Energy, Behavior, and Climate Change

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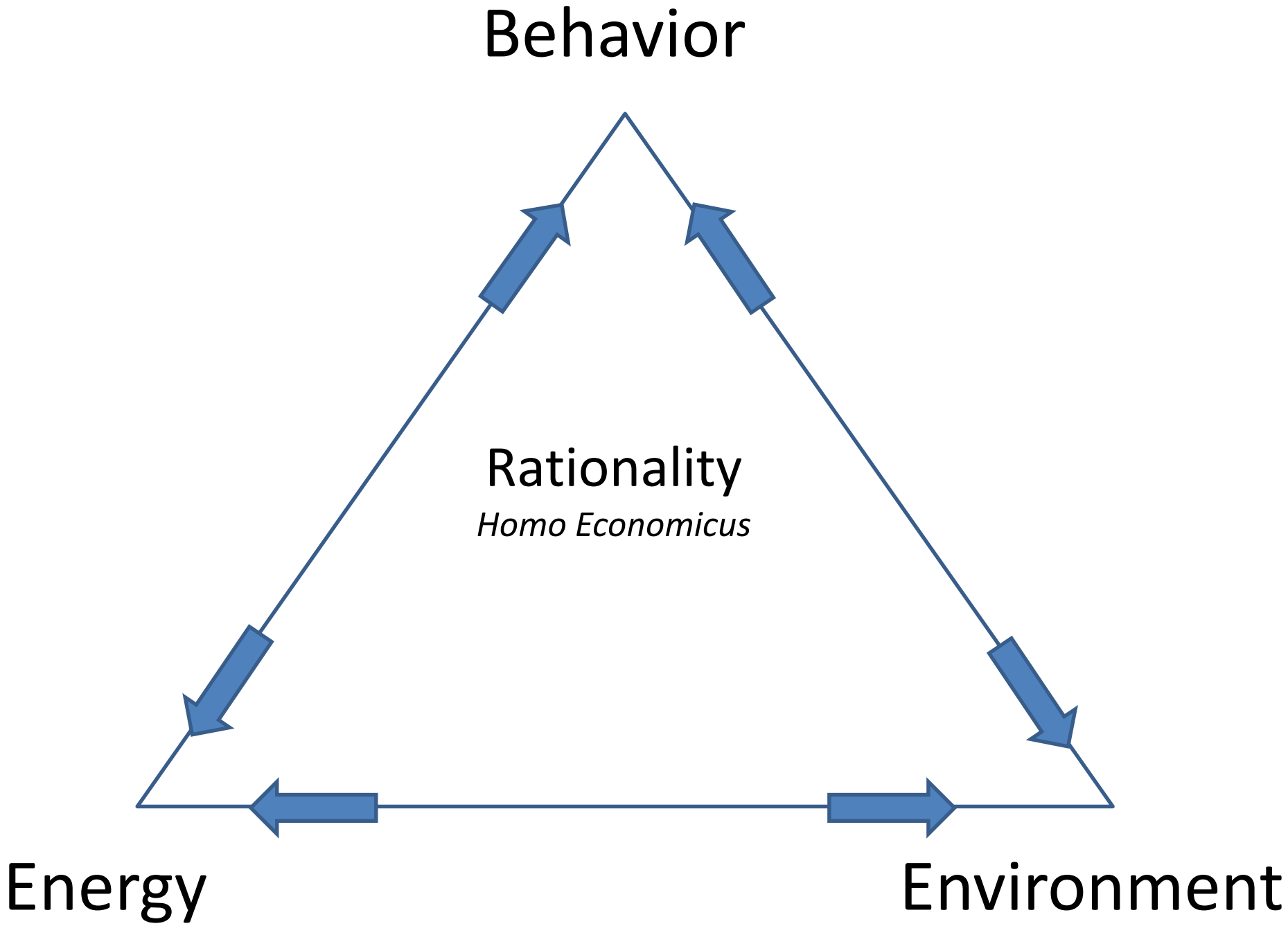

Behavior
Rationality
Homo Economicus
Energy
Environment

Science → Action
No Action → Information Deficit

IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
WMO UNEP

Fifth Assessment Report release

New York Times Editorial, April 1, 2014:
"Perhaps now the American public will fully accept that global warming is a danger now and an even graver threat to future generations."

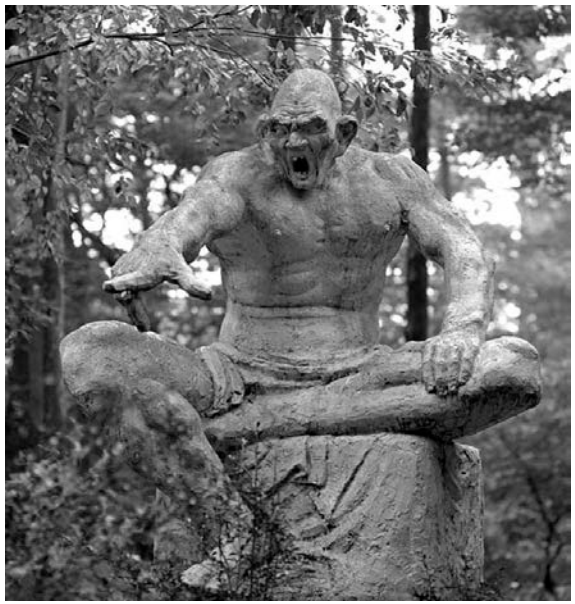
Homo sapiens

- Not primarily a creature of rational deliberation

- Instead, a creature of habit
  - Learn best from personal experience

- Use emotions/associations and rules/habits to guide actions

- Many goals, often conflicting



Why not more Attention and Action on CC?

- Business action
  - Resilience of systems/infrastructure related to food production, energy production, transportation...
- Investor action
  - SEC Interpretative Guidance on Climate Risk Disclosure
    - < 40% of S&P500 companies voluntarily disclose
- Political action
  - UNFCCC commitments
  - R&D investments into renewable energy, carbon capture, ….
- Individual action
  - Energy efficiency paradox (McKinsey, 2009)

Climate Change as the “perfect storm”

- Action seems painful
  - Costs certain and upfront
  - Benefits uncertain, in dribbles, over time

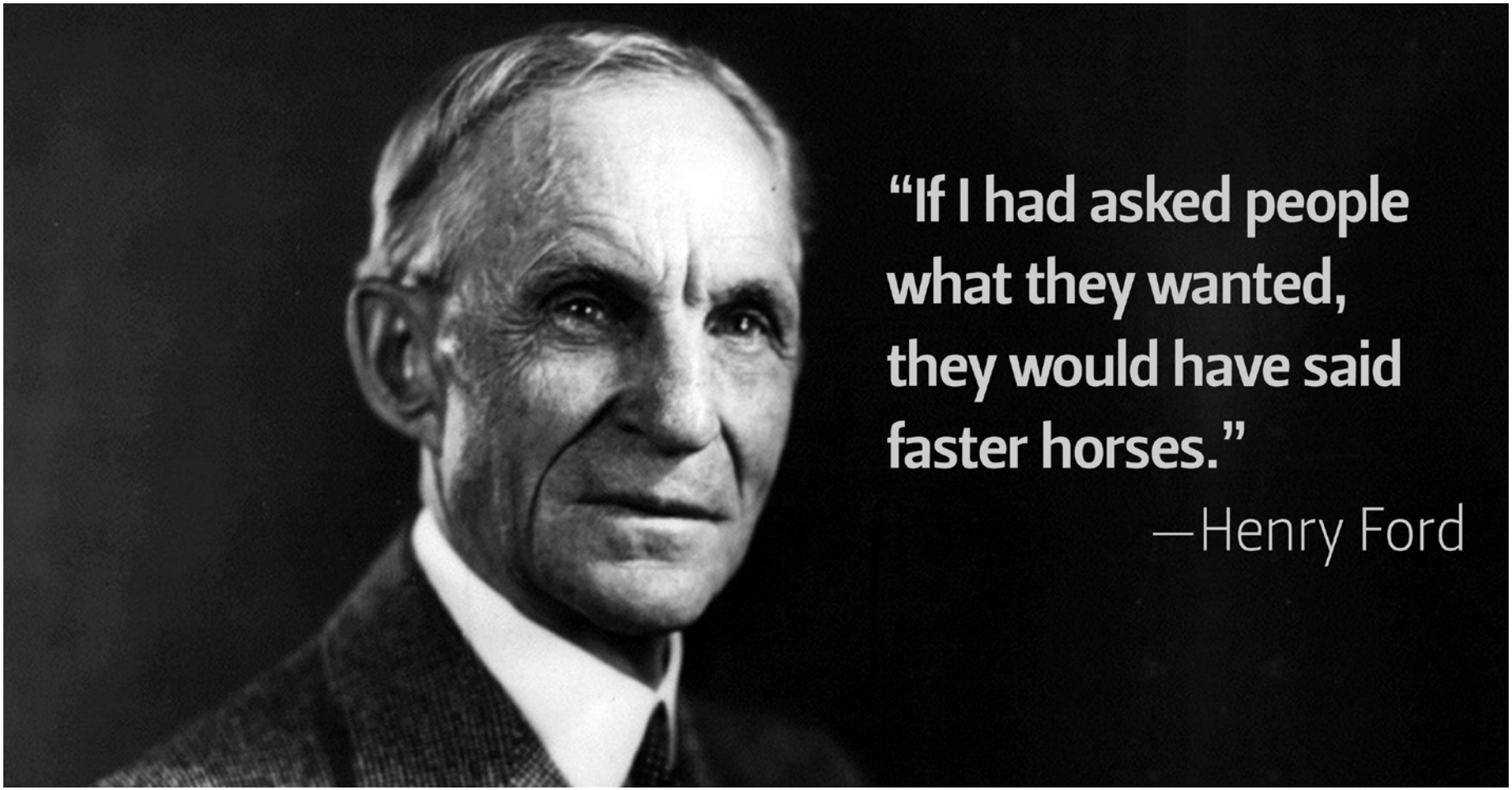
- (Effective) action is complicated
  - Problem is massive
  - Collective action required
  - Many uncertainties
    - climate science, technology, political, and social
  - No *silver bullet*, only *silver buckshot*

- Inaction is the status-quo
  - Vested interests in status-quo
    - “Merchants of doubt”

Status-quo bias

“if you build it, they may ***not*** come”

Status-quo bias and lack of imagination



What to do?

- Solutions can be found in the “diagnosis”
  - ***Why*** is there status-quo bias?
    - Typically, safety in “the known”
      - Not the case for climate change and other environmental challenges!!!

- Argument for scaring people/organizations into action?

“The Day After Tomorrow”

What to do?

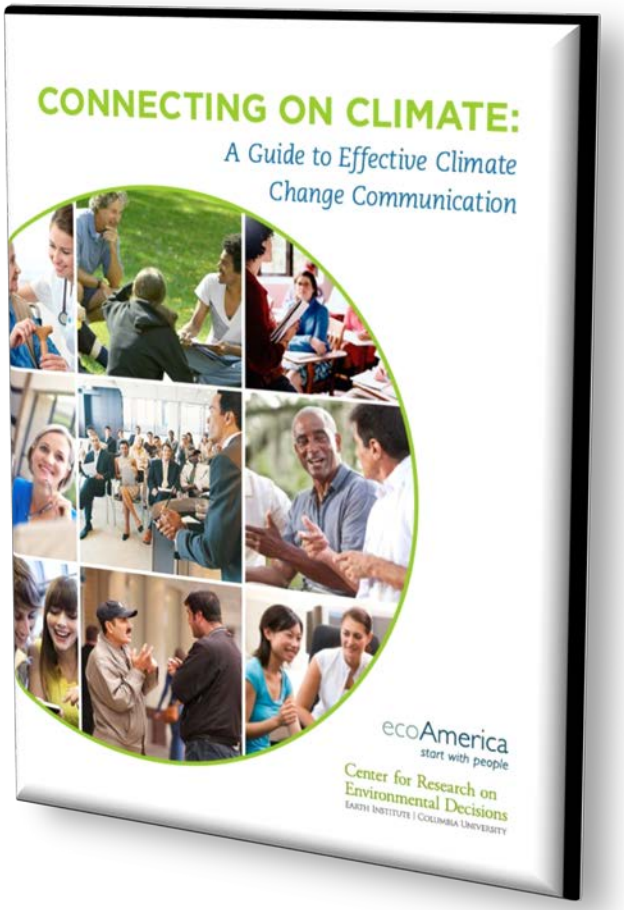
- ***No!*** to fear- or guilty-based messaging
  - Gets attention but not *sustained* action (Weber, 2006)

- Provide solutions!
  - ***This*** is where an information-deficit exists!
    - Risky Business (2014) report by Bloomberg, Paulson, Steyer
    - World Bank Green Growth Knowledge Platform

- Focus on behavioral barriers to change
  - At all levels
    - Politicians, COP negotiators, companies, infrastructure architects, engineers, consumers

- Make best action simple!
  - Green defaults

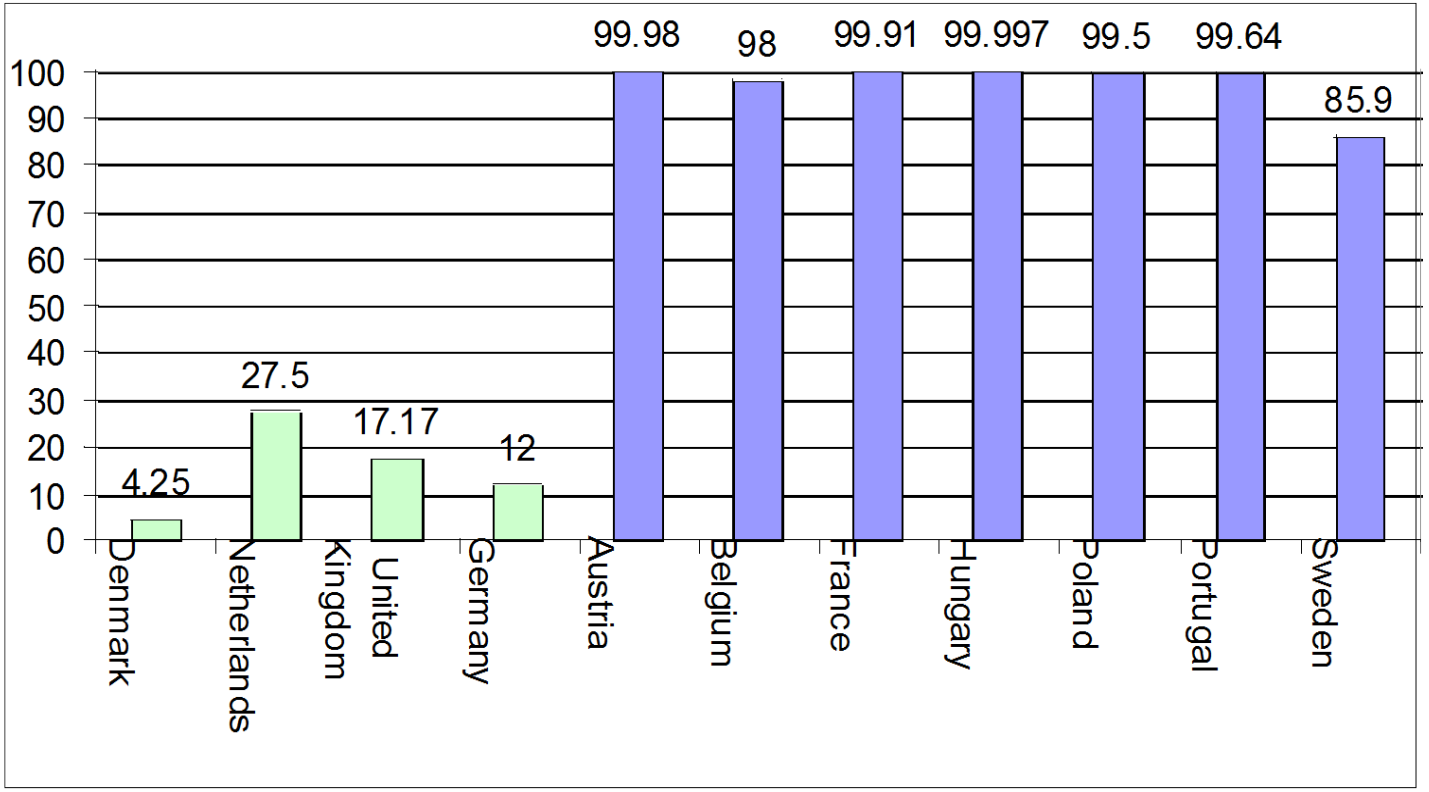
CC Communication Guide



connectingonclimate.org

Choice defaults matter in the “real world”

- Agreement rates to donate organs in different European countries (Johnson & Goldstein, 2003)



Defaults work for multiple reasons

- Minimize effort
  - Capitalize on status-quo bias
- Default implies endorsement
  - Social norms
- Arguments for default get queried first
  - Query theory (Johnson et al., 2007; Weber et al., 2007)

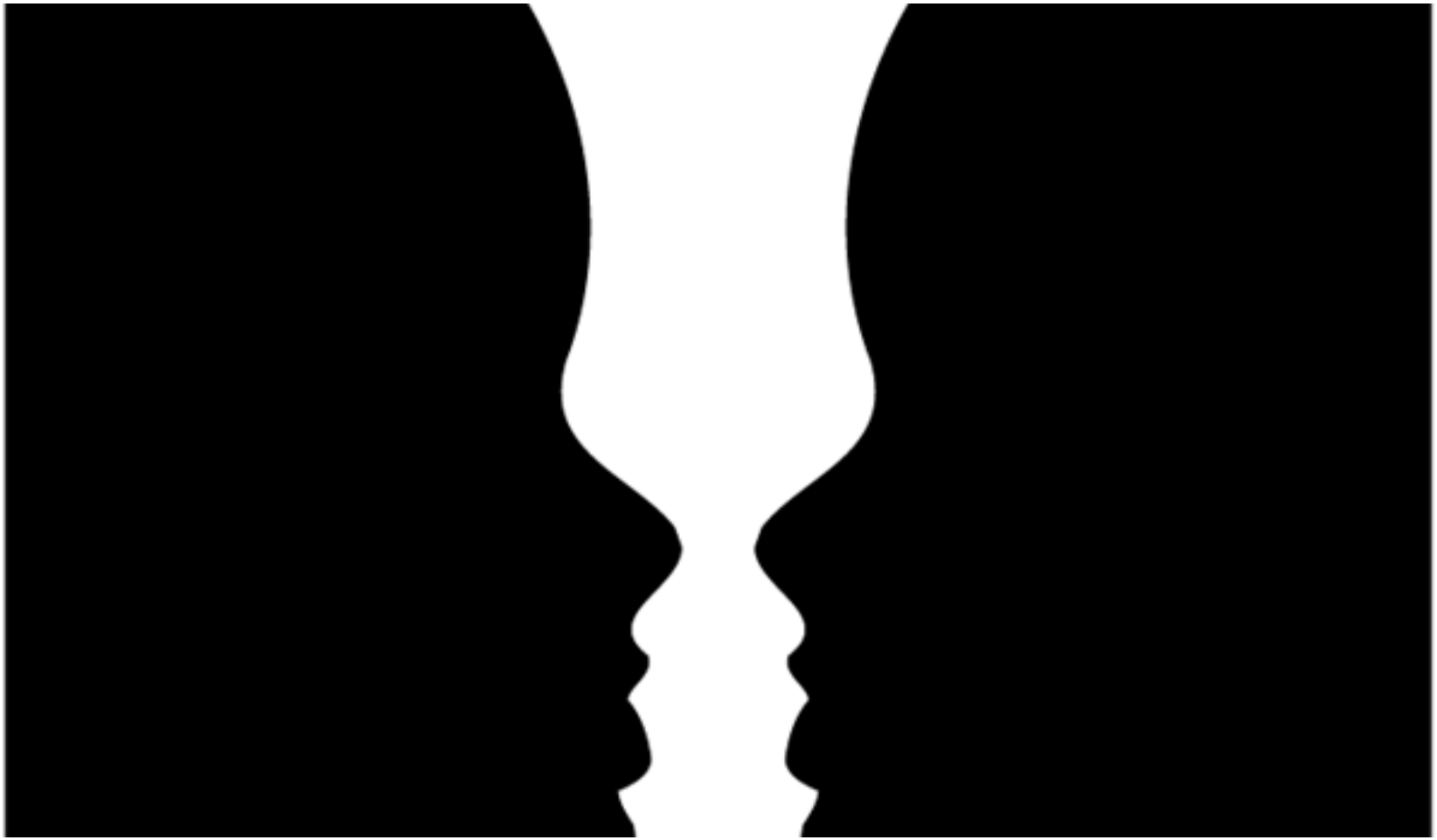
Query Theory (Johnson et al, 2007; Weber et al., 2007)

- Judgment and choice tasks involve (implicit) and sequential generation of evidence, typically by querying memory
  - "Arguing with yourself" about different courses of action

- Normatively inconsequential variations in procedure or context influence order of queries

- Query order matters
  - less evidence generated for later queries

Opposing arguments like reversible figures, impossible to see simultaneously



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“Green” defaults

- CFL vs. incandescent light bulbs
  - Dinner et al. (2011)
- Green vs. brown electric power providers
  - Pichert & Katsikopoulos (2008)
- Sunstein & Reisch (2014) review in Harvard Environmental Law Review
- Do defaults affect engineers or other infrastructure designers?
  - Shealy, Klotz, Weber, Bell, Johnson, 2016, *Journal of Construction Engineering and Management*

Engineers often justify infrastructure decisions with codes and rating systems

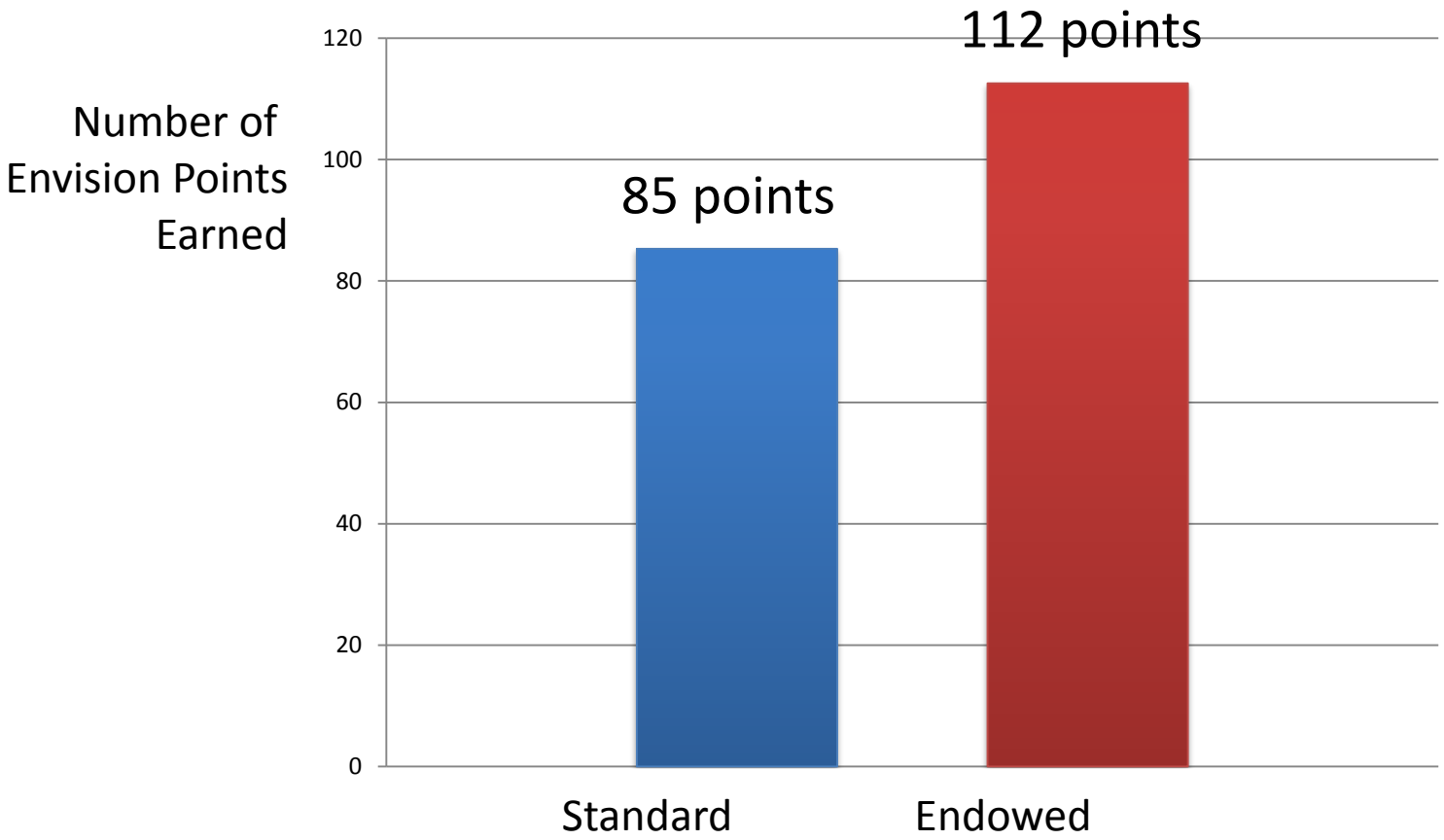
Framing design decisions:

Gain *or* loss in sustainability

Levels of Achievement	*Standard*	*Endowed*
Industry Norm	★ *0 points*	*(-12)*
Improved	*1*	*(-11)*
Enhanced	*2*	*(-10)*
Superior	*5*	*(-7)*
Conserving	*12*	★ *12 points*
Restorative	*15*	*(+3)*

★ Prechecked default

Engineers endowed with “conserving level” scored 24% higher



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Back to Status-Quo Bias

- Prediction about reaction to the prospect of change?
  - ***People will object!***

Embarcadero Freeway Transportation Infrastructure Decision

Back to Status-Quo Bias

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- What happens when the status-quo gets changed anyway?
  - By an act of god

Back to Status-Quo Bias

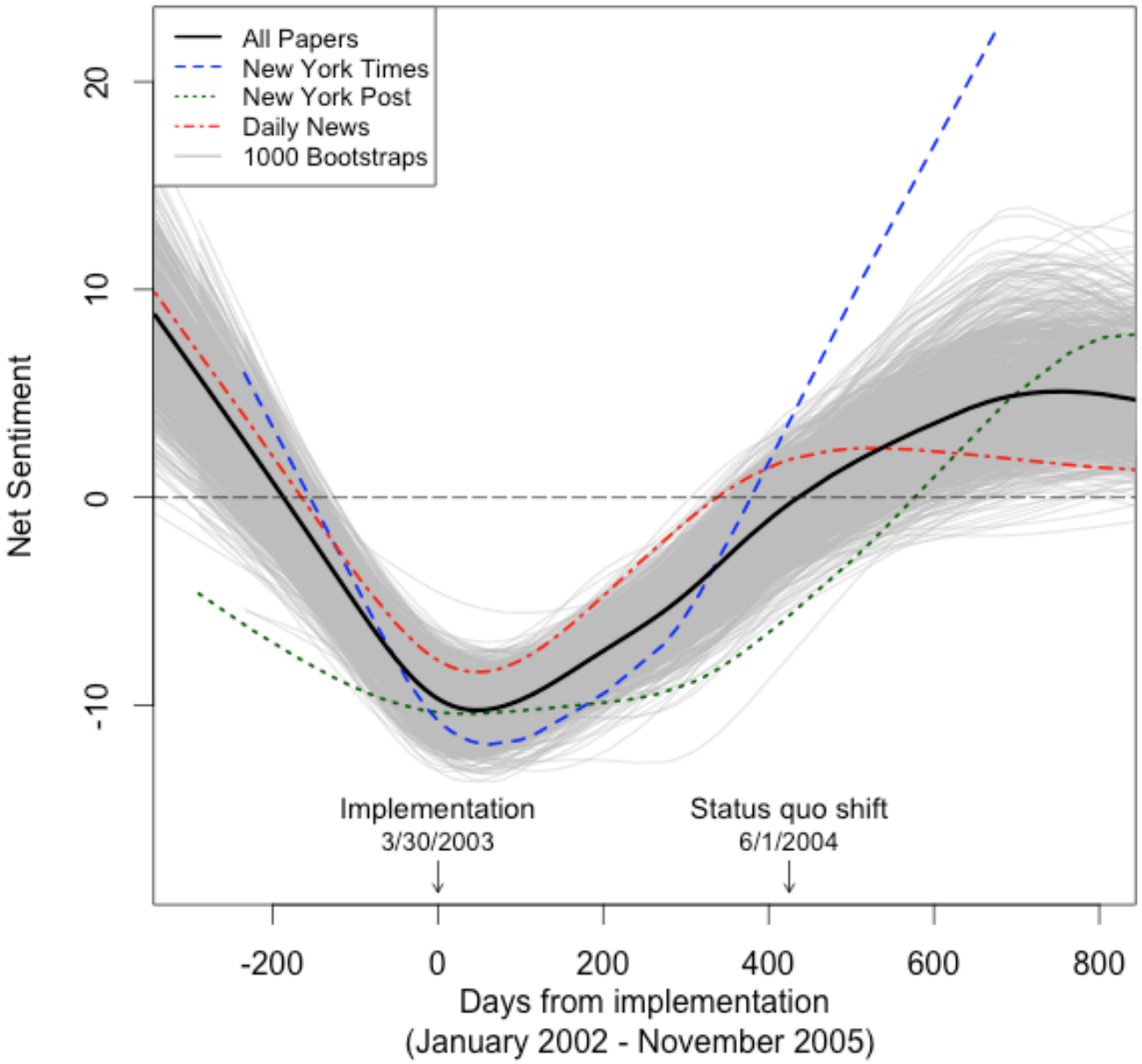
- Prediction about human reaction to the prospect of change?
  - ***People will object!***

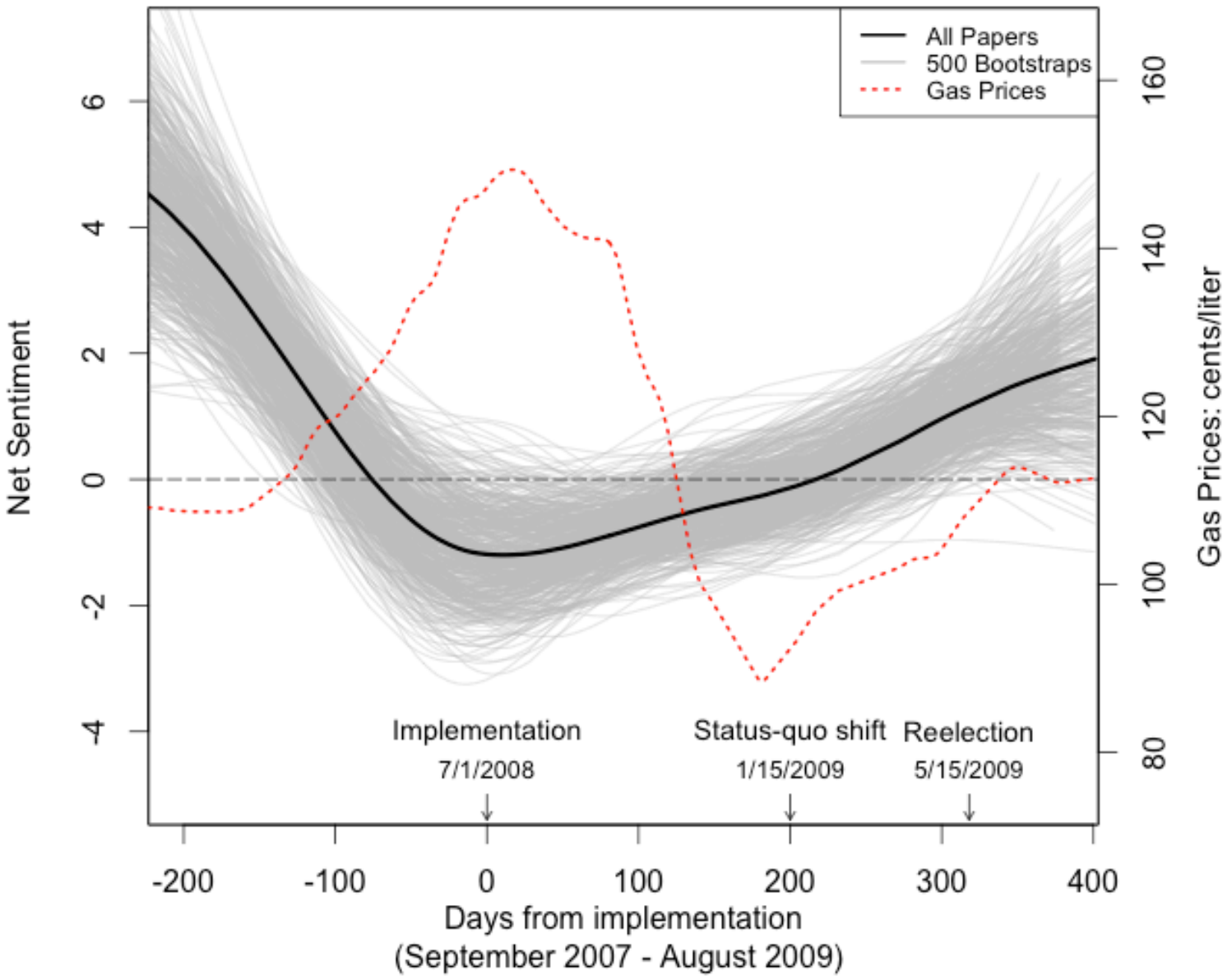
- What happens when the status-quo gets changed anyway?
  - By an act of god
  - By a brave and responsible politician
    - Will change in preference follow?
    - How long will it take before new state is accepted as new status-quo?

Two Bold Policies

- 2002 New York City smoking ban
  - Banned smoking in all public buildings in NYC, including bars
- 2008 British Columbia carbon tax
  - Revenue neutral tax on greenhouse gas emissions
- Media analysis
  - Weber (2015); Treuer et al. (2013)

Newspaper coverage of the NYC smoking ban



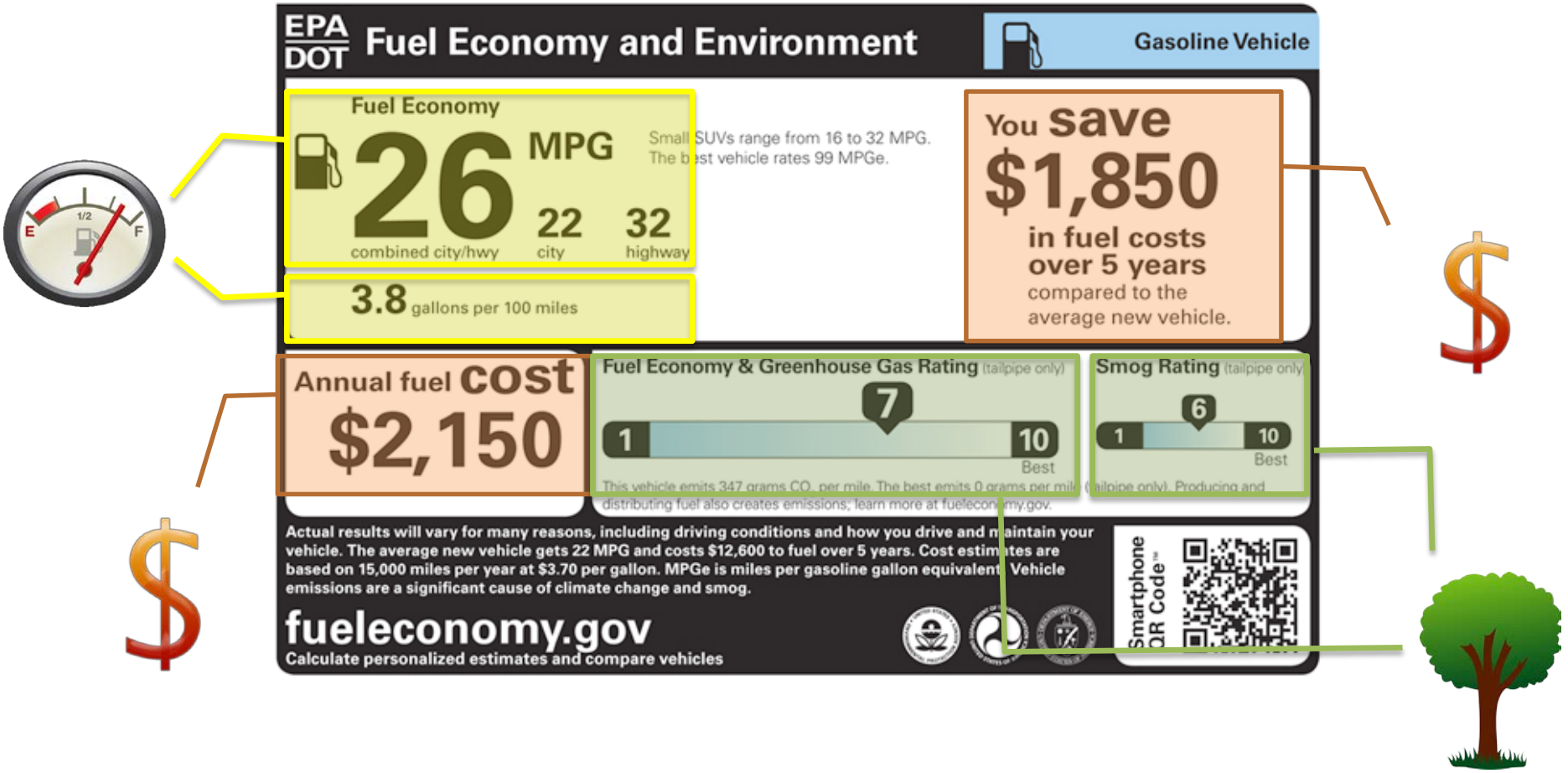

Newspaper coverage of the BC carbon tax
All Papers
500 Bootstraps
Gas Prices
Net Sentiment
Gas Prices: cents/liter
6
4
2
0
-2
-4
160
140
120
100
80
Implementation
7/1/2008
Status-quo shift
1/15/2009
Reelection
5/15/2009
-200
-100
0
100
200
300
400
Days from implementation
(September 2007 - August 2009)

Query Order

- What option is considered first?
  - Choice default
  - “Attractive” option
    - Labels matter

Labels Matter

- MPG illusion (Larrick & Soll, Science, 2008)
- Redesign of EPA Fuel Economy Label
  - Highly correlated attributes



Translated Attributes Study

Ungemach, Camilleri, Larrick, Johnson, Weber (in press), *Management Science*

- Choice between a *cheaper*, fuel *inefficient* car and a *more expensive*, fuel *efficient* car
  - Information on different subsets of EPA label attributes and price attributes
- Different buyer segments pick the translation that matches their goal

From Diagnosis to Treatment

- Anticipate responses of citizens/consumers
- Help them achieve long(er)-term objectives
  - Make it simple → set appropriate defaults
  - Match labels/metrics to audience
- Let experts decide
  - Redistribute decisions between consumers and private and public sector (Kunreuther & Weber, 2014)