Gideon Henderson

Dean’s Lecture

Taking it Back: Removing CO$_2$ from the Atmosphere to Limit Climate Change

Wednesday, April 3, 2019
19:00 Ted Center, Blue Big Room
Mitigation and Adaptation Studies


Contents
- Decisions and Human Nature:
  - Biases
  - Overcoming Biases
  - Fast and Slow Thinking - Enigma of Reason
- Science-Society Dialog
- Economic Context
- Social and Political Context

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Decision and Human Nature
Decision and Human Nature

Intuition

Rational

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Decision and Human Nature

Biases

Intuition

Rational

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Fast Thinking

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Decision and Human Nature: Biases

Behavioral economics studies the effects of psychological, social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences for market prices, returns, and resource allocation, although not always that narrowly, but also more generally, of the impact of different kinds of behavior, in different environments of varying experimental values.

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THE BEHAVIORAL ECONOMICS OF DECISION MAKING
Daniel Kahneman (the lead author) and Amos Tversky introduced the idea of cognitive biases, and their impact on decision making, in 1974. Their research and ideas were recognized when Kahneman was awarded a Nobel Prize in economics in 2002. These biases, and behavioral psychology generally, have since captured the imagination of business experts.
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Some notable popular books on this topic:
You make thousands of rational decisions every day — or so you think.

From what you'll eat throughout the day to whether you should make a big career move, research suggests that there are a number of cognitive stumbling blocks that affect your behavior, and they can prevent you from acting in your own best interests.

Here, we've rounded up the most common biases that screw up our decision-making.

20 COGNITIVE BIASES THAT SCREW UP YOUR DECISIONS
1. Anchoring bias.  
People are over-reliant on the first piece of information they hear. In a salary negotiation, whoever makes the first offer establishes a range of reasonable possibilities in each person’s mind.

2. Availability heuristic.  
People overestimate the importance of information that is available to them. A person might argue that smoking is not unhealthy because they know someone who lived to 100 and smoked three packs a day.

3. Bandwagon effect.  
The probability of one person adopting a belief increases based on the number of people who hold that belief. This is a powerful form of groupthink and is reason why meetings are often unproductive.

Failing to recognize your own cognitive biases is a bias in itself. People notice cognitive and motivational biases much more in others than in themselves.

5. Choice-supportive bias.  
When you choose something, you tend to feel positive about it, even if that choice has flaws. Like how you think your dog is awesome—even if it bites people every once in a while.

6. Clustering illusion.  
This is the tendency to see patterns in random events. It is key to various gambling fallacies, like the idea that red is more or less likely to turn up on a roulette table after a string of reds.

7. Confirmation bias.  
We tend to listen only to information that confirms our preconceptions—one of the many reasons it’s so hard to have an intelligent conversation about climate change.

8. Conservatism bias.  
Where people favor prior evidence over new evidence or information that has emerged. People were slow to accept that the Earth was round because they maintained their earlier understanding that the planet was flat.
Decision and Human Nature: Biases

9. Information bias.  
The tendency to seek information when it does not affect action. More information is not always better. With less information, people can often make more accurate predictions.

10. Ostrich effect.  
The decision to ignore dangerous or negative information by “burying” one’s head in the sand, like an ostrich. Research suggests that investors check the value of their holdings significantly less often during bad markets.

11. Outcome bias.  
Judging a decision based on the outcome — rather than how exactly the decision was made in the moment. Just because you won a lot in Vegas doesn’t mean gambling your money was a smart decision.

12. Overconfidence.  
Some of us are too confident about our abilities, and this causes us to take greater risks in our daily lives. Experts are more prone to this bias than laypeople, since they are more convinced that they are right.

13. Placebo effect.  
When simply believing that something will have a certain effect on you causes it to have that effect. In medicine, people given fake pills often experience the same physiological effects as people given the real thing.

14. Pro-innovation bias.  
When a proponent of an innovation tends to overvalue its usefulness and undervalue its limitations. Sound familiar, Silicon Valley?

15. Recency.  
The tendency to weigh the latest information more heavily than older data. Investors often think the market will always look the way it looks today and make unwise decisions.

Our tendency to focus on the most easily recognizable features of a person or concept. When you think about dying, you might worry about being mauled by a lion, as opposed to what is statistically more likely, like dying in a car accident.
### Decision and Human Nature: Biases

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<td>Allowing our expectations to influence how we perceive the world. An experiment involving a football game between students from two universities showed that one team saw the opposing team commit more infractions.</td>
<td>Expecting a group or person to have certain qualities without having real information about the person. It allows us to quickly identify strangers as friends or enemies, but people tend to <strong>overuse and abuse it</strong>.</td>
<td>An error that comes from focusing only on surviving examples, causing us to <strong>misjudge a situation</strong>. For instance, we might think that being an entrepreneur is easy because we haven't heard of all those who failed.</td>
<td>Sociologists have found that we love certainty — even if it's counterproductive. Eliminating risk entirely means there is no chance of harm being caused.</td>
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**Sources:** Brain Biases; Ethics Unwrapped; Explorable; Harvard Magazine; HowStuffWorks; LearnVest; Outcome bias in decision evaluation. Journal of Personality and Social Psychology; Psychology Today; The Bias Blind Spot: Perceptions of Bias in Self Versus Others, Personality and Social Psychology Bulletin; The Cognitive Effects of Mass Communication, Theory and Research in Mass Communications; The less-is-more effect: Predictions and tests, Judgment and Decision Making: The New York Times; The Wall Street Journal; Wikipedia; You Are Not So Smart; ZhuamlyWiki
Six biases highly relevant to **slowly developing threats** (like climate change, sea level rise, extinction, overpopulation, …)

**Positive illusions**: unrealistically favorable attitudes about own abilities, control of events, and of the future.

**Cognitive dissonance**: a bias that emerges when facing information that is psychologically discomforting because it is inconsistent with current believes or opinion; is handled by selecting, organizing, or even distorting, conflicting information so that it matches preferred or pre-existing beliefs.

**Fundamental attribution error**: tendency to attribute the behavior of others to their personality or intentions, called dispositional causes, while one’s own behavior is attributed to limited choices, necessities, or competing concerns, called situational causes.

…
Six biases highly relevant to **slowly developing threats** (like climate change, sea level rise, extinction, overpopulation, …)

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**Risk perception bias**: Describes the way people choose between alternatives that involve risk, where people make decisions based on the potential value of losses and gains rather than on the final outcomes:
- risk-averse when choosing among potential gains (the domain of gains),
- risk-prone when choosing among potential losses (the domain of losses).

In case of expected negative consequences: high apparent costs leads to doing nothing.

**In-group bias**: Based on the minimal group paradigm proposing that the minimal condition for this bias (such as favoritism towards one’s own group and prejudice towards other groups) is simply being a member of a group. More likely to emerge in the presence of strong categorizations into groups and in the presence of actual or perceived inter-group threats and low information flow between groups.

**Present bias**: disregarding of costs and benefits occurring in the future.
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Dangerous biases can creep into every strategic choice. Here's how to find them—before they lead you astray. by Daniel Kahneman, Dan Lovallo, and Olivier Sibony

Before You Make That Big Decision...

THANKS to a deluge of popular new books, many executives today realize how biases can distort reasoning in business. Confirmation bias, for instance, causes people to ignore evidence that contradicts their preconceived notions. Another cause them to weigh one piece of information too heavily in making decisions, thus squeezing out other possible avenues. In our experience, however, awareness of the effects of biases has done little to improve the quality of business decisions at either the individual or the organizational level.

Though there may be far more talk of biases among managers, talk alone will not eliminate them. But it is possible to take steps to counteract them. A recent McKinsey study of more than 1,200 major business investments showed that when organizations worked at reducing the effect of bias in their decision-making processes, they achieved returns up to seven percentage points higher. (For more on this study, see "The Case for Behavioral Strategy" McKinsey Quarterly, March 2019.) Reducing bias makes a difference. In this article, we will describe...
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THANKS TO A VIEW of popular new books, many executives today realize how biases can distort reasoning in business. Confirmation bias, for instance, causes people to ignore evidence that contradicts their preconceived notions. Anchoring causes them to weigh one piece of information too heavily in making decisions. Loss aversion makes them too cautious. In our experience, however, awareness of the effects of biases has done little to improve the quality of business decisions at either the individual or the organizational level.

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Ask yourself

1. CHECK FOR SELF-INTERESTED BIASES
   Is there any reason to suspect the team making the recommendation of errors motivated by self-interest?

   Review the proposal with extra care, especially for overoptimism.

2. CHECK FOR THE AFFECT HEURISTIC
   Has the team fallen in love with its proposal?

   Rigorously apply all the quality controls on the checklist.

3. CHECK FOR GROUPTHINK
   Were there dissenting opinions within the team?

   Solicit dissenting views, discreetly if necessary.

June 2013 — McKinsey Quarterly
**Ask the recommenders**

**Check for Salience Bias**
Could the diagnosis be overly influenced by an analogy to a memorable success?

**Ask for more analogies, and rigorously analyze their similarity to the current situation.**

**Check for Confirmation Bias**
Are credible alternatives included along with the recommendation?

**Request additional options.**

**Check for Availability Bias**
If you had to make this decision again in a year’s time, what information would you want, and can you get more of it now?

**Use checklists of the data needed for each kind of decision.**

**Check for Anchoring Bias**
Do you know where the numbers came from? Can there be unsubstantiated numbers?

**...extrapolation from history?**

**...a motivation to use a certain anchor?**

**Reanchor with figures generated by other models or benchmarks, and request new analysis.**

**Check for Halo Effect**
Is the team assuming that a person, organization, or approach that is successful in one area will be just as successful in another?

**Eliminate false inferences, and ask the team to seek additional comparable examples.**
Decision and Human Nature: Overcoming Biases

Check for sunk-cost fallacy, endowment effect

Are the recommenders overly attached to a history of past decisions?

Consider the issue as if you were a new CEO.
Decision and Human Nature: Overcoming Biases

Ask about the proposal

9
CHECK FOR SUNK-COST FALLACY, ENDOWMENT EFFECT
Are the recommenders overly attached to a history of past decisions?

Consider the issue as if you were a new CEO.

10
CHECK FOR OVERCONFIDENCE, PLANNING FALLACY, OPTIMISTIC BIASES, COMPETITOR NEGLECT
Is the base case overly optimistic?

CHECK FOR DISASTER NEGLECT
Is the worst case bad enough?

CHECK FOR LOSS AVERSION
Is the recommending team overly cautious?

Have the team conduct a pre-mortem: imagine that the worst has happened, and develop a story about the causes.

Have the team build a case taking an outside view; use war games.

Realign incentives to share responsibility for the risk or to remove risk.
BIASES ARE EVERYWHERE …

Artificial intelligence (AI)

'Bias deep inside the code': the problem with AI 'ethics' in Silicon Valley

As algorithms play a growing role in criminal justice, education and more, tech advisory boards and academic programs mirror real-world inequality

Shortcuts
Motoring

The racism of technology - and why driverless cars could be the most dangerous example yet

'Machine vision' is struggling to recognise darker-skinned pedestrians, and cost pressures could make things worse

Alex Hern
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Wed 13 Mar 2019 12.31 EDT

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Photo: Justin Tallis/AFP/Getty Images
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THINKING, FAST AND SLOW

DANIEL KAHNEMAN
Herbert Simon on Intuition:
“The situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition.”

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When confronted with a problem—choosing a chess move or deciding whether to invest in a stock—the machinery of intuitive thought does the best it can. If the individual has relevant expertise, she will recognize the situation, and the intuitive solution that comes to her mind is likely to be correct. This is what happens when a chess master looks at a complex position: the few moves that immediately occur to him are all strong. When the question is difficult and a skilled solution is not available, intuition still has a shot: an answer may come to mind quickly—but it is not an answer to the original question. The question that the executive faced (should I invest in Ford stock?) was difficult, but the answer to an easier and related question (do I like Ford cars?) came readily to his mind and determined his choice. This is the essence of intuitive heuristics: when faced with a difficult question, we often answer an easier one instead, usually without noticing the substitution.

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The spontaneous search for an intuitive solution sometimes fails—neither an expert solution nor a heuristic answer comes to mind. In such cases we often find ourselves switching to a slower, more deliberate and effortful form of thinking. This is the slow thinking of the title. Fast thinking includes both variants of intuitive thought—the expert and the heuristic—as well as the entirely automatic mental activities of perception and memory, the operations that enable you to know there is a lamp on your desk or retrieve the name of the capital of Russia.

Conclusions

I began this book by introducing two fictitious characters, spent some time discussing two species, and ended with two selves. The two characters were the intuitive System 1, which does the fast thinking, and the effortful and slower System 2, which does the slow thinking, monitors System 1, and maintains control as best it can within its limited resources. The two species were the fictitious Econs, who live in the land of theory, and the Humans, who act in the real world. The two selves are the experiencing self, which does the living, and the remembering self, which keeps score and makes the choices.

Two Selves

The possibility of conflicts between the remembering self and the interests of the experiencing self turned out to be a harder problem than I initially thought.

The remembering self’s neglect of duration, its exaggerated emphasis on peaks and ends, and its susceptibility to hindsight combine to yield distorted reflections of our actual experience.

The remembering self is a construction of System 2. However, the distinctive features of the way it evaluates episodes and lives are characteristics of our memory. Duration neglect and the peak-end rule originate in System 1 and do not necessarily correspond to the values of System 2. We believe that duration is important, but our memory tells us it is not. The rules that govern the evaluation of the past are poor guides for decision making, because time does matter. The central fact of our existence is that time is the ultimate finite resource, but the remembering self ignores that reality. The neglect of duration combined with the peak-end rule causes a bias that favors a short period of intense joy over a long period of moderate happiness. The mirror image of the same bias makes us fear a short period of intense but tolerable suffering more than we fear a much longer period of moderate pain. Duration neglect also makes us prone to accept a long period of mild unpleasantness because the end will be better, and it favors giving up an opportunity for a long happy period if it is likely to have a poor ending.

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Reason, we are told, is what makes us human, the source of our knowledge and wisdom. If reason is so useful, why didn’t it also evolve in other animals? If reason is that reliable, why do we produce so much thoroughly reasoned nonsense? In their groundbreaking account of the evolution and workings of reason, Hugo Mercier and Dan Sperber set out to solve this double enigma. Reason, they argue with a compelling mix of real-life and experimental evidence, is not geared to solitary use, to arriving at better beliefs and decisions on our own. What reason does, rather, is help us justify our beliefs and actions to others, convince them through argumentation, and evaluate the justifications and arguments that others address to us. In other words, reason helps humans better exploit their uniquely rich social environment. This interactionist interpretation explains why reason may have evolved and how it fits with other cognitive mechanisms. It makes sense of strengths and weaknesses that have long puzzled philosophers and psychologists—why reason is biased in favor of what we already believe, why it may lead to terrible ideas and yet is indispensable to spreading good ones.
Core concepts:
- modules are tasks with highly specialized tasks
- representations and metarepresentations
Rapidly declining remarkability of temperature anomalies may obscure public perception of climate change

Frances C. Moore, Nick Obradovich, Flavio Lehner, and Patrick Baylis

PNAS March 12, 2019 116 (11) 4905-4910; published ahead of print February 25, 2019
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Evidence-based strategies to combat scientific misinformation

Justin Farrell, Kathryn McConnell & Robert Brulle
Nature Climate Change 9, 191–195 (2019)  Download Citation

Abstract

Nowhere has the impact of scientific misinformation been more profound than on the issue of climate change in the United States. Effective responses to this multifaceted problem have been slow to develop, in large part because many experts have not only underestimated its impact, but have also overlooked the underlying institutional structure, organizational power and financial roots of misinformation. Fortunately, a growing body of sophisticated research has emerged that can help us to better understand these dynamics and provide the basis for developing a coordinated set of strategies across four related areas (public inoculation, legal strategies, political mechanisms and financial transparency) to thwart large-scale misinformation campaigns before they begin, or after they have taken root.

Americans’ climate change concerns surge to record levels, poll shows

Total of 72% polled now say global warming is personally important to them, Yale said, as 73% accept it is happening

Oliver Milman in New York
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Tue 22 Jan 2019
12:45 EST

8533
This article is over 2 months old

▲ People in Atlantic Beach, North Carolina watch as Hurricane Florence threatens the Carolinas on 12 September 2018. Photograph: Travis Long/TNS/Getty Images
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“Repeat a lie often enough and it becomes the truth”, is a law of propaganda often attributed to the Nazi Joseph Goebbels.
Repetition makes a fact seem more true, regardless of whether it is or not. Understanding this effect can help you avoid falling for propaganda, says psychologist Tom Stafford.
Recently, a team led by Lisa Fazio of Vanderbilt University set out to test how the illusion of truth effect interacts with our prior knowledge. Would it affect our existing knowledge? They used paired true and un-true statements, but also split their items according to how likely participants were to know the truth (so "The Pacific Ocean is the largest ocean on Earth" is an example of a "known" items, which also happens to be true, and "The Atlantic Ocean is the largest ocean on Earth" is an un-true item, for which people are likely to know the actual truth).

What Fazio and colleagues actually found, is that the biggest influence on whether a statement was judged to be true was... whether it actually was true. The repetition effect couldn’t mask the truth. With or without repetition, people were still more likely to believe the actual facts as opposed to the lies. This shows something fundamental about how we update our beliefs – repetition has a power to make things sound more true, even when we know differently, but it doesn't over-ride that knowledge.
If repetition was the only thing that influenced what we believed we'd be in trouble, but it isn't. We can all bring to bear more extensive powers of reasoning, but we need to recognise they are a limited resource. Our minds are prey to the illusion of truth effect because our instinct is to use short-cuts in judging how plausible something is. Often this works. Sometimes it is misleading.

Once we know about the effect we can guard against it. Part of this is double-checking why we believe what we do – if something sounds plausible is it because it really is true, or have we just been told that repeatedly? This is why scholars are so mad about providing references - so we can track the origin on any claim, rather than having to take it on faith.

But part of guarding against the illusion is the obligation it puts on us to stop repeating falsehoods. We live in a world where the facts matter, and should matter. If you repeat things without bothering to check if they are true, you are helping to make a world where lies and truth are easier to confuse. So, please, think before you repeat.
“Repeat a lie often enough and it becomes the truth”, is a law of propaganda often attributed to the Nazi Joseph Goebbels.

“Repeat a truth often enough and eventually it will become widely accepted.”