

#Post-truth and Renewable Energy: Misinformation and its Correction

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Australian Government
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THE
ROYAL
SOCIETY

What is “Misinformation”?

Laboratory Experiments

Rock idol Richard Blake was found dead in his apartment. Police suspected a drug overdose as heroin was found near the body. Blake's sudden death shocked fans.

Fans will pay tribute at a ceremony tomorrow.

How should police and politicians respond?

"The police should investigate the local drug scene."

"Artists need addiction support programs."

Laboratory Experiments

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Fans will pay tribute at a ceremony tomorrow.

How should police and politicians respond?

"The police should invest

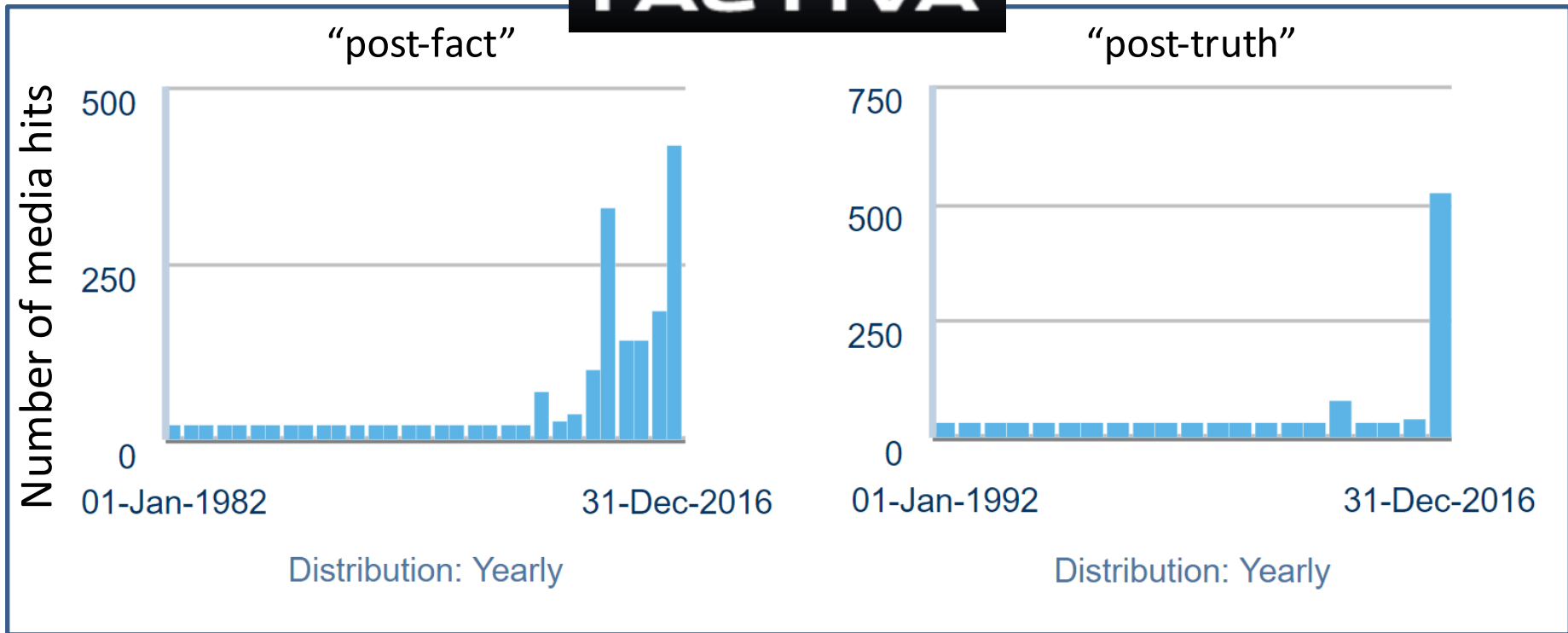
"Artists need addicti

Misinformation: Something thought to be truthful later turns out to be false

From the Laboratory to Society

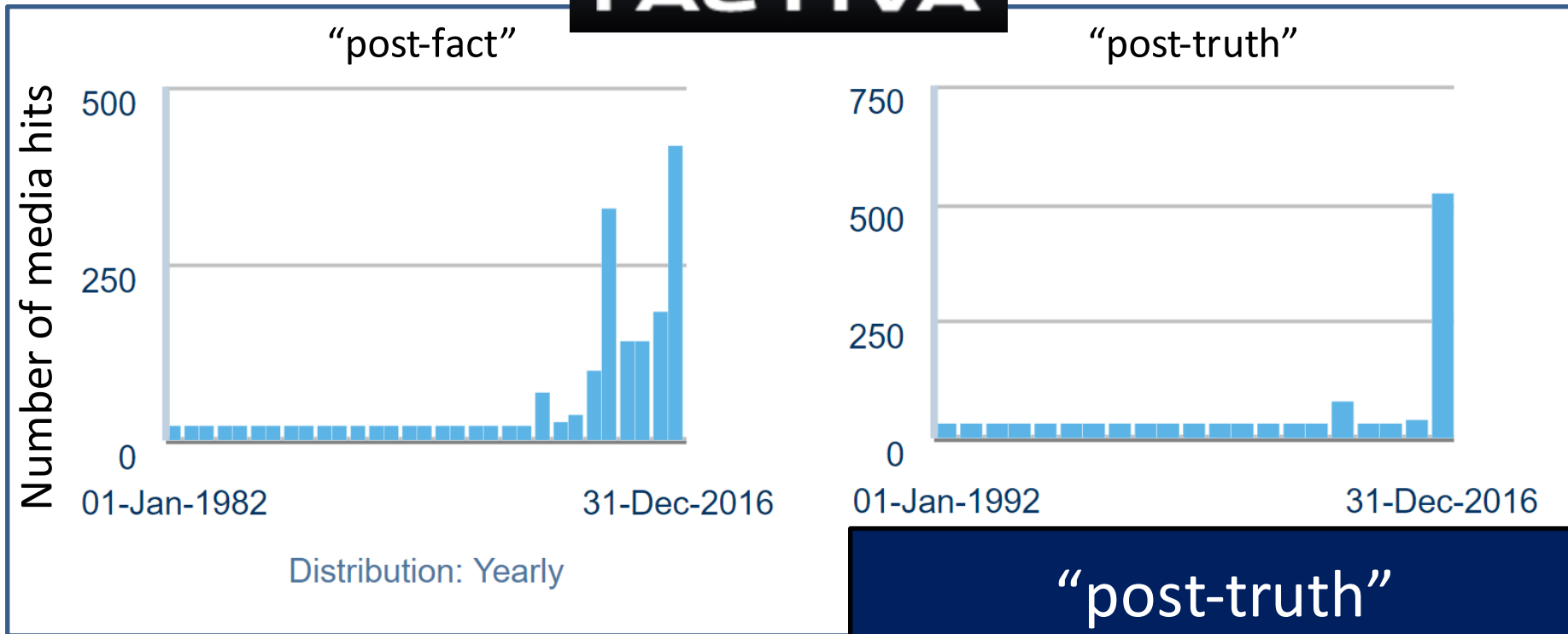
“Post-Fact” World—“Post-Truth” Politics

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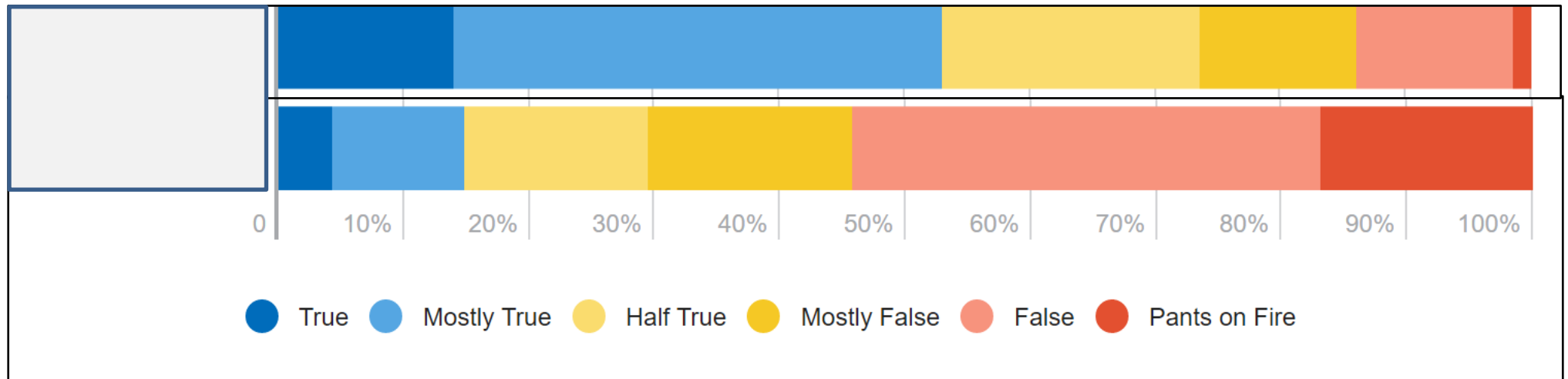
“Post-Fact” World—“Post-Truth” Politics

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“post-truth”
Word of the year 2016
(*Oxford Dictionaries*)

U.S. Presidential Candidates



Politifact score card of election campaign

Do Facts Matter?

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

- Present online sample (MTurk workers) with Trump statements
 - true or false
 - attributed to Trump or unattributed
 - obtain belief ratings

Do Facts Matter?

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

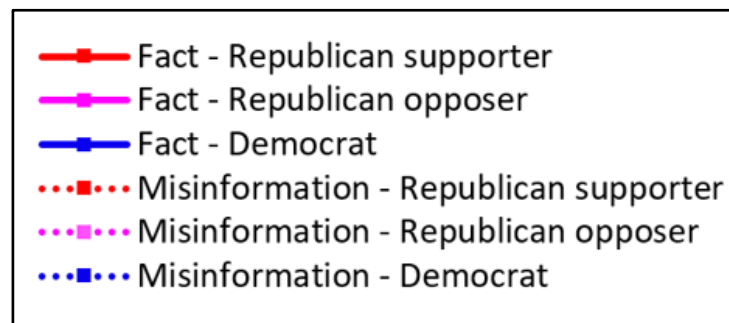
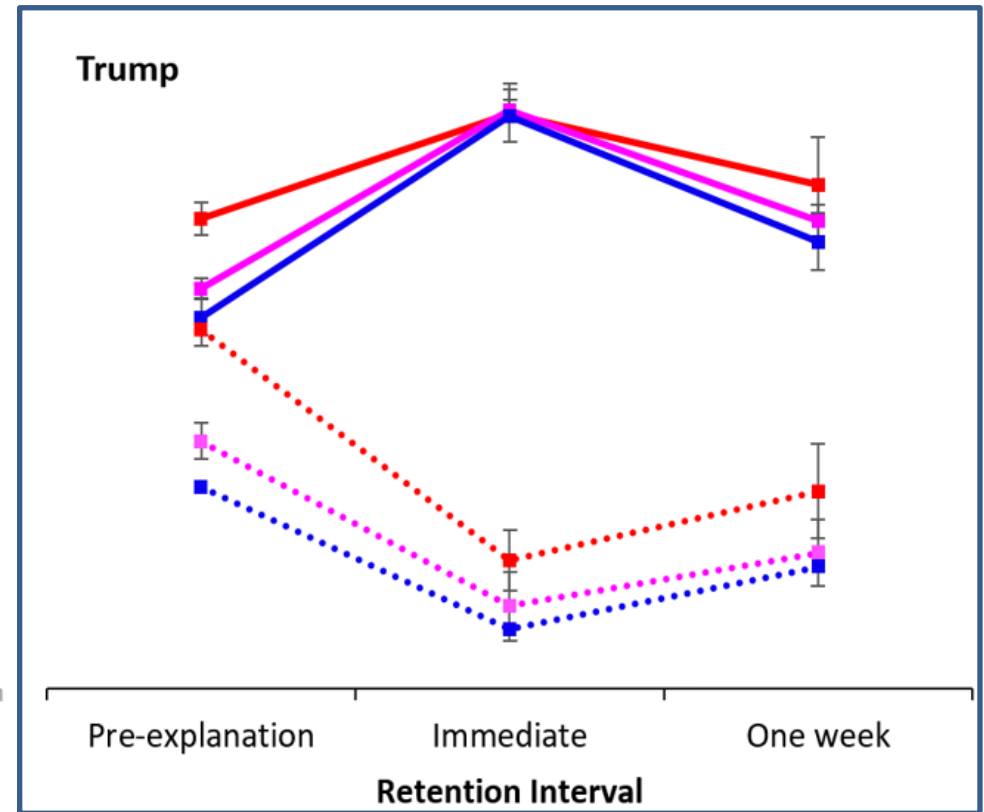
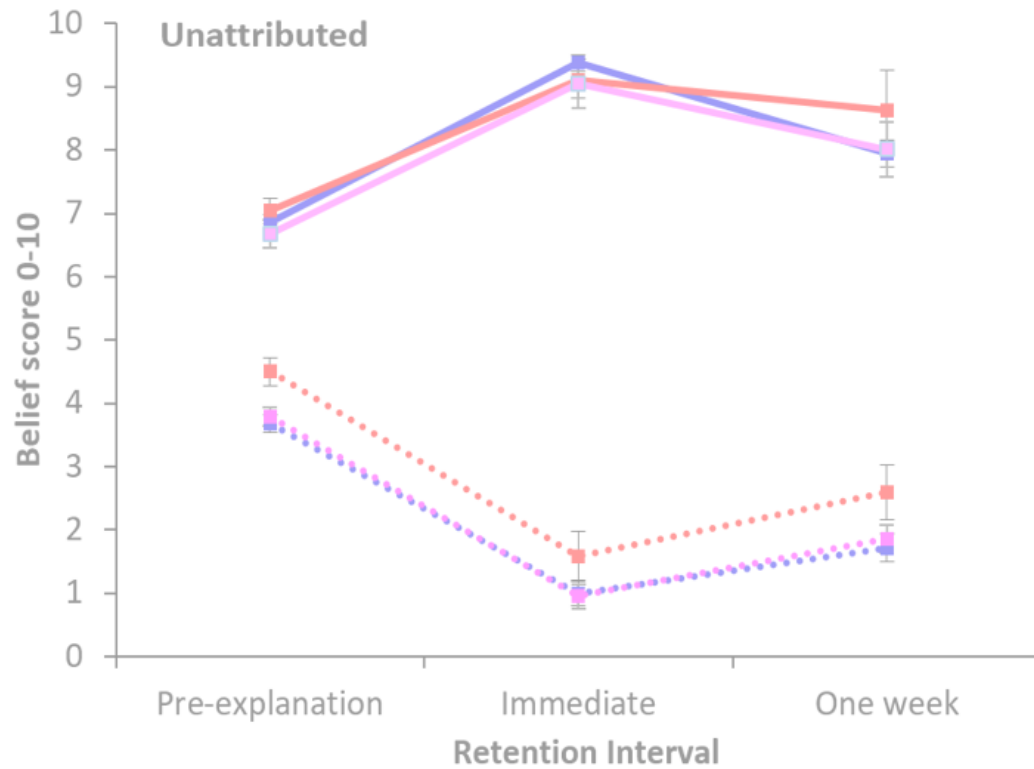
- Present only the facts that support your position
 - Donald Trump said that vaccines cause autism (MISINFORMATION)
 - true or false
 - attributed to Donald Trump
 - obtain belief
- Present only the facts that disprove your position
 - Donald Trump said that the US spent \$2 trillion on the war in Iraq (FACT)
 - true or false
 - attributed to Donald Trump
 - obtain belief

Do Facts Matter?

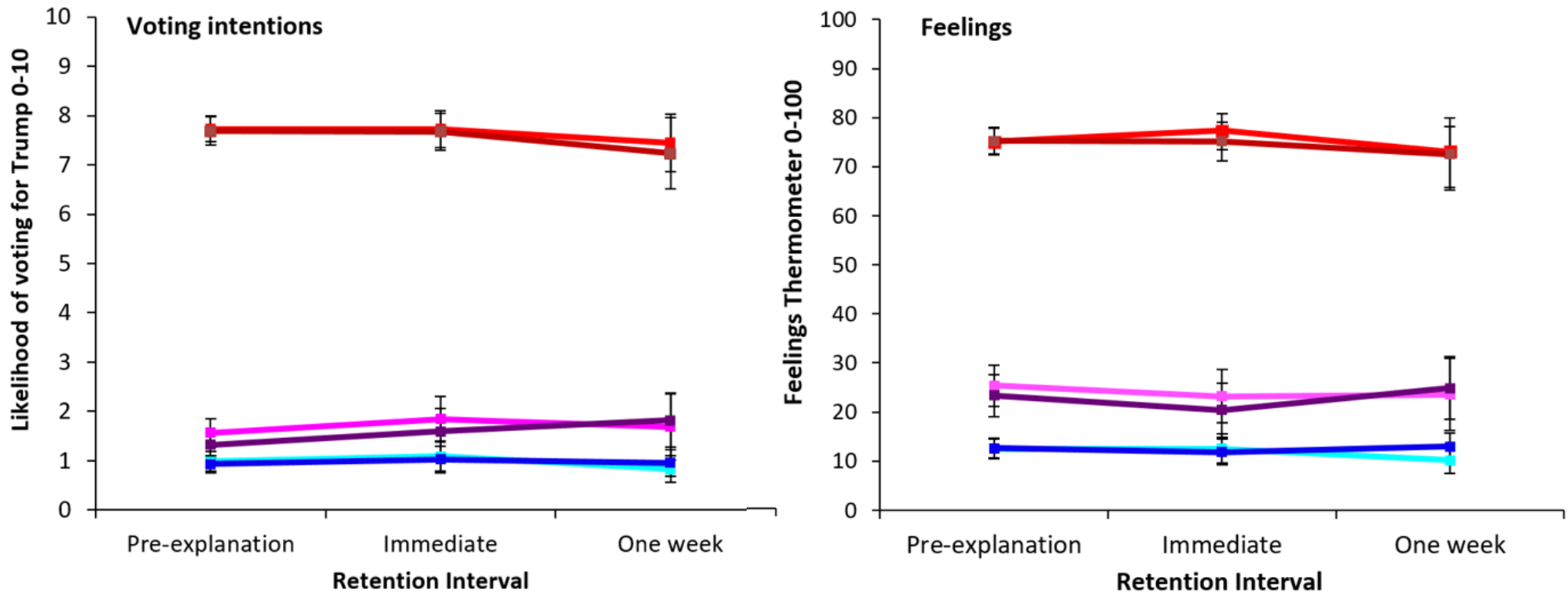
(Swire, Berinsky, Lewandowsky, & Ecker, 2017)

- Present only true (false) statements
 - Trump stated that vaccines cause autism (MISINFORMATION)
 - true or false
 - attributed to Donald Trump
 - obtain belief ratings
- Present only false (true) statements
 - Donald Trump said that the US spent \$2 trillion on the war in Iraq (FACT)
- Rebut (affirm) false (true) statements
 - ask for belief ratings immediately or week later

Belief Ratings (Swire et al., 2017)

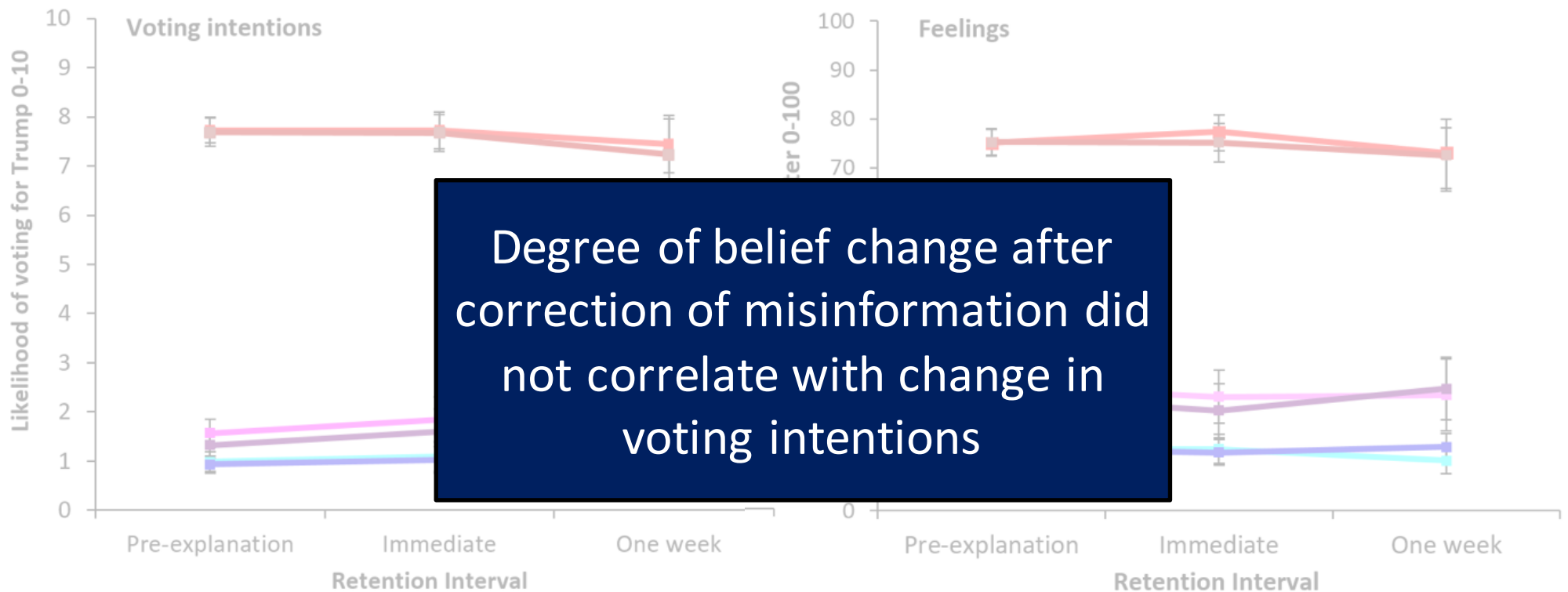


Voting Intentions (Swire et al., 2017)



- Republican supporter unattributed
- Republican supporter Trump
- Republican opposer unattributed
- Republican opposer Trump
- Democrat unattributed
- Democrat Trump

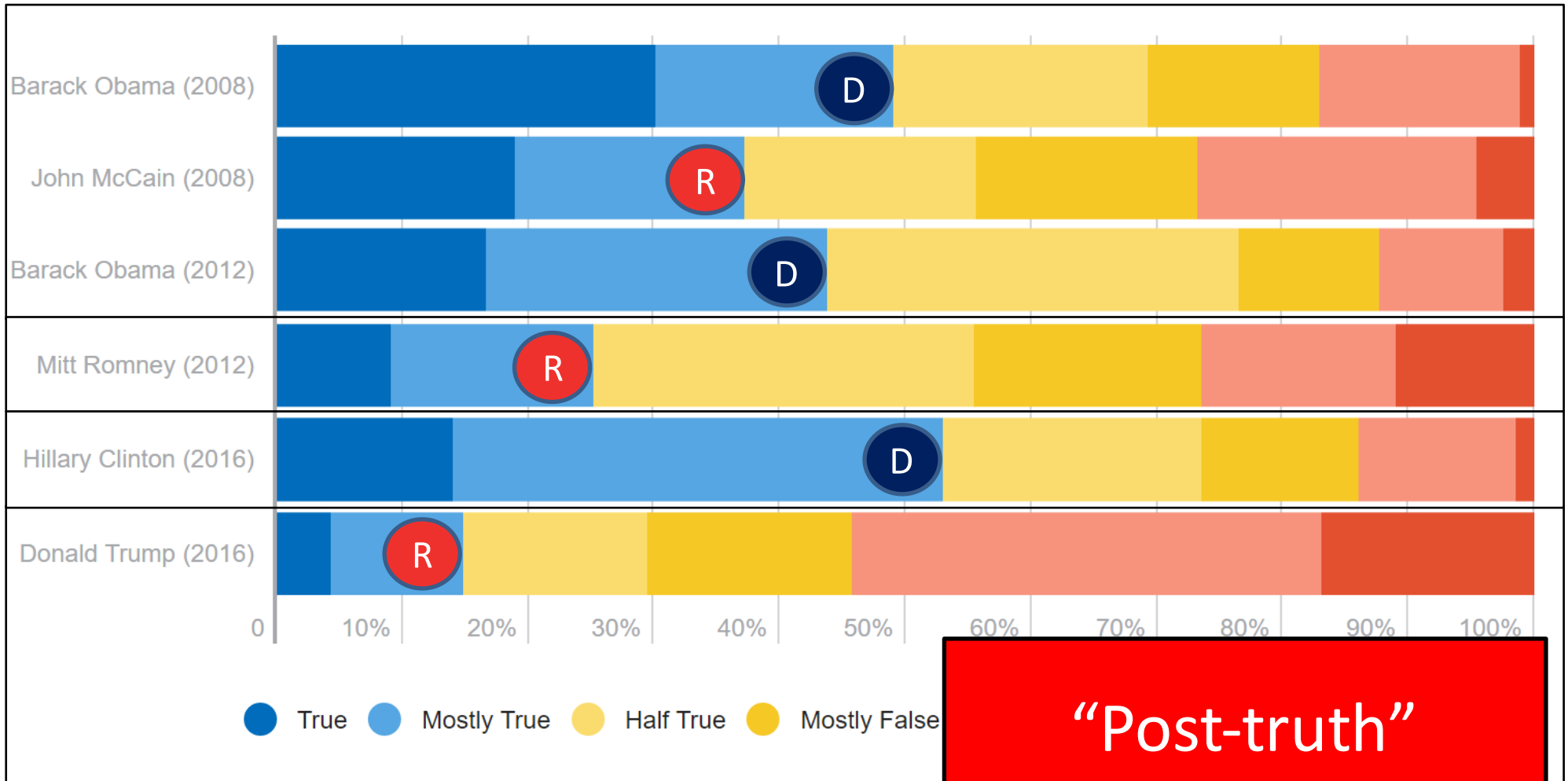
Voting Intentions (Swire et al., 2017)



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

- Republican supporter unattributed
- Republican supporter Trump
- Republican opposer unattributed
- Republican opposer Trump
- Democrat unattributed
- Democrat Trump

Elections Over Time



Misinformation

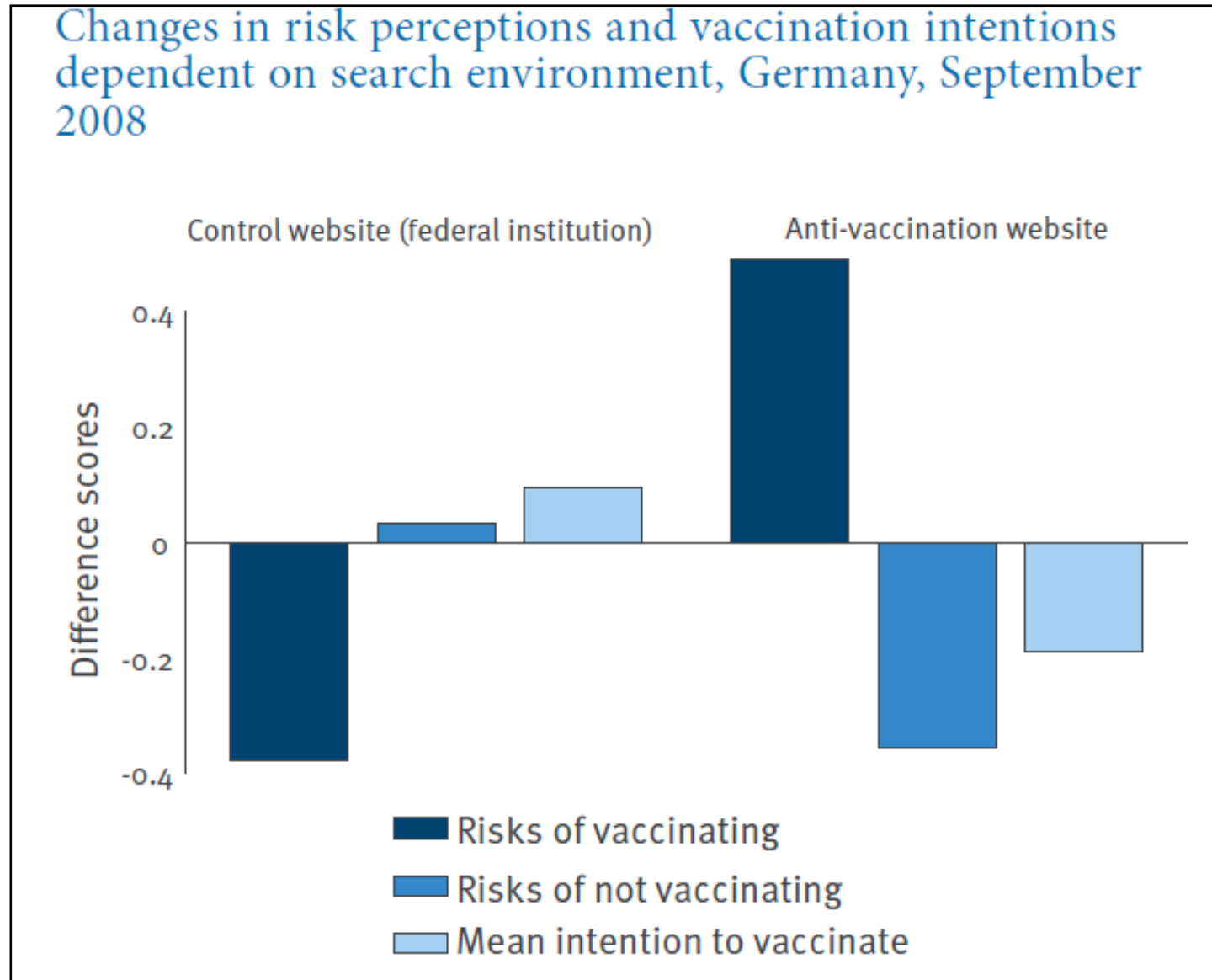
- Scope of the problem and its sources
- Does it matter?
- Why do people believe?
- Why do people continue to rely on retracted information?
- Ironic failures of corrections and “backfire” effects
- Successful debiasing

Misinformation

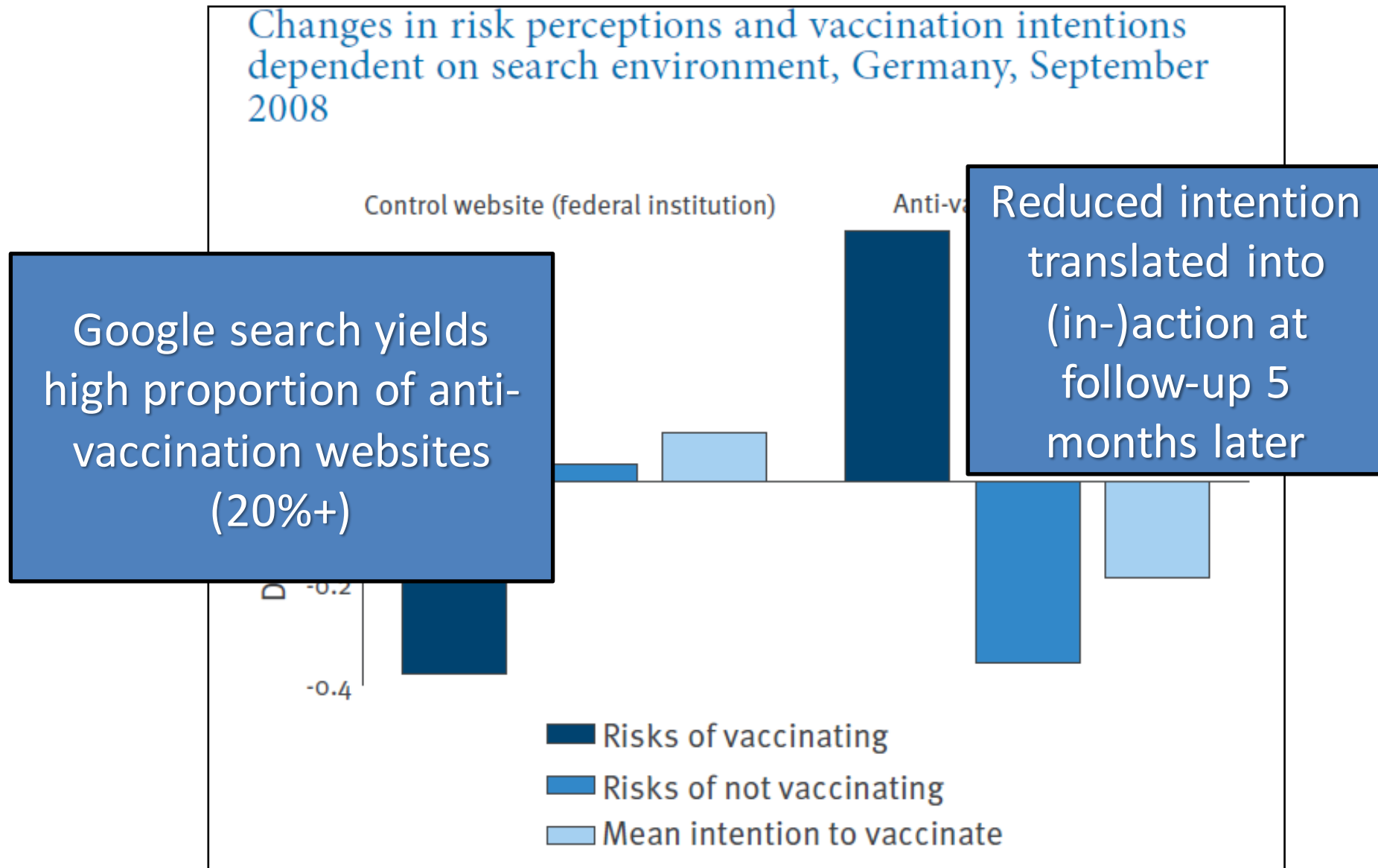
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What are the Sources of Misinformation?

Internet Sources (Betsch, 2011)



Internet Sources (Betsch, 2011)



Ramsay et al. (2010)

It is unclear whether Obama was born in the US—or, Obama was not born in the US

	Never	Rarely	About once a week	About 2-3 times a week	Almost every day
Fox News	32	36	55	50	63
CNN	52	39	48	33	41
MSNBC	48	38	49	42	39
Network TV news broadcasts	56	39	46	43	43
Public broadcasting (NPR or PBS)	51	46	41	26	22
Newspapers and news magazines (in print or online)	55	38	49	36	45

Most scientists think climate change is not occurring + views are divided evenly

	Never	Rarely	About once a week	About 2-3 times a week	Almost every day
Fox News	30	37	45	36	60
CNN	51	40	39	25	25
MSNBC	49	34	35	35	20
Network TV news broadcasts	59	37	41	36	35
Public broadcasting (NPR or PBS)	49	41	36	21	13
Newspapers and news magazines (in print or online)	48	43	41	24	40

Scope of Misinformation

- Difficult to quantify but some false beliefs seem to be relatively widespread


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Poll: 51 percent of GOP Obama born abroad

887 Like 3.2k Tweet 136 +1 1



Fifty-one percent of Republican primary voters believe Obama was born abroad

By ANDY BARR | 2/15/11 11:30 AM EST

INTERNET ARCHIVE Wayback Machine http://www.scrippsnews.com/911poll 77 captures 5 Aug 06 - 17 Mar 13

ScrippsNews beta release |

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Home » News » National News

Third of Americans suspect 9-11 government conspiracy

National News | News | Politics

By THOMAS HARGROVE
Scripps Howard News Service

More than a third of the American public suspects that federal officials assisted in the 9/11 terrorist attacks or took no action to stop them so the United States could go to war in the Middle East, according to a new Scripps Howard/Ohio University poll.

Vaccinations, Autism, and the Public

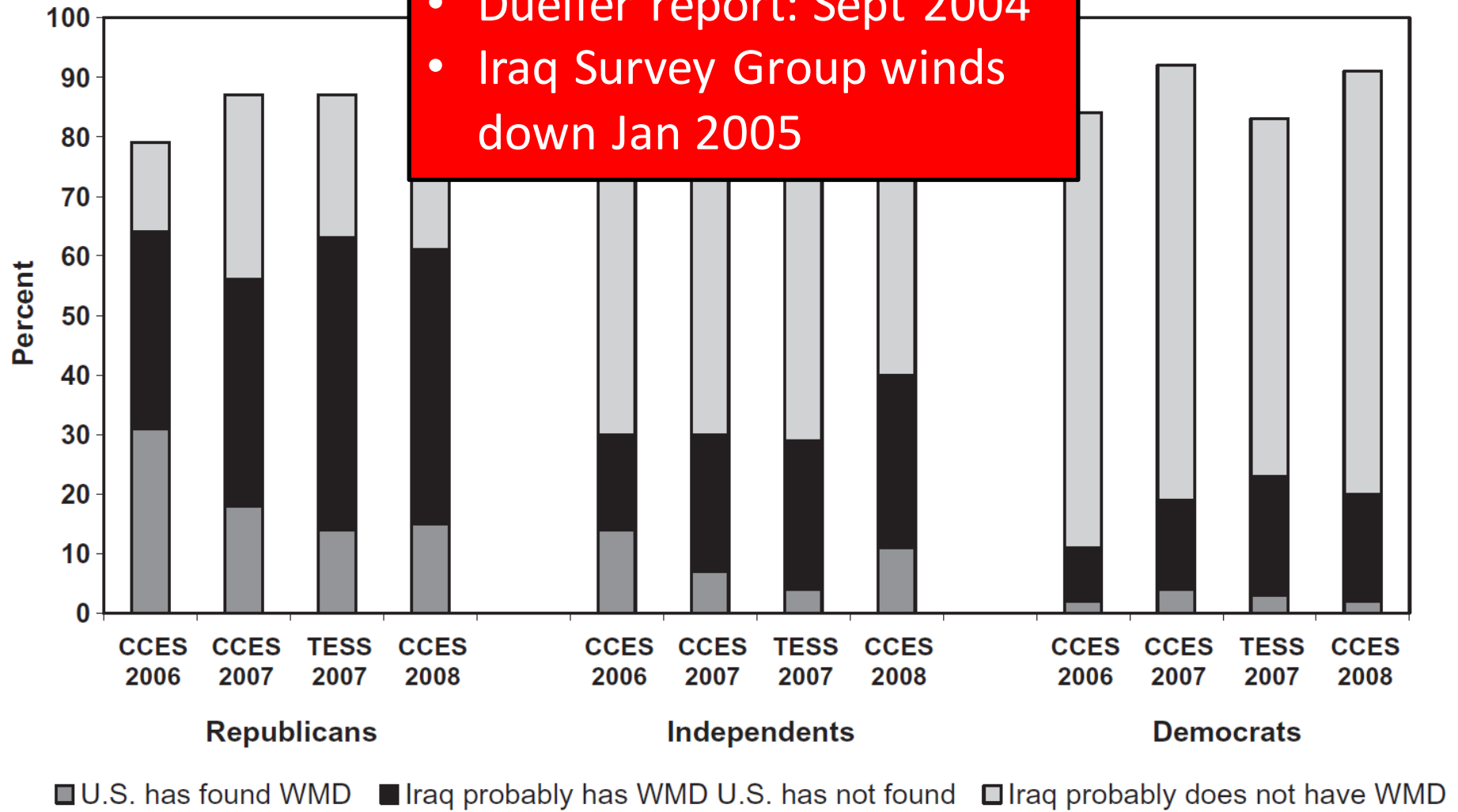
- U.K. public in 2002 (Colgrove & Bayer, 2005):
 - **25%** believed in link MMR vaccination – autism
 - **39%** believed in “equal evidence on both sides”

Petrovich et al. (2001):

13% of GP's and **27%** of nurses found association with autism to be very likely or possible (Welsh sample).

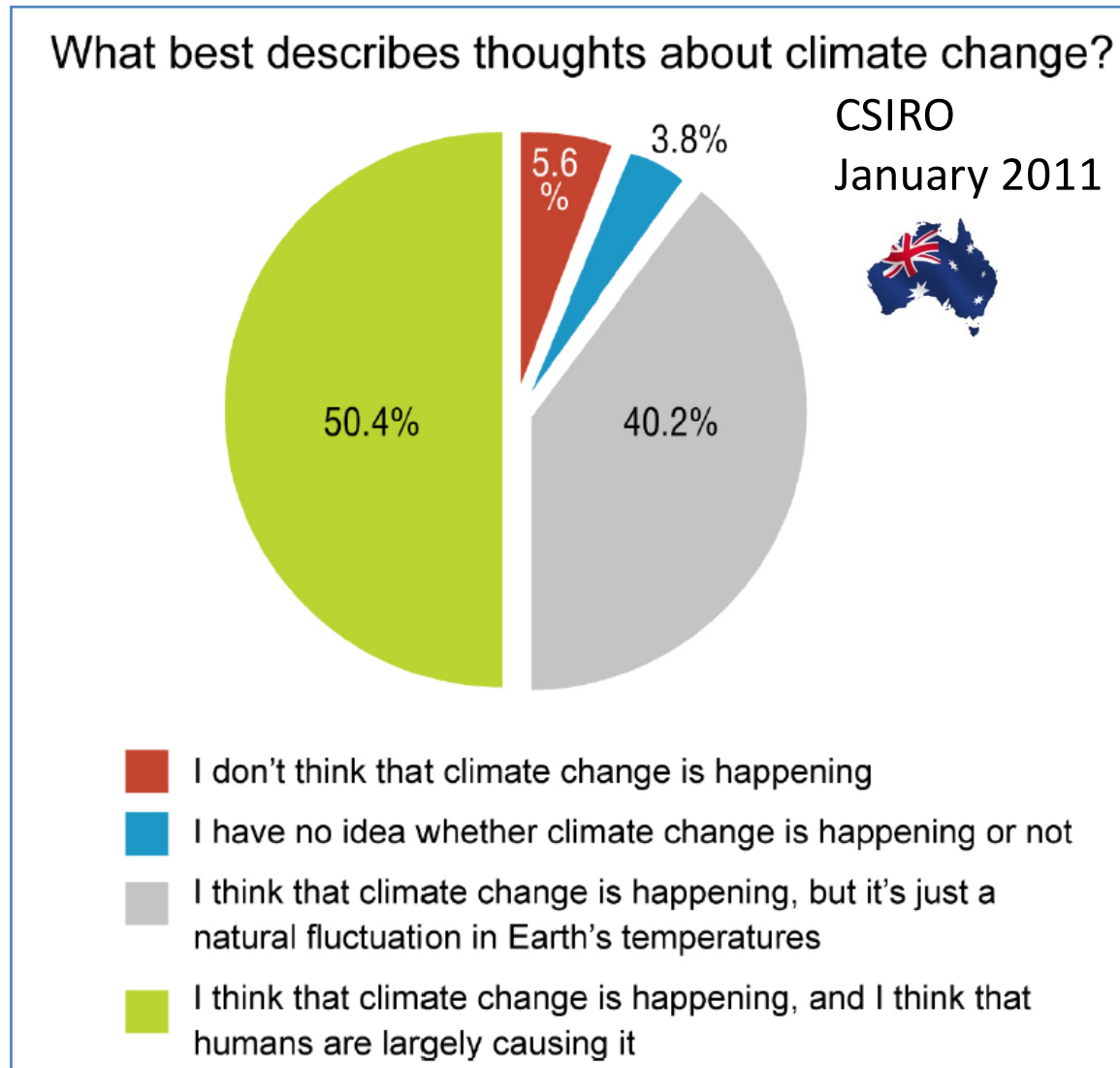
WMD: Persistence of a Myth

- Duelfer report: Sept 2004
- Iraq Survey Group winds down Jan 2005



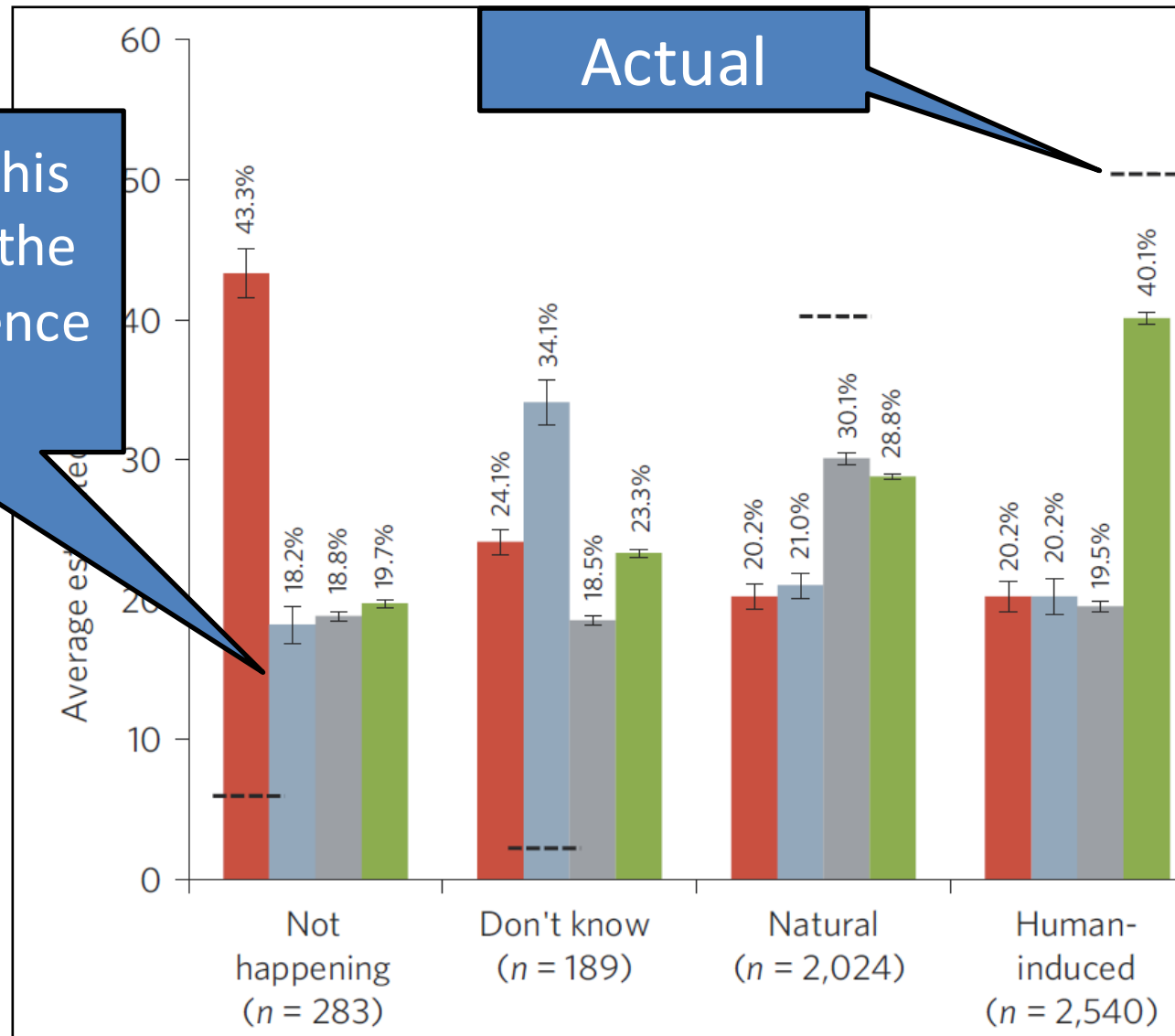
Pluralistic Ignorance and False Consensus Effect

Climate Change: The Public vs. The Public



False Consensus Effect (Leviston et al., 2013)

The greater this discrepancy, the greater resilience to change



When Are Opinions Misperceived? (Shamir & Shamir, 1997)

- Correlated with prominence of an opinion in the media
- Information that is more accessible raises people's estimates of the preponderance of that opinion

When Are Opinions Misperceived? (Shamir & Shamir, 1997)

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theguardian

News | Sport | Comment | Culture | Business | Money | Life & styl

Environment > Climate change

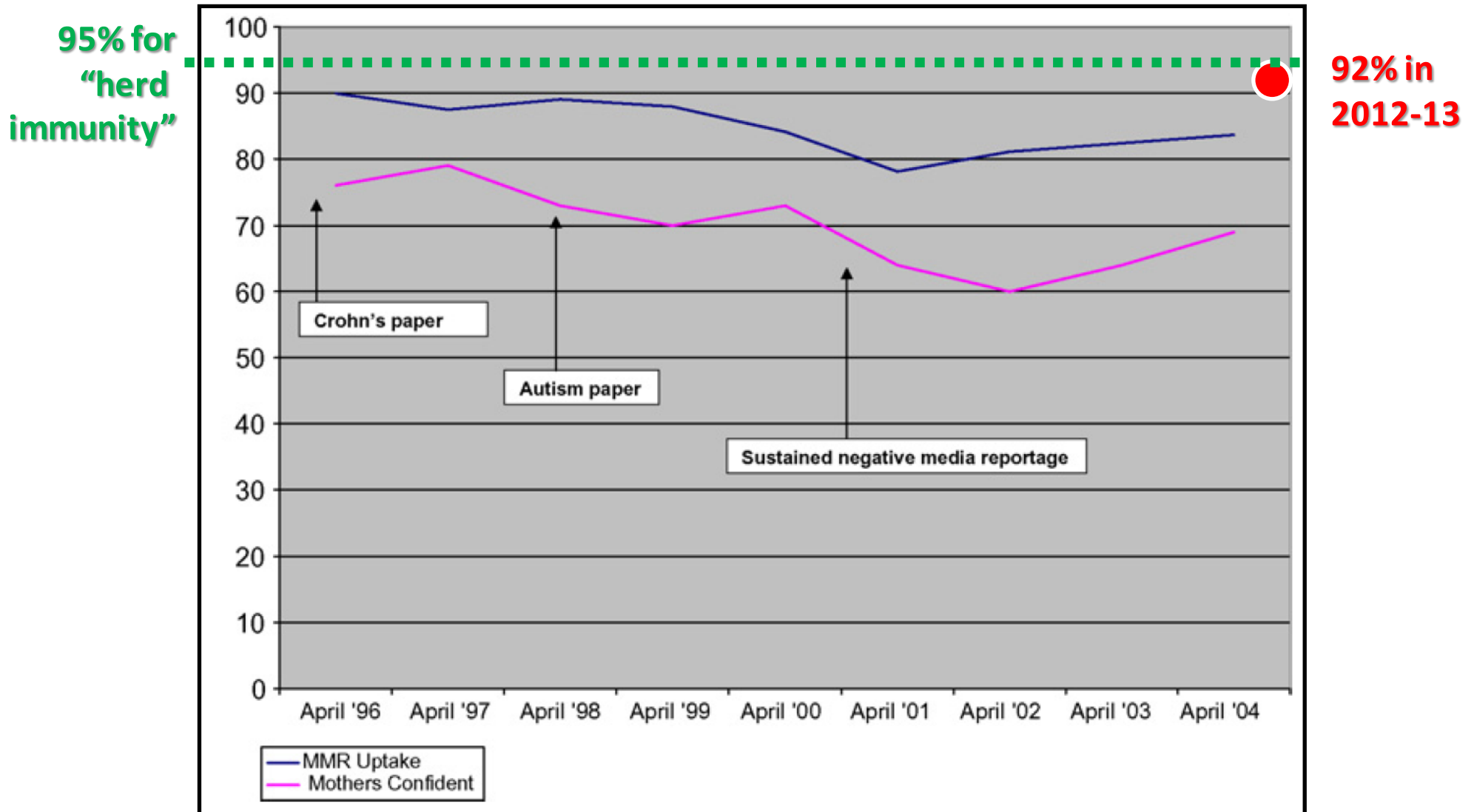
One third of Australia's media coverage rejects climate science, study finds

An academic study has found that 32% of articles dismissed or questioned the link between human activity and climate change

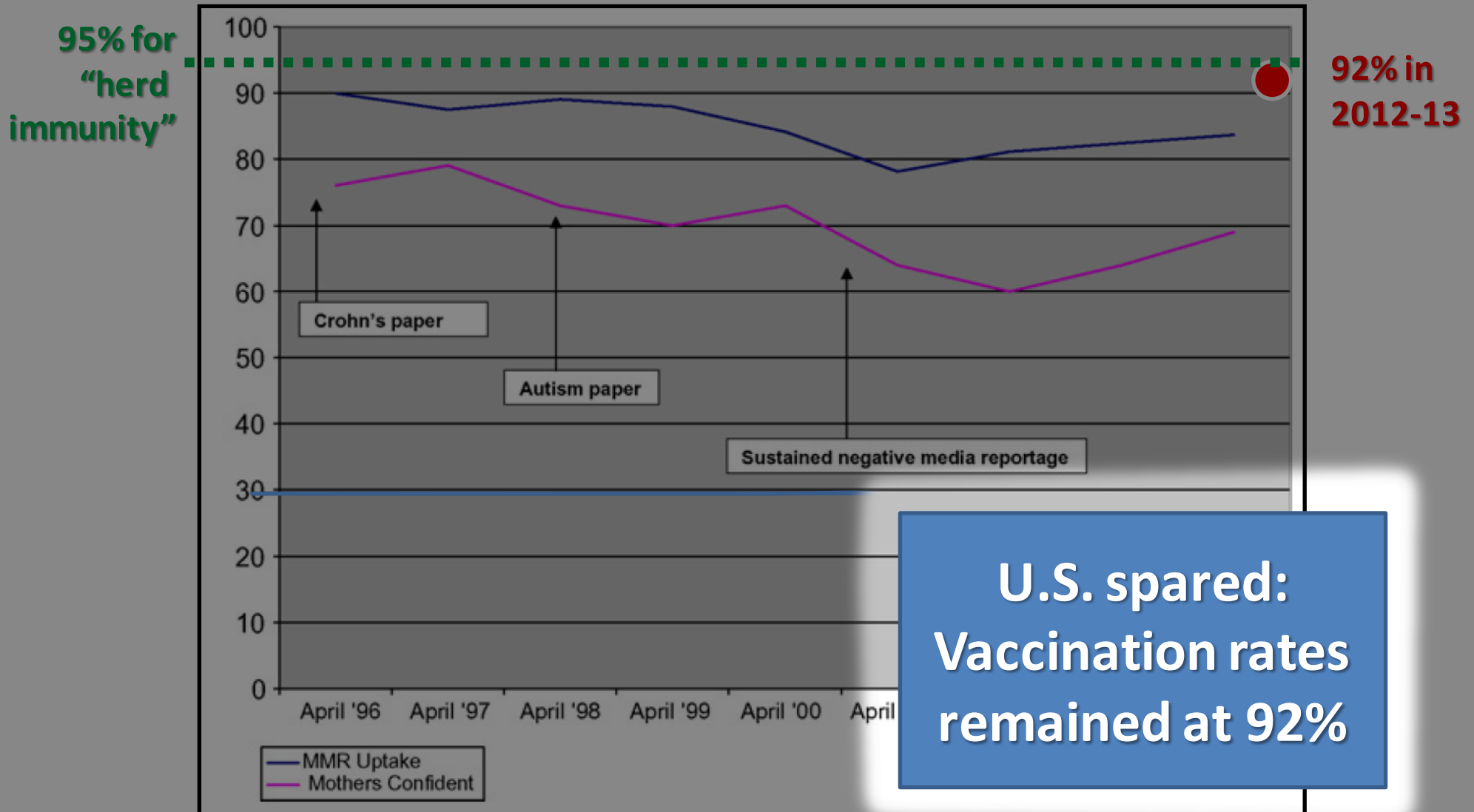
Misinformation

- Scope of the problem and its sources
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U.K. MMR Vaccination Rates (Smith et al., 2007)



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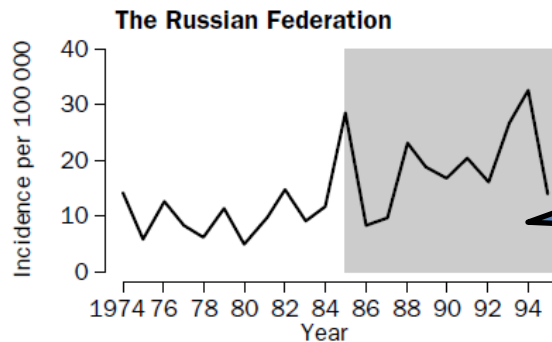
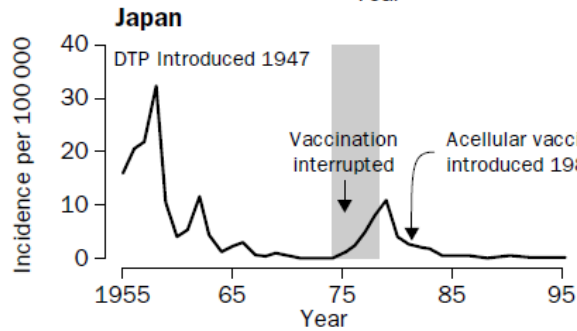
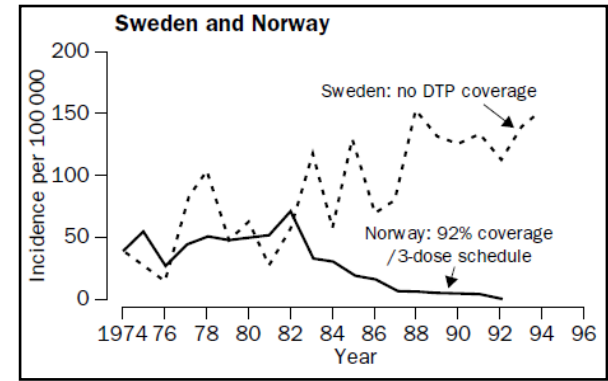
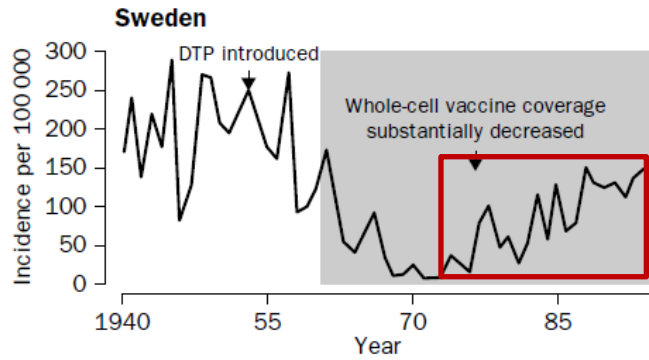


DTP Vaccinations

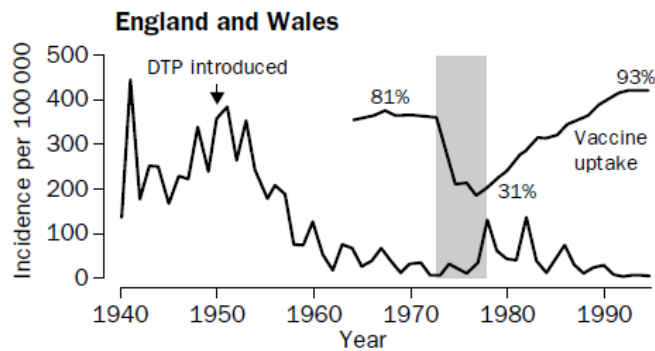
(Gangarosa et al. 1998)

- DTP = diphtheria-tetanus-pertussis
- Pertussis (whooping cough)
 - millions of cases and 100,000's of deaths annually (developing countries)
 - preventable by vaccination
 - difficult to treat and can have serious long-term consequences even in survivors
- Localized opposition provides naturalistic “experiment”

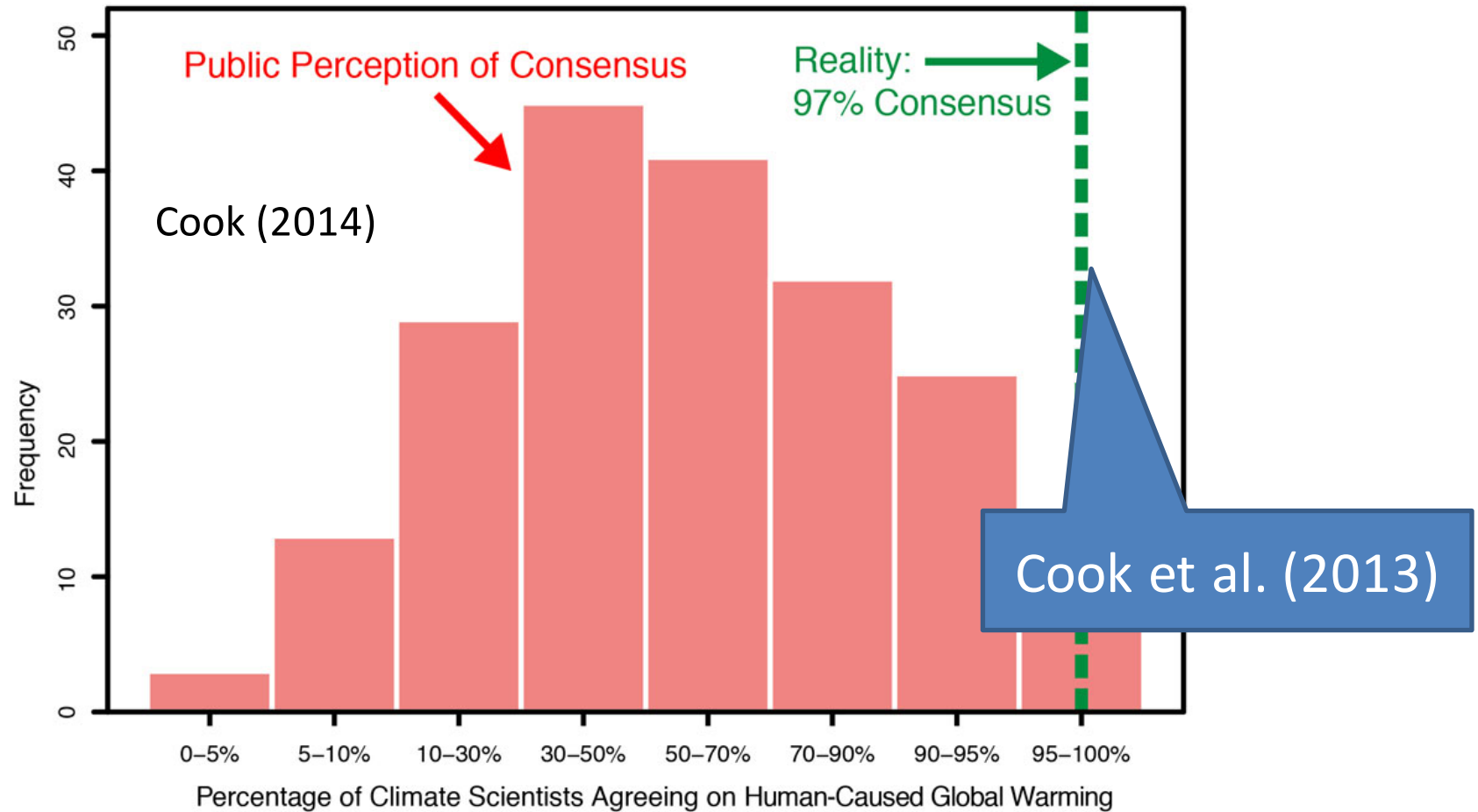
Incidence of pertussis (whooping cough)



Gray shading signifies anti-vaccination movement



Policy Support: Climate Mitigation



Policy Support: Climate Mitigation

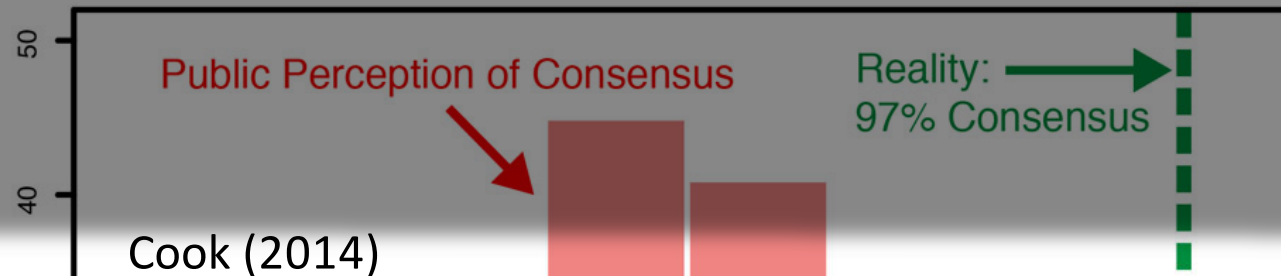


Table 3. Skeptical Arguments by Category and Year

	2007	2008	2009	2010	Total
It's not happening					
Temperature record is unreliable	4	1	4	4	13
It's cooling	17	9	31	23	80
Ice isn't melting	16	6	11	12	45
Climategate/CRU email suggests conspiracy	0	0	27	13	40
Sea level rise is exaggerated	6	0	2	4	12
There is no consensus	45	17	28	39	129

RESEARCH ARTICLE

Open Access



Highlighting consensus among medical scientists increases public support for vaccines: evidence from a randomized experiment

Sander L. van der Linden^{1*}, Chris E. Clarke² and Edward W. Maibach²

- Perception of scientific consensus pivotal for climate-change attitudes (Lewandowsky et al., 2013; Cook & Lewandowsky, 2016; van der Linden et al., 2015)

Misinformation

- Scope of the problem and its sources
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How and What *Do* People Believe?

- Norms of everyday conversational conduct suggests speakers are *truthful* and *relevant* (Grice, 1975).
- Comprehension often impossible without initial acceptance of truth and hence belief (Gilbert, 1991)
 - people first believe upon comprehension ...
 - then attach negation “tag” (unless they are distracted)
 - negation tag may be forgotten sooner than the to-be-negated information

Fluency and Truth (Reber & Schwarz, 1999).

Bolligen is a city in Switzerland

Osorno is a city in Chile

- If it's easy to read or understand (no accent), material is more likely to be judged true.
- “Fluency” is taken to be an indicator of compatibility with prior knowledge.

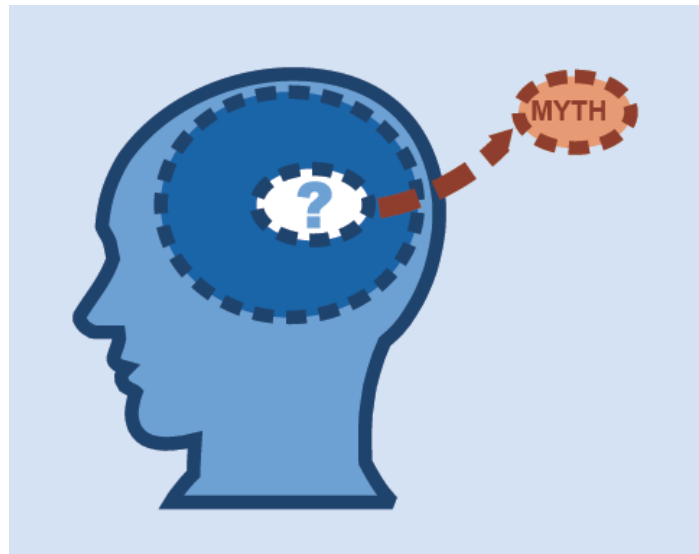
Misinformation

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Pretrial Publicity

- **Notwithstanding standard admonition to ignore pretrial publicity** **“Guilty”**
- *Control* **45%**
- *Pretrial publicity: Inflammatory articles prior to transcript* **80%**

Why Does Misinformation Persist?



- Correction of misinformation leaves a gaping hole in people's event model.
- People prefer a *wrong* model to an *incomplete* model.

That Was the Good News

Misinformation

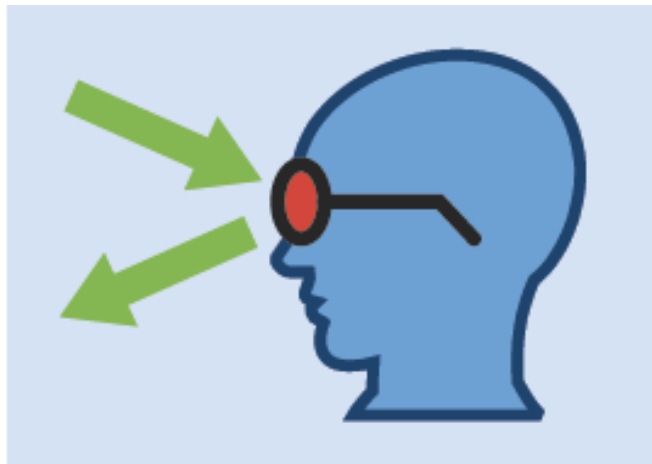
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Backfire or Boomerang Effects

- Corrections can make things worse
- Telling people that something is wrong may make them believe *more* in the *wrong* information
 - worldview backfire effect
 - (familiarity backfire effect)

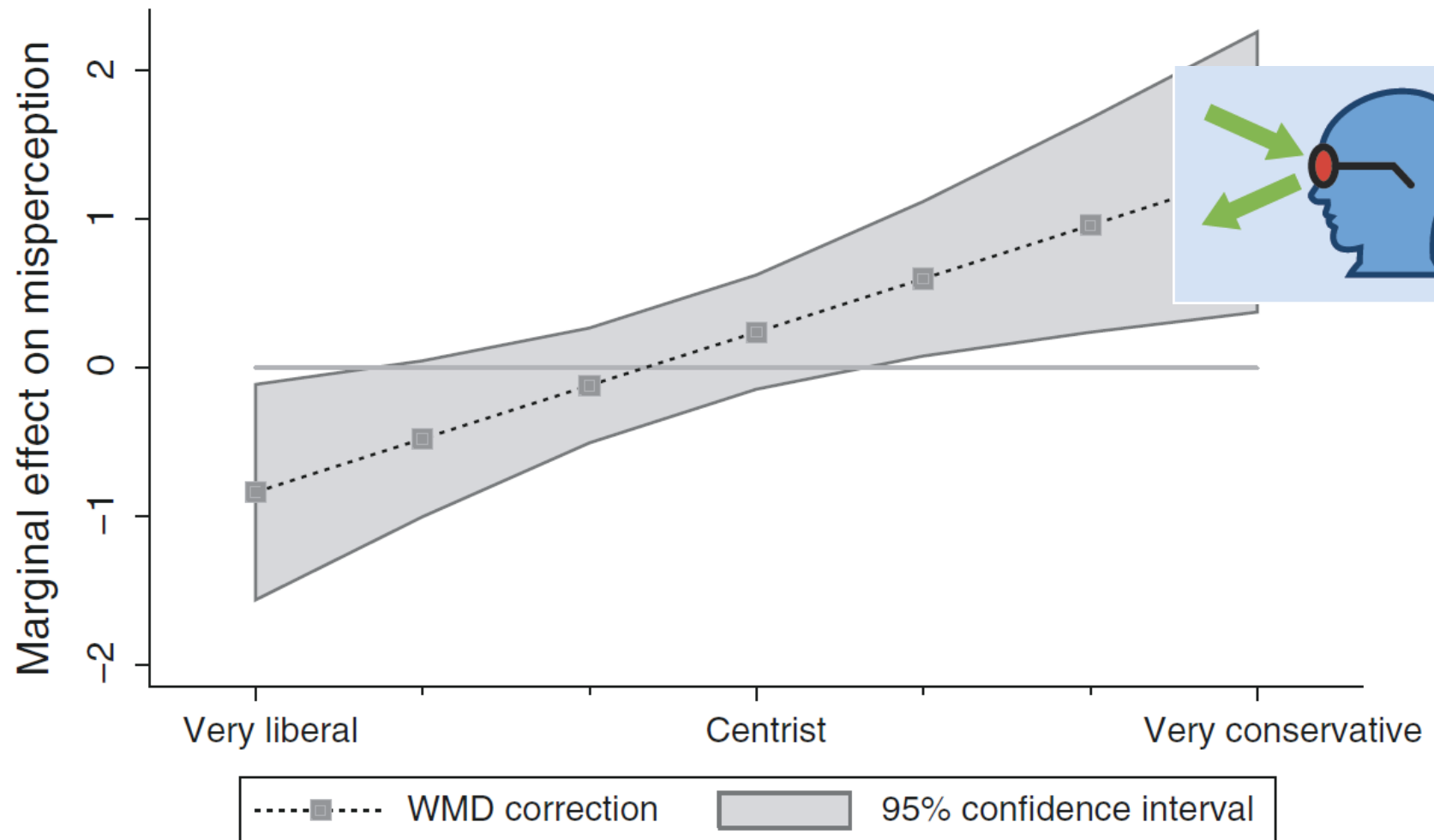
Worldview Backfire Effect

- Belief in WMD split along partisan lines
 - Republicans **61%** (average 2006 - 2008)
 - Democrats **18%**
- What happens if corrective information is presented?



Worldview Backfire Effect

(Nyhan & Reifler, 2010)



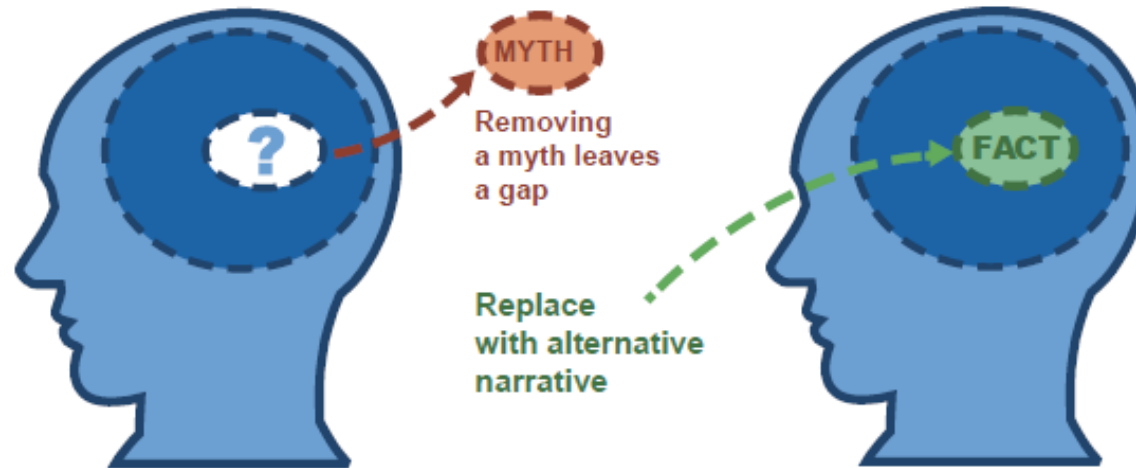
Worldview Backfire Effect

- People actively counter-argue to resist the correction (Prasad et al., 2009).
- Initially-held incorrect beliefs become *more* entrenched.
- Some evidence for ideological symmetry of worldview effects (i.e., for political left, Nyhan & Reifler, 2010).
- Also shown for vaccinations (in people who have negative pre-existing attitudes, Nyhan et al., 2014).

Misinformation

- Scope of the problem and its sources
- Does it matter?
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- **Successful debiasing**

Providing an Alternative



- Correction of misinformation leaves a gaping hole in people's *event model*.
- But they like a *correct* alternative even better.

Pretrial Publicity Revisited

- All participants read transcript of murder trial and deliver verdict. **“Guilty”**
- *Control* **45%**
- *Pretrial publicity*: Inflammatory articles prior to transcript **80%**
- *Suspicion*: Inflammatory articles followed by suggestion that prosecutor planted them **36%**

Fein et al. (1997)

Pretrial Publicity Revisited

- All participants read transcript of murder trial and deliver verdict. “Guilty”
- *Control* 45%
- *Pretrial publicity*: Inflammatory articles prior to transcript 80%
- *Suspicion*: Inflammatory articles followed by suggestion that prosecutor planted them 36%

Fein et al. (1997)

Suspicion and Inoculation

- Research on misinformation: Correction effective if people are:
 - skeptical of a source
 - suspicious of motives
 - people who doubted that Iraq War was over WMD processed information more accurately (Lewandowsky et al., 2005, 2009)
- Important to analyze denial and publicize their techniques

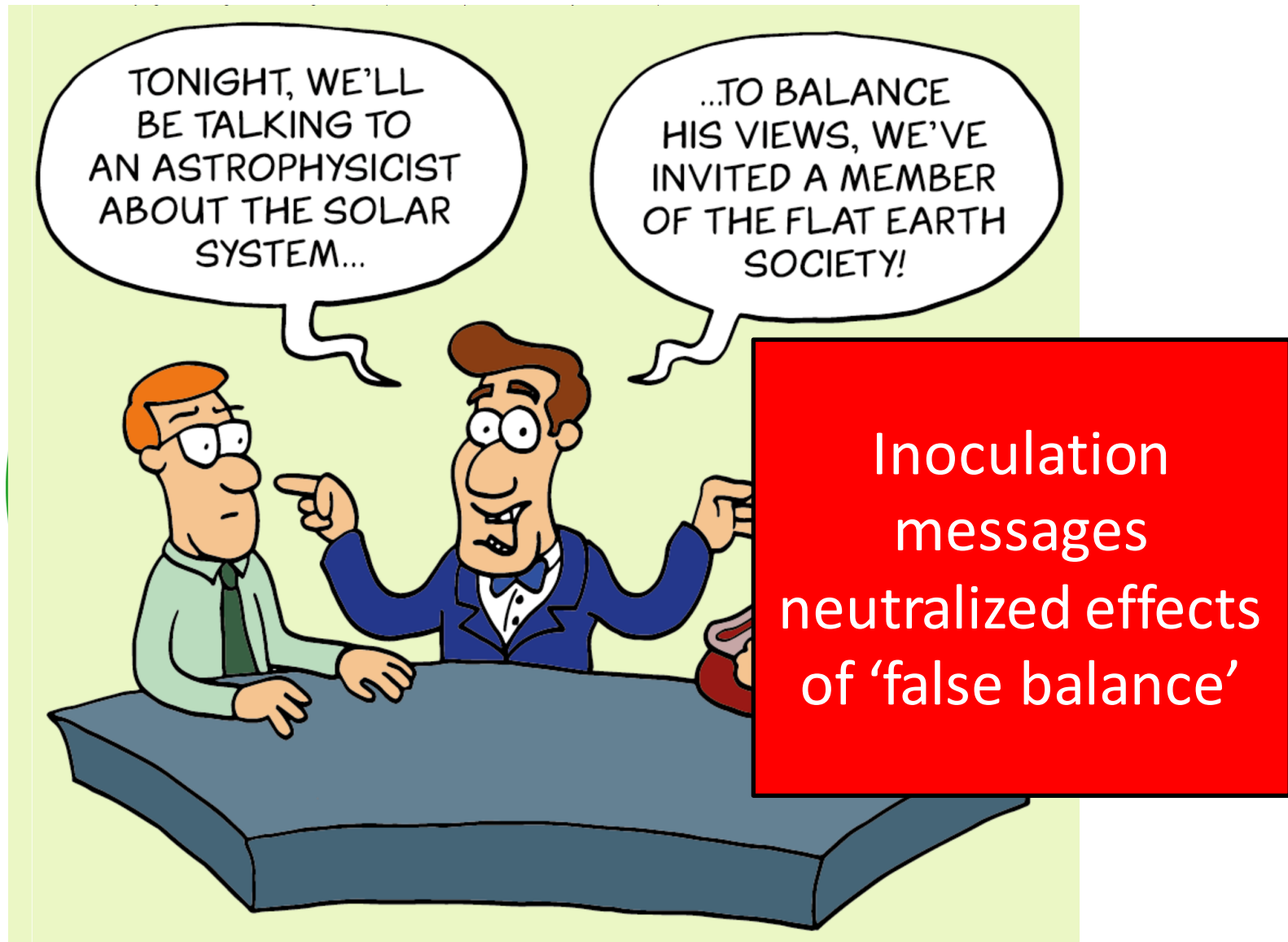
Inoculation

(Cook, Lewandowsky, & Ecker, 2017)



Inoculation

(Cook, Lewandowsky, & Ecker, 2017)



Successful Debunking

- People can discount misinformation if they are suspicious or skeptical of motives
- People can discount misinformation when there is a causal alternative
 - if an alternative explanation for an event is provided
 - if people discover misinformation was “astroturfed” by a “front group”
 - which can discredit hidden sponsor

Successful Debunking

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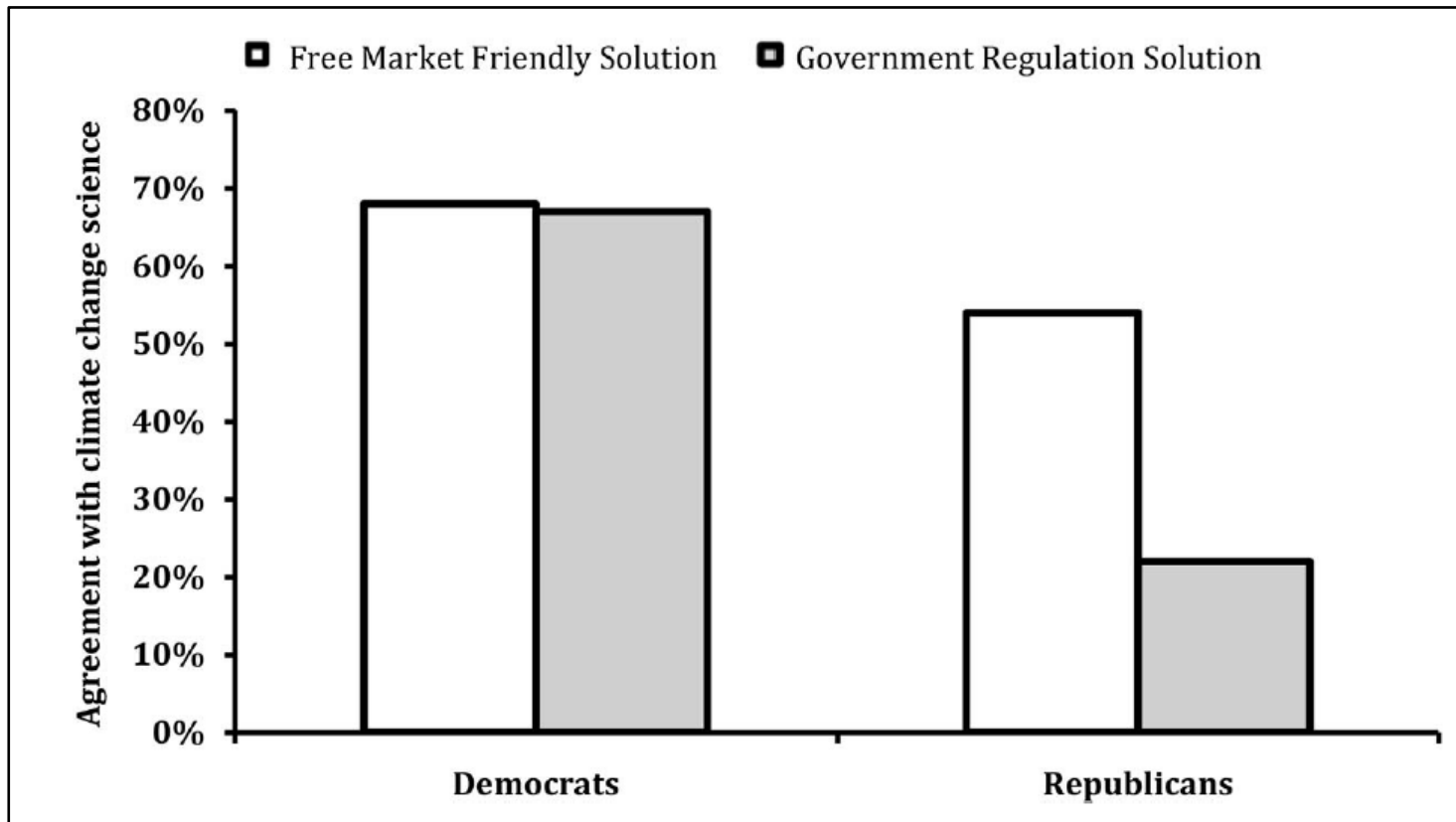
Remember Richard Blake?
Who died of a drug overdose ...

“The toxicology report was negative and the cause of death was linked to cardiac problems”

Renewable Energy

Solution Aversion: On the Relation Between Ideology and Motivated Disbelief

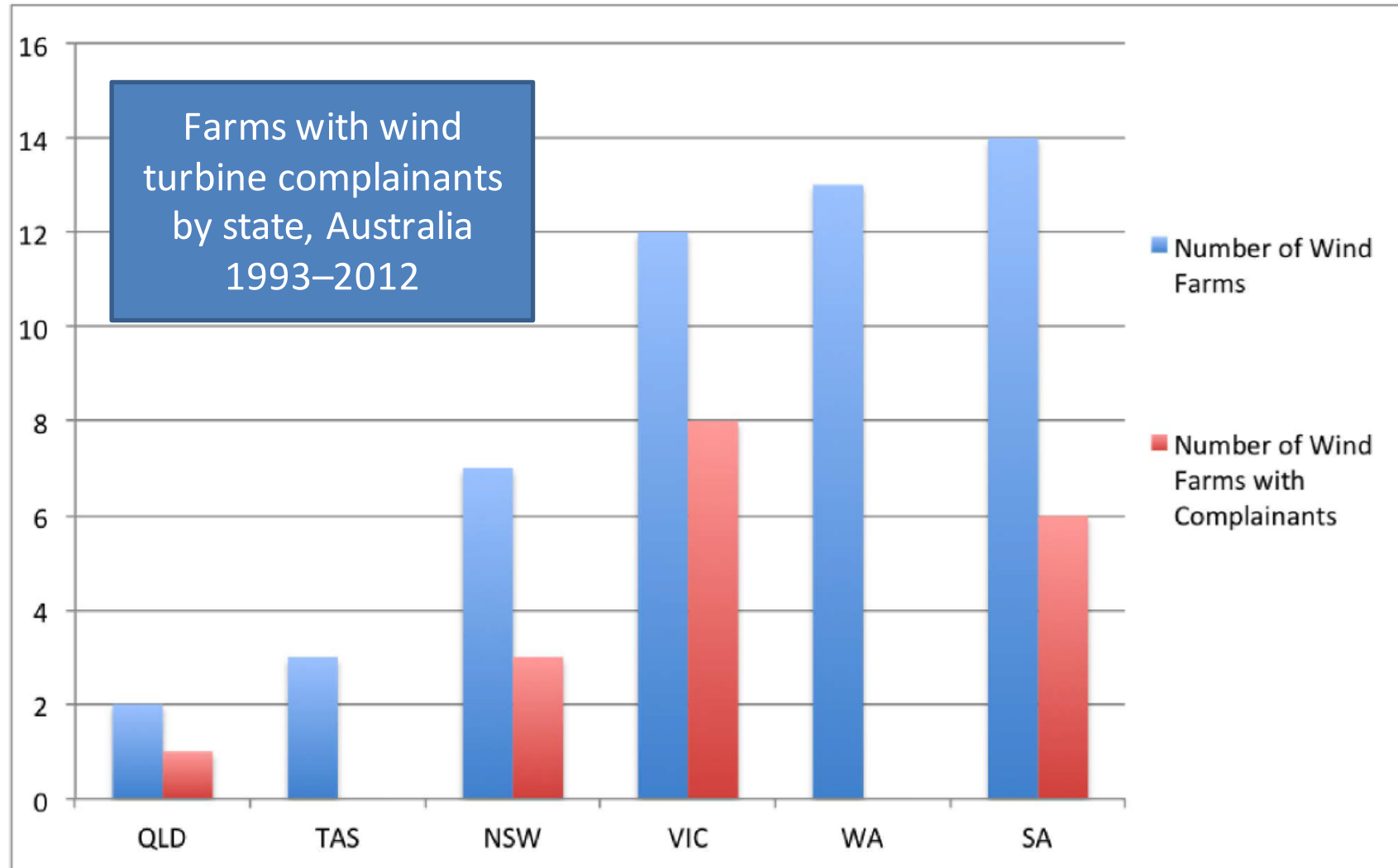
Troy H. Campbell and Aaron C. Kay
Duke University



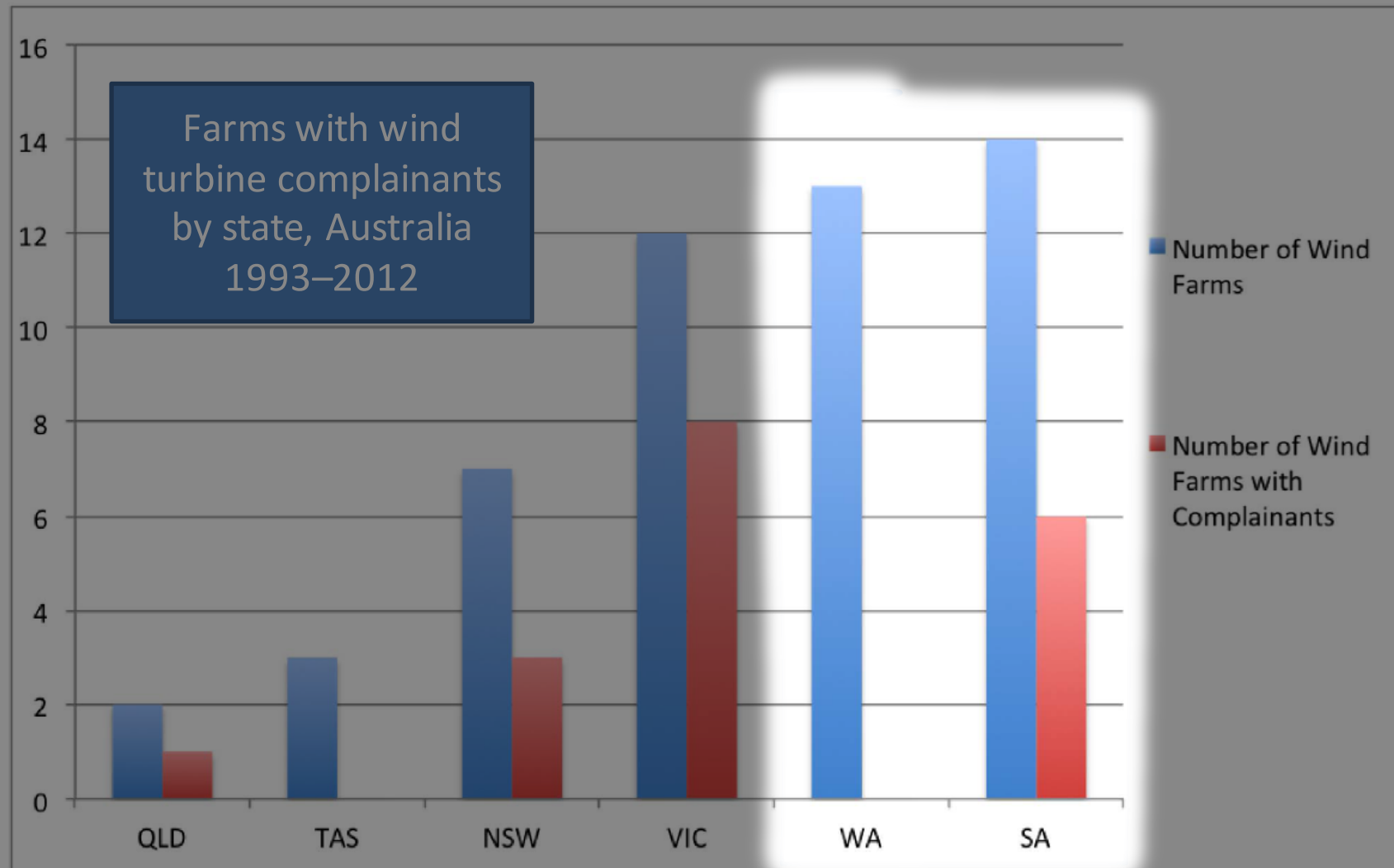
Wind Turbines

- There are no verifiable adverse health effects of wind turbines
- ... although there is a lot of pseudoscience to suggest otherwise ...
- ... and although health complaints from the public seem to suggest otherwise

Nocebo Effect (e.g., Chapman et al., 2013)



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Nocebo Effect

(e.g., Chapman et al., 2013)

- Only 129 individuals ever complained (out of 32,000+ residents within 5km)
- 116/129 (90%) of complainants made their first complaint after 2009 when anti wind farm groups began campaign
- Laboratory evidence suggests that expectation determines symptomology (Crichton et al., 2013).

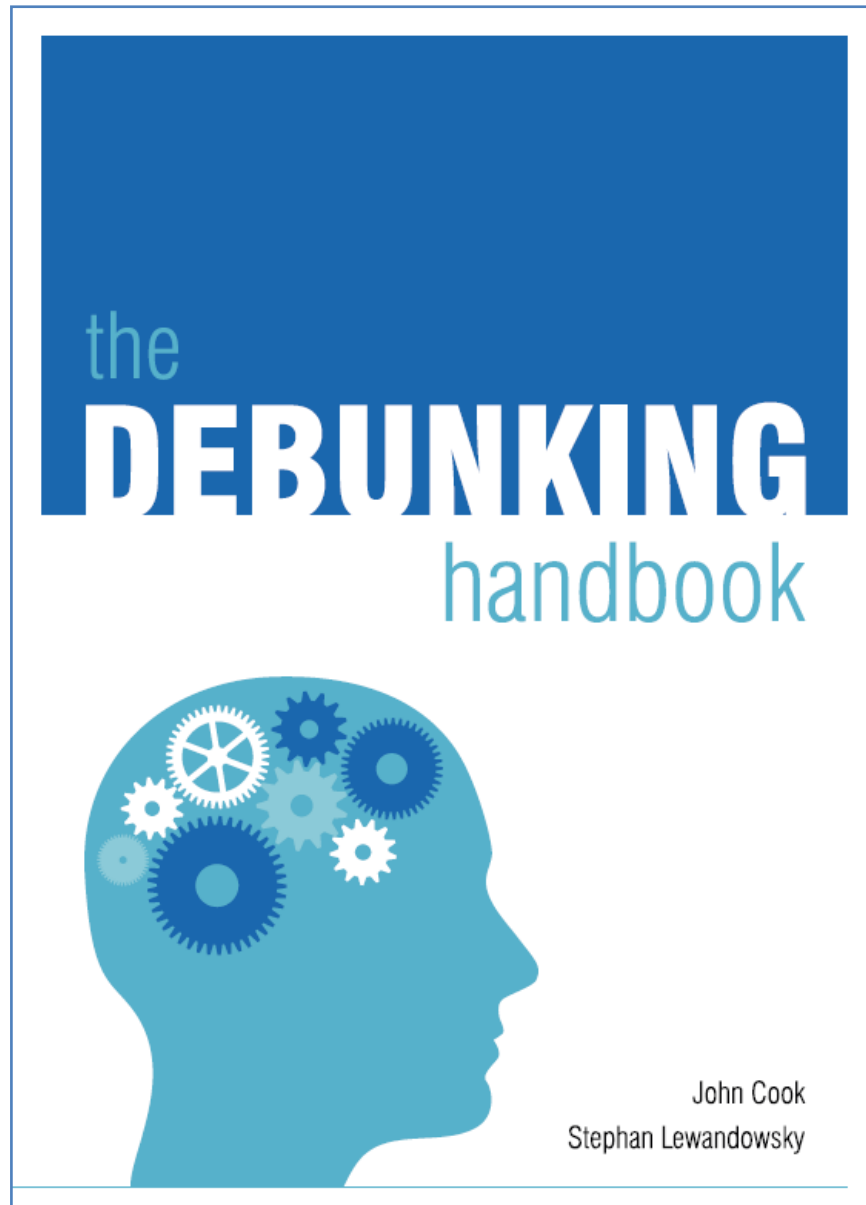
Nocebo Effect

(e.g., Chapman et al., 2013)

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Use this information to
induce skepticism

Thank You.



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Dutch, Polish,
Swedish, Spanish,
and Italian

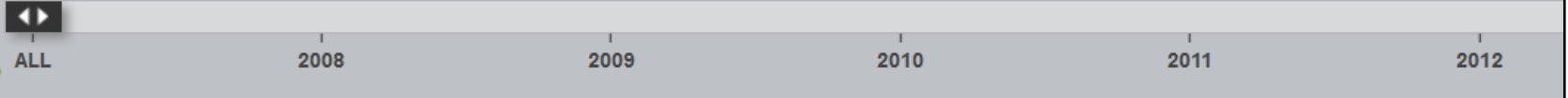
<http://sks.to/debunk>

The End

Vaccine-Preventable Outbreaks

INTRODUCTION

MAP



Filter by:

Disease

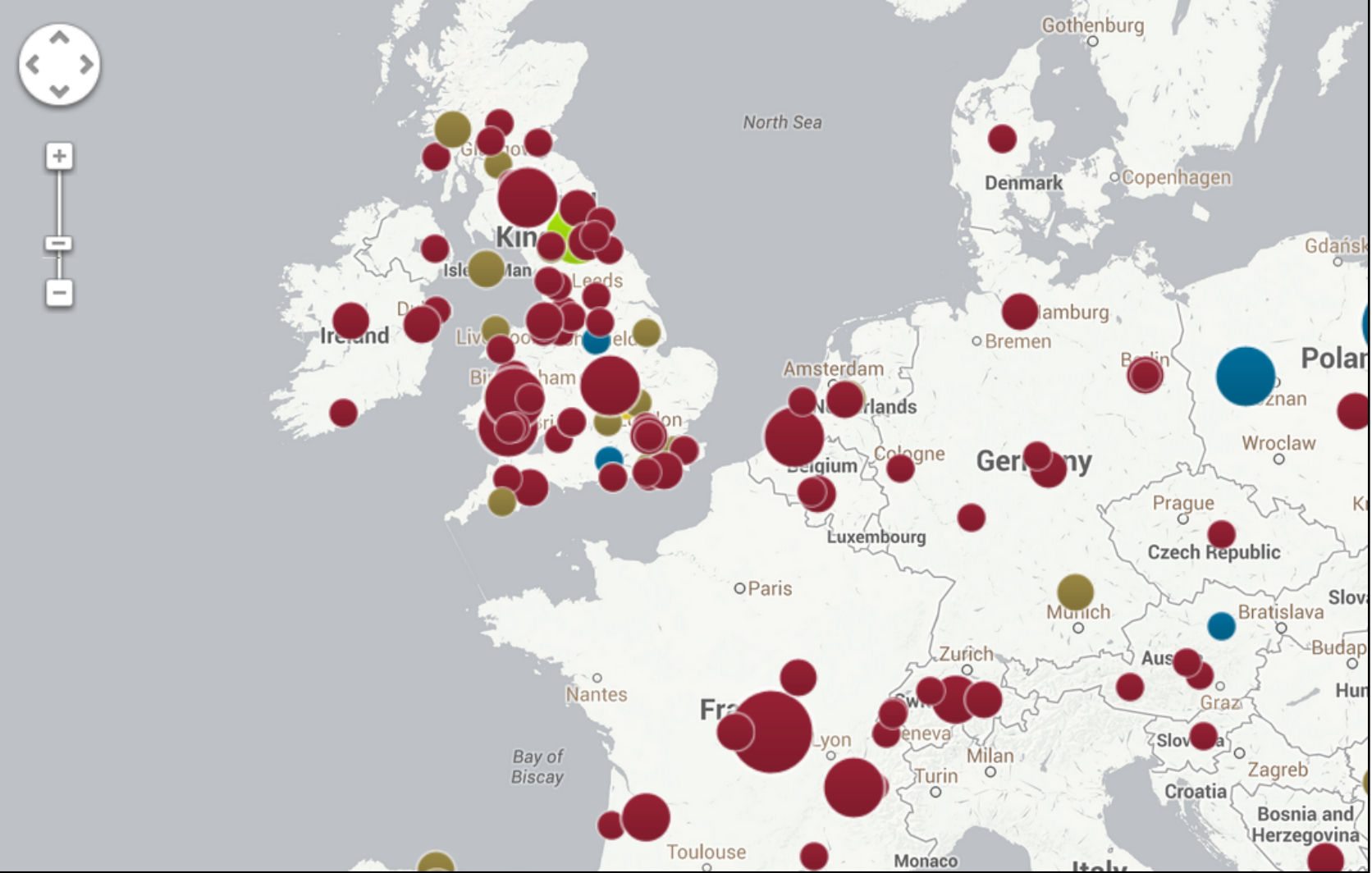
- Measles
- Mumps
- Rubella
- Polio
- Whooping Cough
- Other

Region

- All
- Asia
- Africa
- Europe
- North America
- South America
- Australia

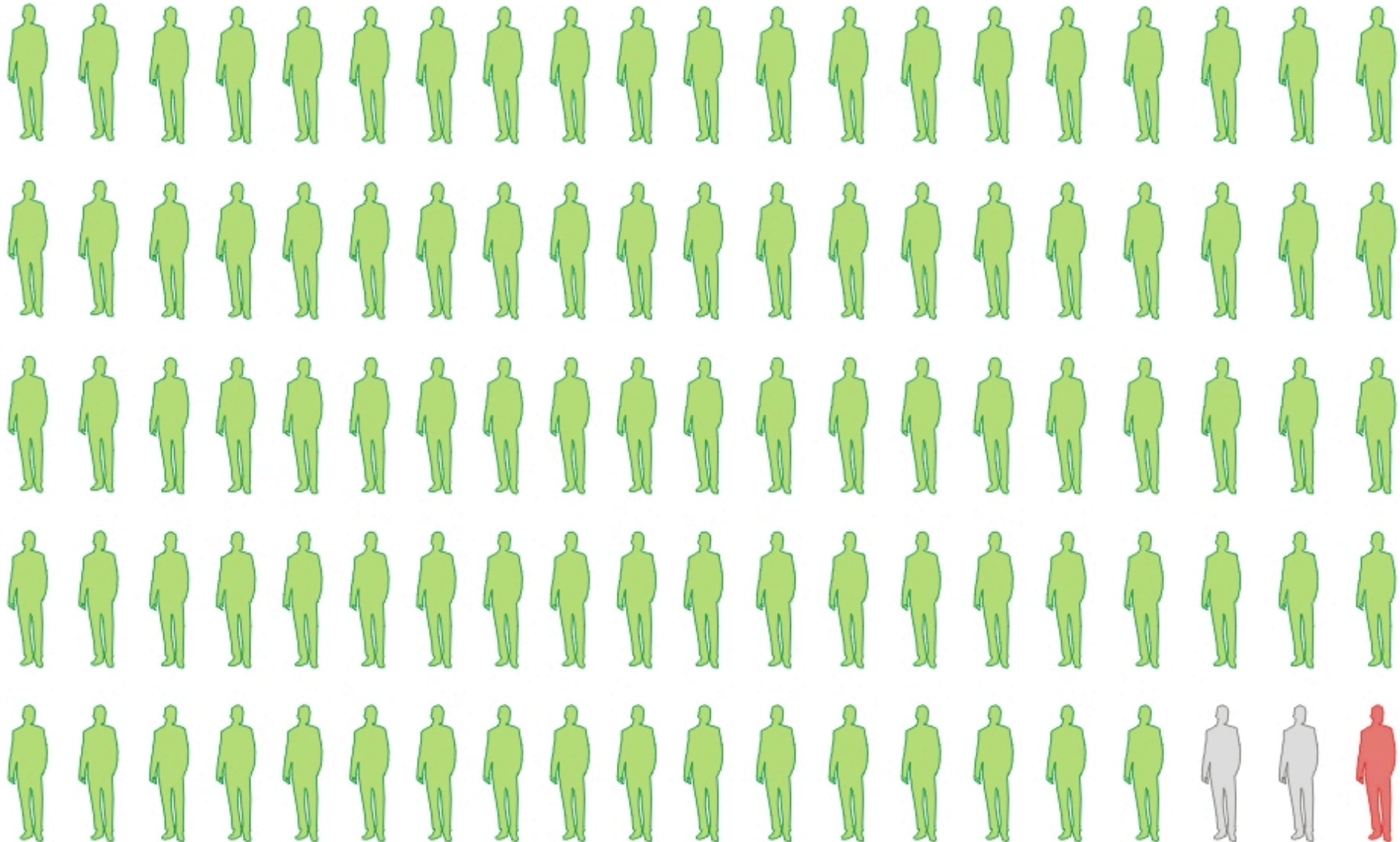
SUBMIT A POINT

CREDITS



http://www.cfr.org/interactives/GH_Vaccine_Map/#map

97 out of 100 climate experts think humans are causing global warming



97 out of 100 climate experts think human activity is driving climate change

Item	Condition	
	Control	Consensus
(a) Acceptance of scientific propositions*		
CO ₂ emissions cause climate change	3.96 (0.081)	4.35 (0.146)
Smoking causes lung cancer	4.63 (0.069)	4.72 (0.109)
HIV virus causes AIDS	4.24 (0.106)	4.61 (0.146)
(b) Perceived consensus among scientists		
Emissions and climate change	67.28 (3.11)	88.47 (3.66)
Smoking and lung cancer	91.81 (1.90)	92.79 (2.62)
HIV and AIDS	84.83 (2.79)	91.21 (3.16)
(c) General climate trends[†]		
Increase in atmospheric temperature	60.53 (2.42)	71.86 (3.05)
Increase of global sea level	61.52 (2.94)	66.28 (3.15)
Doubling of weather-related natural disasters	53.26 (3.38)	57.56 (3.52)

Broader Context

- ...activists with ties to the Tea Party ... brand ... preserving open space as ... a United Nations-led conspiracy to deny property rights... They are showing up at planning meetings to denounce bike lanes ... and smart meters...



Broader Fallout of Conspiracism

British Journal of Psychology (2012)
© 2012 The British Psychological Society



The British
Psychological Society

www.wileyonlinelibrary.com

The social consequences of conspiracism: Exposure to conspiracy theories decreases intentions to engage in politics and to reduce one's carbon footprint

Daniel Jolley* and Karen M. Douglas*

University of Kent, Canterbury, UK

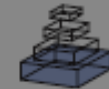
Broader Fallout of Conspiracism

frontiers in
PSYCHOLOGY

ORIGINAL RESEARCH ARTICLE

published: 18 July 2013

doi: 10.3389/fpsyg.2013.00453



The Sarrazin effect: the presence of absurd statements in conspiracy theories makes canonical information less plausible

Marius Hans Raab, Nikolas Auer, Stefan A. Ortlieb and Claus-Christian Carbon*

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Reptile prime ministers and flying Nazi saucers—extreme and sometimes off-wall conclusion are typical ingredients of conspiracy theories. While individual differences are a common research topic concerning conspiracy theories, the role of extreme statements in the process of acquiring and passing on conspiratorial stories has not been regarded in an experimental design so far. We identified six morphological components of conspiracy theories empirically. On the basis of these content categories a set of narrative elements for a 9/11 story was compiled. These elements varied systematically in terms of conspiratorial allegation, i.e., they contained official statements concerning the events of 9/11, statements alleging to a conspiracy limited in time and space as well as extreme statements indicating an all-encompassing cover-up. Using the method of narrative construction, 30 people were given a set of cards with these statements and asked to construct the course of events of 9/11 they deem most plausible. When extreme statements were present in the set, the resulting stories were more conspiratorial; the number of official statements included in the narrative dropped significantly, whereas the