

# Responding to “Fake News” About Vaccination

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## In 558 days, President Trump has made **4,229** false or misleading claims

The Fact Checker's ongoing database of the false or misleading claims made by President Trump since assuming office.



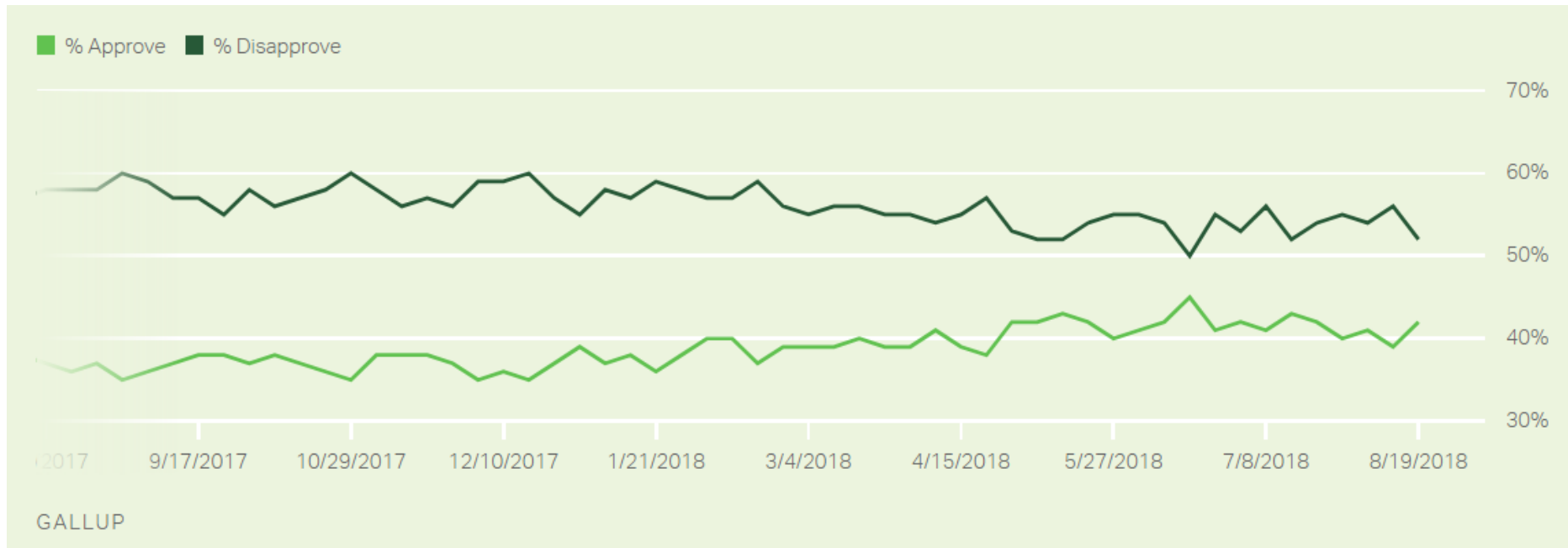
“post-truth”

Word of the year 2016  
(Oxford Dictionaries)

“fake news”

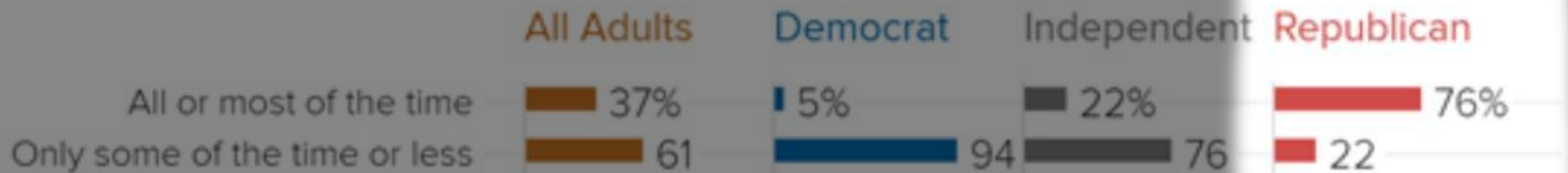
Word of the year 2017  
(Collins Dictionaries)

# Presidential Approval (Gallup Weekly)



# Perceived Honesty

How often does President Trump tell the truth?



# Today: Fake News and Vaccinations

- Do facts matter?
- Do “fake news” matter?
- How are “fake news” disseminated?
- Who is receptive to misinformation?
- What can we do about it?

# Do Facts Matter?

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(Swire, Berinsky, Lewandowsky, & Ecker, 2017)

- Present online statements

- true or false
- attributed to
- obtain belief

Donald Trump said that vaccines cause autism  
(MISINFORMATION)

Donald Trump said that the US spent \$2  
trillion on the war in Iraq  
(FACT)

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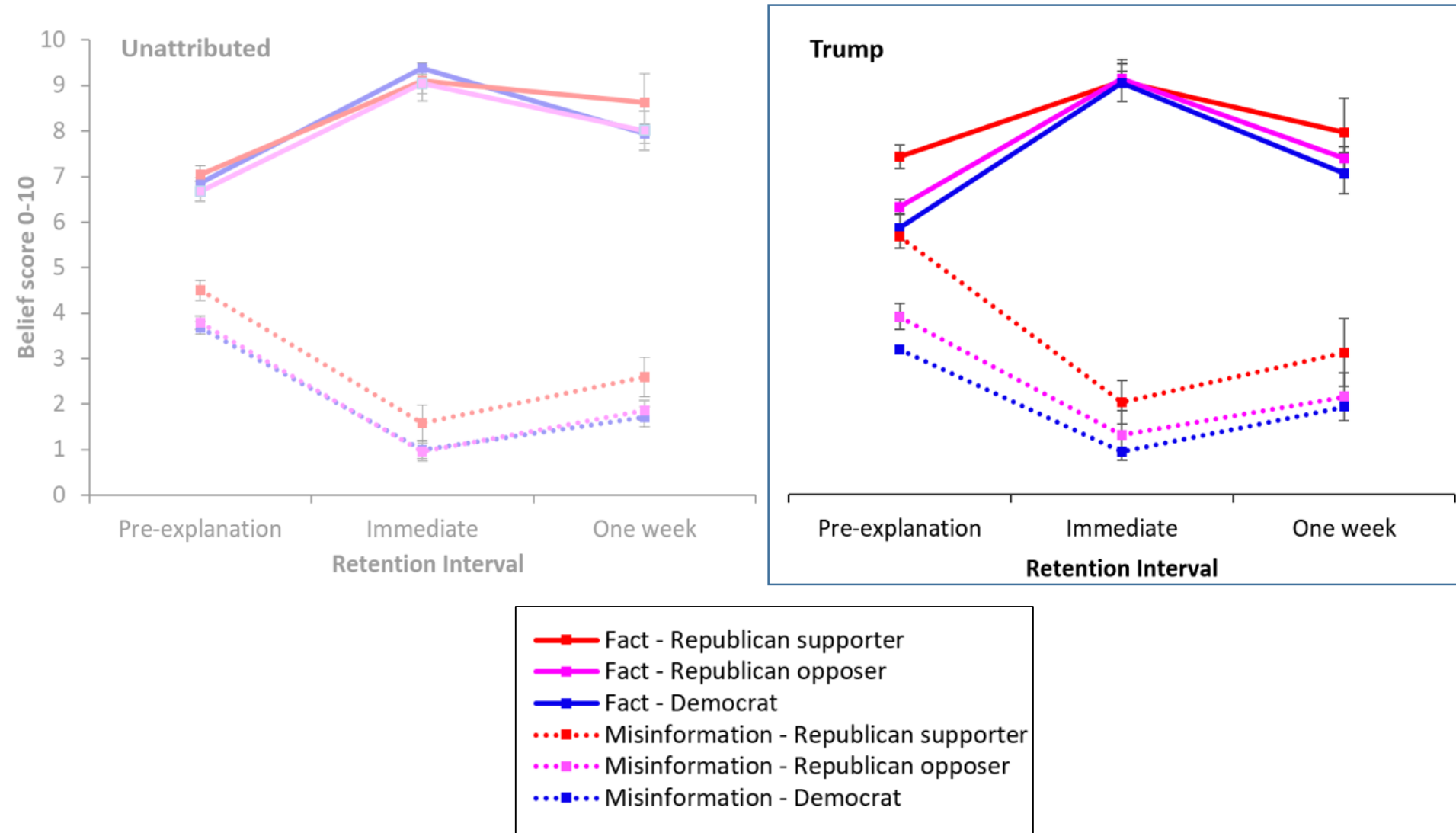
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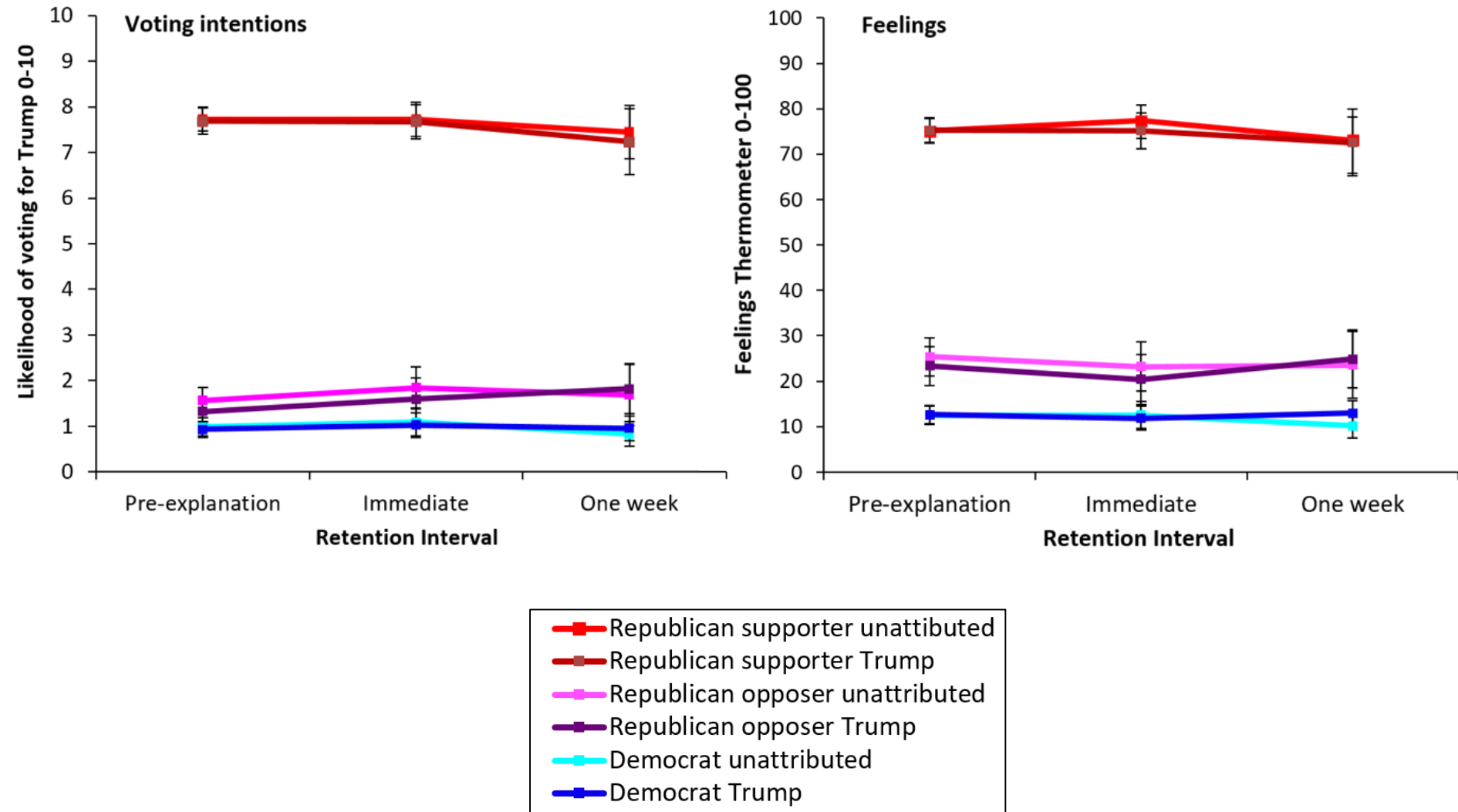
- Correct (affirm) false (true) statements
  - ask for belief ratings immediately or week later



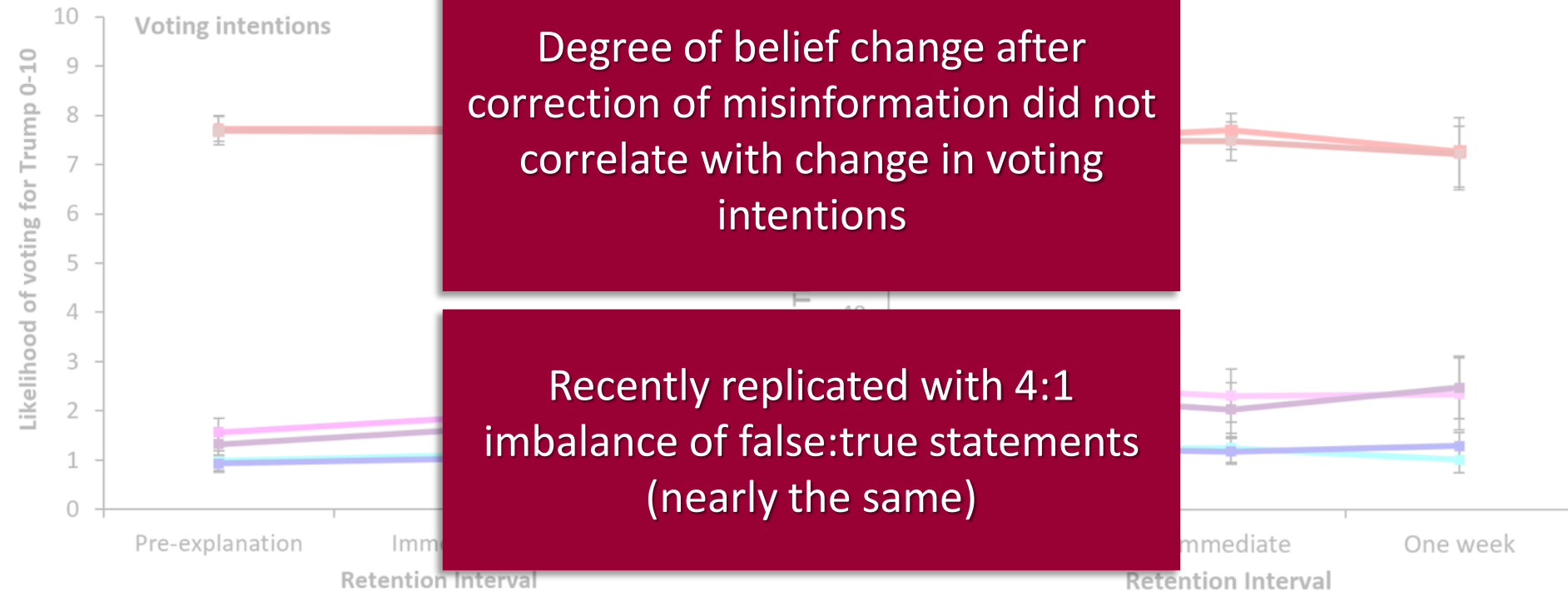
# Belief Ratings (Swire et al., 2017)



# Voting Intentions (Swire et al., 2017)



# Voting Intentions (Swire et al., 2016)



Degree of belief change after correction of misinformation did not correlate with change in voting intentions

Recently replicated with 4:1 imbalance of false:true statements (nearly the same)

Independent confirmation of these findings by Nyhan et al. (2017) using different methodology

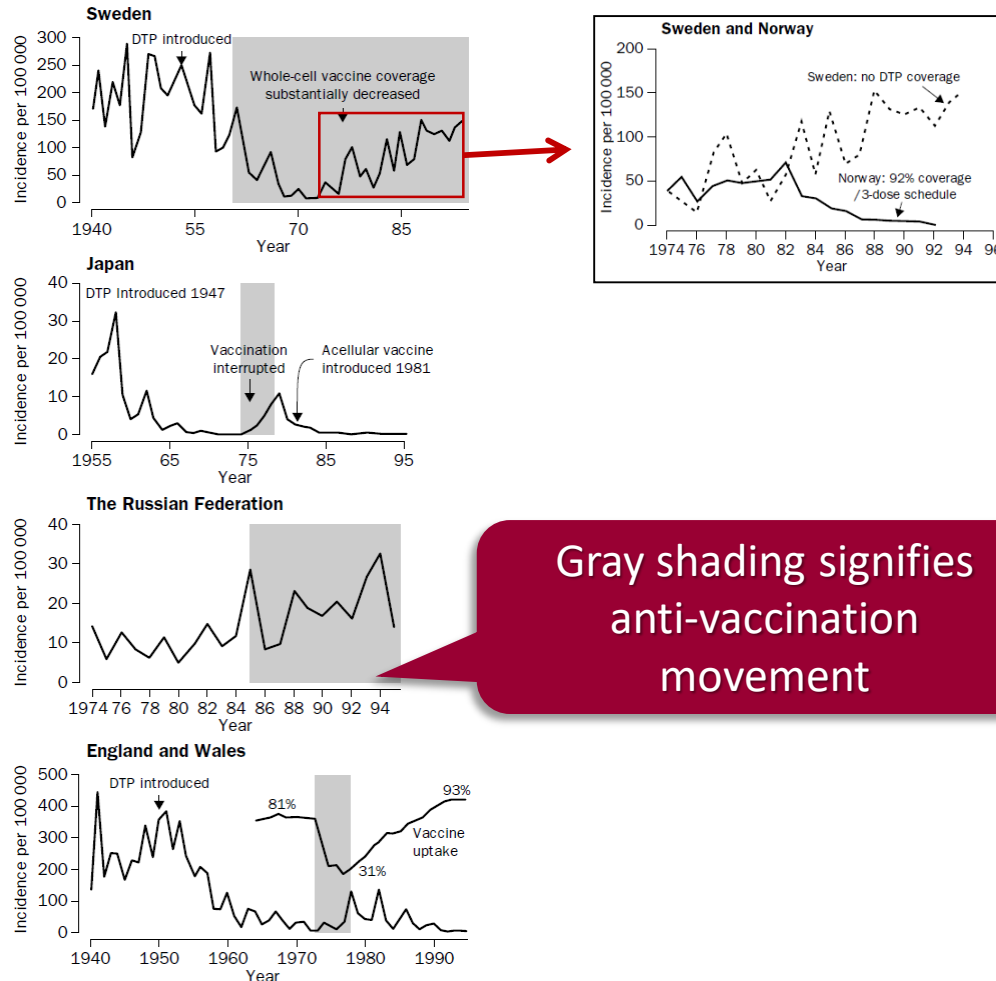
Do “Fake News” Matter?

# Anti-Vaccination Movement

- There is no medical evidence to back up any of the claims of the anti-vaccination movement
- Anti-vaccination argumentation is based on flawed reasoning (Jacobson et al., 2007)
- Anti-vaccination information is misinformation (“fake news”)

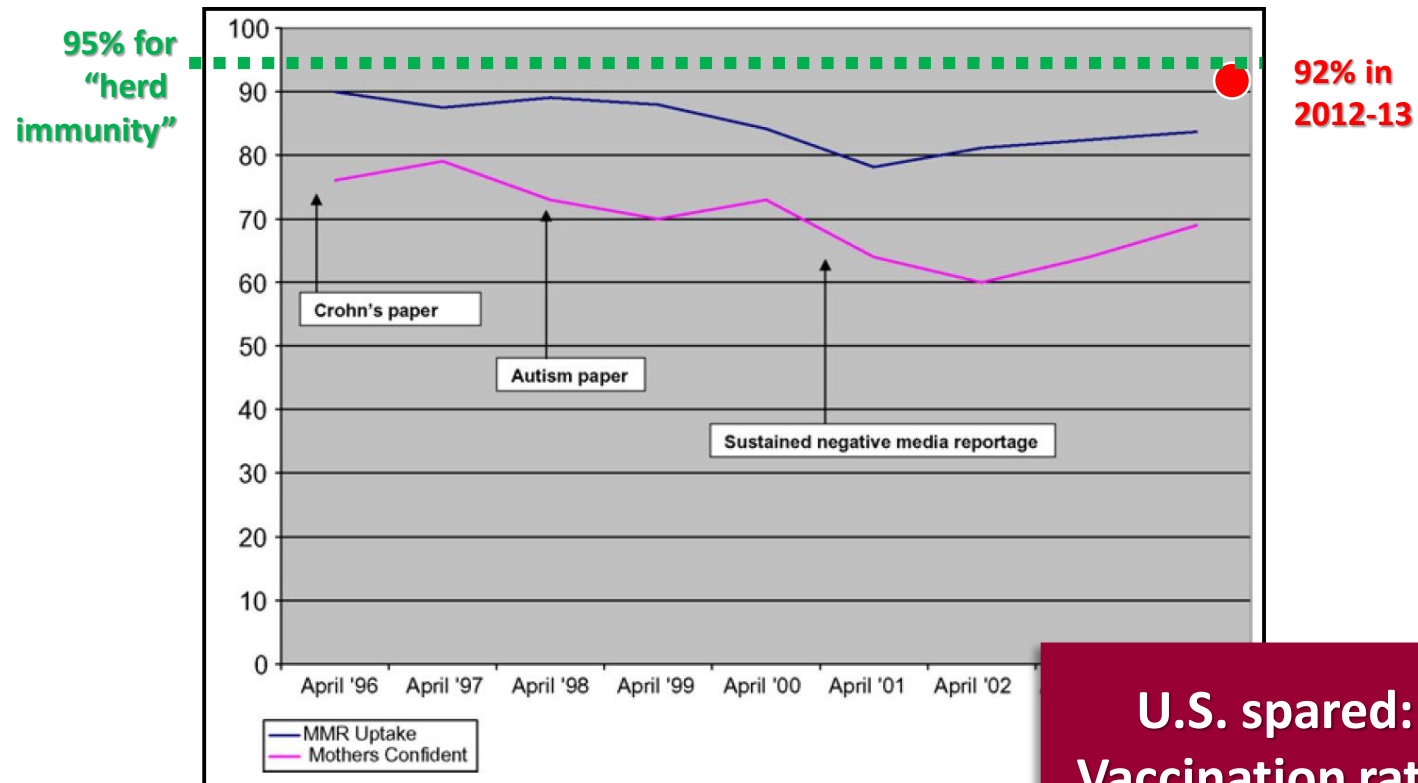
# DTP Vaccinations: Localized opposition provides naturalistic “experiment”

Incidence of pertussis (whooping cough)



(Gangarosa et al. 1998)

# U.K. MMR Vaccination Rates



**U.S. spared:  
Vaccination rates  
remained at 92%**

# Medical Community Not Immune

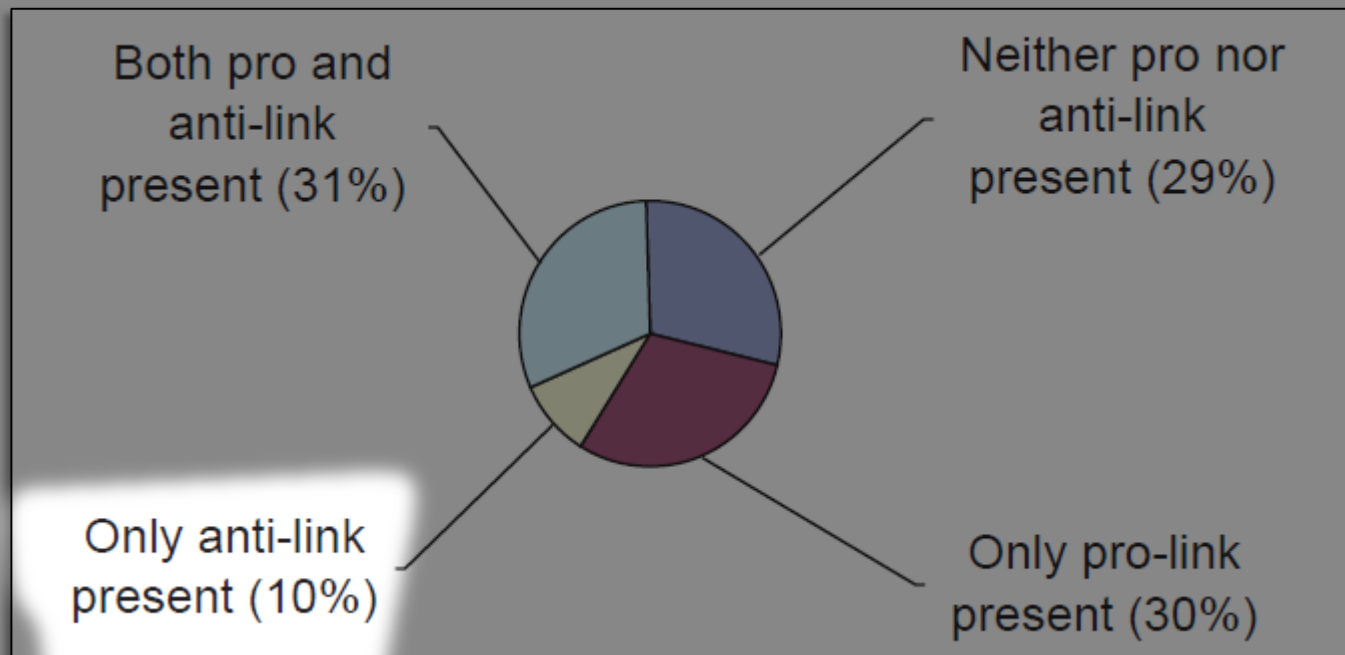
- Survey of health practitioners in Wales in 1998 (Petrovic et al., 2001)
  - 13% of GPs ...
  - 27% of nurses ...
  - found association between MMR and autism to be “very likely or possible”
- Survey of Italian pediatricians in 2006-2007 (Anastasi et al., 2009)
  - only 42% knew *all* recommended vaccinations (but high knowledge of mandatory vaccinations)
  - only 25% routinely administered recommended vaccinations (including MMR)



# How Are “Fake News” Disseminated?

# Media and False Balance

- MMR reporting after Wakefield's fraudulent research characterized by false balance (Clarke, 2008)

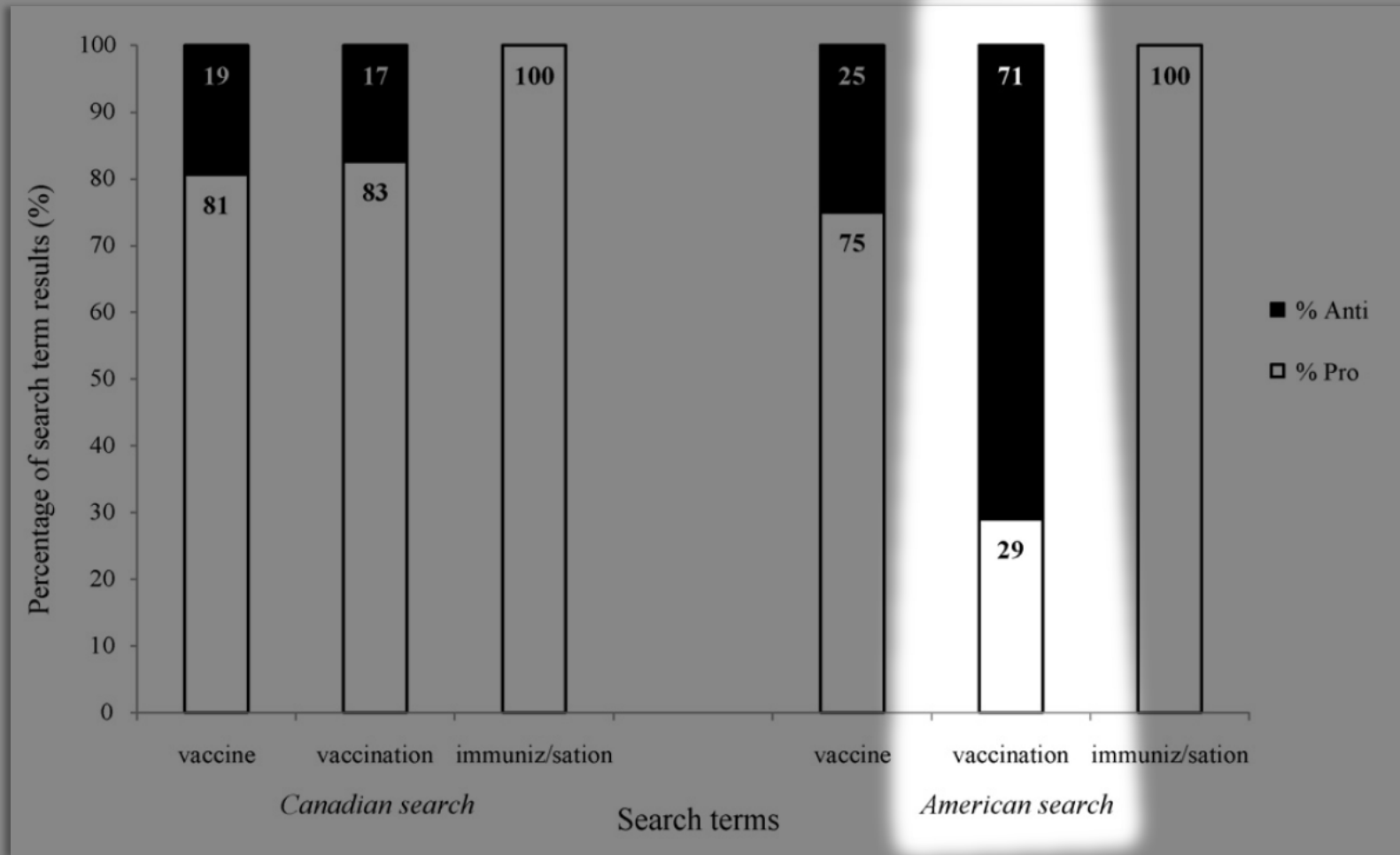


(UK media, 1998-2006)

# Media and False Balance

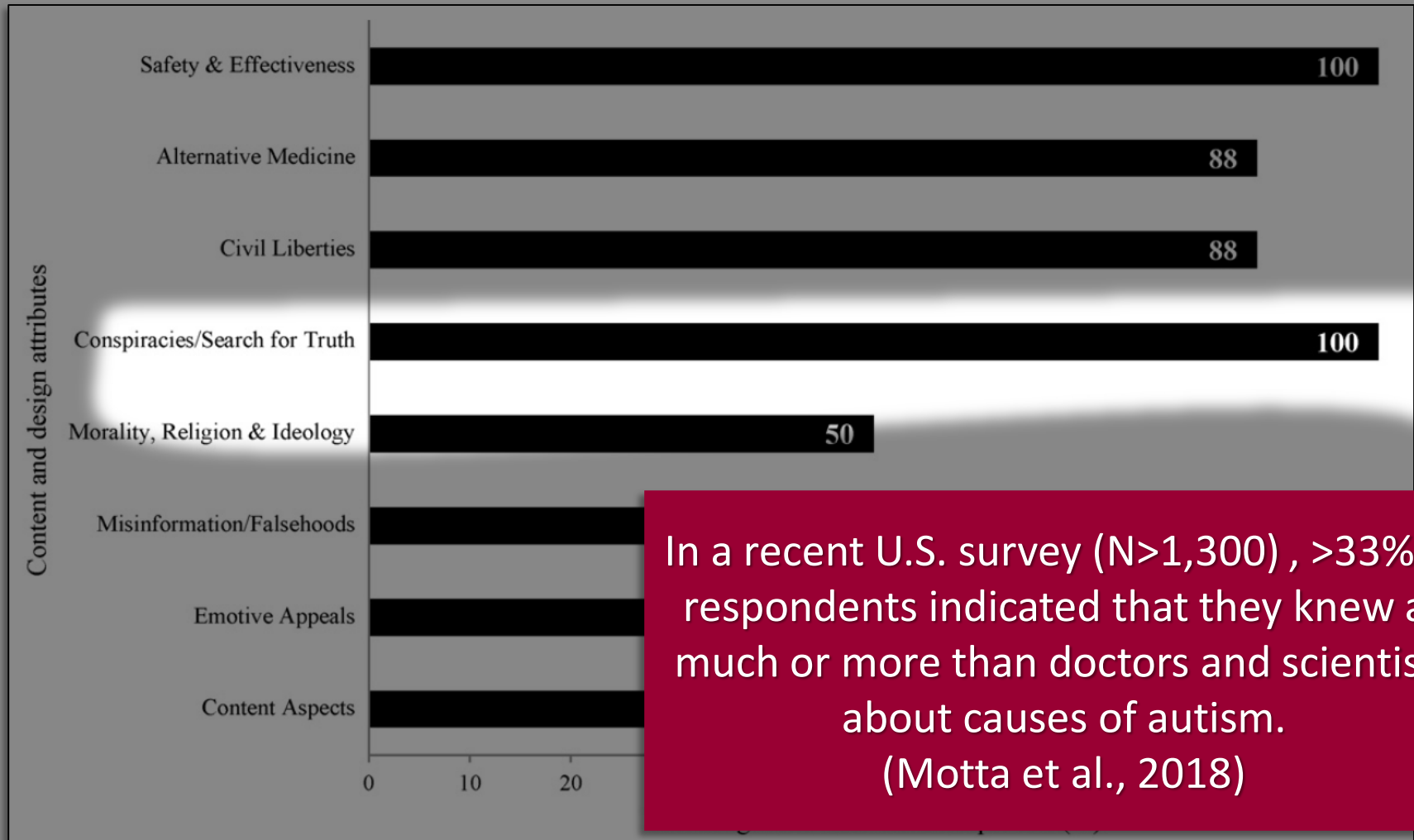
- Exposure to balance decreases people's certainty and generates impression of divided expert opinion (Dixon & Clarke, 2013)
- U.K. public in 2002 (Colgrove & Bayer, 2005):
  - **25%** believed in link MMR vaccination – autism
  - **39%** believed in “equal evidence on both sides”

# Internet and Social Media



(Kata, 2010)

# Anti-Vaccination Internet Sites



In a recent U.S. survey (N>1,300) , >33% of respondents indicated that they knew as much or more than doctors and scientists about causes of autism.  
(Motta et al., 2018)

(Kata, 2010)

# Russian Twitter Trolls

- Analysis of 1.8M tweets about vaccination (2014-2017)
- 93% of tweets are from accounts that cannot be verified as humans, tweeting anti-vaccination misinformation
- Russian trolls far more likely to tweet about vaccination than human users
  - content is *not* all anti-vaccination
  - tweeting both sides of the issue (same hashtag) is seeding discord and undermining perception of scientific consensus

(Broniatowski et al., 2018)

# Who is Receptive to Misinformation?



# Worldview, Ideology, and Vaccinations: Media and Anecdotes

**Mother Jones**

The Science of Why We Don't Believe Science

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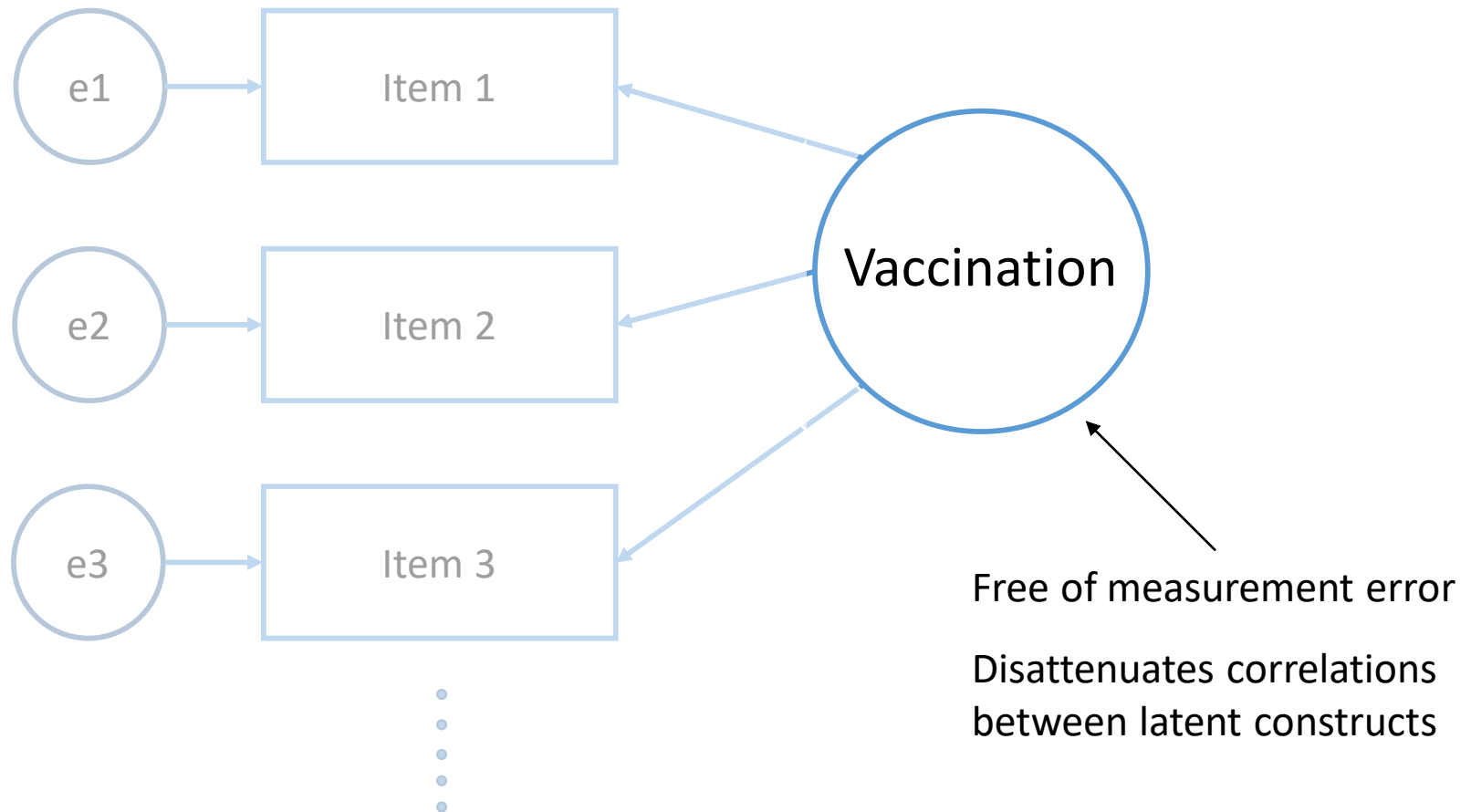
***Is there a case study of science denial that largely occupies the political left? Yes: the claim that childhood vaccines are causing an epidemic of autism.***



# Vaccination Attitudes: 3 Studies

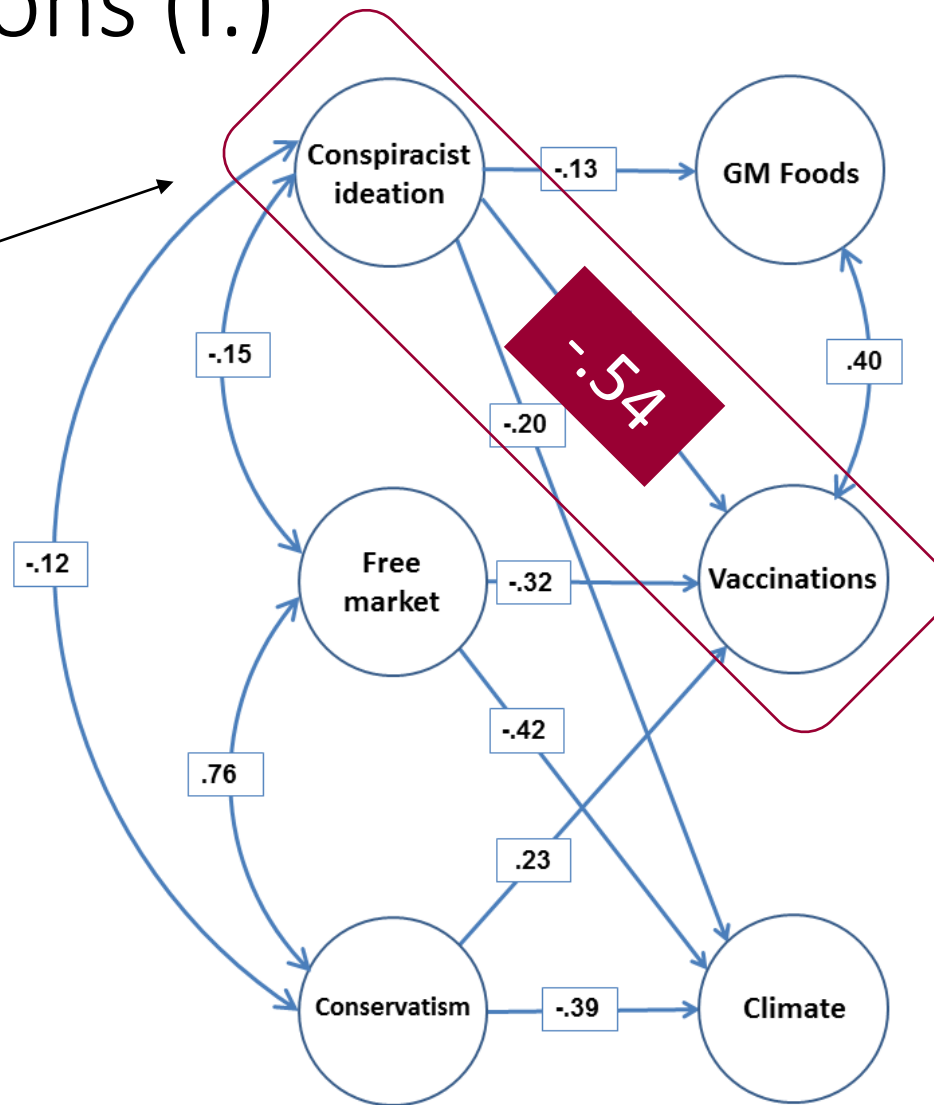
- Large ( $N \approx 1,000$ ) U.S. representative samples
  - surveyed in 2012, 2017, and 2018
- Various mainly political constructs as potential predictors of attitudes
- Vaccination items ( $N = 5$ ):
  - I believe that vaccines are a safe and reliable way to help avert the spread of preventable diseases.
  - The risk of vaccinations to maim and kill children outweighs their health benefits
- Structural Equation Models (SEM)

# Structural Equation Models

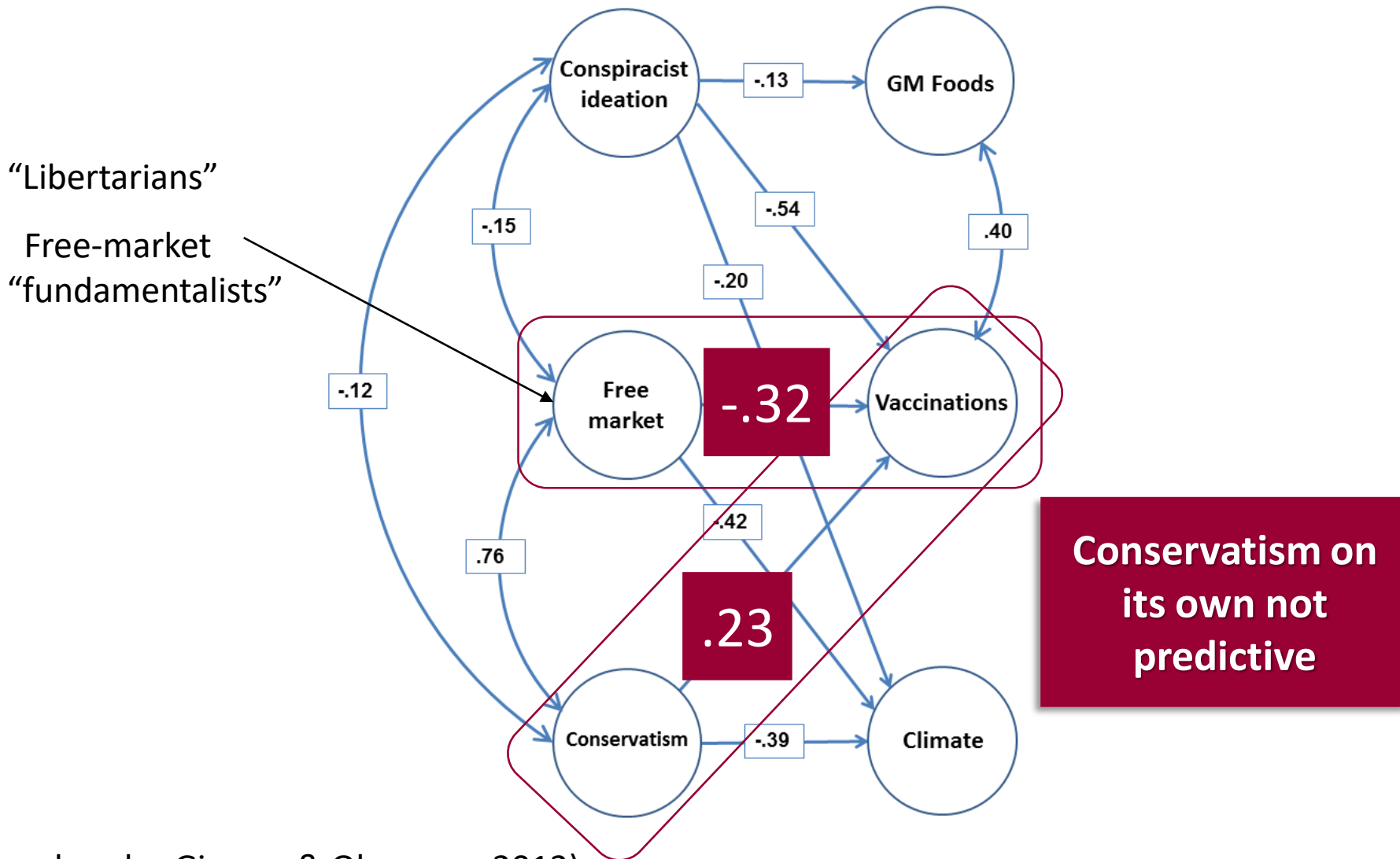


# Worldview, Ideology, and Vaccinations (I.)

“Princess Diana’s death was not an accident but an assassination by the British royal family”

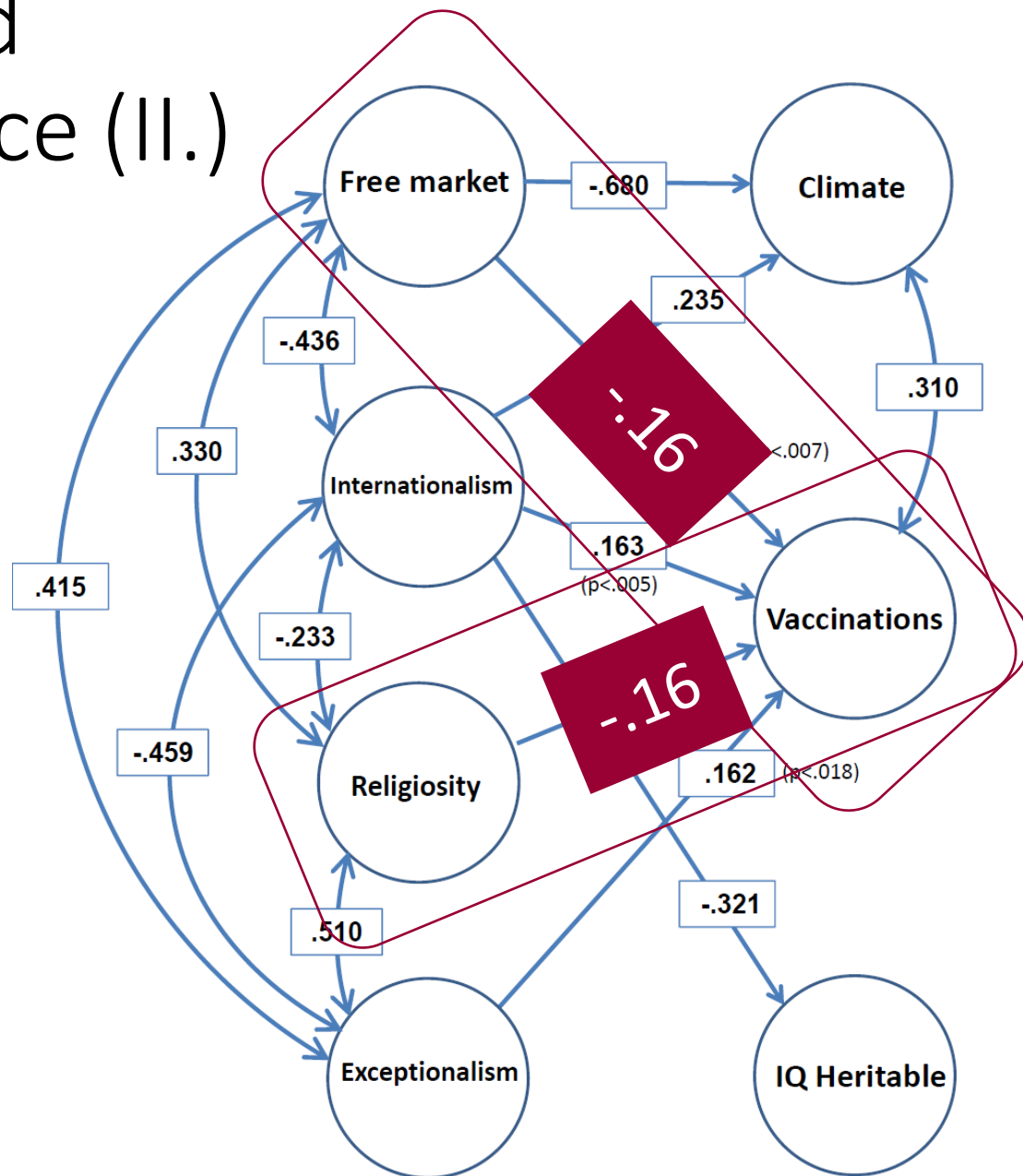


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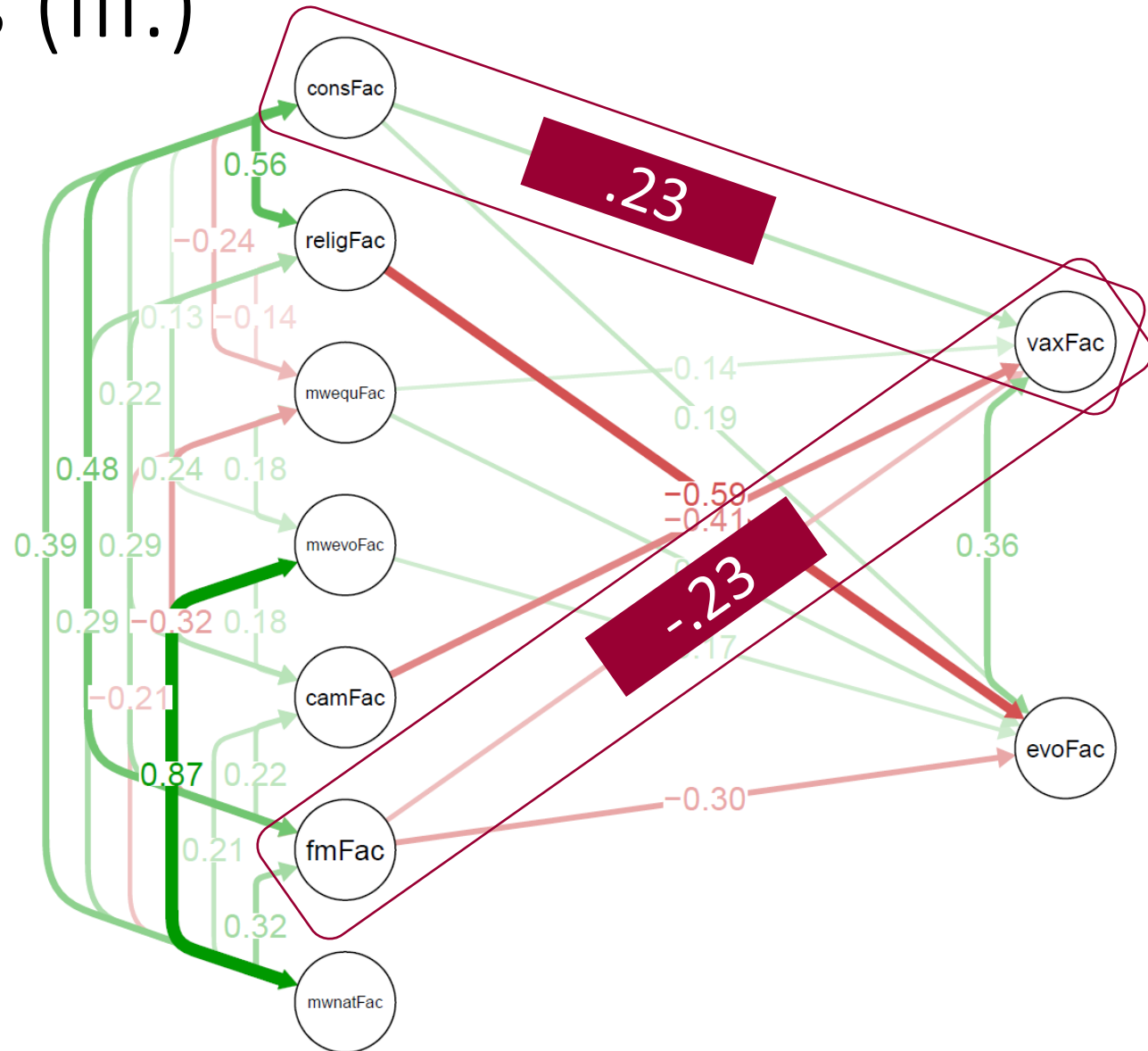
(Lewandowsky, Gignac, & Oberauer, 2013)

# Worldviews and Norms of Science (II.)



(Lewandowsky & Oberauer, forthcoming)

# Worldviews (III.)

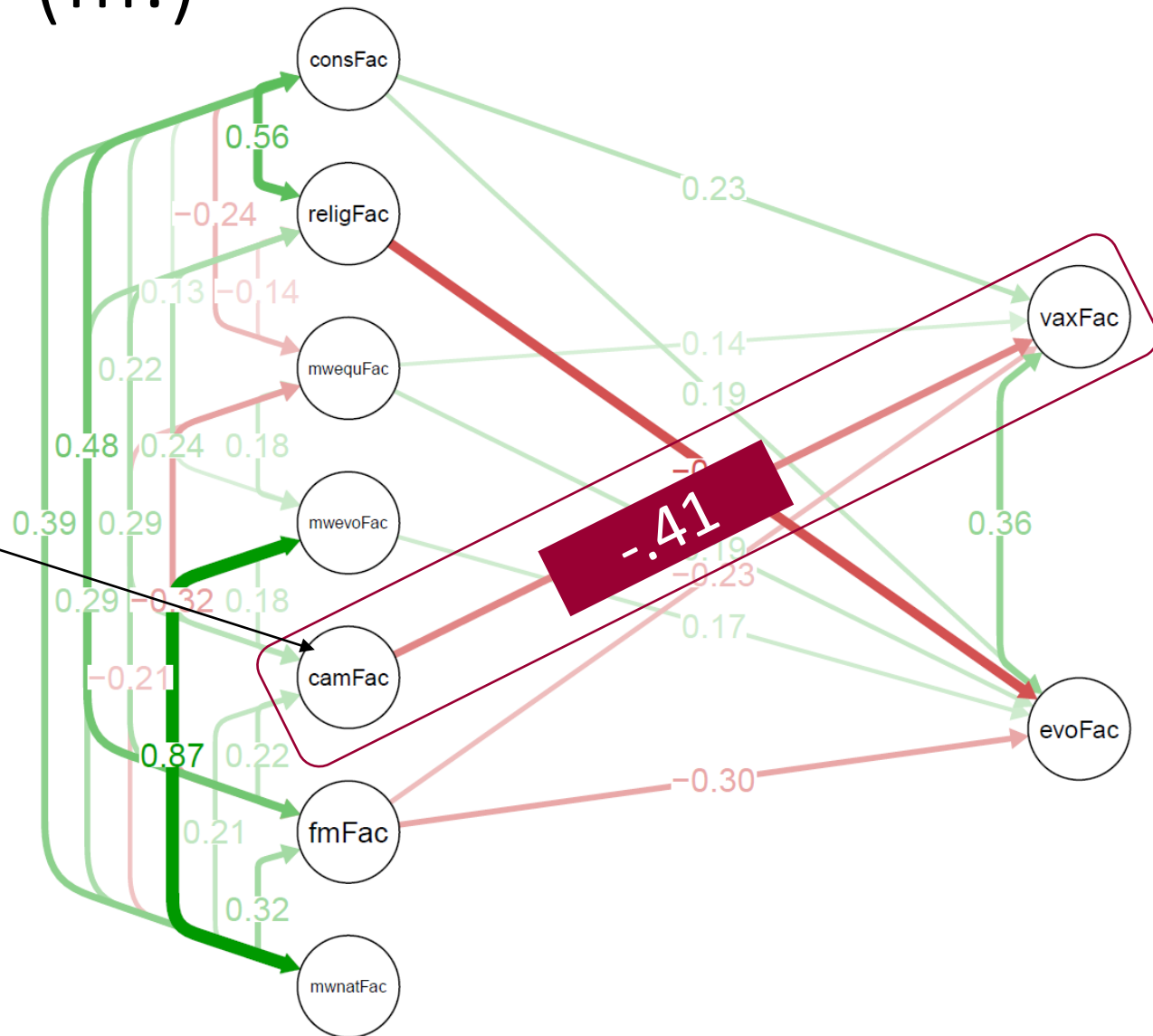


**Conservatism on  
its own not  
predictive**

# Worldviews (III.)

Endorsement of  
“Complementary and  
alternative medicine” (CAM)

Vax refusal among Swiss  
CAM users: 18.2%  
(vs. 3.2% baseline)  
(Zuzak et al., 2008)



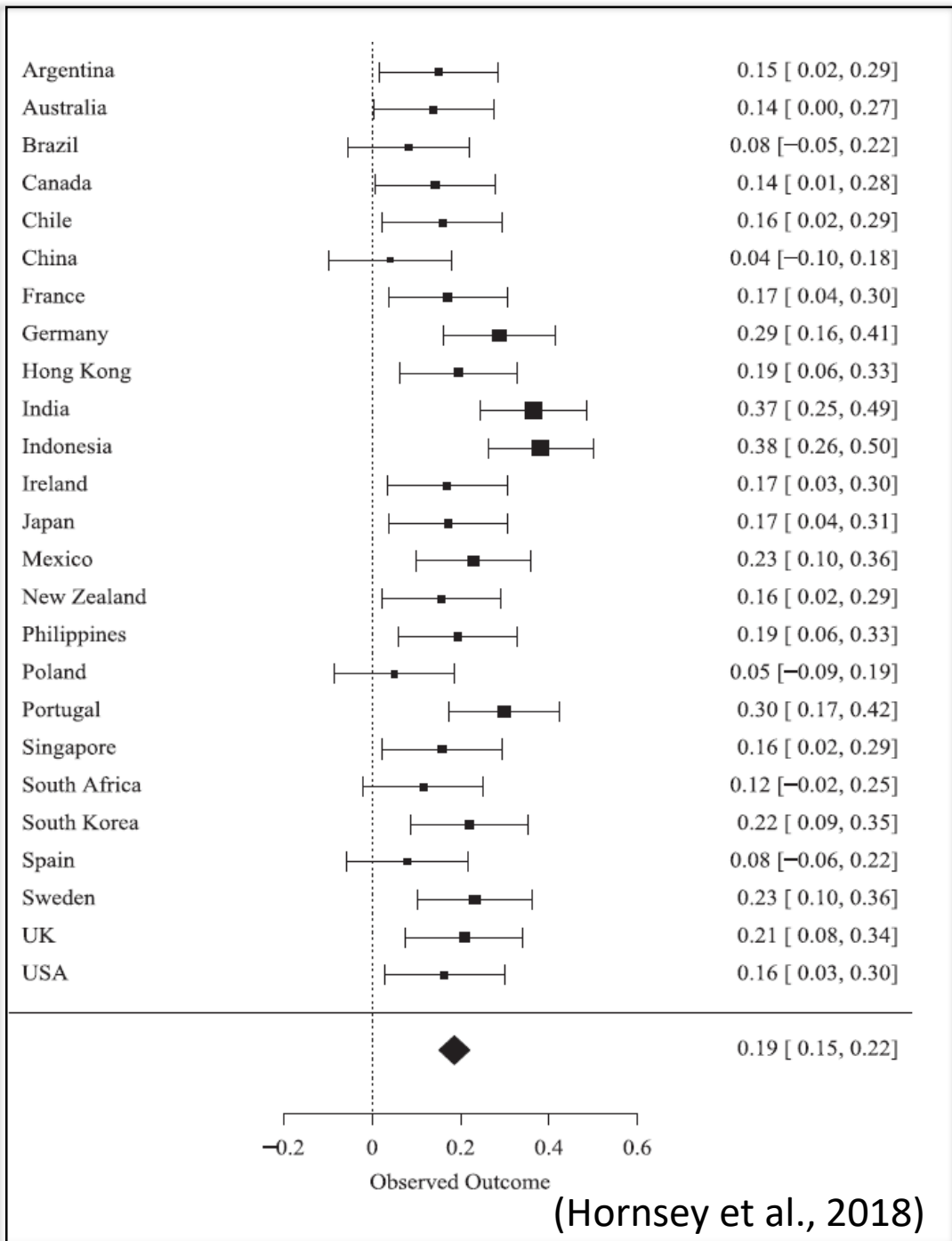
# Worldviews: Conclusions

- Conspiracist ideation strongly associated with vaccination rejection
  - independently confirmed across 24 countries (Hornsey et al., 2018)
- Libertarianism associated with vaccination rejection
  - overrides (sometimes opposing) effect of conservatism
  - no evidence of left-wing involvement in vaccination rejection
  - independently confirmed (e.g., Hamilton et al., 2015; Rabinowitz et al., 2016)



# Worldview

- Conspiracist ideology  
vaccination refusal  
– independence  
et al., 2018)
- Libertarianism  
– overrides (s  
– no evidence  
rejection  
– independence  
Rabinowitz



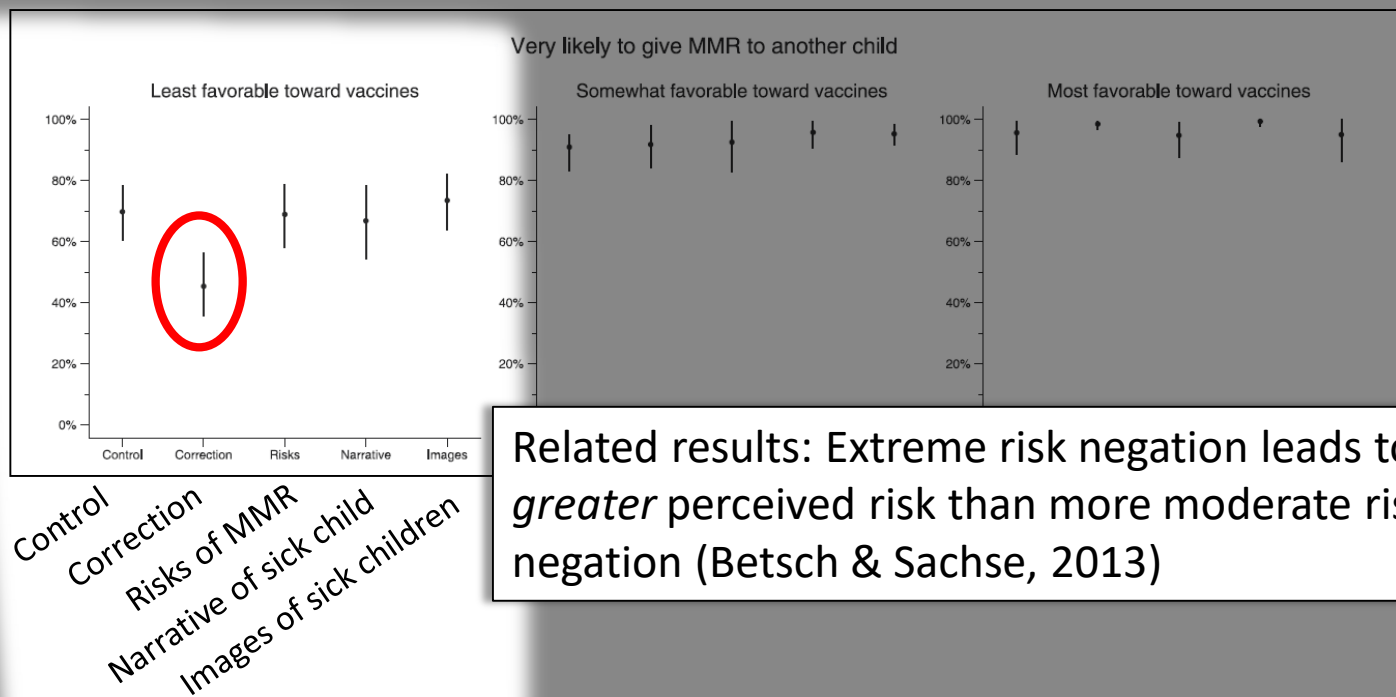
# Why Do Worldviews Matter?

# Worldviews: Implications (I.)

## Backfire Effect

- When presented with messages that correct misconceptions,
- ... but are worldview-incongruent:
  - people actively counter-argue to resist the correction (Prasad et al., 2009)
  - initially-held incorrect beliefs can become *more* entrenched (Nyhan & Reifler, 2010)

# Vaccination Attitudes and Backfire Effects



# Worldviews: Implications (II.)

## Conspiracies

- Conspiracy theories are “self-sealing” (e.g., Lewandowsky et al., 2015)
  - contrary information is reinterpreted as supportive
  - “medical research is an oligopolistic cartel that manufactures evidence”
- Notoriously difficult to correct (Sunstein & Vermeule, 2009)

# Vaccination attitudes and Conspiracy theories

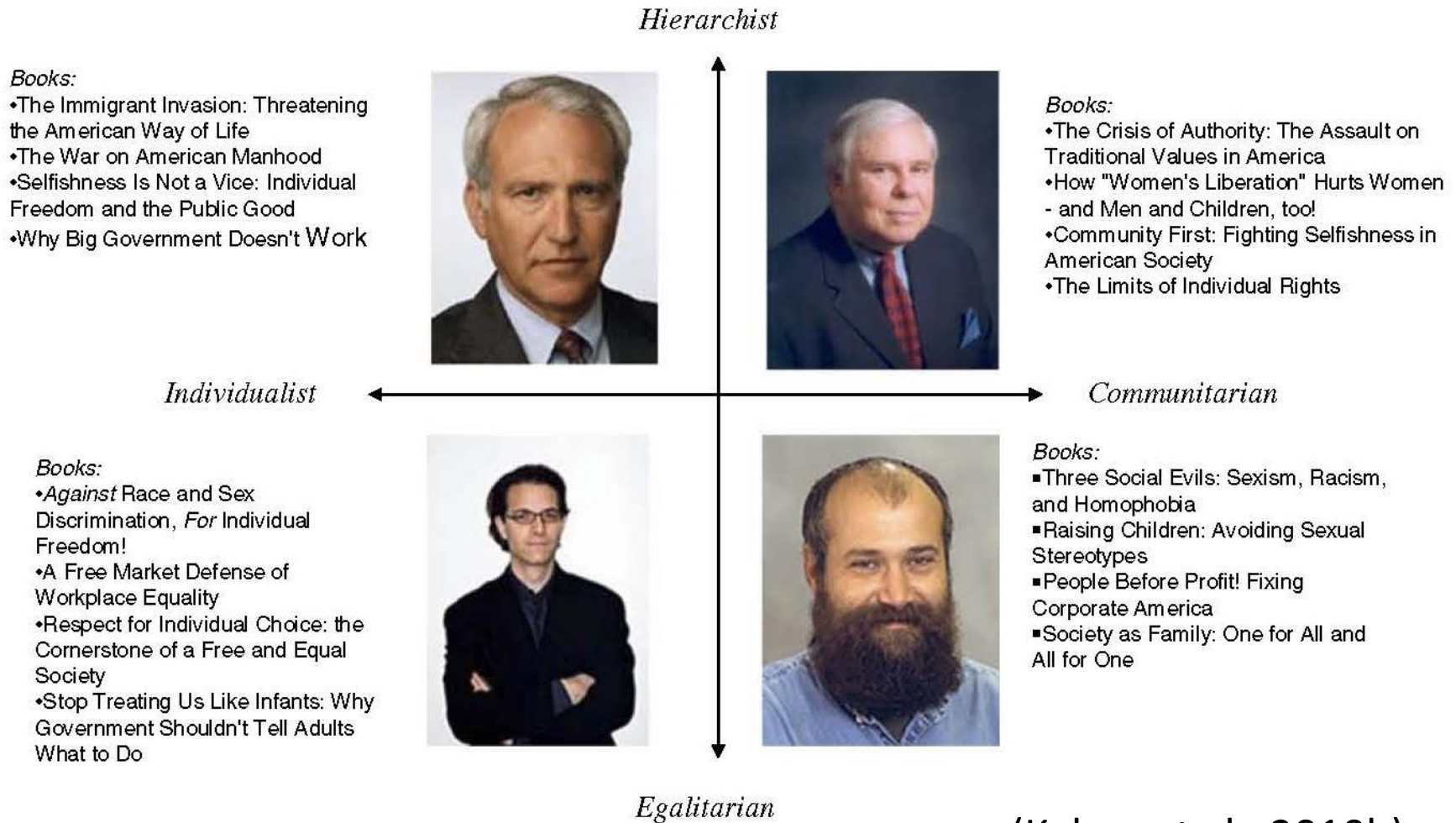
Condition	Intention to vaccinate (1-7)
Control	5.50
Conspiracy	<b>4.42</b>
Conspiracy → Anti-conspiracy	<b>4.80</b>

(Jolley & Douglas, 2017)

# What Can We Do About It?

Brewer et al. (2017). Increasing vaccination: Putting psychological science in action. *Psychological Science in the Public Interest*, 18, 149-207.

# Worldview Jiu Jitsu: The Role of the Messenger



(Kahan et al., 2010b)



# The Message: HPV Vaccine

- Pro- and anti-vaccination messages presented
  - unattributed
  - messenger aligned as expected
  - messenger alignment violates expectation

Condition	Polarization (out of 3)
Unattributed	0.57
Aligned as expected	<b>0.83</b>
Alignment violates expectation	<b>0.16</b>

(Kahan et al., 2010b)

# Jiu Jitsu Persuasion

- Attitude roots
  - deeply held worldviews and beliefs
- Surface attitudes
  - climate “skepticism”
  - anti-vaccination attitudes
- Change surface attitudes by messages that *align* with attitude roots

# Particularly Promising Avenue: Inoculation

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# A Promising Avenue: Inoculation

Condition	Intention to vaccinate (1-7)
Control	5.50
Conspiracy	<b>4.42</b>
Conspiracy → Anti-conspiracy	<b>4.80</b>
Anti-conspiracy → conspiracy	<b>5.04</b>

- People can be “trained” (3-minute video) to recognize incoherence of arguments that characterizes denial
- This boosts support for vaccinations  
(Lewandowsky & Butterfield, 2018)

# Conclusions

- Organized opposition to vaccinations has adverse consequences for public health
- Hesitancy greater (and trust lower) on the political right
- Conspiracist ideation plays major role in vaccine hesitancy
- Messenger and message should align with worldview of audience
- Inoculation—rather than debunking—is crucial to success of corrective messages

THE END