceptions are genuine and sincerely held. These beliefs do appear to differ from ignorance in the sense that people often hold them with a high degree of certainty (Kuklinski et al. 2000) and consider themselves to be well-informed about the issues in question (Nyhan 2010). Any research in this area must confront difficult measurement tradeoffs, however. As Luskin, Sood, and Blank (N.d.) note, survey responses that use closed-end questions and exclude don't know options may overstate the proportion of people who strongly hold false or unsupported beliefs (see also Pasek, Sood, and Krosnick 2015). Alternatively, the use of open-ended questions and don't know options may understate the prevalence of highly salient myths by allowing people who are misinformed to indicate uncertainty rather than belief.

  A related scholarly literature considers whether survey respondents answer misperception questions honestly or whether they are responding in an expressive fashion that misrepresents their true beliefs. For instance, Bullock et al. (2015) and Prior, Sood, and Khanna (2015) find that belief polarization is reduced by providing financial incentives for correct answers. However, these studies do not clearly indicate, as many people have concluded, that people are willing to reveal their genuine, more accurate beliefs when incentives are provided. In reality, only one of the four studies finds greater belief accuracy as a result of incentives. It seems instead that providing incentives causes people to answer in a more thoughtful or considered manner (Bullock et al., for instance, find more don't know responses as a result of incentives in their second study) or are using

different heuristics that have the effect of reducing the influence of directional motives without generally increasing accuracy.[2] This interpretation is consistent with Berinsky (N.d.), who finds "little evidence of expressive responding on the question of whether Obama is a Muslim" across numerous studies.

Further research is necessary to determine what types of questions are most effective for measuring misperceptions. It is worth considering in particular whether question format or response options should vary depending on the salience of the myth in question.

The role of elites in misperception belief

To understand misperceptions, it is necessary to go beyond studies of public opinion and examine the actions of public figures and the media, which seem to play a key role in promoting and disseminating misinformation. For instance, Sarah Palin ignited a media frenzy when she falsely claimed President Obama's health care reform proposal included "death panels." Within weeks, the vast majority of Americans had heard of the claim, which was repeated by numerous other elites, and a number of them came to believe in it (Nyhan 2010). However, little is known more generally about how elites exploit misinformation for strategic purposes or what effects misleading media coverage has on public opinion.

In politics, the literature on party position change and public opinion suggests that elites often play a key role in shaping voter issue positions. Carmines and Stimson (1989) and Layman et al. (2010) argue that activists help drive a process among elected officials that proceeds from the top down, prompting subsequent changes in policy preferences among party identifiers (e.g., Layman and Carsey 2002). Similarly, Lenz (2012) argues that voters tend to adopt the policy positions of politicians they prefer rather than choosing the politician whose views best match their own — an argument that is consistent with the elite-driven model of public opinion presented in Zaller (1992).

This theoretical framework could be applied to understanding partisan and ideological *belief* change, which often fuels the political misperceptions that are most salient and difficult to correct. Under certain circumstances, politicians may not only change the positions they express but the factual claims that they make. Indeed, these processes are often interrelated. Opposition to climate change mitigation is closely linked to denial of the scientific consensus, for example, though one can acknowledge global warming while, say, opposing the Kyoto Protocol (e.g., Inglis and Laffer 2008). However, this outcome was not inevitable. The parties have adopted conflicting positions on many issues during the period in which climate change has become salient, but few others center on a salient misperception. More should

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[2]It is important to note that the questions are very difficult and have quantitative factual answers that are obscure and unlikely to be drawn from memory (e.g., the proportion of federal spending devoted to the military in Bullock et al. 2015). As a result, few people have existing beliefs they can either honestly report or misrepresent. It is more likely that almost all participants are instead constructing their responses to these questions from the top of their head (Zaller 1992). In that case, there is no "true" belief that is being revealed, but instead a set of considerations people draw upon and a cognitive/affective process they go through to construct an answer, which may vary depending on context, incentives, etc.

thus be learned about the role of elites in *belief* politicization on climate and other issues.

This framework also has important policy implications. First, promoting greater elite consensus on climate science might reduce belief polarization more effectively than messages directed to the public. Moreover, it is important to counter science politicization *before* it becomes entrenched on issues like the safety of vaccines and genetically modified foods (Ball 2014; Nyhan 2015a,b), where misperceptions circulate widely but polarization is limited.

Another important macro-level factor in misperception belief is media coverage, which shapes the flow of false claims to the public both directly in its coverage and indirectly via its influence on elite behavior. For instance, "balanced" news reports that do not adequately represent the evidence in a policy or scientific debate are common and can contribute to misperceptions (e.g., Boykoff and Boykoff 2004; Boykoff 2008; Malka et al. 2009; Lawrence and Schafer 2012; Dixon and Clarke 2013).[3] In other cases, the content of media coverage is not just balanced but actively misleading. One example is Jerit and Barabas (2006), which that inaccurate descriptions of the financial status of Social Security in the media contributed to misperceptions that the program would run out of money. Conversely, however, the accountability provided by critical media coverage may help to constrain elite behavior. Nyhan and Reifler (2015c) conducted a field experiment in which they reminded a large sample of state legislators of the electoral and reputational risks posed by fact-checkers. They found that these reminders reduced the likelihood that legislators would make a claim that received a negative rating from PolitiFact or whose accuracy was questioned publicly.

These findings underscore the importance of understanding the factors shaping the coverage provided by the media. In a recent field experiment, for instance, Graves, Nyhan, and Reifler (2016) found that reporters provided more coverage of fact-checking when they were reminded of its status in the profession and the journalistic values it seeks to promote. By contrast, a message about audience demand for fact-checking had no significant effects. Further research is needed, however, to determine the conditions under which media outlets are most likely to provide responsible and effective coverage.

Conclusion

Misperceptions are one of the most difficult challenges of contemporary democracy, which has seen polarization not just of issue positions but of factual beliefs themselves. By developing new insights into the psychology of misperceptions and the process by which they develop and propagate, we can provide recommendations to public officials, educators, journalists, and civic groups for how they can more effectively correct myths and counter false beliefs, helping create a stronger factual basis for political debate, public policy, and individual choice.

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[3]Unfortunately, accurate coverage may not be enough — the public may resist accepting uncomfortable facts even when they receive substantial media coverage (Jerit and Barabas 2012).

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