OLLI Study Group 395
Climate Policies: what works, what doesn't.
Miria Pigato

Class # 8: Environmental behavioral economics

https://www.pinterest.com.au/pin/444167581969725359/
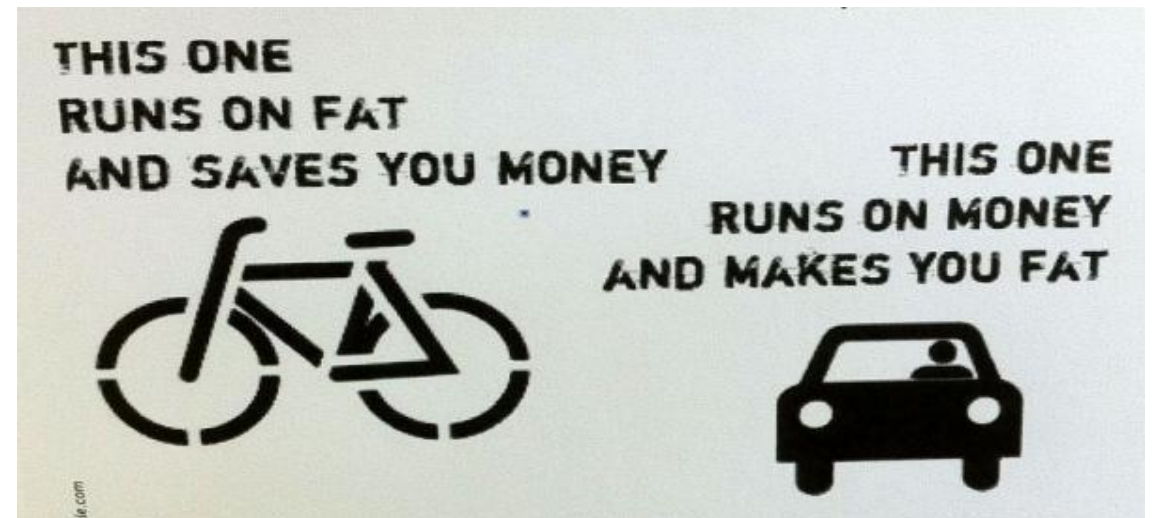
Outline

- What is behavioral Economics? Challenging the assumption of rational behavior.
- Examples of systematic departures from rational choice: generosity and selflessness, information bias, fairness bias, overconfidence, predictions bias, time inconsistency/hyperbolic discounting, framing, and trust.
- Perceptions of climate change and of climate change policies (US, rest of the world).
- Environmental behavioral economics: nudges, defaults, heuristics

Video: https://ecampusontario.pressbooks.pub/testbookje/chapter/failures-of-awareness-the-case-of-inattentional-blindness/

Challenging the assumption of rational behavior

The model of economic behavior we have considered so far is based on the assumption of rational behavior:

- Economic agents are assumed to:
  - be perfectly rational and use information optimally
  - understand risk and uncertainty
  - have well defined and stable preferences
  - prefer consumption today rather than tomorrow and to be risk averse
  - Be self-interested

  "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard for their own self-interest. We address ourselves not to their humanity, but to their self-love, and never talk to them of our necessities, but of their advantage."   from Adam Smith, the Wealth of Nations

Behavioral Economics

Behavioral economics – Branch of economics that incorporates psychological insights into models of economic behavior.

- It aims to develop positive – rather than normative - approaches to understand human decision making, based on empirical and experimental data.

Behavioral economics explores and rationalizes systematic deviations from rational choice theory such as:

➢ Bounded rationality: people do not have unlimited abilities to process all the information to make rational choices.

➢ Bounded willpower: sometimes people lack self-control: they procrastinate, save too little etc.

➢ Bounded self-interest: people are concerned about others, they can reciprocate, are averse to inequality.

Examples of systematic departures from rational choice

- Generosity and Selflessness

- Information bias

- Fairness bias

- Overconfidence

- Predictions bias

- Time inconsistency/Hyperbolic Discounting

- Framing

- Trust

https://www.cmu.edu/dietrich/news/news-stories/2016/december/images/behavioral-econ_663x373.jpg

Deviations from the standard economic model: generosity bias

People are not just self-interested:

➢ People care about their families and friends, and they care about what other people think about them*.

➢ They trust other people. Trust reveals a human tendency towards unselfish behavior.

But 'generosity behavior' also has biases:

- *Implicit bias*: donations raised by large health charities such as cancer or heart research raise more funds than other organizations because many people have been touched by these diseases.

- *Identifiable victim effect*: donors are more likely to give to a single victim with a name, rather than an unidentified group of victims.

Information bias

People do not always use information optimally.

1. **They might prefer limited information**
   - ➢ Example: Your parents have a genetic disease. Would you do the test to know if you have it? Why not?

2**. They tend to believe what they want to believe**
   - ➢ Example: people living in floods area tend to ignore climate change.

3. **People don't pay attention**.
   - ➢ They get easily distracted.

Fairness bias (1)

A football team sells tickets on the day of the game. Tickets are in great demand. The team owners can distribute the tickets in one of three ways.

1) By auction: the tickets are sold to the highest bidders.

2) By lottery: the tickets are sold to the people whose names are drawn

3) By queue: the tickets are sold on a first-come-first-served basis.

Using phone surveys, people were asked to rank these 3 in order of what they felt was the fairest and least fair.

Source: Kahneman D., J. L. Knetsch, R. H. Thaler, Fairness and the Assumptions of Economics The Journal of Business, Vol. 59, No. 4, Part 2: The Behavioral Foundations of Economic Theory. (Oct., 1986), pp. S285-S300.

Fairness bias (2)

Allocation Method	Most Fair (%)	Least Fair (%)
Auction	4	75
Lottery	28	18
Queue	68	7

People's fairness judgment rankings are the exact inverse of the economic efficiency rankings.

Fairness bias with coding

Example #1: A company with a small profit is located in a community experiencing a recession with substantial unemployment and no inflation. Salary=100.

The company decides to decrease salaries by 7%. Results from phone surveys:

➢Acceptable 38%; Unfair 62%

Example #2. A company with a small profit is located in a community experiencing a recession with substantial unemployment and inflation of 12%. Salary=100

The company decides to increase salaries only by 5% this year. Results from phone surveys:

➢Acceptable 78% Unfair 22%

In both cases, the real salary is 93. Why are more acceptances in the second example?
A nominal wage cut is **coded as a loss** and thus readily judged as unfair. A nominal raise that does not cover inflation is more acceptable because it is coded as a gain relative to the reference wage.

Social preferences and fairness (1)

The Ultimatum Game

Player A is given an amount of money to split with player B. Player A announces the split, and B can accept or reject the proposed division. If rejected, both parties get nothing. The division is proposed only once (an ultimatum) and both parties know this.

The Dictator Game

Player A, is given an amount to split with the recipient, B. Player **B has no choice and must accept whatever A sends**. A is a dictator; B cannot take any action.

   a)   The play is anonymous, no fear of postgame retaliation.
   b)   Player B knows about the decision

Social preferences and fairness (2)

The Ultimatum game
- Prediction: A will offer the smallest possible amount. B will accept whatever is offered, since any positive amount is preferred to zero.

Results: In experiments, almost all subjects gave more than the minimum—up to 50% of the endowment.

The Dictator game
- Prediction: A should keep everything and send nothing to B.

Results: almost three-quarters of the subjects give something to the second player. Testing under several different conditions found that it was impossible to move all subjects to keep all of their endowment. Why? Maybe he just cares about B, or he just cares about the social impact – wants to be seen as generous.

Over-confidence

Should we allow laptops in class*?

> ➤ YES? useful technology to take notes; save some paper. They're also useful for non-class activities ad more choice is always better: you can watch soccer during class.

> ➤ NO. People are overconfident. They think they pay attention, but they don't. You can't watch soccer and be present in class. There is a large literature on people thinking that they can multitask when, in fact, they cannot.

- Numerous studies have shown that humans tend to overestimate positive attributes about themselves

  - In one survey, 93% of college students said they were "better than average" drivers

  - On a popular dating website, 73% of individuals describe themselves as having "very good" or "better than average" physical attractiveness.

*Source: https://www.nytimes.com/2017/11/22/business/laptops-not-during-lecture-or-meeting.html

Predictions bias

Predictions about how people feel relative to major events (i.e. losing a job, failing an exam, etc.) are reasonably accurate. **However, there are situations where people systematically mis-predict future feelings:**

1. Shopping for groceries on an empty stomach, professions of eternal love during moments of lust, believing you can eat "just one chip", believing you'd be happier if your income were higher
2. People may change preferences over time.
3. People's feelings may be influenced by their predictions – e.g. someone predicting being a parent would be good.
4. Behavior under Temptation / Duress:
   - Drug Craving – Underestimation of the strength of craving and withdrawal
   - Urge to Spend – a large number of credit card users expect to maintain a zero balance but fail to do so

Depends on your state
If you had cancer, would you accept a grueling course of chemotherapy for 3 extra months of life?
0% of radiotherapists; 6% of oncologists; 10% of healthy persons said yes.

But of patients who had cancer, 42% said yes.

Time inconsistency/Hyperbolic discounting

Which would you prefer?

- $2000 right now or 2400 in a year from now

- $2000 in 10 years or $2400 in 11 years

People typically **prefer the immediate $2000** when the choices are immediate. However, **when both outcomes are in the future, people prefer the more delayed $2400**. This is called 'time inconsistency'.

Why? People do not discount all time periods uniformly, but give more weight to time periods that are closer to the present relative to time periods that are further in the future. Hence people have a higher discount rate between now and 1 year from now than over 7 years from now and 8 years from now.

This is known as **hyperbolic discounting.**

Framing

1. You have won $1,000. In addition to these winnings, you can choose between:

   - A: $1000 with 50% probability

   - B: $500 for sure

1. You have won $2,000. In addition to these winnings, you are now asked to choose between:

   - C: Lose $1,000 with 50% probability

   - D: Lose $500 for sure

These two gambles are identical in terms of final wealth states and probabilities. However, subjects are much more likely to **choose the risk averse B and the risk seeking C.**

The Trust Game

There are two players that are anonymously paired and are given some quantity of money.

The first player must send some amount of his money (zero or more) to the second player. Whatever he sends will be tripled by the experimenter.

The second player is then told to make a similar choice – give some amount of the now-tripled money back to the first player, even if that amount is zero.

Prediction under standard economic assumptions: the first player will send zero money.

Actual results of experiments:

- Only 11% of first players gave nothing. On average, first players sent slightly over fifty percent of their original endowment.

- The average amount returned to the first player by the second was in excess of the amount originally sent. Only 20% of the second players returned nothing.

EXPERIMENTER

PLAYER 1

PLAYER 2

Y

Y x 3

How Much of (Y x 3)?
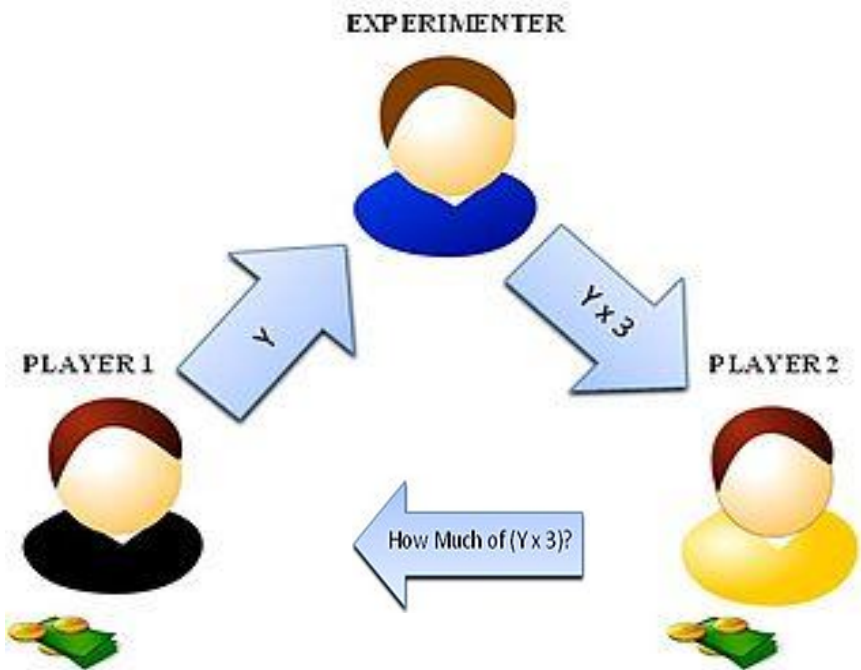
Do people trust themselves?

Betting to lose weight

It's an odd bet: you are betting on an outcome over which you have complete control!

Why?

- People think they can lose weight, so why not making some money?
- The bet to give themselves an incentive to lose weight.

There is an internal conflict: people want to lose weight but they can't stand the pain of doing so.
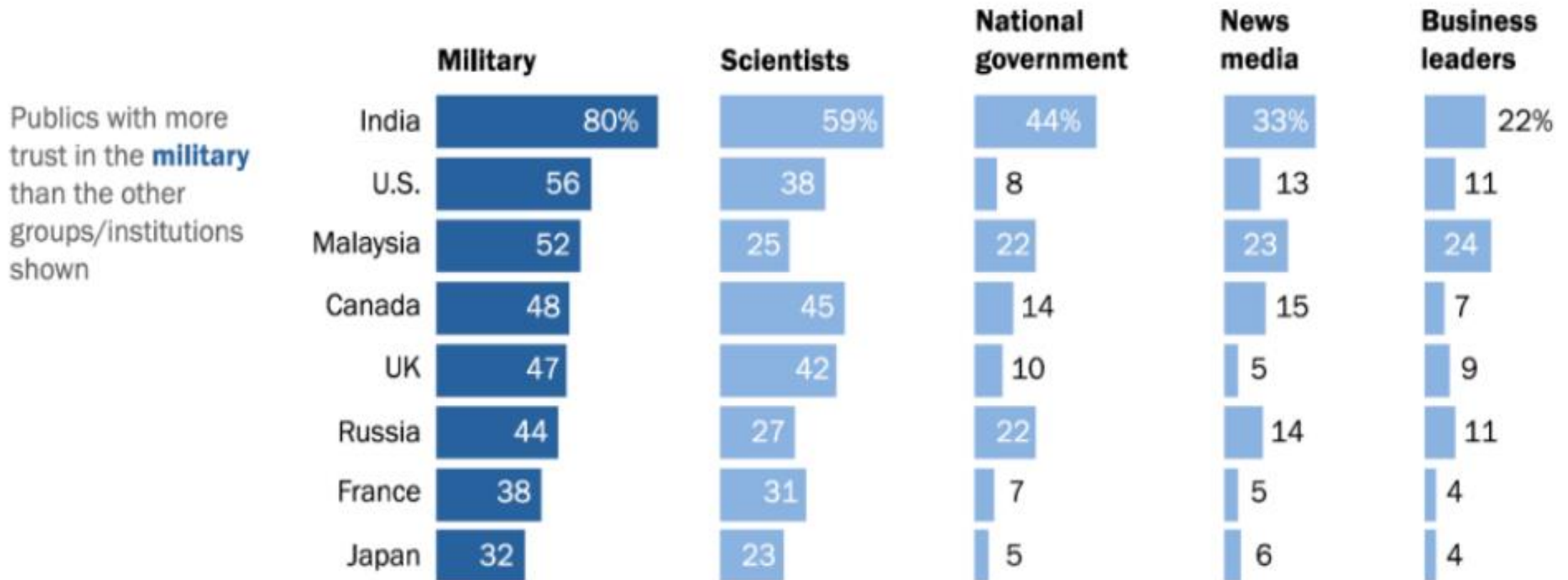
Overall, 80% of the bettors lose.

https://www.sidehustlenation.com/healthywage-review/

What do people trust?

Relatively high trust in the military, scientists across surveyed publics

*% who trust each group **a lot** to do what is right for (survey public)*

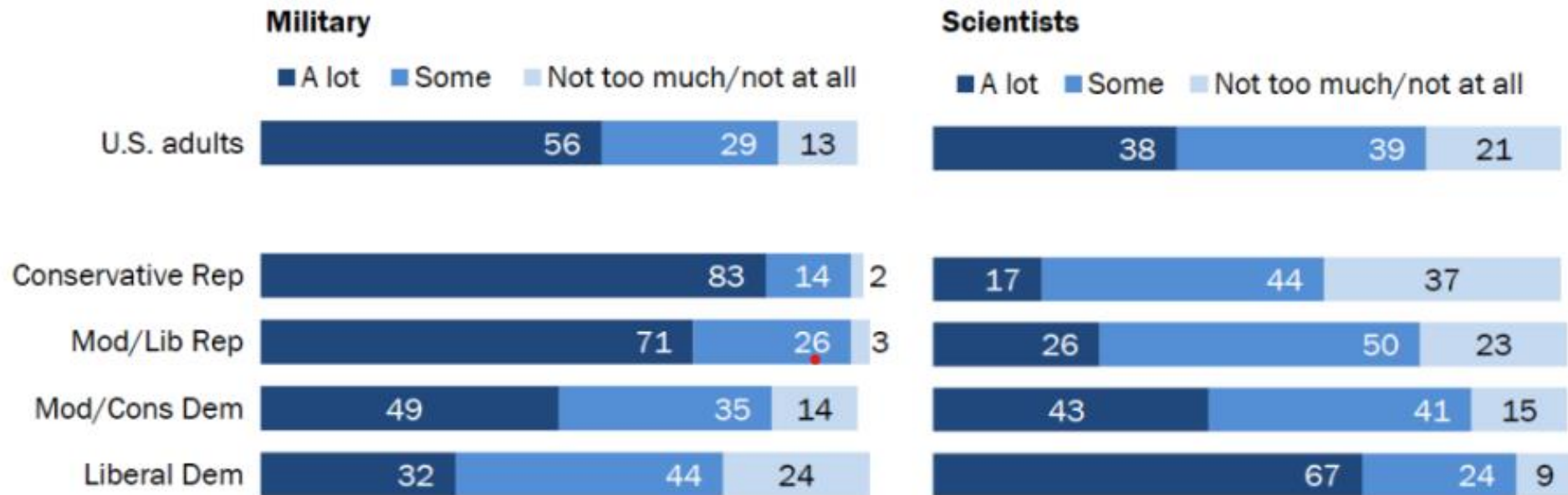|		Military	Scientists	National government	News media	Business leaders
Publics with more trust in the **military** than the other groups/institutions shown	India	80%	59%	44%	33%	22%
	U.S.	56	38	8	13	11
	Malaysia	52	25	22	23	24
	Canada	48	45	14	15	7
	UK	47	42	10	5	9
	Russia	44	27	22	14	11
	France	38	31	7	5	4
	Japan	32	23	5	6	4

Science vs perceptions and partisanship

- Science tell us that climate change is real. **Should we trust science**?

  - About three-quarters of Americans (73%) say science has, on balance, had a mostly positive effect on society.
  - As of 2019, 35% of Americans report a great deal of confidence in scientists to act in the public interest, up from 21% in 2016. About half of the public (51%) reports a "fair amount" of confidence in scientists.
  - One-in-ten or fewer say they have a great deal of confidence in elected officials (4%) or the news media (9%) to act in the public interest.

- **Differences in the level of trust depend on mindsets, beliefs, and partisanship.**

In the US, there are wide political differences in the trust of military and scientists

% of U.S. adults who trust each group _____ to do what is right for the United States

Military

	A lot	Some	Not too much/not at all
U.S. adults	56	29	13
Conservative Rep	83	14	2
Mod/Lib Rep	71	26	3
Mod/Cons Dem	49	35	14
Liberal Dem	32	44	24

Scientists

	A lot	Some	Not too much/not at all
U.S. adults	38	39	21
Conservative Rep	17	44	37
Mod/Lib Rep	26	50	23
Mod/Cons Dem	43	41	15
Liberal Dem	67	24	9

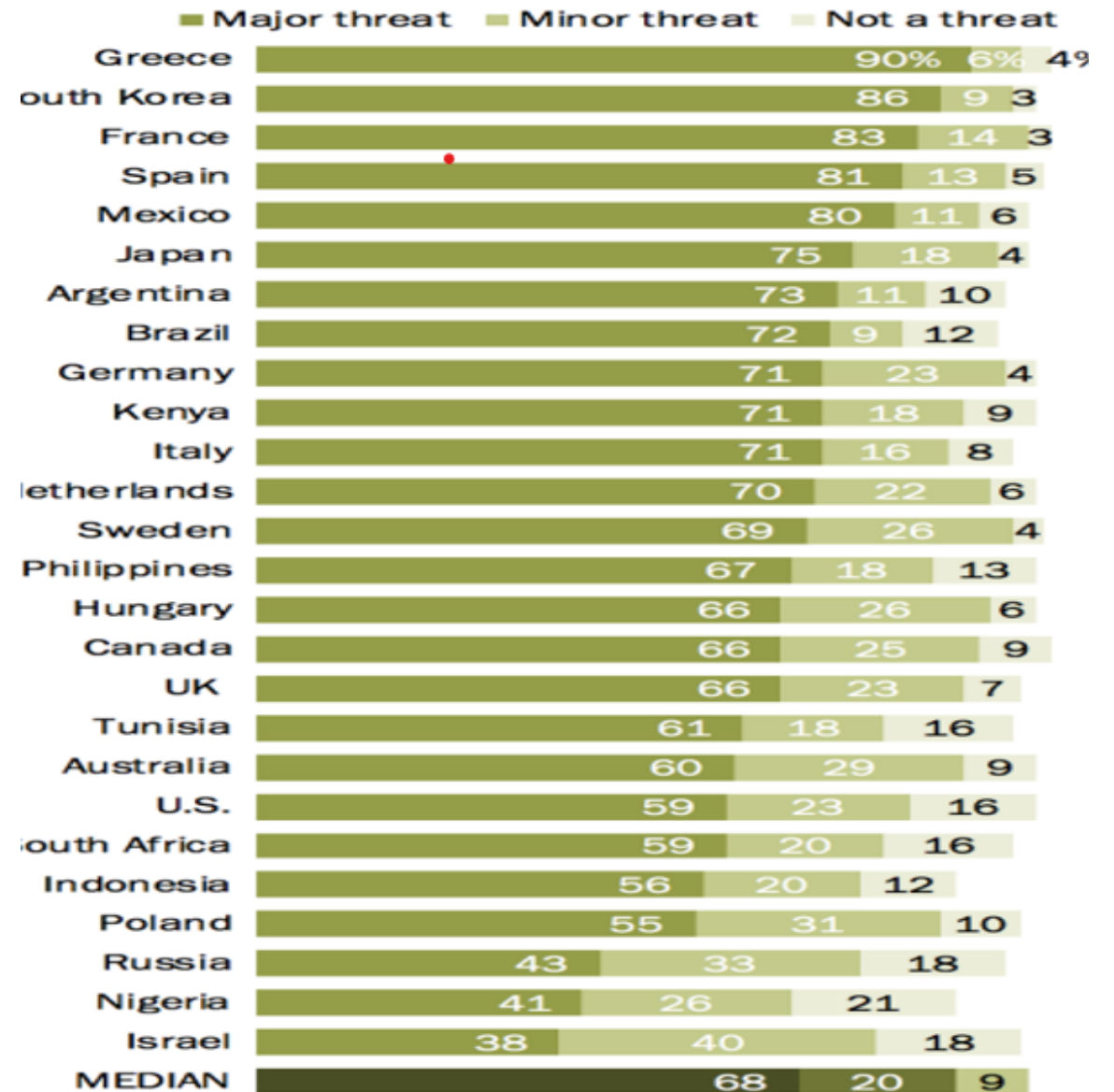# Psychological Factors help explaining low reactions to climate change

- **Uncertainty** – Research has shown that uncertainty over climate change is an impediment to green behavior.
- **Mistrust** – Many people don't believe the risk messages of scientists or government officials. People tend to reject information that goes against their core beliefs or values
- **Denial** – A substantial minority of people believe climate change is not occurring or that human activity has little or nothing to do with it.
- **Undervaluing Risks** – leading people to believe that changes can be made later.
- **Lack of Control** – People believe their actions would be too small to make a difference and choose to do nothing.
- **Habit** – Ingrained behaviors are extremely resistant to permanent change while others change slowly. Habit is the most important obstacle to pro-environment behavior.
- **We can only worry about so much**: if we worry more about climate change, we worry less about other things.

How people around the world see climate change

Majorities in most surveyed countries say global climate change is a major threat to their nation: it is seen as the top threat in 13 of 26 surveyed countries, more than any other issue the survey asked about.

Americans are less likely to be concerned about climate change, with 59% seeing it as a serious threat.

See: https://www.pewresearch.org/fact-tank/2019/04/18/a-look-at-how-people-around-the-world-view-climate-change/

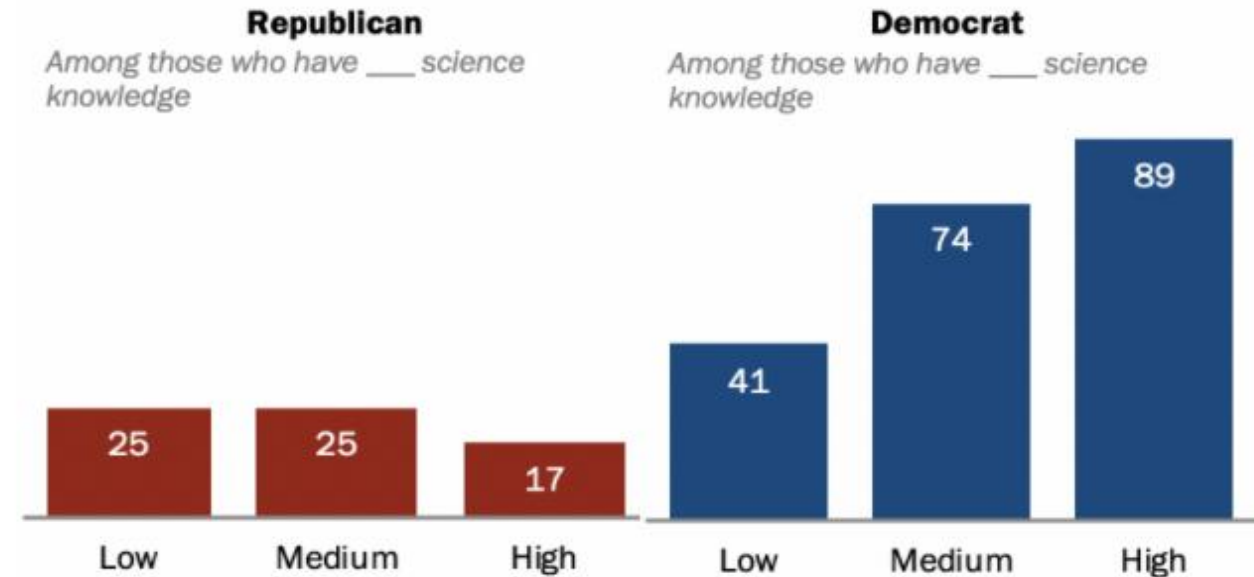|	Major threat	Minor threat	Not a threat
Greece	90%	6%	4%
South Korea	86	9	3
France	83	14	3
Spain	81	13	5
Mexico	80	11	6
Japan	75	18	4
Argentina	73	11	10
Brazil	72	9	12
Germany	71	23	4
Kenya	71	18	9
Italy	71	16	8
Netherlands	70	22	6
Sweden	69	26	4
Philippines	67	18	13
Hungary	66	26	6
Canada	66	25	9
UK	66	23	7
Tunisia	61	18	16
Australia	60	29	9
U.S.	59	23	16
South Africa	59	20	16
Indonesia	56	20	12
Poland	55	31	10
Russia	43	33	18
Nigeria	41	26	21
Israel	38	40	18
MEDIAN	68	20	9

Source: Spring 2018 Global Attitudes Survey. Q22d.

PEW RESEARCH CENTER

How Americans see climate change

A majority of Americans see at least some local effects of climate change. But partisanship is a stronger factor in people's beliefs about climate change than is their level of knowledge and understanding about science.

Most Democrats with high science knowledge say human activity contributes a great deal to climate change, but there is no parallel among GOP

% of Republicans or Democrats who say human activity contributes a great deal to global climate change

Republican
Among those who have ___ science knowledge

Democrat
Among those who have ___ science knowledge

Republican			Democrat		
25	25	17	41	74	89
Low	Medium	High	Low	Medium	High

Note: Republicans and Democrats include independents and others who lean toward the parties. Respondents who gave other responses or who did not give an answer not shown. Levels of science knowledge based on 11-item index in survey conducted Jan. 7-21, 2019. Source: Survey conducted Oct. 1-13, 2019.

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US Democrats and Republicans divided on climate change

Partisans' Levels of Worry About Environmental Problems, 2019-2021
% Expressing "a great deal" of worry about each problem

	2019	2020	2021
	%	%	%
Democrat/Lean Democratic			
Pollution of drinking water	69	74	69
Global warming/Climate change	68	74	68
Pollution of rivers, lakes and reservoirs	66	68	61
Air pollution	57	68	57
Loss of tropical rain forests	51	64	55
Extinction of plant and animal species	57	61	51
Republican/Lean Republican			
Pollution of drinking water	38	40	39
Global warming/Climate change	18	14	14
Pollution of rivers, lakes and reservoirs	36	37	40
Air pollution	24	23	20
Loss of tropical rain forests	25	28	29
Extinction of plant and animal species	24	28	25

Polls conducted in March of each year

GALLUP

Applying behavioral insights to environmental issues

Moving forward: nudges, defaults, heuristics

Guiding guide people's behavior in particular directions without the use of force or mandates. People are free to continue with their existing behaviors if they wish.

- **Nudges**:
  - ➢ A nudge is a motivator or an incentive to elicit a certain desired behavior: human beings look for paths of least resistance and therefore let default option become the choice.*

- **Defaults**:
  - ➢ Example: opt-in and opt-out policy for donating organs. Countries with opt out policies where people are automatically registered or viewed as an organ donor have significantly increased the number of organ donors.

- **Heuristics: shortcuts that may introduce bias:**
  - **Anchoring** is an example of heuristic: a cognitive bias where a specific piece of information is relied upon to make a decision. The 'anchor' is the reference point for future decisions, expectations, or judgments.
  - **Framing**: people's decisions tend to be affected by the way in which the choices are framed through copywriting, imagery, tone, pricing and placement.

* Source: Richard H. Thaler and Cass R. Sunstein (2008), Nudge: Improving Decisions about Health, Wealth, and Happiness, Yale University Press

Using nudges for environmental purposes

A nudge is a motivator. It is a simple way to alter people's behavior in a predictable way, without forbidding any options or significantly changing their incentives.

- **Examples of nudges include** sending people a reminder to schedule a doctor's appointment, ensuring that healthier food is more noticeable in a shop or cafeteria, and reminding people what audience will see what they're about to post on social media.

The best way to nudge the desired behavior is to employ the default option in the choice set because human beings look for paths of least resistance and therefore let default option become the choice.

Source: Richard H. Thaler and Cass R. Sunstein (2008), Nudge: Improving Decisions about Health, Wealth, and Happiness, Yale University Press

Using default rules for environmental purposes

- **Default rules** are settings that apply or outcomes that stick when individuals do not take active steps to change them:
  - Example: make green energy is the default – with a costless (or costly) optout
- **Default rules matter**: the role of inertia, aversion to losses and the power of suggestion.
- **Advantages of green defaults**: they can have beneficial effects while respecting freedom of choice. They are an important tool and can have a larger impact than other policy instruments.

Using default rules for environmental purposes

- **Paper.** Rutger University's adoption of double-sided printing options resulted in a 44% reduction in paper consumption over 4 years.

- A German energy company established 3 options. **The default was green.** About 94% of customers remained with the default option with only 4.3% switching to the cheaper tariffs.

- When energy-inefficient but inexpensive **incandescent light bulbs** (ILB) were the default, they were chosen 44% of the time; when the energy-efficient but **more costly compact fluorescent light bulb** was the default, the ILB was chosen only 20.2% of the time.

How information is framed matters

- **Climate Change can be "framed" in multiple ways:**
  - Content frames: public health, national security, environmental conservation
  - Structure frames: loss vs. gain; present vs. future
- **We generally accept risk if thinking about possible losses; but avoid risk if thinking about possible gains**
  - So, take more risks when think we are going to lose something
- **Climate change generally presented as losses frame but better to frame it in a "gains" frame: "if we invest, here is the better things we would have"**
- **How we frame climate change solutions influences skepticism**
  - Costs of climate solutions lead Republicans to disbelieve climate science
    - Climate solution of "promoting green tech" vs. "regulating industry"
  - "I don't like the solution, so I discount that there's a problem."

Why people might choose green energy even if it is more expensive than gray energy.

- Adapting to social norms (notion that good people choose green energy)

- Desire to express certain values or to act in accordance with self-conceptualizations

- Signaling value and preferences to others. Buying green is often done for status reasons while behaving green is less visible and status-laden

- Automatic judgement in favor of (or against) green (power of green branding).
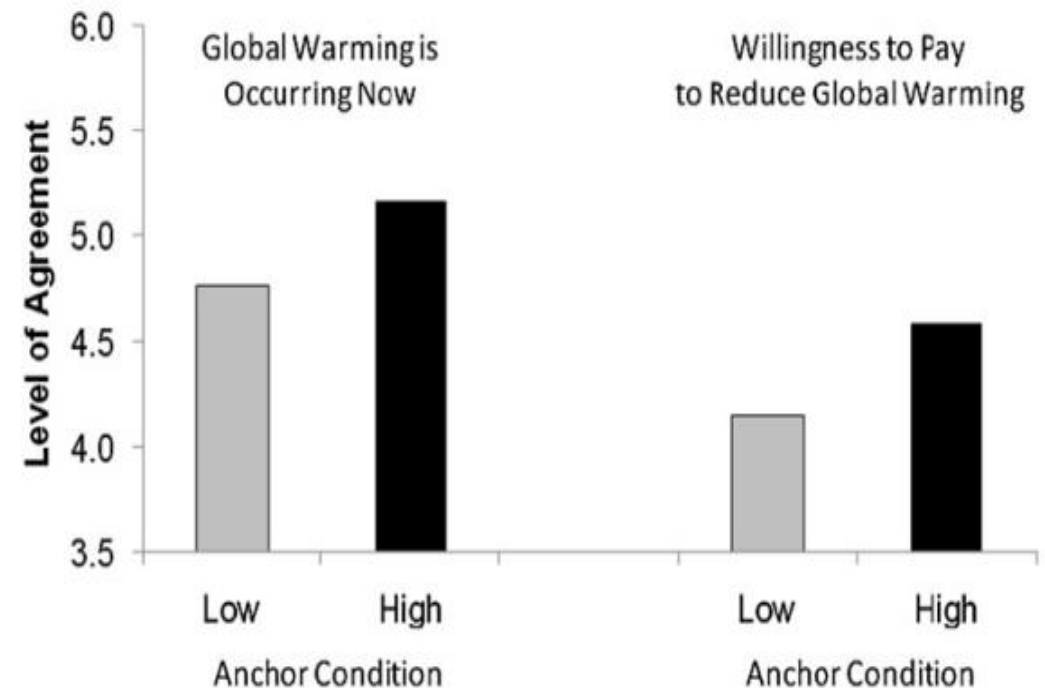

SAVE THE TREES

Anchoring

2 groups of students

- Group 1 is asked: Do you believe the earth's temperature will rise by exactly 1 degree Fahrenheit over the next 30 years?" (low anchor).

- Group 2 is asked: "Do you believe the earth's temperature will rise by exactly 10 degrees Fahrenheit over the next 30 years?" (High anchor).

Results:

When people were given an initially high anchor for possible increases in the earth's temperature, they were more likely to believe global warming is occurring now and were more **willing to pay to reduce global warming.**

Effect of numerical anchor on belief in global warming and willingness to pay to reduce global warming.

Source: Joireman, J., et al., Effect of outdoor temperature, heat primes and anchoring on belief in global warming, Journal of Environmental Psychology (2010).

The energy-efficiency paradox

- **Energy efficiency** improvements very often pay-off even in the short run – but they are not implemented; this is called the **energy efficiency paradox**.

- Reasons for the **energy efficiency paradox** :
  - **Principal-agent problem**: a landlord is not incentivized to invest in costly energy-efficient appliances because h/she will not benefit from the resulting energy savings; tenants would pays the bill but may not be able to amortize the cost of the appliances.
  - **Behavioral failures**: A consumer could be averse to purchasing an appliance with a higher upfront cost, even if the lifetime energy savings benefits outweigh the costs.
  - **Inattention**, which refers to a consumer either ignoring or misunderstanding information relevant to the decision they are making and, consequently, making an irrational decision.

- **Challenges exist** for reducing overall energy consumption even after energy efficiency has improved. The rebound effect refers to the phenomenon that improved energy efficiency can lead, to some extent, to an increase in energy use because the cost of the energy service declines.

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