

Lessons learned from social science experiments

Jason Reifler

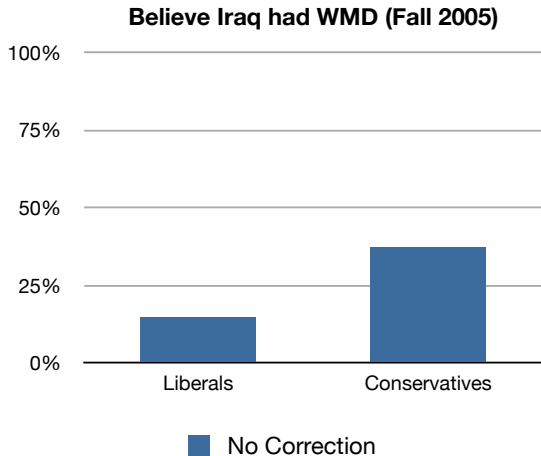
University of Exeter
Department of Politics

September 30, 2015

Overview

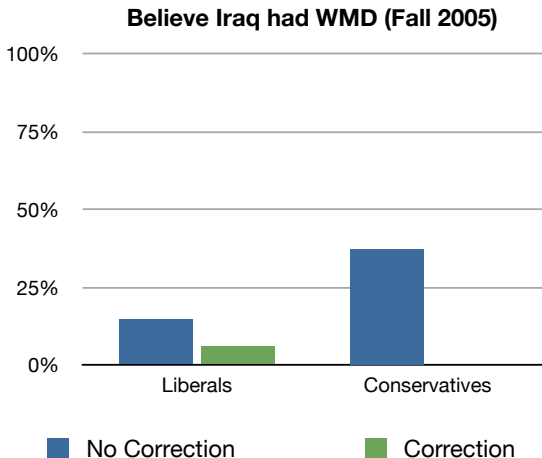
- ▶ Be excited about the project
- ▶ Nothing ever goes quite as you expect
- ▶ Think about external validity
- ▶ Think about appropriate population
- ▶ Have clear theoretical expectations
- ▶ Outcomes

When Corrections Fail



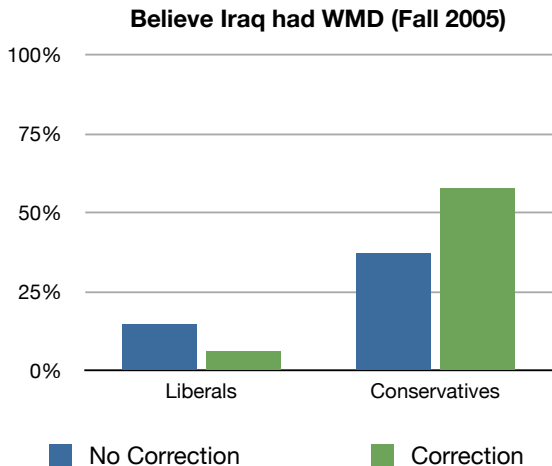
(Nyhan and Reifler 2010)

When Corrections Fail



(Nyhan and Reifler 2010)

When Corrections Fail



(Nyhan and Reifler 2010)

How we wish the world worked



The facts are coming! The facts are coming!

How the world (often) actually works



The problem of misperceptions

- ▶ People often lack correct information about important topics
- ▶ Some **un**informed, but some **mis**informed:
 - ▶ False or unsupported beliefs that are thought to be correct
- ▶ Misperceptions may be difficult to address

Multiple causes of misperceptions...

- ▶ Information deficits
- ▶ Challenges to important beliefs spark counter-arguing
- ▶ Cognitive biases/failures of memory
- ▶ Proliferation of misinformation

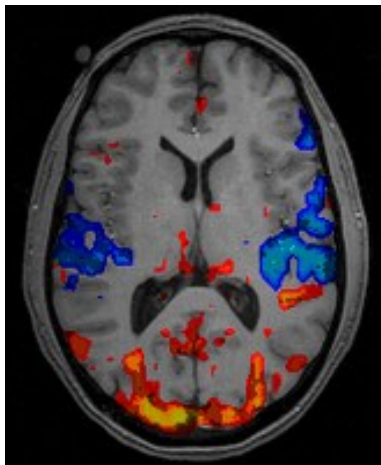
...means no single solution

- ▶ Information deficits
 - ▶ Better, more usable information
- ▶ Challenges spark counter-arguing
 - ▶ Reduce threat to self
- ▶ Cognitive biases
 - ▶ Take human cognition into account
- ▶ Proliferation of misinformation
 - ▶ Change incentives

Nonetheless, keep experiments simple

- ▶ Avoid complex multifactorial designs when possible
 - ▶ Greatly reduce statistical power
 - ▶ Increase difficulty of a telling a clean story
 - ▶ 2-way Interactions are difficult enough to communicate
- ▶ Temptation is great to add another manipulation
- ▶ Particularly difficult if you think there are demographic/attitudinal moderators

Cognitive neuroscience



Pediatrics study: Theoretical motivations

- ▶ Motivated reasoning
- ▶ Prospect theory

Prospect theory

- ▶ Tversky and Kahneman Disease experiment:
Two versions of choosing between two policy options
- ▶ Gain frame
 - ▶ If Treatment A is adopted, 200 people will be saved.
 - ▶ If Treatment B is adopted, there is a $1/3$ probability that 600 people will be saved and a $2/3$ probability that no people will be saved.
- ▶ Loss frame
 - ▶ If Treatment C is adopted, 400 people will die.
 - ▶ If Treatment D is adopted, there is a $1/3$ probability that nobody will die and a $2/3$ probability that 600 people will die.

Pediatrics study: Manipulations

- ▶ Corrective information debunking MMR-autism link
- ▶ Risks of disease
- ▶ Disease narrative
- ▶ Disease images

Study design/sample

Two-wave Knowledge Networks (GfK) survey experiment (with control group):

- ▶ Wave 1: 2,299 US parents of children ages 17 and younger
- ▶ Wave 2: Re-interviews with 1,759 US parents of children ages 17 and younger
 - ▶ Experimental manipulation
 - ▶ Measure vaccine attitudes (post-treatment)

Correction of vaccine misinformation

All children should be vaccinated for measles, mumps, and rubella. The measles, mumps, and rubella vaccine (MMR) is safe and effective.

Because signs of autism may appear around the same time children receive the MMR vaccine, some parents may worry that the vaccine causes autism. Vaccine safety experts, including experts at the Centers for Disease Control (CDC) and the American Academy of Pediatrics, agree that MMR vaccine is not responsible for recent increases in the number of children with autism. A 2004 Institute of Medicine report concluded that there is no link between autism and MMR vaccine, and that there is no link between autism and vaccines that contain thimerosal as a preservative. Many scientific studies have found no link between MMR vaccine and autism. These studies include:

- ▶ A September 2008 study published in Public Library of Science was conducted to determine whether results from an earlier study claiming to find measles virus RNA in the intestinal tissue of autistic children could be confirmed. The results could not be confirmed, and no link between MMR and autism was found.
- ▶ A 2006 study published in the Journal of Autism and Developmental Disorders of 351 children with autism and 31 typically-developing children did not find a link between MMR vaccination and autism.
- ▶ A 2002 study by CDC in the New England Journal of Medicine followed more than 500,000 children and found no association between MMR vaccination and autism.

Disease danger: Text

All children should be vaccinated for measles, mumps, and rubella. These are serious diseases.

Measles

- ▶ Measles virus causes rash, cough, runny nose, eye irritation, and fever.
- ▶ It can lead to ear infection, pneumonia, seizures (jerking and staring), brain damage, and death.

Mumps

- ▶ Mumps virus causes fever, headache, and swollen glands.
- ▶ It can lead to deafness, meningitis (infection of the brain and spinal cord covering), painful swelling of the testicles or ovaries, and, rarely, death.

Rubella (German Measles)

- ▶ Rubella virus causes rash, mild fever, and arthritis (mostly in women).
- ▶ If a woman gets rubella while she is pregnant, she could have a miscarriage or her baby could be born with serious birth defects.

You or your child could catch these diseases by being around someone who has them. They spread from person to person through the air.

Measles, mumps, and rubella (MMR) vaccine can prevent these diseases. Most children who get their MMR shots will not get these diseases. Many more children would get them if we stopped vaccinating.

Disease danger: Narrative

All children should be vaccinated for measles, mumps, and rubella. This is a true story that shows why vaccination is so important.

If you hear “106 degrees” you probably think “heat wave,” not a baby’s temperature. But for Megan Campbell’s 10-month-old son, a life-threatening bout of measles caused fevers spiking to 106 degrees and sent him to the hospital.

“We spent 3 days in the hospital fearing we might lose our baby boy,” Campbell said. “He couldn’t drink or eat, so he was on an IV, and for a while he seemed to be wasting away. When he could drink again, we got to take him home. But the doctors told us to expect the disease to continue to run its course, including high fever – which spiked as high as 106 degrees. We spent a week waking at all hours and soothing him with damp washcloths.” Thankfully, the baby recovered fully.

Megan now knows that her son was exposed to measles when another mother brought her ill son into their pediatrician’s waiting room.

Disease danger: Images

All children should be vaccinated for measles, mumps, and rubella. These are serious diseases.

Because of advances in public health, most people in the United States have never had measles, mumps, and rubella or seen a child with these diseases. Please look at these pictures of children with the diseases before proceeding.

Measles



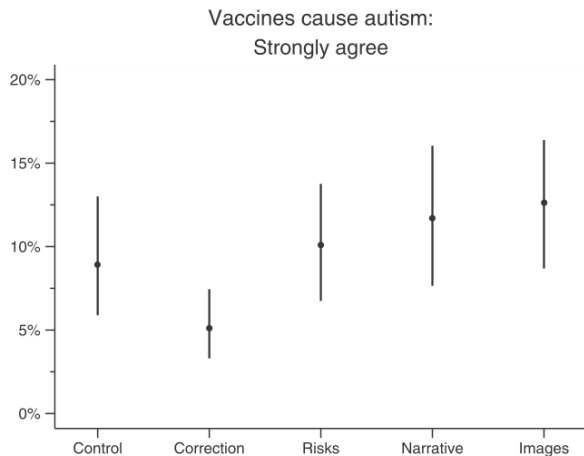
Mumps



Rubella



Consequences for public health

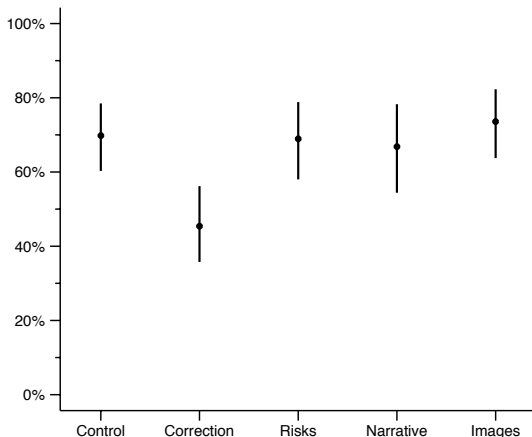


(Freed, Nyhan, Reifler, and Richey 2014; *Pediatrics*)

Consequences for public health

Very likely to give MMR vaccine to another child

Least favorable toward vaccines



(Freed, Nyhan, Reifler, and Richey 2014; *Pediatrics*)

Future work

Four studies we are currently working on:

- ▶ Disgust sensitivity as predictor of vaccine hesitancy
- ▶ Explaining how vaccines work
- ▶ Cross-national comparison study of vaccine attitudes
- ▶ Pre-post Disneyland panel study

More broadly

- ▶ There are demand reasons for vaccine misinformation
- ▶ There are supply reasons for vaccine misinformation
- ▶ Corrections are difficult in the best of circumstances
- ▶ One potential future avenue is focusing on supply of misinformation
 - ▶ Better information
 - ▶ Be accurate
 - ▶ Don't repeat falsehoods
 - ▶ Generate reputational costs

Further reading

- ▶ Nyhan, Brendan and Jason Reifler. 2015. "The Effect of Fact-checking on Elites: A field experiment on U.S. state legislators." *American Journal of Political Science* 59(3):628-640. doi:10.1111/ajps.12162
- ▶ Nyhan, Brendan and Jason Reifler. 2015. "Does Correcting Myths about the Flu Vaccine Work? An experimental evaluation of the effects of corrective information." *Vaccine* 339: 459-464. doi:10.1016/j.vaccine.2014.11.017
- ▶ Nyhan, Brendan and Jason Reifler. 2015. "Displacing misinformation about events: An experimental test of causal corrections." *Journal of Experimental Political Science* 2(1): 91-93. doi:10.1017/XPS.2014.22
- ▶ Nyhan, Brendan, Jason Reifler, Sean Richey, Gary Freed. 2014. "Effective Messages in Vaccine Promotion: A Randomized Trial." *Pediatrics* 133(4):e835-e842. doi:10.1542/peds.2013-2365
- ▶ Cobb, Michael, Brendan Nyhan, and Jason Reifler. 2013. "Beliefs Don't Always Persevere: How political figures are punished when positive information about them is discredited." *Political Psychology* 34(3):307-326.
- ▶ Nyhan, Brendan, Jason Reifler, and Peter Ubel. 2013. "The Hazards of Correcting Myths About Health Care Reform." *Medical Care* 51(2):127-132.
- ▶ Nyhan, Brendan and Jason Reifler. 2010. "When Corrections Fail: The Persistence of Political Misperceptions." *Political Behavior* 32(2):303-330.
- ▶ Nyhan, Brendan and Jason Reifler. 2013. "Which Corrections Work? Research results and practice recommendations." New America Foundation Media Policy Initiative Research Paper. http://newamerica.net/publications/policy/which_corrections_work.
- ▶ Nyhan, Brendan and Jason Reifler. 2012. "Misinformation and Fact-checking: Research Findings from Social Science." New America Foundation, Media Policy Initiative. http://newamerica.net/sites/newamerica.net/files/policydocs/Misinformation_and_Fact-checking.pdf

Contact

Email: J.Reifler@exeter.ac.uk

Website: jasonreifler.com

Twitter: [@JasonReifler](https://twitter.com/JasonReifler)