Applied Economics Issues

Beliefs and Social Norms about Climate Change

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Key references for this session

- Andre, P., Boneva, T., Chopra, F. and Falk, A. (2024). Misperceived social norms and willingness to act against climate change. *Review of Economics and Statistics*. 1–46, doi:10.1162/rest_a_01468.
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Why do beliefs about climate change matter?

- Opinions about the existence and drivers of climate change affect:
  - individual environmental behaviours,
  - support for mitigation and adaptation policies.

Leviston et al. (2012)

"our opinions about the existence and drivers of climate change influence our environmental behaviours and support for climate-change mitigation and adaptation policy"

Beliefs as an economic object

- In this lecture, climate beliefs are treated as an **economic variable**:
  - they shape individual choices (consumption, voting, activism),
  - they enter policy evaluation through preferences and welfare.
- But beliefs are not purely informational:
  - they reflect identity, values, and motivated reasoning (Bénabou and Tirole, 2016),
  - and perceptions of what others think and do.

Roadmap of the lecture

1. **Determinants of climate-risk beliefs**
   Identity, cultural values, political orientation, gender, and system-justification motives.
2. **Misperceptions, false consensus, and pluralistic ignorance**
   How people misread what others think about climate change.
3. **Social norms and willingness to act**
   Misperceived norms, causal evidence from Andre et al. (2024).
4. **Nudges and information policies**
   Using choice architecture and social-information interventions to align beliefs and action.

2. What Shapes Opinions about Climate-Change Risk?

Beliefs as social and psychological objects

- **Climate-risk perceptions** are not only about "having the right information".
- They are shaped by:
  - social identification with potential victims,
  - cultural values and group identities,
  - political ideology and system-justification motives,
  - gender and moral values,
  - motivated beliefs.
- Understanding these mechanisms is necessary to:
  - interpret survey data on climate beliefs,
  - design effective communication and policies.

2.1. Social Identification

Social identification and climate risk

- Climate-risk perceptions depend on **who** is seen as affected by climate change.
- People identify more strongly with some groups than others. Individuals identify most strongly with:
  - family and close communities,
  - national or cultural ingroups,
  - groups with shared values, ideology, or lifestyle.
- When victims are seen as **ingroup members**, climate threats feel more immediate and morally compelling.

Social identification matters (1/2)

- Hart and Nisbet (2011) show that the perceived **social distance** of climate victims **affects how people interpret climate messages**.
- Stronger identification with victims leads to:
  - higher perceived risk,
  - stronger emotional engagement,
  - greater support for policy action.

Social identification matters (1/2)

- But when victims are viewed as **socially distant** (e.g., people in faraway countries, abstract "future generations"):
  - the message feels less self-relevant,
  - identity-protective cognition may activate,
  - some groups (especially conservatives) may react with **skepticism or backlash**:
    - climate messages helping "others" more than "people like me" can activate defensive reactions (**identity threat**).
    - messages may be interpreted as moralizing or imposing external values (**reactance**).
    - if climate change already feels abstract; adding social distance makes it seem even less urgent (**psychological distance**).

2.2. Cultural Values

Cultural values and climate-risk perception

- Kahan et al. (2012) show that individuals form climate-risk perceptions that align with the **values of groups they identify with**.
- They show that **cultural values** matter more than **scientific knowledge** in predicting climate concern.
- To do so, they measure two central worldview dimensions:
  1. **Hierarchy vs. Egalitarianism**
  2. **Individualism vs. Communitarianism**
- These worldviews shape:
  - interpretation of scientific evidence,
  - trust in institutions and experts,
  - support for mitigation and regulation.

Cultural values: Hierarchy vs. Egalitarianism scale

- This scale measures attitudes toward **social orderings** with stratified roles and authority.
  - **Hierarchical worldview**:
    - accepts social inequalities,
    - perceives regulation as threatening established roles.
  - **Egalitarian worldview**:
    - favors reducing inequalities and flattening hierarchies.
- This can be measured by agree/disagree questions such as "*We need to markedly reduce inequalities between the rich and the poor, whites and people of colour, and men and women.*"
- **Hierarchical individuals** tend to be more sceptical of climate risks, as acknowledging these risks legitimizes restrictions on commerce and industry.
- **Egalitarian individuals** tend to perceive climate risks as serious and morally urgent.

Cultural values: Individualism vs. Communitarianism scale

- This scales measures attitudes toward the **responsibility for securing well-being**.
  - **Individualist worldview** :
    - individuals should secure their own welfare,
    - sceptical of government intervention.
  - **Communitarian worldview** :
    - society should regulate behaviour when needed for collective welfare,
    - supportive of environmental regulation.
- This can be measured by agree/disagree questions such as "*Government should put limits on the choices individuals can make so they do not get in the way of what is good for society.*"
- **Individualists** oppose climate regulations that constrain personal or market autonomy.
- **Communitarians** view climate change as a collective-action problem requiring regulation.

Science literacy and climate-risk perception

- A common view: "*the public underestimates climate risks because it lacks scientific knowledge or technical reasoning skills.*"
- Kahan et al. (2012) label this the **Science Comprehension Thesis**.
- The Science Comprehension Thesis predicts that:
  - higher science literacy leads to higher perceived climate risk,
  - higher numeracy (system–2 reasoning, see Kahneman, 2003) leads to higher perceived climate risk.
- Using a representative US sample ($N = 1,540$), Kahan et al. (2012) test whether science knowledge and numeracy increase climate-risk perception.

Science literacy and climate-risk perception: Kahan et al. (2012) results

Figure 1: Climate-risk perception vs. science literacy/numeracy. Kahan et al. (2012)

- individuals with **higher literacy and numeracy perceive *less*** climate risk.
- knowledge amplifies **cultural polarization** rather than reduces it.

2.3. Political Identity and System Justification

Political identity and climate-risk perception

- Climate change attitudes are highly **polarized along political lines**.
- In the U.S., conservatives consistently show **greater climate scepticism** than liberals.
- Hornsey et al. (2018) (cross-national study, 25 countries):
  - political conservatism is one of the strongest predictors of climate scepticism,
  - even stronger than education or scientific literacy.
- Mechanism:
  - for many conservatives, climate mitigation policies threaten preferred social and economic arrangements.
  - ideological identity becomes intertwined with climate attitudes.

The conservative white male effect

- McCright and Dunlap (2011) document that **conservative white males** are significantly more likely to endorse climate-change denial.
- They use the ten Gallup nationally representative surveys (2001–2010).
- They show that conservative white males disproportionately:
  - deny that global warming is occurring,
  - deny that it is human-caused,
  - deny that scientists agree on climate change,
  - believe the dangers are exaggerated,
  - report no personal worry.
- This pattern strengthens among those who say they understand climate change "very well."

Identity-protective cognition

- Building on Kahan et al. (2012), McCright and Dunlap (2011) show that climate denial among conservative white males reflects **identity-protective cognition**:

> (McCright and Dunlap, 2011, p. 1165)
>
> *This reaction, which Kahan et al. (2012, p. 470) term 'identity-protective cognition,' serves to protect the status and self-esteem that individuals receive from group membership: 'as a means of identity self-defense, individuals appraise information in a manner that buttresses beliefs associated with belonging to particular groups.'*

- Individuals evaluate information in ways that:
  - protect the status and esteem they derive from their identity group,
  - defend in-group beliefs against out-group sources (scientists, environmentalists).
- Climate change is perceived as challenging economic, political, and social structures culturally valued by conservative white males.

System justification, status quo bias, and climate denial

- Feygina et al. (2009) develop the theory that conservatives exhibit strong **system-justification** tendencies (motivation to **maintain the societal *status quo***).
- System justification involves:
  - motivation to defend, justify, and maintain the existing social, economic, and political order.
- Climate change poses a threat because it implies:
  - faults in the current system,
  - need for large-scale change,
  - potential regulation of markets and industry.
- The **status quo bias** amplifies this reaction (see Samuelson and Zeckhauser, 1988)
  - people prefer existing energy systems and consumption patterns,
  - deep structural changes feel risky or unfair.

System justification, status quo bias, and climate denial

- Hence:
  - acknowledging climate change threatens system legitimacy,
  - denial becomes a psychologically protective strategy.

Feygina et al. (2009, p. 328)

for many people, acknowledging and addressing environmental problems appears to be threatening to the very foundations of the social, economic, and political status quo

2.4. Gender, empathy, and climate concern

Gender, empathy, and climate concern

- Bush and Clayton (2022) document a robust **gender gap** in climate attitudes worldwide.
  - In **wealthier countries**, **men more than women perceive higher economic costs** of mitigation,
  - which **lowers their expressed concern about climate change** relative to women.
- Earlier work on environmentalism and prosocial values:
  - Zelezny et al. (2000); Zelezny et al. (2002): women tend to display more **empathy** and are socialized to value the needs of others,
  - they exhibit more **helping behaviour**, altruism, and pro-environmental attitudes.
- As a consequence:
  - gender differences in climate concern reflect both
    - perceived **material stakes** of mitigation policies (costs, regulations),
    - and underlying **prosocial and empathetic values**.

2.5. Motivated Beliefs

Motivated beliefs about climate change

- Bénabou and Tirole (2016): individuals form **motivated beliefs** (beliefs that balance **accuracy** with **desirability**).
- Beliefs serve psychological and functional needs:
  - maintaining self-image and group identity,
  - avoiding cognitive dissonance,
  - sustaining optimism or moral coherence.
- Applied to climate change:
  - acknowledging climate risks can impose **psychological**, **economic**, or **political** costs,
  - individuals may therefore *downplay*, ignore, or reinterpret evidence,
  - denial reduces anxiety and protects identity or worldview.

Motivated beliefs about climate change

- Manifestations of motivated reasoning:
  - selective exposure to congenial information,
  - discounting dissonant scientific evidence,
  - attributing climate change to non–human causes,
  - endorsing conspiracy narratives.

Bénabou and Tirole (2016, p. 141)

People thus hold certain beliefs in part because they attach value to them, as a result of some (usually implicit) tradeoff between accuracy and desirability. Such beliefs will therefore be resistant to many forms of evidence, with individuals displaying non-Bayesian behaviors such as not wanting to know, wishful thinking, and reality denial. At the same time, motivated beliefs will respond to the costs, benefits, and stakes involved in maintaining different self-views and world-views.

3. Misperceptions, False Consensus, and Pluralistic Ignorance

Misperceptions and climate beliefs

- People often hold incorrect beliefs about **what others think and do** regarding climate change.
- These misperceptions shape:
  - willingness to act,
  - support for climate policies,
  - social pressure and perceived norms.
- Two key mechanisms we are going to describe here:
  1. **False consensus**
  2. **Pluralistic ignorance**

False consensus about climate change

False consensus (Ross et al., 1977)

*Individuals tend to view their own opinions as **more common** than they really are.*

- Leviston et al. (2012) apply this to climate beliefs:
  - supporters of climate action overestimate public support,
  - sceptics overestimate the share of sceptics,
  - people systematically overestimate *rejection* of climate change in the broader community.
- Consequently, they observe that:
  - false consensus reinforces group polarization,
  - individuals with strong false-consensus bias show **less willingness to update beliefs**.

Pluralistic ignorance

Pluralistic ignorance (Miller and McFarland (1987), attributed to Allport (1924); Allport (1931))

Pluralistic ignorance is the situation in which virtually all members of a group privately reject a norm yet believe that virtually all other members accept it.

- Classic consequence (Prentice and Miller, 1993):
  - people **conform to a norm they privately disagree with**,
  - because they believe "everyone else" endorses it.
- Applied to climate change:
  - individuals underestimate how many others are concerned,
  - they publicly under-express their concern, which reinforces the false perception.

The environmental belief paradox

- Pearson et al. (2018): minority and low-income groups in the US report **high environmental concern**, yet the public perceives them as **least concerned**.
- This creates an environmental belief paradox.

> **Environmental belief paradox (Pearson et al., 2018)**
>
> *The tendency to misperceive groups that are among the most environmentally concerned and most vulnerable to a wide range of environmental impacts as least concerned about the environment*

- Misperception is widespread:
  - observed among whites and nonwhites,
  - even minority respondents underestimate their own group's concern.
- Hence, it reinforces stereotypes about who "cares about the environment," and it weakens coalition building and political support.

Pluralistic ignorance: evidence from racial/ethnic groups

- Pearson et al. (2018) highlight a strong evidence of **ingroup pluralistic ignorance**.
  - Blacks, Latinos, and Asians often report being more concerned about the environment than they believe others in their group are.
  - Whites more often report being less concerned than other whites.
- They interpret it as follows:
  - groups underestimate their own pro-environmental norms,
  - leading to muted public expression and weakened social advocacy.

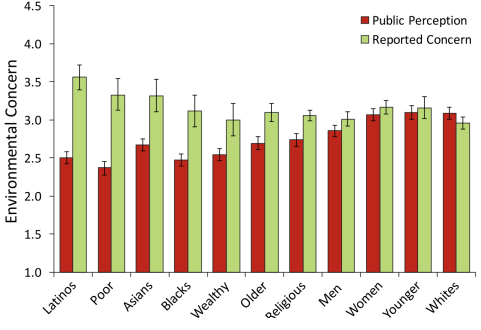

Figure 2: Mean perception of each rated demographic group's concern (red bar) and each group's mean reported concern (green bar) for the environment, aggregated across diversity treatment conditions. Error bars are 95% CIs. (Pearson et al., 2018)

Pluralistic ignorance: evidence from racial/ethnic groups

- Respondents **underestimate the environmental concern** of nearly all demographic groups (except whites), relative to those groups' own reported concern.
- Both white and nonwhite respondents **underestimate minority groups' concern** and consistently perceive minorities as caring less about the environment than whites.

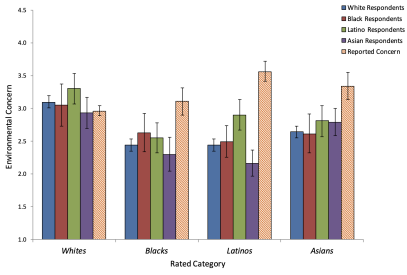

Figure 3: Mean rated environmental concern of racial/ethnic target groups, by respondent race/ethnicity. Diagonal orange bars are mean self-report ratings for each group. Error bars are 95% CIs. (Pearson et al., 2018)

Pluralistic ignorance: evidence from racial/ethnic groups

- Similar patterns are found for poor/wealthy americans.

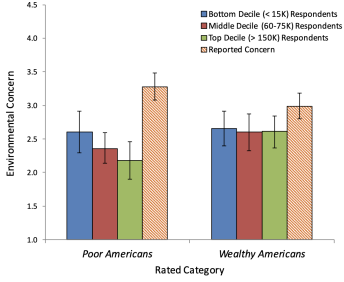

Figure 4: Mean rated environmental concern of Poor and Wealthy Americans by respondent household income (bottom, middle, and top deciles). Diagonal orange bars are bottom and top income decile respondents' mean self-report ratings. Error bars are 95% CIs. (Pearson et al., 2018)

Pluralistic ignorance: evidence from racial/ethnic groups

- Blacks, Latinos, and Asians were more likely to report being **more concerned** about the environment than others in their ingroup, whereas whites were more likely to report being **less concerned** than other whites.
- This corresponds to **pluralistic ignorance** (recall that is means that minority respondents underestimate their own group's concern):
  - minority groups underestimate their own group's concern,
  - whites overestimate theirs.

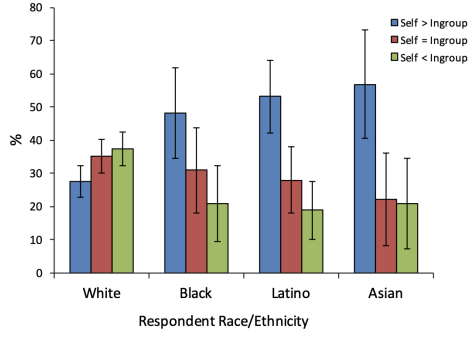

Figure 5: Percentage of US respondents showing ingroup pluralistic ignorance in environmental concern (blue bar) by race/ethnicity. Error bars are 95% CIs. (Pearson et al., 2018)

Misperceptions of who is an "environmentalist"

- In Pearson et al. (2018), respondents strongly associate "**environmentalists**" with **whites**.
  - Both white and nonwhite respondents associated environmentalists with whites more than with nonwhites,
  - In contrast, associations for Blacks, Latinos, and Asians fell **significantly below the midpoint** of the scale: **dissociation** between these groups and the environmentalist identity.

Scales were 1= not at all to 5= very much and 1= very poor/uneducated/young, 3= neutral, 5= very wealthy/educated/old.

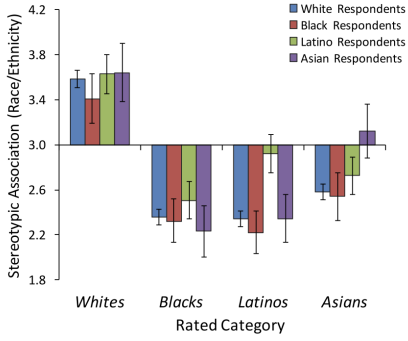

Figure 6: Racial/ethnic associations with the term "environmentalist" by respondent race/ethnicity. Bars indicate strength of association with each rated category relative to the scale midpoint. Error bars are 95% CIs. (Pearson et al., 2018)

3.1. Correcting Misperceptions?

Can misperceptions be changed?

- Pearson et al. (2018) embed a **randomized experiment** in their nationally representative US survey.
- Participants were randomly assigned to view one of two versions of an environmental organization's mission statement:
  1. **Diverse condition** (treatment): image of a racially/ethnically diverse staff + text valuing diverse perspectives.
  2. **Non-diverse condition** (control): no mention or visual cue of diversity.
- After exposure, respondents were asked to rate:
  - racial/ethnic **associations** with the term "environmentalist,"
  - perceived environmental concern of **whites** and **nonwhite** groups.

Effects of the diversity intervention

- Exposure to a **diverse** (vs. nondiverse) environmental organization **significantly reduced the perceived gap** in environmental concern between whites and nonwhites.
- This effect appeared for **both white and nonwhite respondents**.
- The mechanism:
  - the reduction is driven mainly by **lowered perceptions of whites' environmental concern**,
  - not by increased ratings of nonwhites.
- Associations with "environmentalists" also shifted:
  - minority respondents more strongly associated **their own group** with "environmentalists" in the diverse condition (reducing the stereotype that environmentalists are mostly white),
  - whites showed no analogous change.

4. Social Norms, Misperceived Norms, and Willingness to Act

Social norms and climate action

- **Social norms** are collectively shared beliefs about **what others do** (descriptive norms) and **what others think one should do** (injunctive norms).
- Norms structure expectations:
  - they guide behaviour through social approval/disapproval,
  - they reduce uncertainty about how "people like us" act.
- Climate change as a collective-action problem:
  - individuals look to peers to assess what is common and morally expected,
  - misperceiving norms can decrease the willingness to act.

Social norms (Andre et al., 2024, p. 10)

Social norms *are behavioral rules that express the collectively shared understanding of what is typical and morally acceptable behavior. They set the standards of conduct, shape individual behavior, are decentrally enforced, and could thus create a potent momentum either in favor of or against climate action.*

Misperceived norms and willingness to act

- We have seen previously that people often **underestimate** how many others:
  - take climate-friendly actions,
  - believe we *should* fight global warming.
- We said that such misperceptions create a form of **pluralistic ignorance** (individuals privately care but assume others do not).
- As a consequence, this can lead to:
  - reduced personal action,
  - lower policy support,
  - belief that climate action lacks social mandate.

Andre et al. (2024): Measuring norm misperceptions

To measure the causal effect of perceived norms and behaviours on individual willingness to act against climate change in the US, Andre et al. (2024) ran an interesting study.

- Two-wave representative US survey (N = 8,000).
- Wave 1: establish **true norms** and **true behaviours**.
  - 62% say they *try to fight* global warming.
  - 79% say people *should* try to fight global warming.
- Wave 2: elicit **perceived norms** and **perceived behaviour**.
  - Respondents are asked to estimate:
    - what proportion of the US population *try to fight global warming* (**perceived behavior**)
    - what proportion think that 'people in the US should try to fight global warming' (**perceived norms**)
  - Respondents dramatically underestimate both:
    - **perceived behaviour**: $\approx$ 51% (vs. 62% true),
    - **perceived norms**: $\approx$ 61% (vs. 79% true).

Andre et al. (2024): Measuring norm misperceptions

Norms

- True share of Americans who try to fight global warming: 62%,
- Share of respondents who underestimate that share: 67%
- Belief about this share: perceived to be 51% (with a lot of heterogeneity)

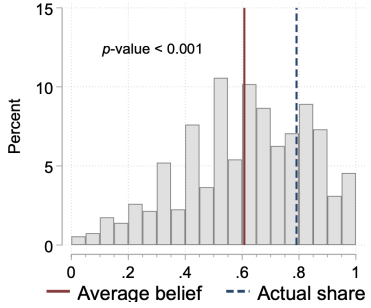

Figure 7: Distribution of people's beliefs about the share of Americans who say that one should fight global warming. (Andre et al., 2024)

Andre et al. (2024): Measuring norm misperceptions

Behaviours

- True share of Americans who think that people in the US should try to fight global warming: 79%
- Share of respondents who underestimate that share: 76%
- Belief about this share: perceived to be 61% (with a lot of heterogeneity)

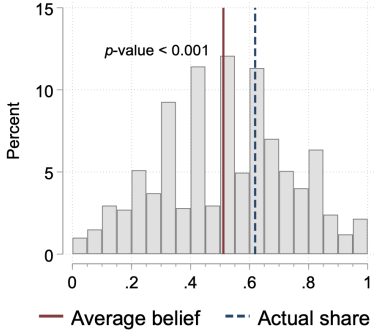

Figure 8: Distribution of people's beliefs about the share of Americans who say that they try to fight global warming. (Andre et al., 2024)

Andre et al. (2024): Willingness to act

- Willingness to act is measured via **incentivized donation**: allocate \$450 between self and climate NGO.
- On average, respondents are willing to donate \$225 of the \$450 to a charity:
  - 6% donate \$0,
  - 12% donate \$450,
  - The amount is correlated to respondents self-reported climate-friendly behaviours.

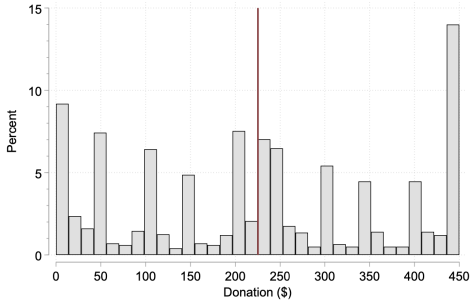

Figure 9: The distribution of individual willingness to fight global warming. This figure shows the distribution of the monetary amounts donated to the climate charity in wave 1. The average donation is indicated by the vertical red line. (Andre et al., 2024)

Determinants of willingness to act: OLS

- Outcome variable:
  - Y_i = amount (in \$) donated to a climate NGO in the incentivized task.
- Main explanatory variables (either one of them):
  - **beliefs** about **prevalent behaviours** (share trying to fight global warming),
  - **beliefs** about **prevalent norms** (share saying people should fight global warming).
- Economic preference controls:
  - altruism, patience, risk tolerance,
  - positive reciprocity, negative reciprocity, trust.
- Moral-value control:
  - **relative universalism** (vs. communal moral focus).
- Socio-demographic controls:
  - political views, gender, age ($+$ age^2),
  - log income, college degree, employment status, parent indicator.

$$Y_i = \beta_1 \text{Beliefs}_i + \beta_2 \text{Preferences}_i + \beta_3 \text{Morals}_i + \beta_4 \text{Demographics}_i + \varepsilon_i$$

Perceived norms strongly predict willingness to act

- OLS results:
  - +1 SD in perceived behaviour ⇒ $12 higher donation,
  - +1 SD in perceived norms ⇒ $14 higher donation.
- The results stress out that **norm beliefs matter roughly as much as economic preferences and moral universalism**.
- This implies that people act more when they believe others act or approve of the action, and that climate action is socially conditional.

Factors positively associated with individual willingness to fight global warming:
- **Economic preferences**: patience ($15), altruism ($52), positive reciprocity ($8)
- **Universal moral values** (captures the tendency to extend altruistic and moral concerns to individuals who are socially distant, measured following the procedure from Enke (2020); opposed to communal, in-group-oriented values): universal moral values ($23)

Correcting misperceived norms: an information nudge

- Changing economic preferences or moral values is difficult. **Changing beliefs** about social norms is less difficult.
- Wave 2 actually includes a randomized intervention in which respondents can receive an information:
  1. **Behaviour treatment**: "62% of Americans try to fight global warming."
  2. **Norms treatment**: "79% think Americans *should* try to fight global warming."
  3. **Control**: no information.

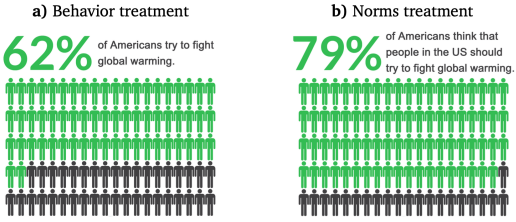

Figure 10: Information shown to the treated individuals, depending on the treatment they receive. (Andre et al., 2024)

Correcting misperceived norms: an information nudge

- The results of the randomized intervention in Andre et al. (2024):
  - Behaviour information $\Rightarrow$ +\$12 donation (+4.7%),
  - Norm information $\Rightarrow$ +\$16 donation (+6.3%).
- These corrections increase:
  - policy support (carbon tax, green subsidies, regulation),
  - and the willingness to engage in activism.

Who responds most to norm corrections?

- The effects are concentrated among respondents who:
  - initially **underestimated** climate norms,
  - are **climate sceptics**.
- The advanced mechanism:
  - sceptics may be **surprised** to learn their views are minority views,
  - norm information aligns self-perception with the majority,
  - moral universalism mediates responsiveness: "*[skeptics] moral compass places more weight on communal values, which might render them more sensitive to information about the behavior and normative expectations of fellow citizens*" (p. 34)
- Andre et al. (2024) report no backfire:
  - respondents who already overestimated norms show no negative effect when they are subject to the information.

Policy implications from Andre et al. (2024)

- The underestimation of climate norms prevents people from:
  - engaging in costly pro-environmental behaviours,
  - supporting ambitious climate policies,
  - participating in climate advocacy.
- Providing **accurate norm information** is:
  - cheap, scalable, and depolarizing,
  - especially effective for hard-to-reach sceptics,
  - complementary to economic incentives (more about this in the next part).
- Overall, the papers shows that:
  - climate action is socially coordinated (people decide whether to act based on what they believe others are doing and what they believe others expect of them),
  - revealing the "silent majority" can unlock collective action.

5. Nudges, Choice Architecture, and Climate Policy

What is a nudge?

Nudge (Richard H. Thaler, 2008, p. 6)

A nudge [...] is any aspect of the choice architecture that alters people's behavior in a predictable way ***without forbidding any options or significantly changing their economic incentives****. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not.*

- To qualify as a "**mere nudge**":
  - opting out must be easy and inexpensive.
- Examples of nudges:
  - placing healthier food at eye level,
  - setting green defaults (e.g., renewable energy, plant-based meal),
  - providing social comparison information.

Introductory example from (Richard H. Thaler, 2008): the school cafeteria

- Richard H. Thaler (2008) open the book with a (fictive) cafeteria example:
  - rearranging the order of food items,
  - placing healthier options at eye level,
  - placing desserts earlier or later in the line.
- By doing so, consumption of some items is assumed to change by up to 25%,
- while keeping menus and prices remain unchanged.
- They state that subtle changes in **presentation**, not incentives, can influence behaviour.

Libertarian paternalism

- Nudges embody what Thaler and Sunstein (2003); Thaler and Sunstein (2008) call **libertarian paternalism**.
- **Libertarian**:
  - people retain full freedom of choice;
  - no option is prohibited or made significantly harder.
- **Paternalism**:
  - the choice architect aims to steer individuals toward options that improve their well-being (as judged by themselves).
- In the cafeteria example:
  - one can still buy fries or dessert,
  - but the default visibility of healthy items encourages better choices.

Humans vs. Econs

Richard H. Thaler (2008) distinguishes between:

- **Econs**: perfectly rational agents of standard economic theory (*homo economicus*):
  - always pick the option maximizing utility-ordering of items, defaults, and framing do not matter.
- **Humans**: real decision-makers with biases, heuristics, limited attention
  - humans are sensitive to defaults, salience and visibility, cognitive load and limited attention,social cues and descriptive norms.

(Richard H. Thaler, 2008, p. 6)

A nudge is any factor that significantly alters the behavior of Humans, even though it would be ignored by Econs.

Hence, nudges can work because people are Humans, not Econs.

Why nudges matter for climate policy

- Climate change is a **collective-action problem** with:
  - diffuse and delayed harms,
  - weak feedback on individual behaviour (e.g., using the AC which requires energy that may produce air pollution, not directly observed by the users),
  - externalities not fully priced.
- **Traditional policy tools**: carbon taxes, penalties, cap-and-trade systems.
- **Nudges** can complement price- and regulation-based tools by targeting the **decision environment** rather than incentives.
- Using nudges, environmental behaviour can potentially be shifted substantially without changing prices.

Choice architecture mechanisms

Nudges work by engaging systematic behavioural biases, among which:

- **Default effects**: strong tendency to stick with pre-selected options, reflecting **status quo bias** (Samuelson and Zeckhauser, 1988)
  - e.g., changing pre-selected options such as the default setting of office printers to duplex to reduce paper consumption (Egebark and Ekström, 2016).
- **Salience**: behaviour responds to what is easy to notice
  - e.g., prominent feedback on energy use or CO_2 emissions helps individuals notice and respond to environmental impacts that are otherwise hidden (Allcott and Rogers, 2014; Benartzi et al., 2017).
- **Social comparisons**: acting to match peer behaviour or norms
  - e.g., showing that most neighbours conserve energy or that most citizens support climate action increases willingness to act by correcting misperceived norms (Andre et al., 2024; Jachimowicz et al., 2018).

Norm-based nudges

- **Norm-based nudges** appear to work because they help people understand what others are doing or expect to be done.
- Recall from Andre et al. (2024), that revealing that many others already engage in climate-friendly behaviour (or support it) indicates that action is socially widespread, not isolated (**signal of collective action**).
- When actions are costly (donating, reducing energy use, supporting regulation), knowing that others will also act makes it worthwhile to participate, it helps align one's behaviour with the group (nudges can act as coordination devices).

Example: energy conservation nudges from Allcott and Rogers (2014)

- **Opower Home Energy Reports** (Allcott and Rogers, 2014):
  - households received personalized electricity-use feedback and **social comparisons** with neighbours ("efficient neighbours" vs. "average neighbours"), which makes energy consumption salient at the moment of decision;
  - average electricity use falls by **1%** to **1.3%** after report delivery.
  - repeated reports lead to **persistent savings** over time.

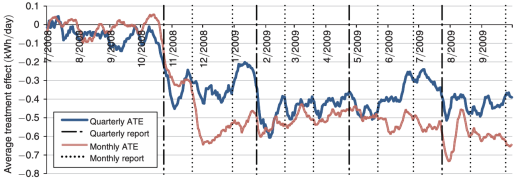

Figure 11: Seven day running mean treatment effects (receiving monthly or quarterly reports) for each day of the first year of treatment for the monthly and quarterly treatment groups. (Allcott and Rogers, 2014)

Example: energy conservation nudges from Allcott and Rogers (2014)

- Benartzi et al. (2017) measured the **cost-effectiveness** of the nudge:
  - about **27 kWh saved per $1 spent**,
  - far more cost-effective than many price-based interventions (e.g., rebates, peak-time incentives).
- The key mechanisme at play here:
  - **descriptive norms** become salient: households adjust consumption when they learn how their usage compares to similar neighbours.

Ethical considerations

Richard H. Thaler (2008) recalls that

- In the 17th chapter of the book, Richard H. Thaler (2008) warns: "*In offering supposedly helpful nudges, choice architects may have their own agendas.*" (p. 239)
- Nudges raise questions about:
  - **autonomy**: do nudges respect individuals as decision-makers?
  - **transparency**: are people aware of how they are being influenced?
  - **manipulation**: do nudges exploit psychological vulnerabilities?
  - **legitimacy**: should governments/private actors engage in such influence? Who decides what counts as an individual's "best interest"?
  - **Distributional concerns**: nudges may have unequal effects across socioeconomic groups, which have the potential to disproportionately burden certain groups.

6. Conclusion

Conclusion

- Climate beliefs are shaped by **identity**, **values**, and **motivated reasoning**, not only by **information**.
- Individuals tend to **misperceive** how much others care about climate change, leading to **false consensus** and **pluralistic ignorance**.
- These misperceptions decrease **willingness to act** and **support for climate policy**
  - correcting them with norm-based information can have large behavioural effects.
- Social norms are powerful: they operate as **signals of collective action** and **coordination devices** for costly pro-environmental behaviours.
- Nudges and choice architecture can complement traditional policies by making climate-friendly choices **easier**, **more salient**, and **socially supported**, while preserving freedom of choice.
- However, ethical deployment requires attention to **transparency**, **autonomy**, and **distributional effects**.

7. Appendix

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