

CLIMATE CHANGE DENIAL AND THE CULTURE OF SCIENTIFIC SKEPTICISM



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PRESENTATION STRUCTURE

1. Terminology
2. James Hansen, Congress, and the American public
3. Types of Deniers
4. Types of Denial Arguments
5. Postmodernism, Public Opinion and Perception
6. Scientific Skepticism

SKEPTICISM OR DENIAL – OR BULVERISM?



SKEPTICISM

- Skepticism: seeking truth within the realization that the world is a complex place
 - Apply critical faculties to both sides of an argument
 - Admit uncertainties
 - Risk management may require appropriate responses regardless of uncertainties (skepticism)



Team Kweeper via Flickr Creative Commons

DENIAL

- Denial: Refusal to believe something no matter the evidence
- Demonstrate 'willful ignorance' and use logical fallacies to maintain unshakeable beliefs



Marc via Flickr Creative Commons

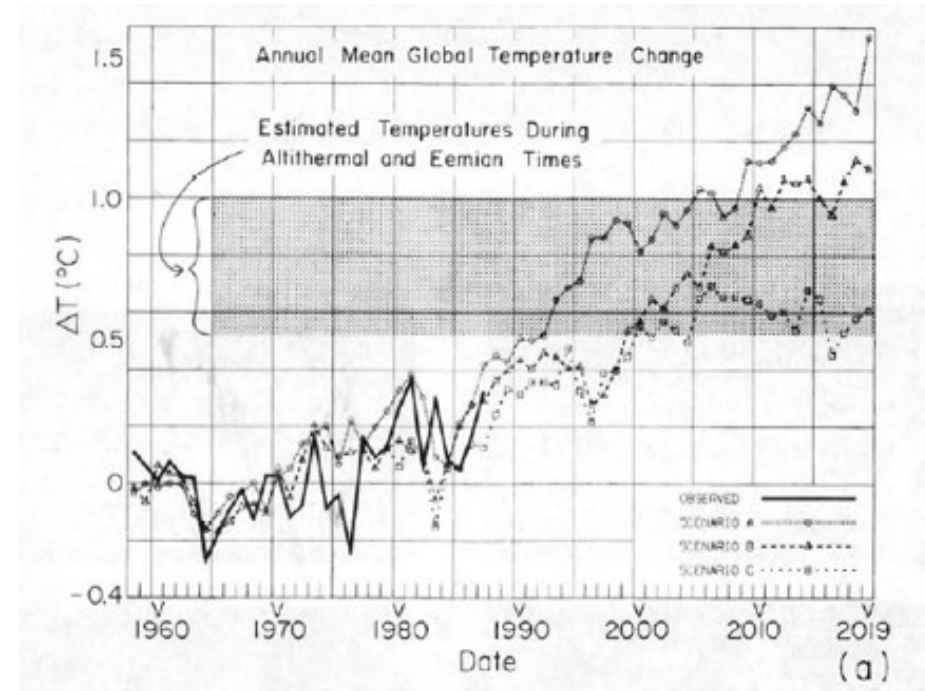
BULVERISM

- Bulverism: avoids need to prove that someone is wrong by first assuming they are wrong, then explaining why they hold their (wrong) view

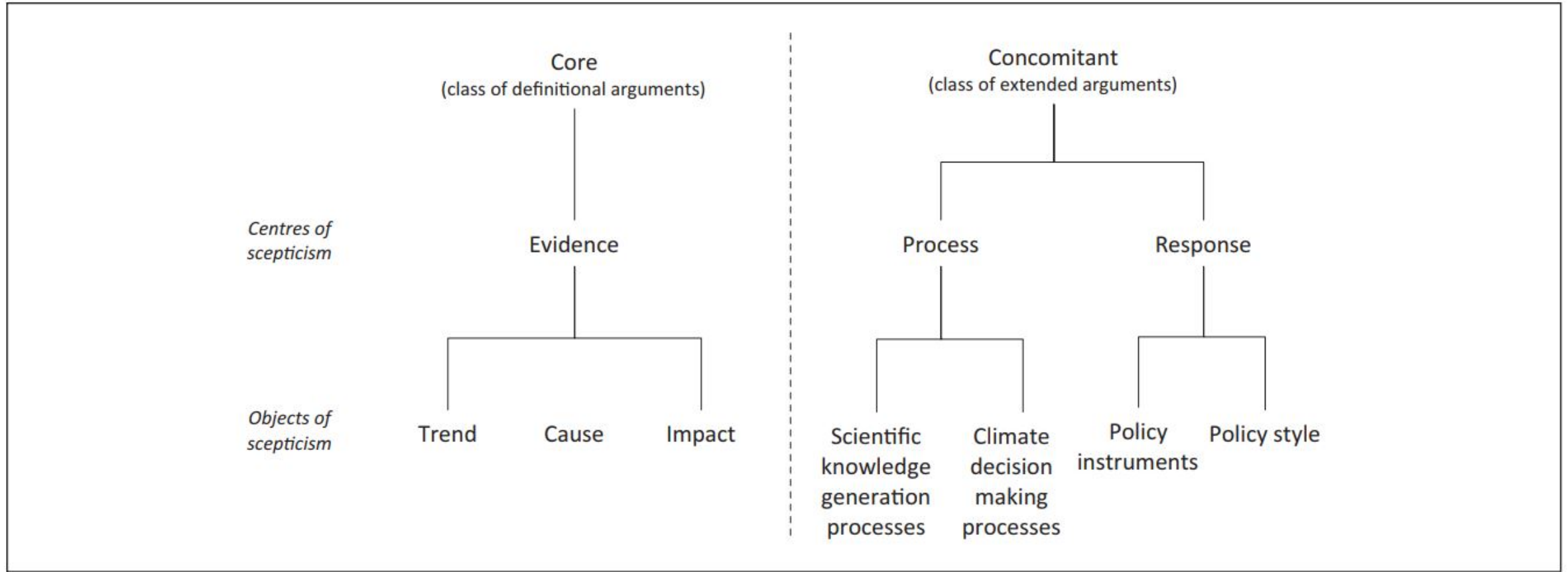


JAMES HANSEN AND THE AMERICAN PUBLIC

- Testified to Congress in 1988
 - First time lead scientist shared connection between human activities, atmospheric pollutants and warming climate
- Brought anthropogenic climate change from a purely scientific realm to public sphere
- 1998 79% of American public believed in anthropogenic climate change
- Inaccuracy in model touted by climate change deniers

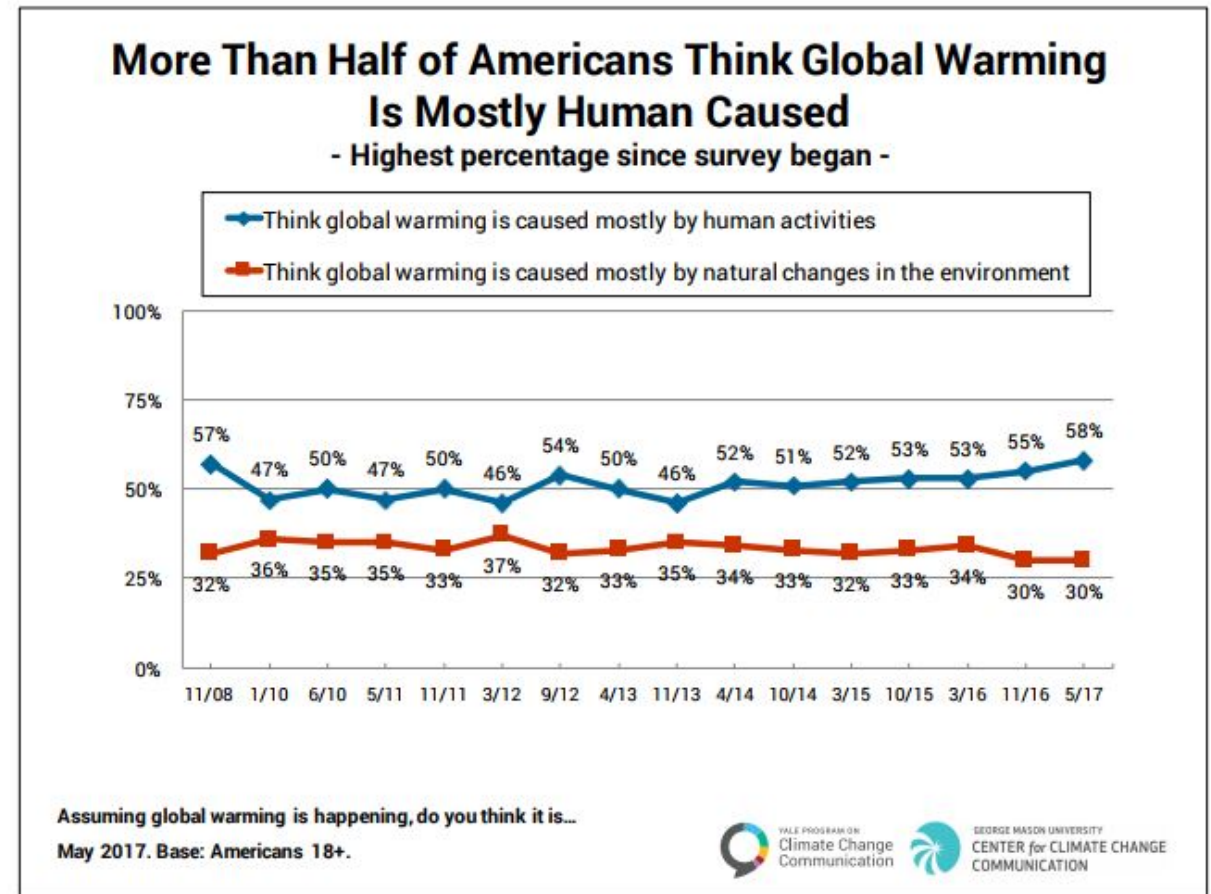


TYPES OF DENIERS: GENERAL



SKEPTIC DEMOGRAPHICS

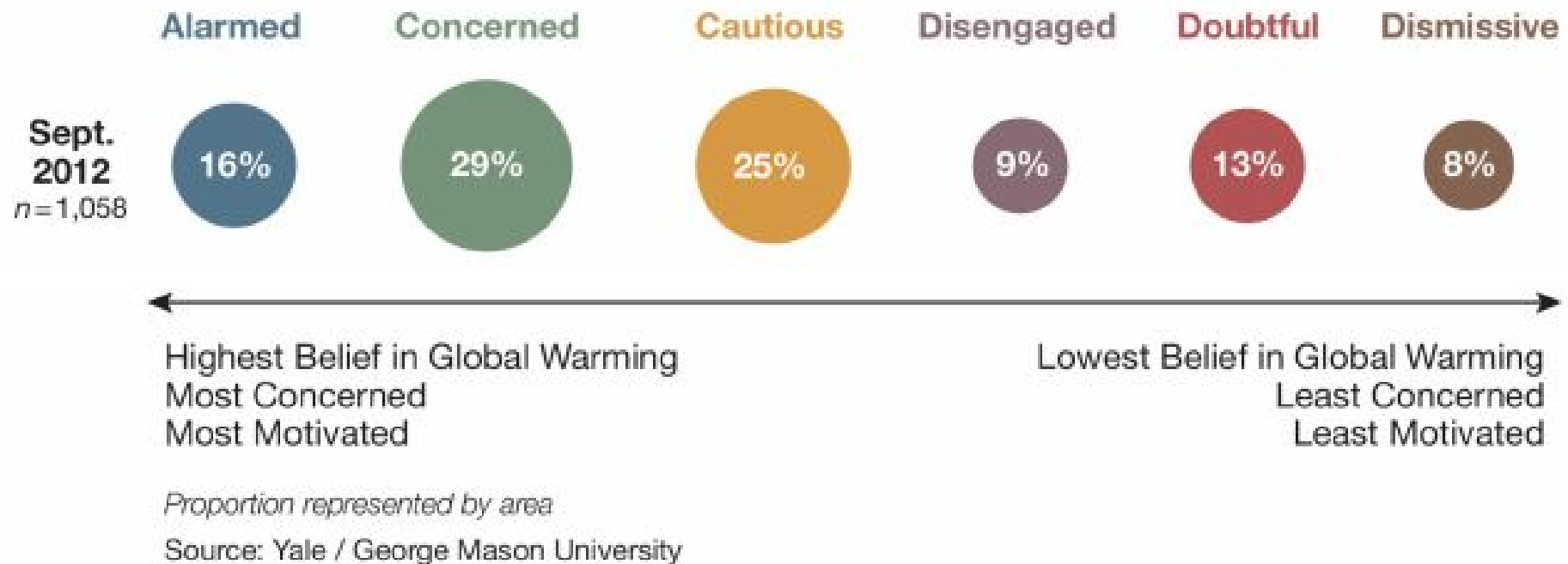
- Political ideology most highly correlates to skepticism regarding climate change
 - Watching Fox News regularly
 - Strongly valuing private property rights
 - Free market ideology
 - Strongly supporting hierarchies
 - Conservative Protestants
- Social, demographic and ideological variables less telling



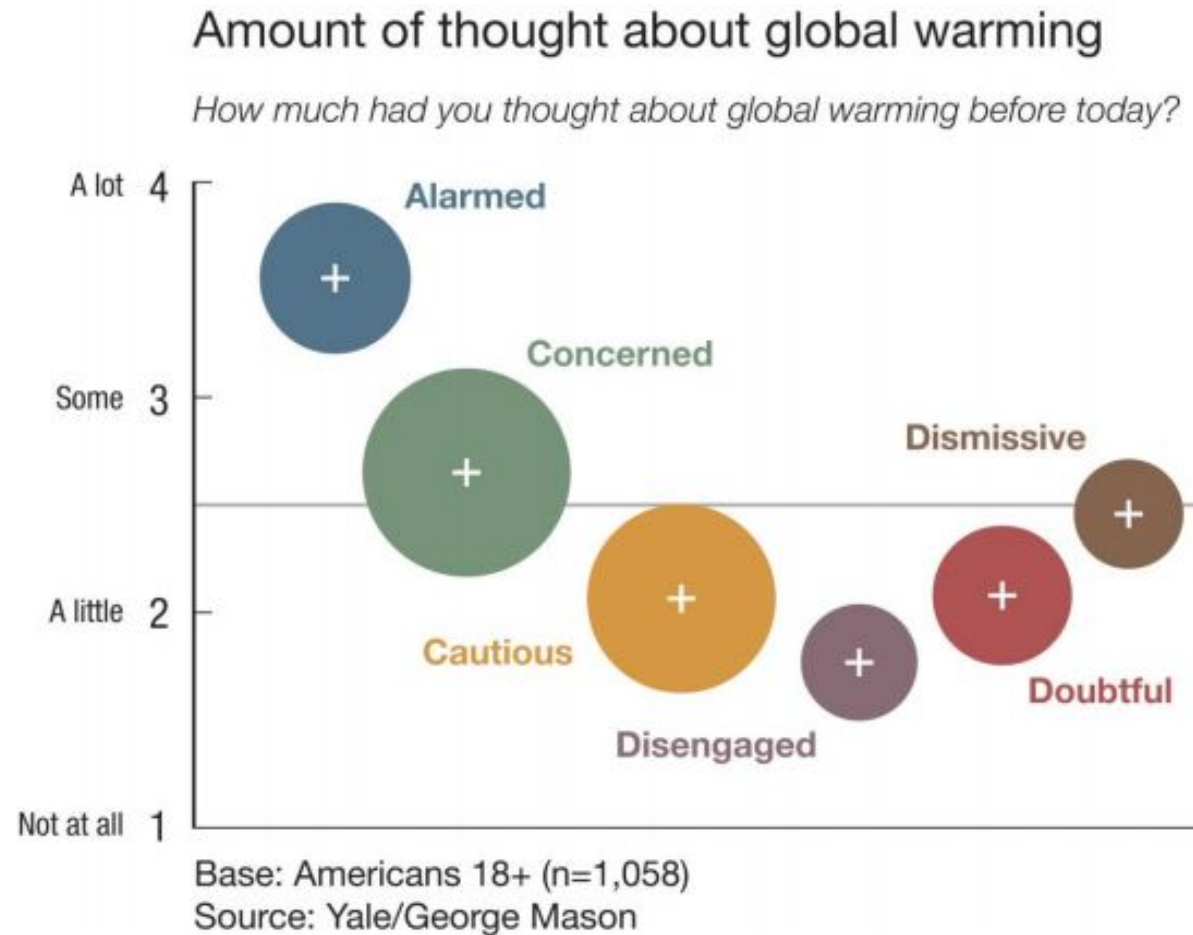
Leiserowitz, A., Maibach, E., Roser-Renouf, C., Rosenthal, S., & Cutler, M. (2017). Climate change in the American mind Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication

McCright, A. M., (2016) Anti-Reflexivity and Climate Change Skepticism in the US General Public Human Ecology Review

COMMUNICATION AND CONSENSUS



COMMUNICATION AND CONSENSUS



CLIMATE CAST

- Minnesota Public Radio News Climate Cast weekly show:
 - “You have to look smaller, and be more specific. It’s in the specificity that you get away from the broad-brush politics, and it also makes it much more interesting for your audience. There’s just so much to talk about the real science – the effects on the economy and people’s lives – that we don’t need to take the ‘Is it really happening’ question. That’s been solved. It’s easy to use the conflict frame, that’s too easy.” – Stephanie Curtis, senior producer of *Climate Cast*

Interview between Sean Lawrence Otto and Stephanie Curtis, September 2016

JUST WORLD BELIEF

- Participants primed to have a stronger belief in a just world
 - Levels of skepticism 29% higher
 - Willingness to reduce carbon footprint: 21% lower
- “These results demonstrate how dire messages warning of the severity of global warming and its presumed dangers can backfire, paradoxically increasing skepticism about global warming by contradicting individuals’ deeply held beliefs that the world is fundamentally just.”



Carla Lombardo Ehrlich for NYT

TYPES OF DENIERS: SCIENTISTS

1. Outright deniers: IPCC is a fraud and climate scientists are fools
2. Combative confrontationalists: automatically adopt position in opposition to any general consensus
3. Professional controversialists: keen to seek recognition by being part of prominent discourse
4. Conflicted naysayers who work closely with industry



TYPES OF DENIAL ARGUMENT

Core objects of scepticism (arguments that define scepticism)			Concomitant objects of scepticism (arguments that strengthen scepticism)			
Evidence			Processes		Response	
Trend	Cause	Impact	Scientific knowledge generation processes	Climate decision-making processes	Policy instruments	Policy style
No postindustrial warming	No CO2 causal mechanism	Negative impacts speculative	Climate change is a hoax	Political interference in IPCC	No problem—no response needed	Economy and jobs should not be harmed
Data inconclusive	Entirely “natural” causes	Extreme weather events unexceptional	A lucrative climate industry now exists	Socialists and Greens drive the climate agenda	Need to prepare for hot or cold scenarios	Wait for global agreement—no unilateral response
Unexceptional warming	Predominantly “natural” causes	Insignificant negative impacts	Climate activists seek fame and money	Wealth redistribution, world government agendas	Better to invest in climate adaptation	A pragmatic and measured response is best
Warming stopped	Too early to tell	Significant positive impacts	Scientists manipulate/hide the evidence	Media sensationalism distort public opinion	Carbon pricing will not cut emissions enough	
		Negative impacts only in distant future	Computer modeling overrated and unreliable	Peer review by “buddies”	The costs of mitigation outweighs the benefits	

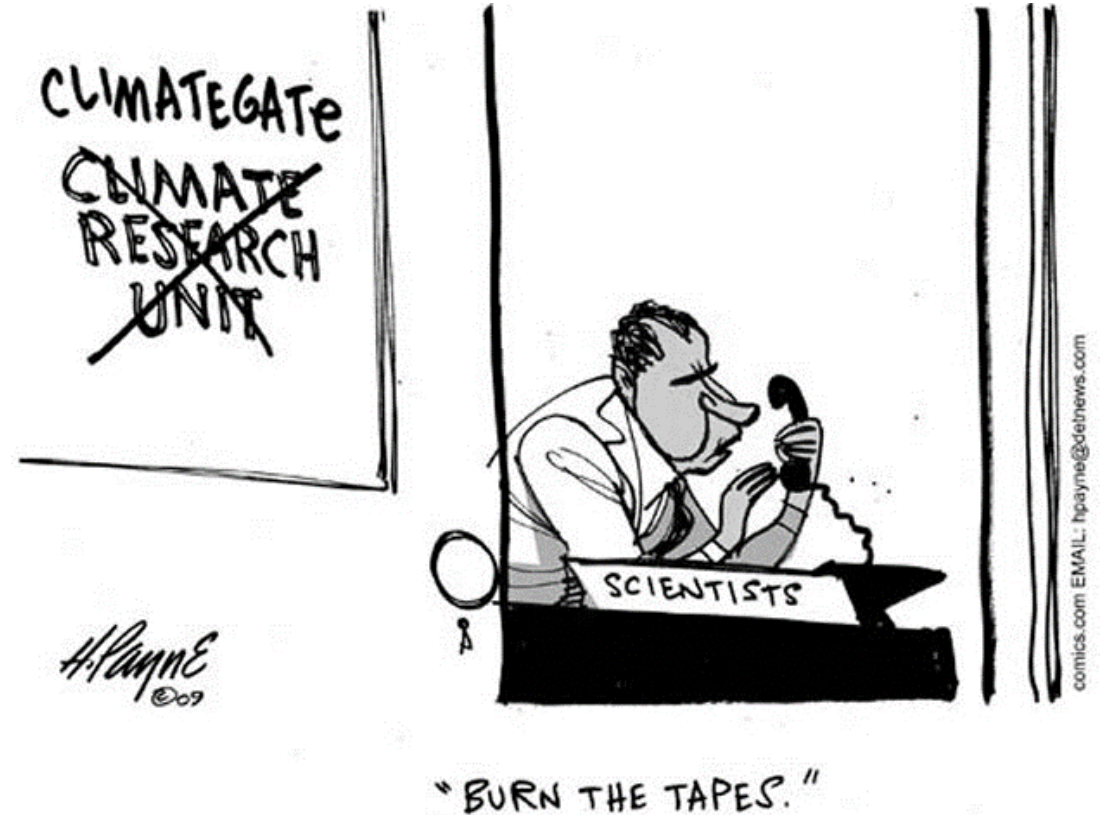
Note. IPCC = Intergovernmental Panel on Climate Change.

TYPES OF DENIAL ARGUMENT

1. Conspiracy theories (Process – scientific knowledge and generation)
2. Fake experts (Process – scientific knowledge and generation)
3. Impossible expectations of what research can offer (Process – scientific knowledge and generation)
4. Misrepresentation and logical fallacies (Process – climate decision making processes)
5. Cherry-picking (Process – scientific knowledge and generation)

1. CONSPIRACY THEORIES: CLIMATEGATE

- November 2009 email hacking at the University of East Anglia in Britain
- “I’ve just completed Mike’s *Nature* trick of adding in the real temps to each series for the last 20 years (i.e. from 1981 onwards) and from 1961 for Keith’s to hide the decline.” – Phil Jones
- “The emails reveal that that leading climate ‘experts’ deliberately destroyed records, manipulated data to ‘hide the decline’ in global temperatures.” – Sarah Palin

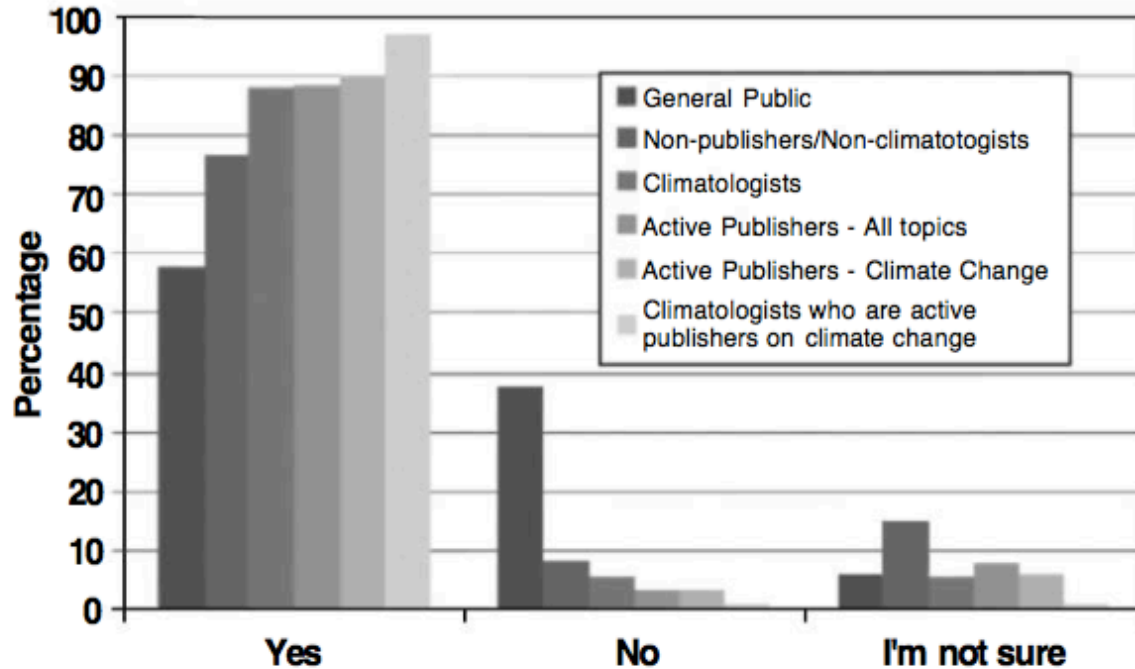


2. FAKE EXPERTS

- The Petition Project: 31,000 people with BSc or higher signed petition rejecting human-caused global warming
 - 0.1% climatologists
- Dr. Wei-Hock Soon paid \$1.2 million; failed to disclose funding in 11 papers
- Conservative think tank publications: *Climate Change: The Facts 2017*



2.5 EXPERTS



Studies into scientific agreement on human-caused global warming



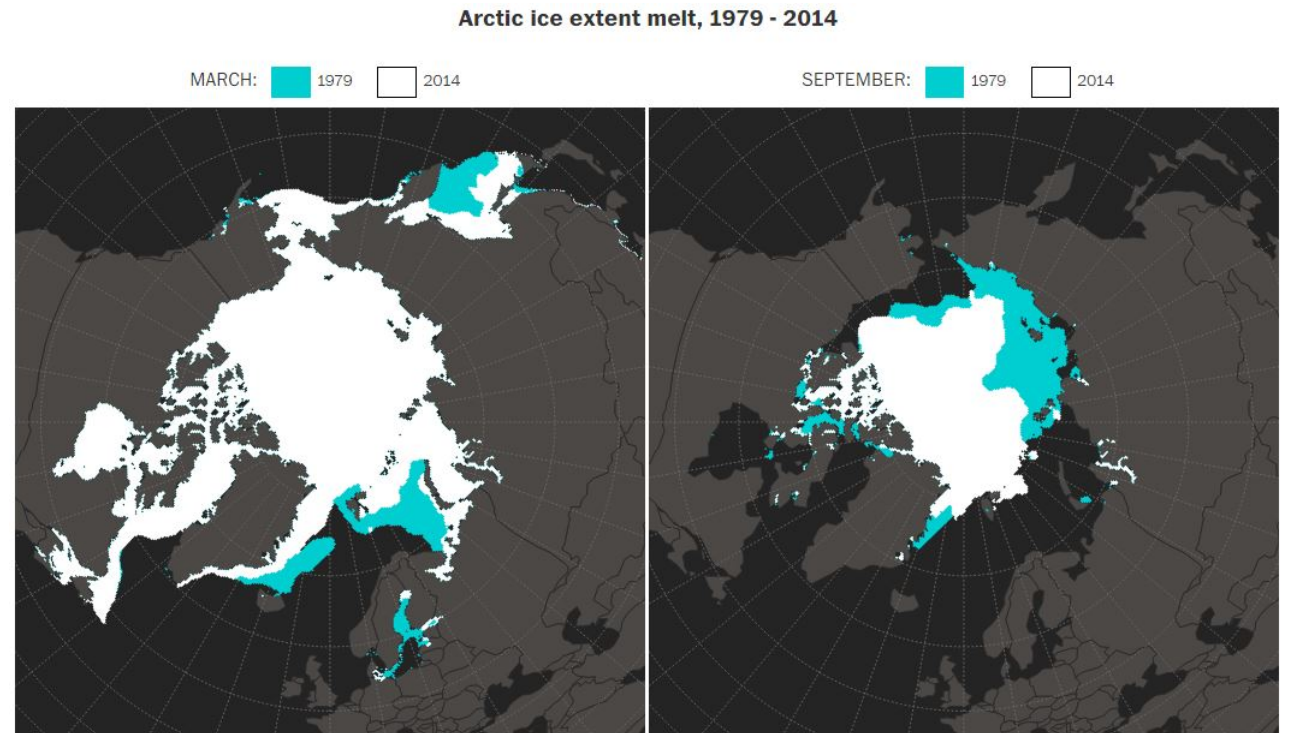
Responses from 2009 Gallup Poll: “Do you think human activity is a significant contributing factor in changing mean global temperatures?”

Doran, P. and M. Zimmerman. (2009) ‘Examining the scientific consensus on climate change’, *Eos, Transactions, American Geophysical Union*, 90 (3):22-23.

www.skepticalscience.com

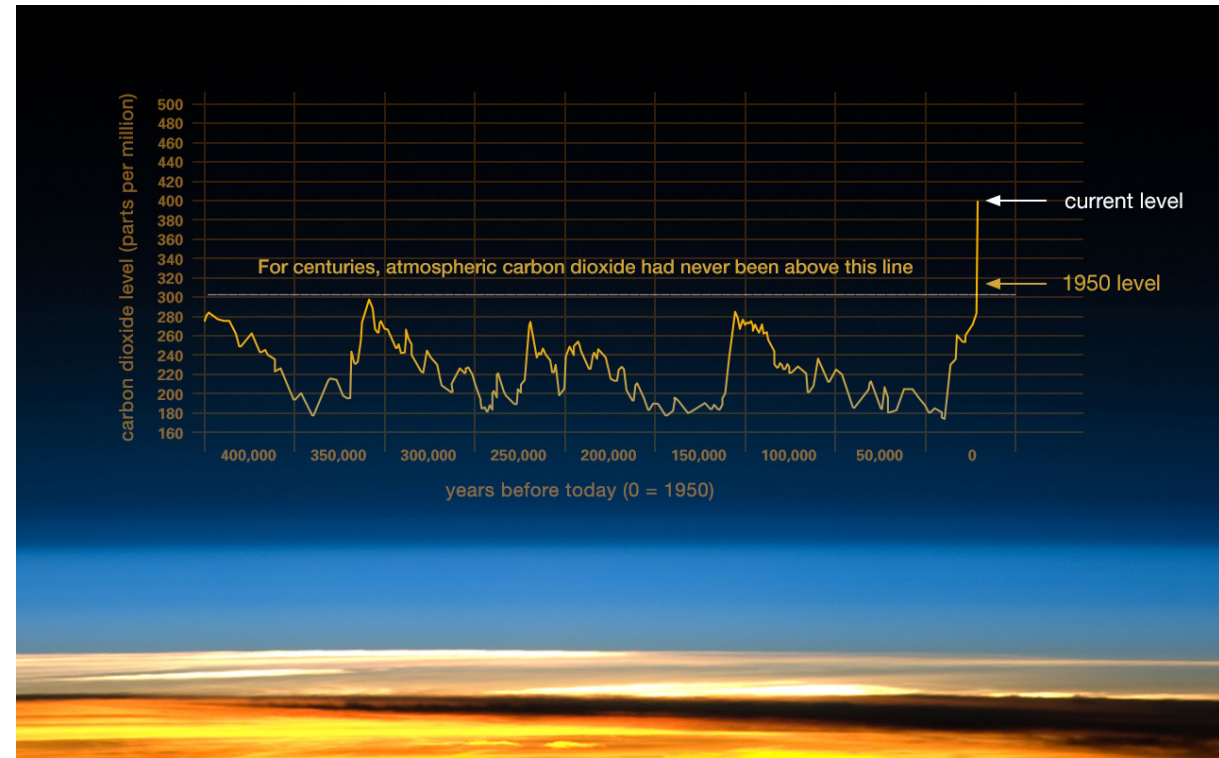
3. IMPOSSIBLE EXPECTATIONS

- Climatic modeling inaccuracies and variability
- Atmospheric influences (Mount Pinatubo)
- Lack of understanding of scientific process
- Impact skepticism: wait until 100% confidence to act



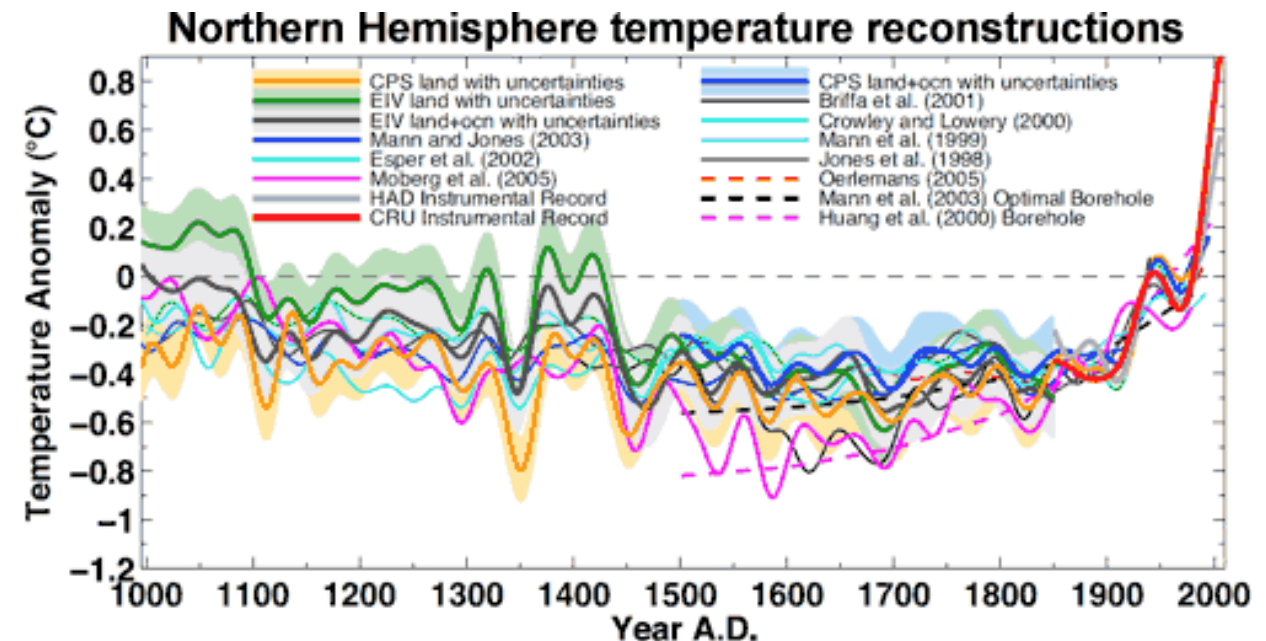
4. MISREPRESENTATION AND LOGICAL FALLACIES

- Most common process denial argument
- “Climate change has changed naturally in the past. Current climate change is normal.”
- Ignores climate sensitivity and net feedback



5. CHERRY PICKING

- Climate change stopped in 1998:
HadCRUT temperature record
- Critique of Mann's "hockey stick" methods
- "It's the sun!"
- Site selection for temperature recording



5.5 CHERRY PICKING IN EVERY CLIMATE

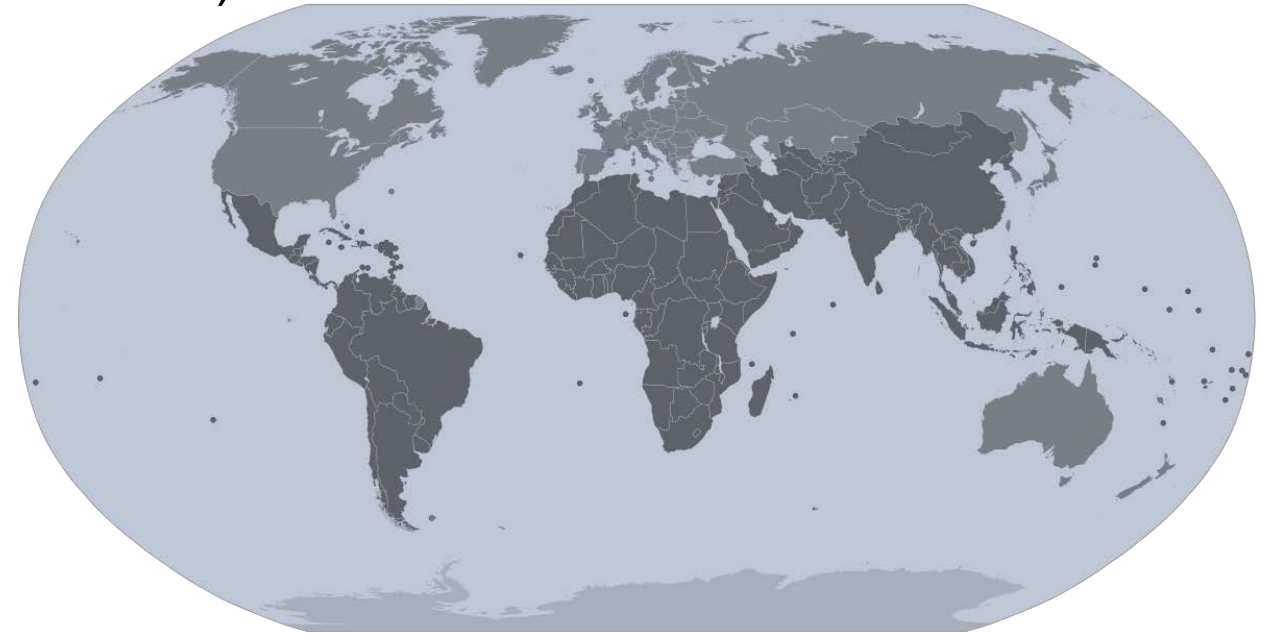
- Increased growing season in Greenland
- Increased productivity of sour orange trees
- Winter deaths will decline as temperatures warm
- Increased plankton biomass in the North Pacific Subtropical Gyre
- Bigger marmots
- Increased Arctic tundra plant reproduction
- Increased cod fishing leading to improved Greenland economy
- Increase in chinstrap and gentoo penguins

TYPES OF DISTORTION

- Outright lies – IPCC ignores saturation of carbon dioxide as concentration increases
- Twisting phrasing – mostly arises from using correct quotes, but then seeks to mislead readers
- Removing qualifiers – no close correlation becomes no correlation
- Bait and switch – true proposition used to imply similar sounding but false proposition
- Guilt by association – climate scientists are too liberal or Marxist
- Misrepresenting nature of evidence ‘for’ vs. ‘against’ – inconclusive nature of some particular evidence used to reject large body of evidence that supports issue
- Raising true but irrelevant ‘facts’- rising sea levels create coral reefs
- Assembling petitions – Oregon Petition denying climate change

MORAL DILEMMA OF COLLECTIVE ACTION

- Global
 - Dispersion of emissions (causes and effects)
 - Institutional inadequacy
 - Spatial fragmentation of agency
 - Existing unequal power networks
- Intergenerational
 - Delayed effects
 - Temporally fragmented agency
 - Intergenerational collective action
- Theoretical
 - Moral corruption
 - Theoretical ineptitude



Wikipedia

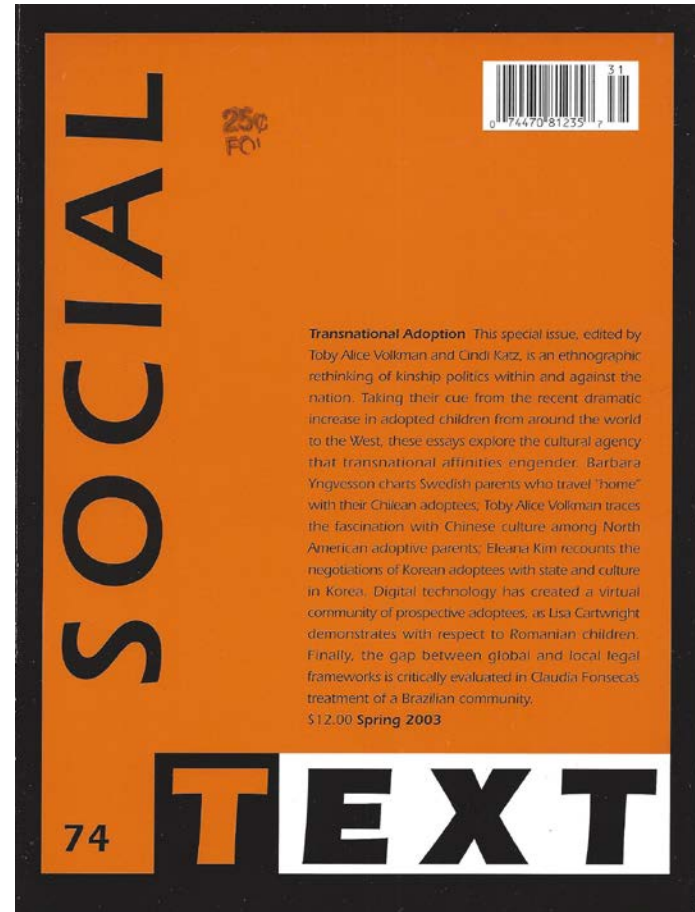
POSTMODERNISM

- Objectivity cannot exist
 - Many subjective realities on par with objective reality
- Rejects idea of reality and facts that exist without our thinking about them
- Enriches number of minority and alternative opinions
- “Multiculturalism = relativism = no supercollider = communism”
 - E.O. Wilson
- “Relativity of truth is not a theoretical insight but a moral postulate, the condition of a free society or so [the students] see it. They have all been equipped with this framework early on, and it is the modern replacement for the inalienable natural rights that used to be the traditional American grounds for a free society. That it is a moral issue for students is revealed by the character of their response when challenged – a combination of disbelief and indignation.”

– Allan Bloom, University of Chicago

“Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity”

- Alan Sokal published in postmodern journal *Social Text* in 1980s
- Mashup of postmodernist writing claiming that “recently, feminist and poststructuralist critiques have demystified the substantive content of mainstream Western scientific practice, revealing the ideology of domination concealed behind the façade of ‘objectivity.’”
- Published hoax in *Lingua Franca* soon after



THE STRUCTURE OF SCIENTIFIC REVOLUTIONS

- *The Structure of Scientific Revolutions* by Thomas Kuhn: science is not the gradual and painstaking accumulation of knowledge
 - Inherently powerful, therefore political
- “The world, including the world of science, is a complex and scattered entity that cannot be captured by theories and simple rules. Nor is there any way of knowing, science; there are many such ways, and before they were ruined by Western civilization they were effective in the sense that they kept people alive and made their existence comprehensible. The material benefits of science are not at all obvious.” – Paul Feyerabend

LUCKY STRIKE'S LUCKY BREAK

Origins of Propaganda

- Edward Bernay's 1929 Easter Day Parade display for the American Tobacco Company
 - Later published *Propaganda*
- Third party technique: public is skeptical if they know they are being manipulated
- Same methods used in contemporary scientific denial

Women Are Free!
AN ANCIENT PREJUDICE HAS BEEN REMOVED

Finally, publicly and socially progress has been emancipated from those chains which bound her. AMERICAN INTELLIGENCE has explained the scientific theory that forced the stigma of inferiority upon a sex.



"toasting did it" —

Gone is that ancient prejudice against cigarettes—Progress has been made. We removed the prejudice against cigarettes when we removed harmful corrosive ACIDS (persistent irritants) from the tobacco.

YEARs ago, when cigarettes were made without the aid of modern science, there originated that ancient prejudice against all cigarettes. That prejudice is no longer justified, LUCKY STRIKE, the finest cigarette you ever smoked, made of the choicest tobacco, properly aged and skilfully blended—It's Toasted.

"TOASTING," the most modern step in cigarette manufacture, removes from LUCKY STRIKE harmful elements which are present in cigarettes manufactured in the old-fashioned way.

Everyone knows that heat purifies, and all "TOASTING"—LUCKY STRIKE'S extra special process—removes harmful corrosive ACIDS (persistent irritants) from LUCKY'S which in the old-fashioned manufacture of cigarettes cause throat irritation and coughing. Thus "TOASTING" has destroyed that ancient prejudice against cigarettes smoked by men and by women.

"It's toasted"
No Throat Irritation—No Cough.



"It's Toasted"—the process that destroys the extra "toasting" process applied in the manufacture of Lucky Strike Cigarettes. The best tobacco in the Crown of the Empire is scientifically subjected to increasing heat at minimum, 350°—maximum, 500°. Patented. The exact, expert regulation of such high temperatures prevents impurities. More than a dozen "It's Toasted" trademarks are utilized in the most modern step in cigarette manufacture.

APCO, TASSC AND JUNK SCIENCE

- Tobacco company Philip Morris hired PR firm APCO
- Founded The Advancement for Sound Science Coalition (TAASC) in 1994
 - Broader comments on government research and regulations
 - Global warming, nuclear waste disposal, biotechnology
- “A national coalition intended to educate the media, public officials and the public about the dangers of ‘junk science’... upon formation of Coalition, key leaders will begin media outreach, for example editorial board tours, opinion articles and brief elected officials in selected states.”
 - APCO initial report on formation of TAASC

GLOBAL CLIMATE COALITION AND INDUSTRY POSITIONING

Communication plan: “We will have achieved victory when”

1. Average citizens ‘understand’ uncertainties in climate science; recognition of uncertainties becomes part of the “conventional wisdom”
2. Media “understands” uncertainties in climate science
3. Media coverage reflects balance on climate science and recognition of validity of viewpoints that challenge current wisdom
4. Industry senior leadership understands uncertainties, making them stronger ambassadors to those who shape climate policy
5. Those promoting the Kyoto treaty on basis of extant science appear to be out of touch with reality

FCC AND FAIRNESS DOCTRINE

- 1949 Fairness Doctrine accompanied mainstream television
 - Controversial issues of public importance: presented in honest, equitable and balanced way
 - Repealed 1987
 - Reduced goal of objectivity in democratic society
 - Increased partisan public dialogue
- Marketplace of emotions, not ideas

CLIMATE SKEPTIC ORGANIZATIONS

Table 1

Climate sceptic organizations. The table displays the total count of words (thousands), the number, and type of documents from 19 well-known conservative think-tanks over the period January 1998–August 2013. Documents have been classified as follows: (A) op-eds, articles and blogs; (B) policy/science reports and analyses; (C) speech/interview transcripts; (D) press releases/open letters; (E) scientific reviews.

Organization name	Total words thous.	Total docs.	Document type				
			A	B	C	D	E
American Enterprise Institute (AEI)	1872.53	745	596	61	48	15	25
Cato Institute	772.68	768	712	41	8	6	1
Center for the Study of Carbon Dioxide and Global Change (CO2Science)	2387.27	4592	713	0	0	1	3878
Competitive Enterprise Institute (CEI)	1743.02	1461	941	55	0	465	0
Committee for a Constructive Tomorrow (CFACT)	738.52	894	882	12	0	0	0
Citizens for a Sound Economy (CSE)	88.2	111	105	6	0	0	0
Fraser Institute	78.39	81	62	19	0	0	0
Foundation for Research on Economics and the Environment (Free-Eco)	76.64	105	105	0	0	0	0
Heartland Institute	9900.54	2930	1383	1537	10	0	0
Heritage Foundation	1825.78	1652	1198	431	23	0	0
Hoover Institution	51.06	37	3	32	2	0	0
Hudson Institute	124.61	83	81	2	0	0	0
Manhattan Institute	315.59	199	183	13	3	0	0
George C. Marshall Institute	209.75	101	69	21	11	0	0
National Center for Policy Analysis (NCPA)	469.78	451	376	75	0	0	0
National Center for Public Policy Research (NCPFR)	393.54	639	378	90	0	171	0
Pacific Research Institute	384.68	435	402	7	0	26	0
Reason Foundation	397.12	192	179	13	0	0	0
Science and Public Policy Institute (SPPI)	3064.88	552	0	552	0	0	0
Total	24,894.58	16,028	8368	2967	105	684	3904

CLIMATE SKEPTIC THEMES

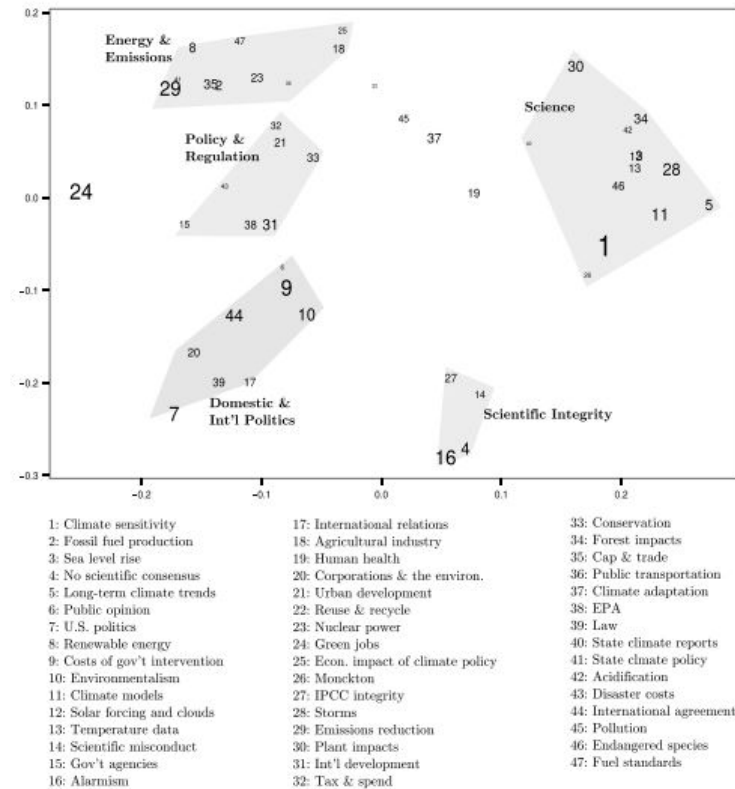


Fig. 1. Topic similarities. The figure presents Jensen-Shannon distances projected onto a 2D space via multi-dimensional scaling. The size of plotted label corresponds to the number of times the topic was sampled in the corpus and thus gives a rough indication of topic importance. Topics using similar words will be closer together in the figure and vice versa. To ease visualization, we plot the convex hull for each cluster in grey.

1. Domestic and international policies
2. Energy and emissions
3. Science
4. Scientific Integrity
5. Policy and Regulation

SHIFT FROM SCIENCE TO POLICY DENIAL

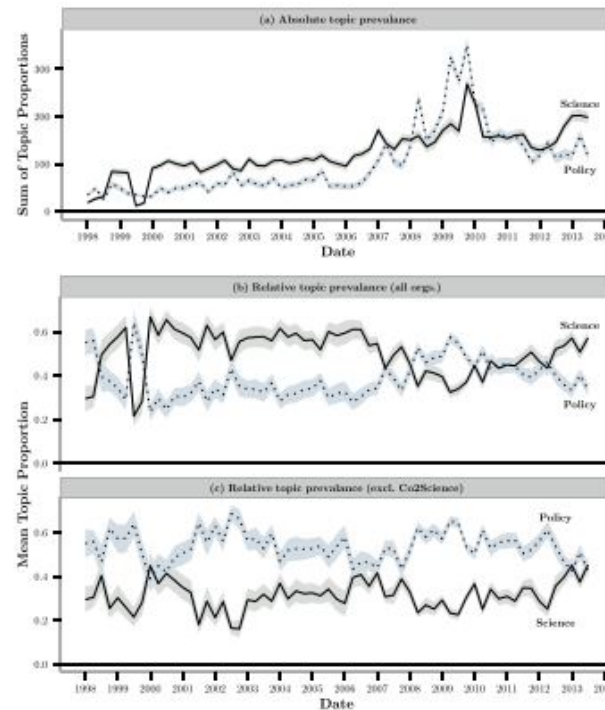


Fig. 2. The evolution of political and science-related discourse. Panel (a) displays the summed quarterly topic probability of “science” (solid) and “politics & policy” (dotted) related themes for all CTTs in the sample over the period January 1998–August 2013. These categories are aggregations of the topics based on the codings displayed in Table 2. The bottom panel shows the average quarterly topic probabilities—a relative measure—for the same categories; (b) uses all available data, while (c) excludes Co2Science. The areas around each series represent the bootstrapped 95% confidence interval.

ANTI-REFLEXIVITY THESIS AND THE RISE OF IMPACT SKEPTICISM

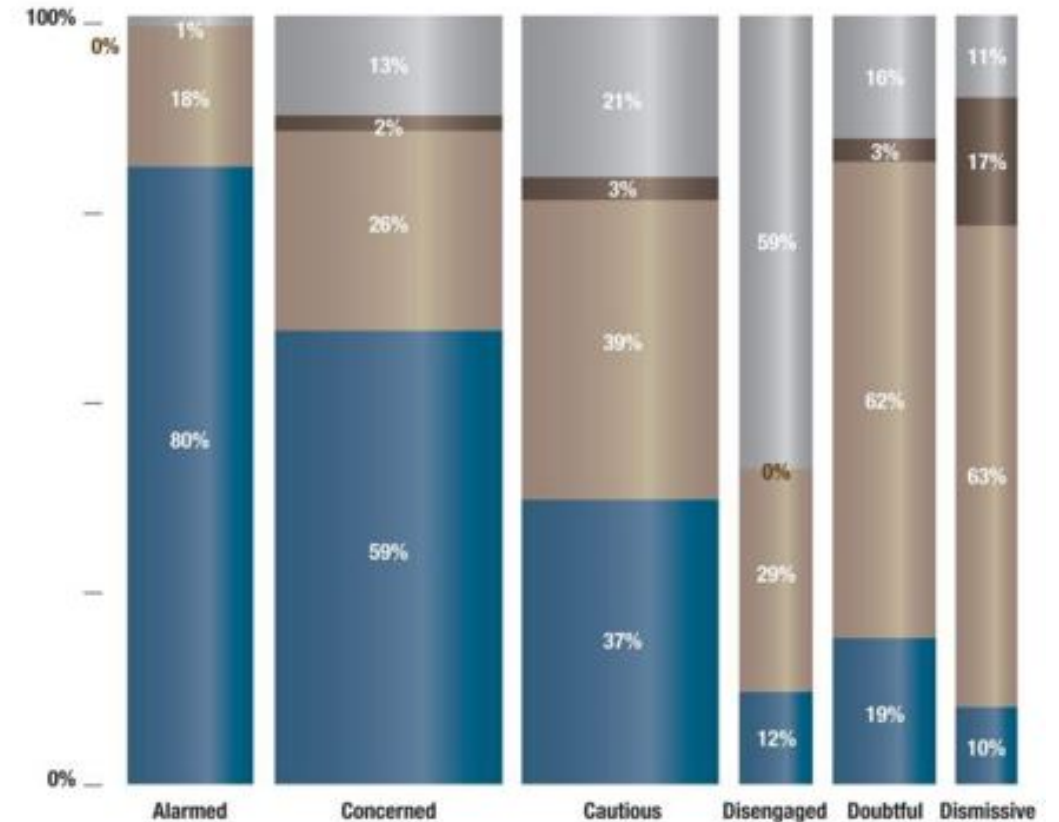
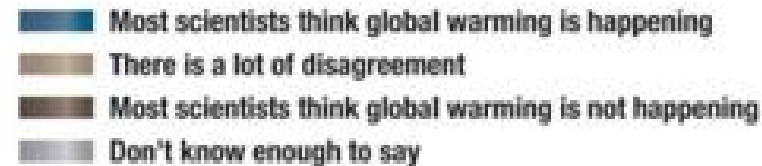
- Climate change deniers seen as a collective force defending the industrial capitalist system against claims that the system causes serious problems
- Recent shift moves beyond the existence or anthropogenic causes of climate change to the necessary (or unnecessary) actions to combat climate change
 - Binding regulations framed as harming the economy and threatening individual freedoms
 - “Economy versus ecology” and tying into an anti-environmentalist discourse

PUBLIC OPINION ON SCIENTISTS BELIEF IN CLIMATE CHANGE

Beliefs about the scientific consensus

Which comes closer to your own view?

- Most scientists think global warming is happening
- Most scientists think global warming is not happening
- There is a lot of disagreement among scientists about whether or not global warming is happening
- Don't know enough to say



Base: Americans 18+ (n=1,058) Source: Yale/George Mason

Note: Column width accurately represents the proportion of the American public in each segment.

CHALLENGES OF SCIENTIFIC COMMUNICATION

- “It seems that the debate on the authenticity of global warming and the role played by human activity is largely nonexistent among those who understand the nuances and scientific basis of long-term climate processes. The challenge, rather, appears to be how to effectively communicate this fact to policymakers and to a public that continues to mistakenly perceive debate among scientists.”

– Doran and Zimmerman