

# Early Final Exam

**1309 SURGE III (The Grove)**

**Monday, March 14**

**5:00-7:00 pm**

**Sign up:**

**<http://tinyurl.com/sas25earlyfinal-W16>**

# Regular Final Exam

Saturday, March 19

6:00-8:00pm

Wellman 106 (normal lecture room)

# Extra Credit Online Discussion Section with Department of Fish and Wildlife

**March 9**

**3:10-4:00 pm**

**<http://ucoe.adobeconnect.com/sas25swisher/>**

To earn extra credit, you must submit a question/discussion topic to the discussion forum on piazza. In addition, there will be an extra credit question on the final exam that will come from the discussion section.

# Global Climate Change

The Human Response

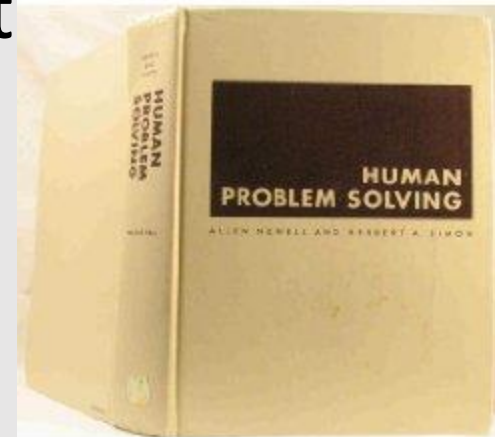
# How do you feel about climate change?

Human mental skill set is highly attuned to solve urgent, well-defined problems with clear solutions

- Where to find our next meal
- Finding a safe place to sleep

Global climate change is the opposite

- Extends over several generations
- Vague and abstract
- No surefire remedies



# Which Would You Rather Eat?



# How do you feel about climate change?

Potential remedies will not solve the problem, only lower the odds of undesirable outcomes

- Mitigation lessens the severity of a problem. Does not actually solve it.



# How do you feel about climate change?

Many people do not see climate change as an imminent danger that requires immediate attention

- Prefer warmer winters and earlier springs
- Sea level rise and violent hurricanes not a threat if you live on high ground





# Societal Factors

- National origin
- Education, gender, race, income, age
- Religion

# National Origin

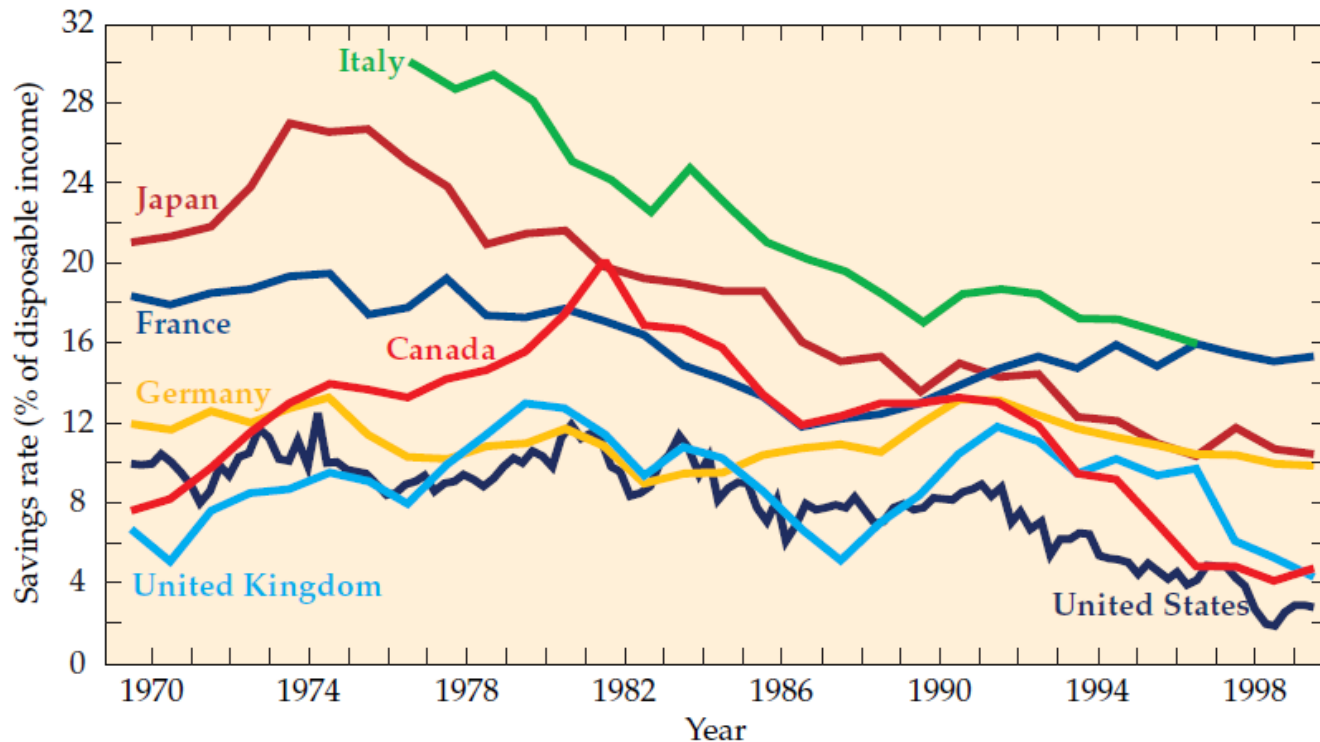
- Different countries view risk differently
- People in the USA are risk takers and are thus less worried about long-term risks such as global climate change



# Americans Are Risk Takers

Savings accounts provide a financial buffer against risk

- Americans don't invest as much in savings
- French and Germans deposit over 10% of their disposable income to savings accounts



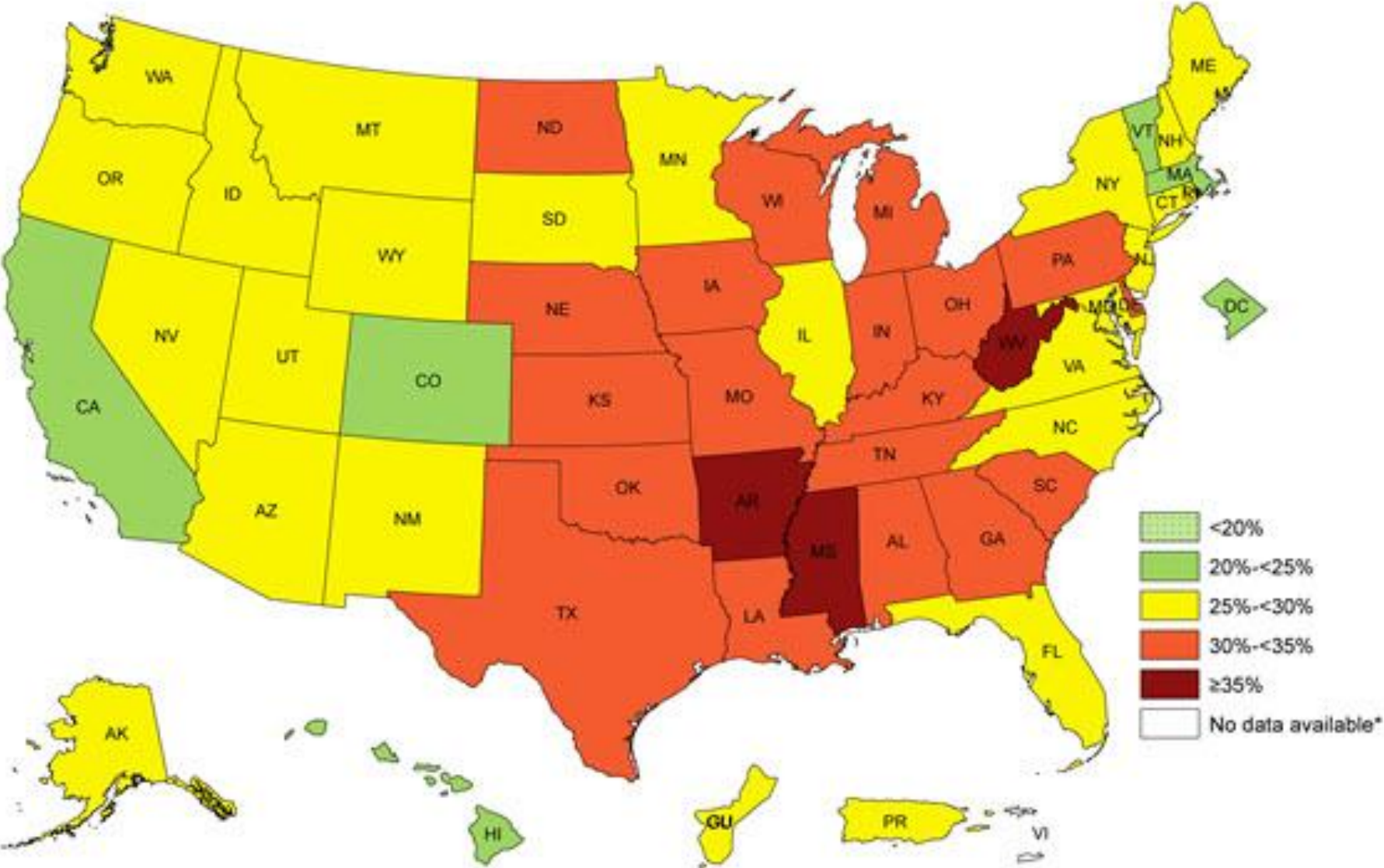
# Obesity

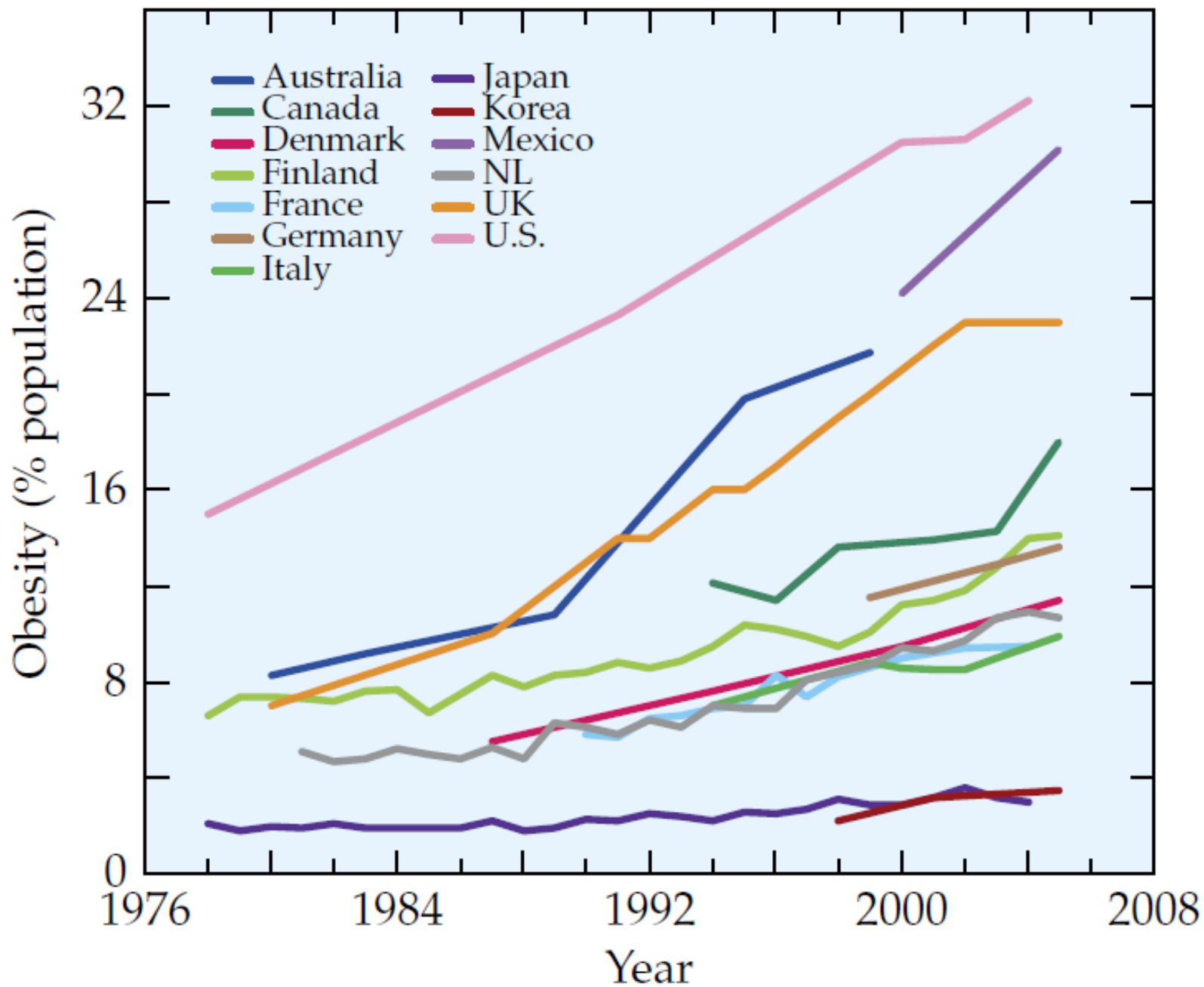
Associated with increased health risks. Human life expectancy decreases with obesity

- The rate of obesity is highest in the United States.  
Afflicts 1/3 of adults



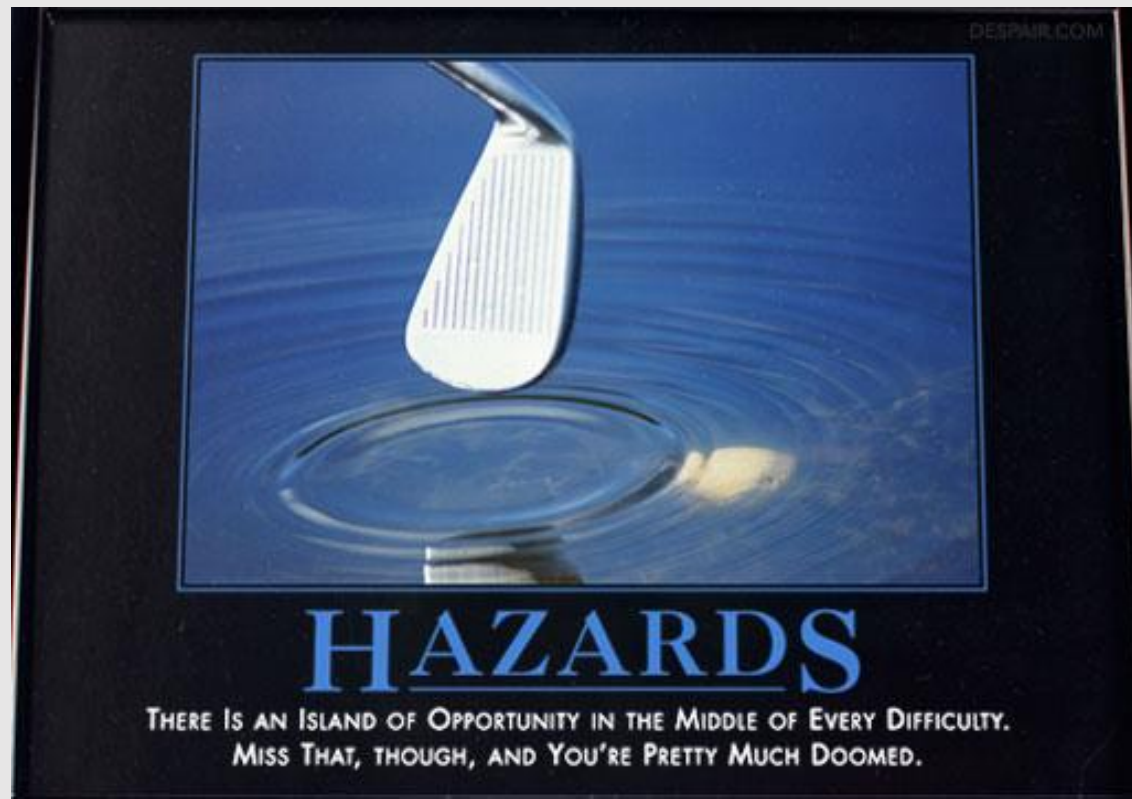
# CDC, 2014





# Americans Are Risk Takers

- Take advantage of current opportunities rather than dwelling on negative future possibilities
- Little long term and global perspective



# Other Countries

- Japan, France, Germany:
- Weathered severe resource limitations
- Fought major wars on their soil in the 20<sup>th</sup> century
- Have become more adverse to risk
- Mitigation of global climate change is a central issue of several political parties. GHG emissions have diminished.



**Table 12.1 Percentage of respondents in various countries who have heard about global climate change, and the degree of concern about the issue by those who have heard. (Pew Research Center 2006a)**

Country	Have heard (%)	Concern			
		Great deal (%)	Fair amount (%)	Little/none (%)	Do not know (%)
China	78	20	41	37	2
Egypt	47	24	51	23	1
France	97	46	41	14	0
Germany	95	30	34	36	1
India	57	65	20	13	2
Indonesia	35	28	48	23	1
Japan	99	66	27	7	0
Jordan	48	26	40	34	
Nigeria	42	45	33	20	2
Pakistan	12	31	25	39	5
Russia	80	34	31	34	
Spain	93	51	34	14	2
Turkey	75	41	29	23	8
UK	100	26	41	32	1
U.S.	91	19	34	47	1



# Climate Change in the American Mind

October 2015, Yale and George Mason University

67% think climate change is happening

–16% think climate change is NOT happening

53% think that climate change, if it is happening, is mostly human caused

–33% believe it is due mostly to natural changes in the environment

**97.4%** of professional climate scientists who publish peer-reviewed research about climate change **believe human-caused climate change is happening**

10% of Americans are aware of that

57% of Americans say they are at least “somewhat worried” about climate change

16% say they are “very worried”

34% think people in the U.S. are being harmed “right now” by climate change

42% believe climate change will harm **them personally**

56% believe climate change will harm **people in the U.S.**

61% believe climate change will harm **people in developing countries**

70% believe climate change will harm **future generations**

# Education, gender, race, income and age

The belief that human activities are responsible for global warming increases with education



# Education, gender, race, income and age

Belief that global warming is a very serious problem  
increases with income

–Relationship with education





# Education, gender, race, income and age

Females in the US are slightly more likely than males to believe that human activities are responsible for global warming

– Support greater expenditures on mitigation



# Education, gender, race, income and age

- Race does not have a major effect on opinions, but region and community do
- People in urban communities in the northeastern and western US more likely to believe that human activities are responsible for global warming



# Education, gender, race, income and age

Young adults in the US accept responsibility for global warming more readily than older people.



# Religion

Spiritual values: moral obligation to the world at large, future generations, and Mother Nature



# Evangelical Protestants

2006: 86 senior US evangelical Protestant leaders endorsed a statement called the **Evangelical Call to Action on Climate Change**

“The consequences of climate change will be significant, and will hit the poor hardest...Christian moral convictions demand our response to the climate change problem...The need to act now is urgent. Governments, businesses, churches and individuals all have a role to play in addressing climate change—starting now. The basic task for all of the world’s inhabitants is to find ways now to begin to reduce the carbon dioxide emissions from the burning of fossil fuels that are primarily cause of human-induced climate change.”

# Interfaith Stewardship Alliance Rebuttal – 110 evangelical Protestants

“Global warming will have more moderate and mixed (not only harmful but also helpful), not catastrophic, consequences for humanity...Human emissions of carbon dioxide and other gases are probably a minor and possibly insignificant contributor to its causes...Government-mandated carbon dioxide emissions reductions not only would not significantly curtail global warming or reduce its harmful effects but also would cause greater harm than good to humanity—especially the poor...Therefore we pledge to oppose quixotic attempts to reduce global warming.”

# The Pope Francis Effect



Issued an encyclical titled “On Care for Our Common Home”

Visited the U.S. for 5 days. Addressed:

- President Obama

- U.S. Congress

- General Assembly of the United Nations



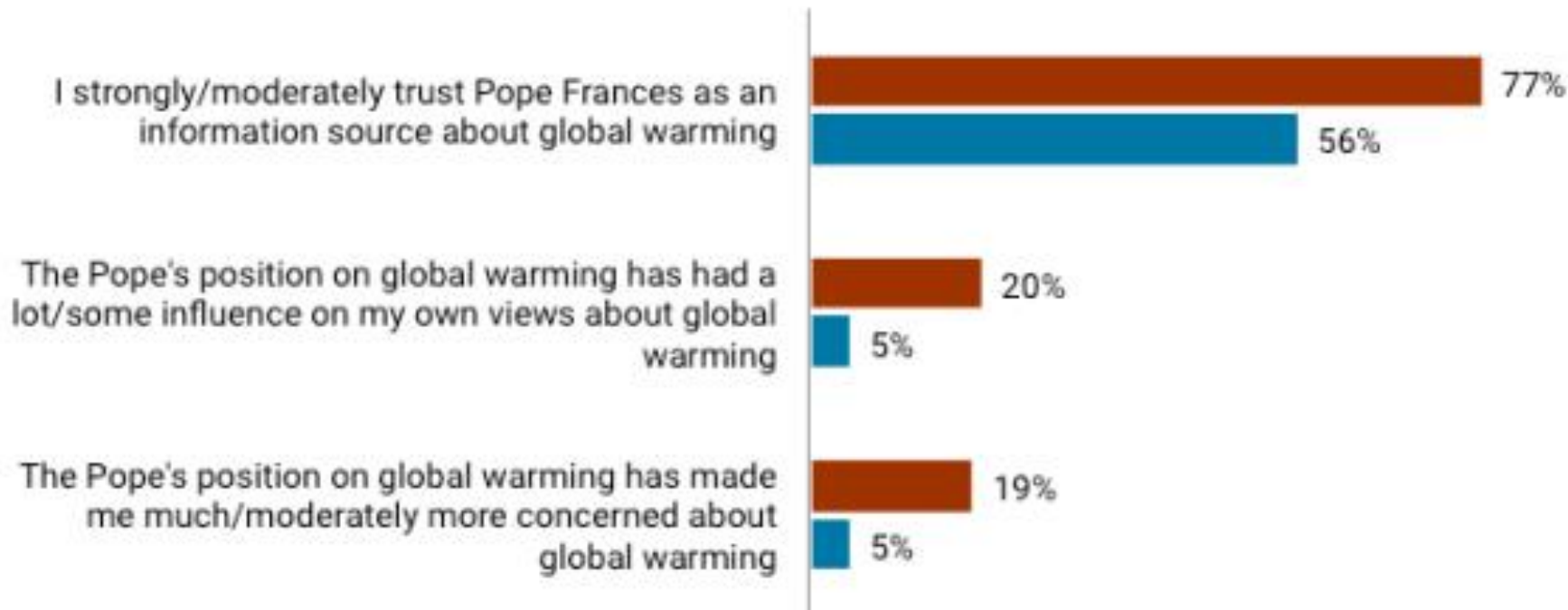
“Right of the environment...we human beings are part of the environment” and must abide by its “ethical limits” ... “ We Christians, together with the other monotheistic religions, believe that the universe is the fruit of a loving decision by the Creator, who permits man respectfully to use creation for the good of his fellow men and for the glory of the Creator; he is not authorized to abuse it, much less destroy it.”

“The ecological crisis, and the large-scale destruction of biodiversity, can threaten the very existence of the human species”

“Climate change is a problem which can no longer be left to a future generation.”

# Pope Francis's Teachings About Global Warming Have Had an Impact on Americans, Especially Catholics

■ Catholic Americans (n=293)   ■ Not Catholic (n=1,037)



How much do you trust or distrust the following as a source of information about global warming...?  
How much impact, if any, has the Pope's position on global warming had on your own views about global warming?  
Has the Pope's position on global warming made you..?

Base: Americans 18+ (n=1,330). October, 2015.

Note: Results in this chart differ slightly from results for the same question presented in Melbach, E., Leiserowitz, A., Roser-Renouf, C., Myers, T., Rosenthal, S. & Feinberg, G. (2015) *The Francis Effect: How Pope Francis Changed the Conversation about Global Warming*, which reported on a separate national survey conducted using a different methodology.



# Why Does Controversy Persist?

Climate changes have been subtle

Climate change varies place to place, and year to year



# Making Predictions

- Complex GCMs
- Range of possible outcomes

“I don’t trust science”

# The Scientific Method

Allows research to be unbiased by personal belief or opinion

- Observation
- Hypothesis
- Test the hypothesis with experiments
- Examine results to see if they support or disprove the hypothesis
- Publish results in peer reviewed publications

# The Scientific Method

- No scientist should ever set out to “prove” their hypothesis.
- It is impossible to prove a hypothesis. Only possible to support it or disprove it.
- Peer review is a key step. All methods used during experimentation are published. Work must be repeatable by another researcher.

Scientists are compelled to support their findings with careful observation and replicable analysis

Their critics are free to make sweeping statements condemning their work as fraudulent without much evidence or support



- In science, there is always more to learn, always uncertainties to be addressed.
- Critics pick up on those uncertainties and point to them as evidence that “scientists don’t know what they’re doing.”
- “Climate scientists are paid to do climate science; their job is not persuading the public.”
  - Gavin A. Schmidt, a senior climatologist with the NASA Goddard Institute of Space Studies.

# The IPCC Rules

- Scientific claims must be checked with several experts before being published (peer review)
- IPCC reports must reflect disagreements when consensus can't be reached
- People who write the reports must not advocate specific environmental actions

The IPCC informs policy makers without being political