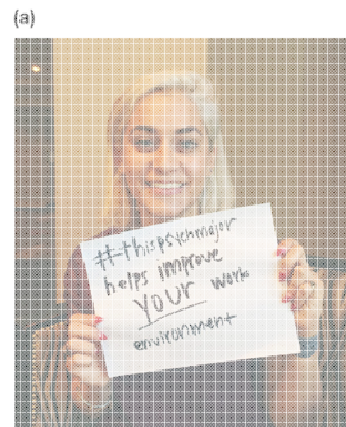


How You Think Biases Decision Making

Decision making is a form of thinking in which you select among choices.

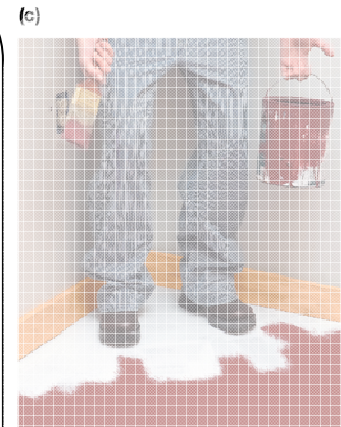


You use **reasoning** to determine if a conclusion is valid. In the 2016 presidential campaign, candidate Jeb Bush stated that psychology majors needed to "realize, you're going to be working at Chick-fil-A." To show this statement was not valid, many people provided evidence. They posted signs showing what they do with their psychology degrees.

FIGURE 8.10



You use **decision making** to select between options. People often have to choose between foods that maximize pleasure and those that are better for their health.



You use **problem solving** to overcome obstacles. For example, how did this man solve the problem of getting out of the corner he painted himself into?

Courtesy of Kendra Schugt; Jamie Grill/Getty Images; JSP Studios/Alamy Stock Photo
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However, there are quick strategies for making a decision that are not optimal and can lead to systematic errors, but are generally good enough in your daily life.

Heuristics

Heuristics are mental shortcuts that uses very little time and resources of deciding. With heuristics, we don't research background information, collect data, weigh evidence, evaluate options or develop a process for deciding.

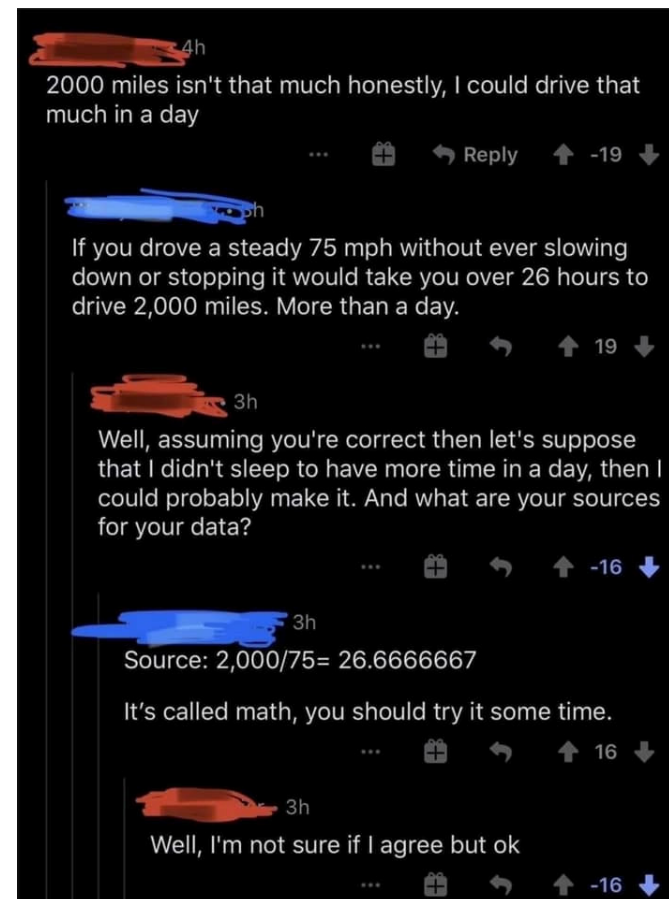
Examples of common heuristics

- Confidence heuristic: You judge the accuracy of a person's statement based on how confident they sound.
 - People who claim they are abducted by aliens, have been reincarnated, who are confident in their flashbulb memories are believed, not because of any corroborating evidence, but by how confident they believe the experience has occurred.
- Price heuristic: You judge the quality of a product based on its price. A more expensive product believed to be of a higher quality than the less expensive product.
 - Most people believe that the expensive brand of bleach is “better” than the generic brand due to price. A reason for the price difference is advertising costs.
- Familiarity heuristic: We judge the truthfulness and accuracy of a statement based on how familiar it sounds.
- Tarnish heuristic: You judge the age of a coin based on the presence (or lack of) tarnish on it. Generally speaking, the presence of tarnish means it is “old”.



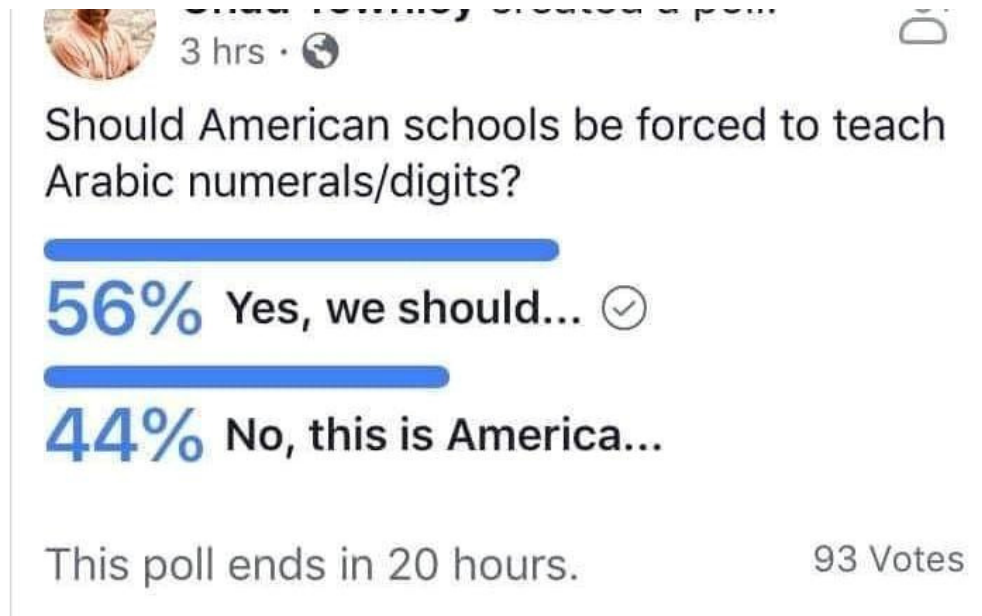
Heuristics

In the following memes, people are likely using shortcuts to decide about what is true and false instead of being thorough.






Heuristics

In the following memes, people are likely using shortcuts to decide about what is true and false instead of being thorough.



Heuristics

Three common heuristics that influence decision making are

<ul style="list-style-type: none">• Availability heuristic	<p>A mental shortcut used to assess how common or probable something is based on how quickly information comes to mind (page 313).</p>	<p>(a)</p>  <p>FIGURE 8.12</p>
<ul style="list-style-type: none">• Representativeness heuristic	<p>A mental shortcut used to place people or objects in a category if they are similar to the prototype for that category (page 314).</p>	<p>(b)</p>  <p>FIGURE 8.12</p>
<ul style="list-style-type: none">• Affective heuristic	<p>A mental shortcut to make decisions or judgments based on current emotions (page 314).</p>	<p>(c)</p>  <p>FIGURE 8.12</p>

Availability Heuristic

A mental shortcut used to assess how common or probable something is based on how quickly information comes to mind ([page 313](#)).

The availability heuristic is the heuristic where people judge the likelihood or frequency of an event based on its vividness or ease to recall specific examples.

Can we think of examples?



If NO, then
we judge the event as unlikely

If YES, then
We judge the event as likely

Examples

- (1) Estimate how many words have a k in 3rd position (cake) and how many words begin with a k (kitten)?
- (2) Estimate how many English words fit the pattern:
 - (a) _ _ _ _ n _
 - (b) _ _ _ i n g
- (3) Are there more deaths due to homicide or due to diabetes-related deaths in America?

Availability Heuristic

Normally, we would count the frequency of events to get an accurate count. However, instead of counting, we take a “short cut” and think of the number of examples to estimate the frequency of these events.

Can we easily think of examples of the phenomena in question (are examples psychologically available)?

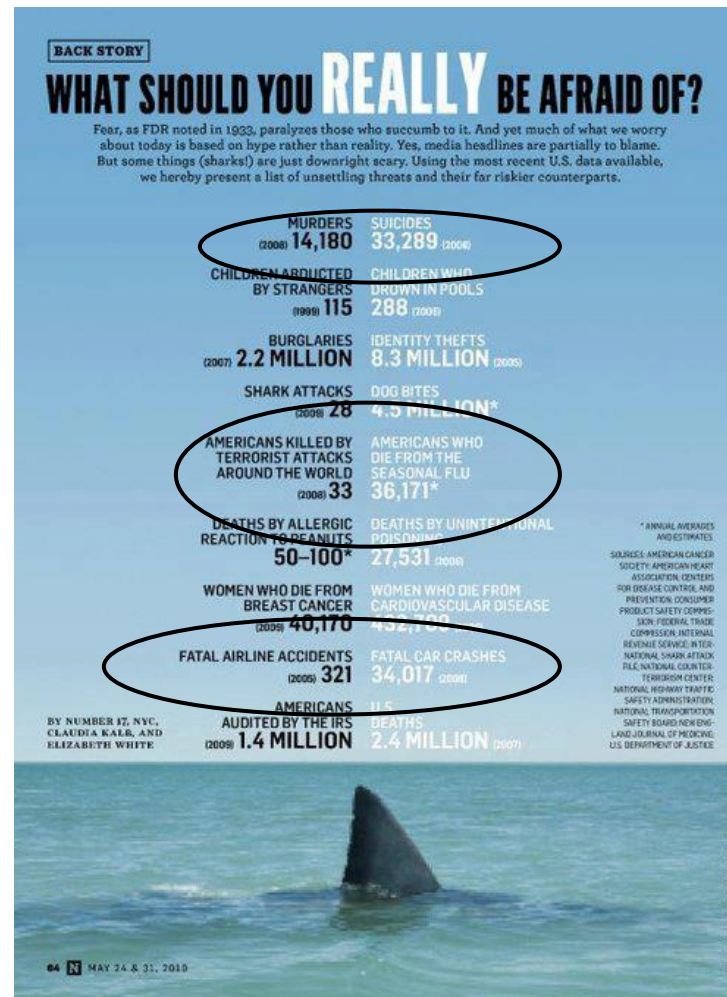


If NO, then
we judge the event as
unlikely

If YES, then
We judge the event as
likely

k in 3rd position (c <u>a</u> ke)	begin with a k (<u>k</u> itten)
____n_	___ing
diabetes-related deaths	deaths due to homicide

Availability Heuristic



Murders, terrorist attacks and fatal airline accidents are psychologically available and easy to think of examples, therefore, we tend to overestimate their likelihood.

Other “Real-Life” Examples of the Availability Bias (Availability Heuristic)

- We overestimate the likelihood of winning the lottery because we hear about the winners all the time and underestimate the likelihood of losing because we don't hear about the losers.
- Those who are unemployed tend to overestimate the unemployment rate because they associate with the unemployed more often and examples are more psychologically available.
- Those who are employed tend to underestimate the unemployment rate because they associate with those who have a job. It is easier to think of examples of people who have jobs.
- If we constantly tell ourselves negative self-statements, we tend to recall negative things about ourselves. If we constantly tell ourselves positive self-statements, we tend to recall positive things about ourselves.
- We also think of creative geniuses as a sudden light bulb of inspiration that leads to success because we hear about the successes. What we don't hear about all the failures.



- The odds of making a living as an author are low. We overestimate the odds by easily thinking of authors who are famous.
- We tend not to hear about acts of kindness and citizens helping one another and judge it as unlikely.
- We tend to think that bringing the Olympics to a city brings prosperity (on the average, it doesn't).
- We judge the likelihood of an event based on personal experience because our personal experiences are easily recalled and more vivid.

Why is Learning About the Availability Heuristic Important?

- Employers can underestimate how much hard work and how much experience matters with their employees. They only see the finished product and not the hard work and pitfalls avoided by good experienced employees, which can make someone believe that the job is easy and can be replaced by a less paid employee, or the idea that "anyone can do it".
- Because you only see your contributions to their organization and not of your coworkers, you can exaggerate your relative importance.
- Students overestimate how easy learning and success is because they only see the finished product and not the hard work involved. We don't see or hear of Jordan's or Thomas Edison's failures. Because of this we underestimate how much hard work and "mistakes" it takes to be good because we don't see or hear about the failures, and only see the success.
- Because we tend to hear about the few individuals who win the lottery and not the millions of people who lost the lottery, we can overestimate the odds of winning.

Ego-centric bias

The belief that you contributed more to a group effort, such as a marriage or team project than you actually did.

This occurs because you can easily recall your contribution (the availability heuristic), rather than someone else's contributions, thus overestimating the relative proportion of your contributions.

- Researchers Michael Ross and Fiore Sicoly (1970) found that couples overestimated the relative contribution to their relationship:
 - both would say they put the dishes away more often than the other person,
 - the other person starts arguments more, etc.
- Basketball teams were more likely to attribute the turning point of the game to their own team than of the other team (regardless if it was a men's or women's team—there was no difference among gender).
- A student wrote that he thinks CEOs deserve an enormous salary because they think of all the thing they do for their corporation and not all of the other things everyone else does.



Ego-Centric Bias

Some people are motivated to overestimate the amount of work they contributed to a group effort, but the overestimation cannot be entirely explained by motivation.

There is a cognitive component.

- Recognizing the ego-centric bias, makes it is easier to understand how disagreements about relative contributions to group efforts can lead to disagreements, arguments and conflict.
- Without recognizing the possibility of the ego-centric bias, it can make it difficult to work together in good faith and difficult to maintain good relations.
- It is difficult to gauge who is overestimating their contribution in hindsight. Most students always accuse the other person of overestimating their contribution.

References:

Ross, M. and Sicoly, F. (1979). Journal of Personality and Social Psychology. 37, 322-336.

Student examples with explanations and impacts

Example: Kris's brother John and her boyfriend Bill were building an entertainment center for her living room. When they had finished, John complained to his sister "I had to do practically all the work and your lazy boyfriend barely helped at all!" Later, when Kris was with Bill he told her "You know, your brother really didn't help out that much with the entertainment center. I had to do most of the real work."

Explanation of egocentric bias: Both John and Bill thought that they had contributed more to the building project than they actually had.

Example: I talked to my dad on the phone last night, and he told me that he wished I could have found out the bus schedule from Eugene to Portland for him, so he could choose to rent a car, or take the bus to Eugene (he flies in today). He said that he had already done so much in preparation for this visit, that the least I could do is check on the bus schedule.

Explanation of ego-centric bias: He forgets that I have done a lot of work on this end to prepare for his visit. He only realized what he has done, and to him, he feels that he has contributed more than I have.

Example: When I was young, my brother and I had to do chores around the house. One of these chores was to put away the dishes after the dishwasher finished washing them. Quite often my brother would disagree with me about “whose turn it is to put away the dishes”. He would claim that he seems to always put away the dishes, while I would think the same thing.

Explanation of the ego-centric bias: When estimating how often each of us puts away the dishes, we easily think of all the times we put away the dishes and not the times the other person put away the dishes, thus inflating our own estimate.

Representativeness Heuristic

Scenario 1: An all-out nuclear war between the United States and the former Soviet Union.

Scenario 2: A situation in which neither the United States or the former Soviet Union intends to attack the other side with nuclear weapons, but an all-out nuclear war between the United States and the former Soviet Union is triggered by the actions of a third country such as Iraq, Israel, Pakistan or North Korea.

- (1) Which scenario is more likely to occur?**
- (a) Scenario 1
 - (b) Scenario 2

Ron Reagan is politically liberal and from a conservative family. When he told his parents that he was atheist, they were not surprised and very supportive of him and wished him well. Ron realizes that in the U.S., there is a negative stigma of being an atheist and does not want to run for political office.

- (2) Is it more likely that Ron lives in?**
- (a) California
 - (b) San Francisco

-
- (3) You are going to a store to buy some fruit. What are you more likely to find?**
- (a) a red apple.
 - (b) a green apple.
 - (c) an apple.

Representativeness Heuristic

A mental shortcut used to place people or objects in a category if they are similar to the prototype for that category ([page 314](#)).

Does the event match our mental representation (not the definition in your book)?



If NO, then
we judge the event as
unlikely

If YES, then
We judge the event as
likely

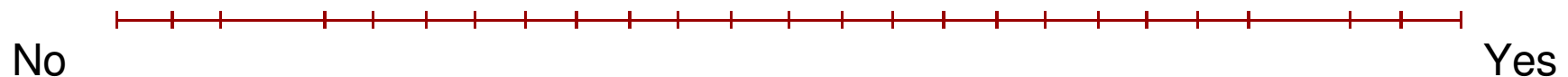
An all-out nuclear war between the United States and the former Soviet Union.	A situation in which neither the United States or the former Soviet Union intends to attack the other side with nuclear weapons, but <u>an all-out nuclear war between the United States and the former Soviet Union</u> is triggered by the actions of a third country such as Iraq, Israel, Pakistan or North Korea.
California	San Francisco
Apple	Red Apple

Representativeness Heuristic

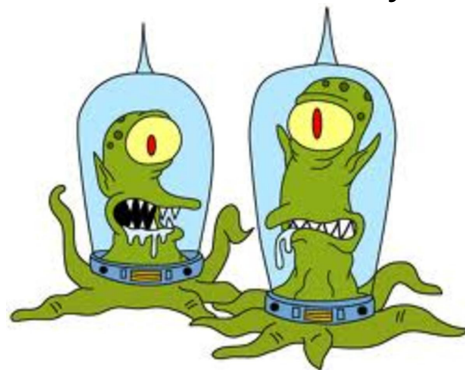
A thinking strategy where we make a judgment of likelihood based on how well it matches our mental representation, prototype or stereotype.

- If the person, event or object is similar to our mental representation, image, stereotype, or prototype, then we are likely to believe that event.
- If the person, event or object is dissimilar to our mental representation, image, stereotype, or prototype, then we are not likely to believe that event.

Does it match our mental representation?



Does not match our mental representation of space aliens, therefore, we judge the encounter as unlikely.



Matches our mental representation of space aliens, therefore, we judge the encounter as likely.



Representativeness Heuristic

A thinking strategy where we make a judgment of likelihood based on how well it matches our mental representation, prototype or stereotype.

- If the person, event or object is similar to our mental representation, image, stereotype, or prototype, then we are likely to believe that event.
- If the person, event or object is dissimilar to our mental representation, image, stereotype, or prototype, then we are not likely to believe that event.

Does it match our mental representation?



Yes

No



Representativeness Heuristic

A thinking strategy where we make a judgment of likelihood based on how well it matches our mental representation, prototype or stereotype.

- If the person, event or object is similar to our mental representation, image, stereotype, or prototype, then we are likely to believe that event.
- If the person, event or object is dissimilar to our mental representation, image, stereotype, or prototype, then we are not likely believe that event.



If NO, then
we judge the event as
unlikely

If YES, then
We judge the event as
likely



Other examples of judgments using representativeness:

- Susan Smith drowned her kids and claimed a black man stole the car. People believed her story because it fit their mental representation of a carjacking.
- People didn't believe bacteria could cause infection or diseases because something that large and devastating had to come from something big, not something small.
- We are more likely to believe that Nazi Germany advocated the use of eugenics because it fits our mental representation of Nazi Germany. However, we are not likely to believe eugenics was advocated by the United States during the same time period because it does not fit our mental representation of the United States.
- In 2018, racist Twitter trolls claimed that white movie goers were attacked while attending the premier of the movie Black Panther.
- We are likely to believe that the average individual is likely to be less happy when their children leave home (the empty nest syndrome).
- We are not likely to believe that a Cuyahoga river caught on fire because it doesn't match our world view.



- When describing an encounter with space aliens, you are more likely to be believed if you describe them in a way that fits the current cultural depiction of space aliens (e.g. Green Martians, “gray aliens”, Aliens from the movie Aliens)



- Susceptibility to hypnosis is unrelated to submissiveness, trust or psychopathology, but we have a hard time believing it because it doesn't fit our world view or mental representation or commonsense notion of hypnosis.
- We are not likely to believe that there is a seaport in Idaho because it doesn't match our mental representation of ports or Idaho.

Representativeness Heuristic



Few people believed that she was actually a software engineer because she didn't fit their mental representation of a software engineer (they thought she was an actor).

Representativeness Heuristic

How the Murder Rate in Oklahoma Compares to the Rest of the Country

Along with rape, robbery, and aggravated assault, murder is one component of the broader violent crime category. Just as Oklahoma has a higher than average murder rate, its overall violent crime rate is also higher than average. There were a total of 459 violent crimes reported for every 100,000 people in the state in 2020, compared to 399 per 100,000 nationwide.

All data used in this story, including population figures used to calculate population-adjusted crime rates, is from the FBI's 2020 Uniform Crime Report.

Rank	Geo	Murders per 100,000 people, 2020	Total murders, 2020	Violent crimes per 100,000 people, 2020
1	Louisiana	15.8	734	639
2	Missouri	11.8	723	543
3	Arkansas	10.6	321	672
3	Mississippi	10.6	315	291
5	South Carolina	10.5	549	531
6	Alabama	9.6	471	454
6	Tennessee	9.6	663	673
8	Illinois	9.1	1,151	426
8	Maryland	9.1	553	400
10	Georgia	8.8	943	400
11	North Carolina	8.0	852	419
12	Pennsylvania	7.9	1,009	390
13	New Mexico	7.8	164	778
14	Michigan	7.6	754	478
15	Indiana	7.5	505	358
16	Delaware	7.4	73	432
16	Oklahoma	7.4	296	459
18	Kentucky	7.2	323	259
19	Ohio	7.0	820	309
20	Arizona	6.9	513	485
21	Alaska	6.7	49	838
22	Texas	6.6	1,931	447
22	West Virginia	6.6	117	356
24	Virginia	6.1	524	209
25	Florida	5.9	1,290	384
26	Nevada	5.7	180	460
27	California	5.6	2,203	442
28	Wisconsin	5.3	308	323
29	Colorado	5.1	294	423
30	Montana	5.0	54	470
31	South Dakota	4.5	40	501
32	New York	4.2	808	364

Representativeness Heuristic

How people think they get hacked



How they really get hacked

	<p>Asking where you'd get married again is like asking where you met.</p> <p>A "porn name" that exposes your middle name AND a street you grew up on are TWO pieces of info that people need.</p>	

Representativeness Heuristic



The scientists who first discovered the platypus thought it was fake. Although indigenous Aboriginal people already knew of the creature, European scientists assumed an egg-laying, duck-billed, beaver-tailed, otter-footed, venomous mammal had to be an elaborate hoax.

Photo courtesy of John Lewin / wikimedia

@factsweird

Availability and Representativeness Heuristic

Availability	Representativeness
<p>The availability heuristic is the heuristic where people judge the likelihood or frequency of an event based on its vividness or ease to recall specific examples.</p>	<p>A thinking strategy where we make a judgment of likelihood based on how well it matches our mental representation, prototype or stereotype.</p>
<ul style="list-style-type: none">• Judging that you are more likely to be killed by sharks (especially in the summer) than alcohol related illnesses or accidents• Ignoring the problems (judging the likelihood of a problem to occur as low) of American infrastructure (water lines, roads, bridges) because we don't see the problems	<ul style="list-style-type: none">• Description of alien abductions by Grey aliens vs. one eyed one horned purple people eater• Susan Smith claiming her sons were abducted by someone looking "criminal-like"• Picking the "Arab" looking person to be likely of committing an act of terror
<ul style="list-style-type: none">• Can I think of specific examples?	<ul style="list-style-type: none">• How well does it compare to what I know?

Affective heuristic

A mental shortcut to make decisions or judgments based on current emotions ([page 314](#)).



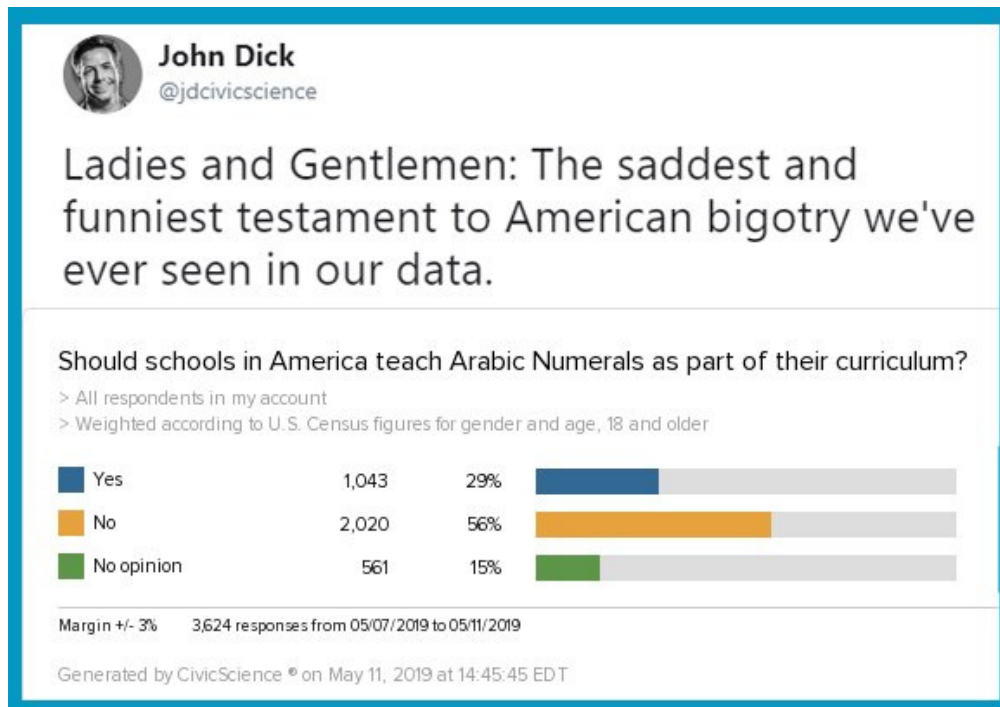
There are people right now in this country, with plastic shopping bags filled with gasoline in their cars and houses, who won't take a researched vaccine because it's "unsafe."

World View and Emotions

When there are challenges to our world view, we feel psychologically threatened. A woman playing Dr. Who or 007 makes us uncomfortable and we react emotionally.



Emotions and Decision Making



Most people would say we should make informed decisions. If we don't know something, we should investigate and learn about it. However, most people don't know what Arabic numerals are. Instead of spending the time to look up what Arabic numerals are, some react quickly and have an emotional response to anything Arabic, which, in the United States, tends to have negative associations, and answer "no" to the question. The following are Arabic numerals: 1, 2, 3, 4, 5, 6, 7...

Emotions and Decision Making

“Media often fails to distinguish between facts and opinions” by Drew Weston,
Nov 23, 2004

Question: Should Donald Rumsfeld testify before Congress about his involvement in the Abu Ghraib prison torture scandal?

What predicts people’s response?

Westen gave two groups different quantities of evidence and surveyed their feelings on several topics

- Quantity of evidence (told Little or Lots)
- Feelings toward the military (measured)
- Feelings toward Human Rights Groups (measured)
- Feelings toward Republicans (measured)

Very Little Evidence	Lots of Evidence
<ul style="list-style-type: none">• Feelings toward the military• Feelings toward Human Rights Groups• Feelings toward Republicans	<ul style="list-style-type: none">• Feelings toward the military• Feelings toward Human Rights Groups• Feelings toward Republicans
Predict their answer 84% of the time	Predict their answer 85% of the time

Emotions and Dishonesty

Solve as many of 20 math problems in five minutes	Shred your work (it really wasn't shredded)	Report how many math problems solve		Receive \$1 for each math problem solved	The average reported 6, solved, the average solved 4 (Some lying)
Solve as many of 20 math problems in five minutes	Shred your work (it really wasn't shredded)	Report how many math problems solve	<i>Receive a plastic token for each math problem solved</i>	Receive \$1 for each plastic token	The average reported 8, solved, the average solved 4 (more lying)

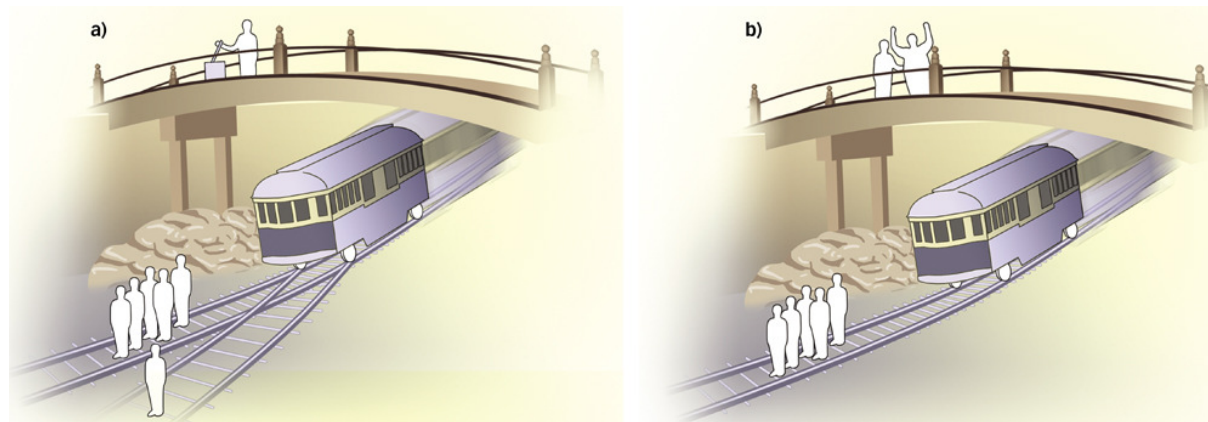
<http://www.npr.org/2012/06/04/154287476/honest-truth-about-why-we-lie-cheat-and-steal>

Intuitive Moralist

Our decisions on what is moral and immoral might not be based on any abstract notion of right or wrong, but how we feel about an event.

There is a runaway train that is going to hit 5 people.

Participants find it acceptable that to pull a lever and redirect the train to another track where it will kill another person (picture a). However, participants also find it unacceptable to push a person into the train, saving the lives of the 5 people (picture b).









People essentially responded that the first situation (picture a) “feels right” where the second situation (picture b) “feels wrong”.

Framing Effects

Framing effects are when people give different answers to the same problem depending on how it is phrased (or framed). In rational choice theory, two frames are logically equivalent, should have the same response.

Imagine that the U.S. is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

“Lives Saved”			“Lives Lost”	
<p>PROBLEM #1</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>First program</p>  <p>100% probability that 1/3 are saved</p> </div> <div style="text-align: center;"> <p>Second program</p>  <p>1/3 probability that all are saved</p>  <p>2/3 probability that none is saved</p> </div> </div>		<p>When you describe the decisions as <u>lives saved</u> you make a different decision when it is described as <u>lives lost</u>, even though they are equivalent.</p>	<p>PROBLEM #2</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>First program</p>  <p>100% probability that 2/3 die</p> </div> <div style="text-align: center;"> <p>Second program</p>  <p>1/3 probability that nobody dies</p>  <p>2/3 probability that all die</p> </div> </div>	
72% prefer Program 1				78% prefer Program 2

According to rational decision theory, each of the four programs have the same expected value (probability \times lives saved). In each of the first description, people tend to be risk averse with gains (lives saved). In the second case, they are risk seeking with losses (lives lost).

Framing Effects

Unleaded Gas: \$ 3.09
\$ 3.04 cash discount

Unleaded Gas: \$ 3.09 credit card surcharge
\$ 3.04



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Most people prefer a gas station that provides the cash discount than the credit card surcharge.

Framing Effects: Language

In a CBS poll, people were asked how they felt about homosexuals or gay men and lesbians serving in the military using one of two questions.

- Do you favor or oppose homosexuals being allowed to serve openly?
- Do you favor or oppose gay men and lesbians being allowed to serve openly?

	"Homosexuals"	"Gay Men & Lesbians"
Favor	44%	58%
Oppose	42%	28%

How you are asked the question affect how much you are in favor or opposed to gay men and lesbians or homosexuals being allowed to serve openly in the military.

Framing Effects

Version #1: An incarcerated inmate is applying for parole. Based on the nature of his crimes, 20% of those released will commit a violent crime. Do you grant parole?

Version #2: An incarcerated inmate is applying for parole. Based on the nature of his crimes, 20 of 100 of those released will commit a violent crime. Do you grant parole?

Both are equivalent descriptions.

- When it is described as 20%, 41% will grant parole.
- When it is described as 20 of 100, 21% will grant parole.

People think of the logically equivalent frames differently. In the first case, people tend to reference 20% to zero and are more risk seeking.

Framing Effects: Reason-Based Choice

Like framing effects, logically equivalent frames should not affect the outcome of a decision.

Consider the following problem:

Imagine that you serve on the jury of an only-child sole-custody case following a relatively messy divorce. The facts of the case are complicated by ambiguous economic, social and emotional considerations, and you decide to base your decision entirely on the following few observations:

Parent A	Parent B
<ul style="list-style-type: none">• Average Income• Average health• Average working hours• Reasonable rapport with the child• Relatively stable social life	<ul style="list-style-type: none">• Above-average income• Minor health problems• Lots of work-related travel• Very close relationship with the child• Extremely active social life

To which parent would you award sole custody of the child?

- 55% of the participants would award custody to parent B

However, when asked

To which parent would you deny sole custody of the child?

- 64% of the participants would deny custody to parent B.



- When asked which parent should you award custody, people looked for reasons to justify awarding custody and focused on the positive attributes of Parent B.
- When asked which parent should you reject custody, people looked for reasons to justify rejected custody and focused on the negative attributes of Parent B.

Parent A	Parent B
<ul style="list-style-type: none">• Average Income• Average health• Average working hours• Reasonable rapport with the child• Relatively stable social life	<ul style="list-style-type: none">• Above-average income• Minor health problems• Lots of work-related travel• Very close relationship with the child• Extremely active social life

How do we describe the integration of women into combat units?



- Women in military combat units have shown no improvement in combat readiness.
- Women in military combat units have shown no declines in combat readiness.
- Women in military combat units do not affect combat readiness.



Framing Effects

Other examples

- Ground beef that is 75% lean is described being better than ground beef that is 25% fat.
- Students feel safer with condoms that are 90% successful versus those that are have a 10% failure rate.
- Samoa Air announced that it would charge passengers by weight. Is this an extra charge for heavy people or a discount for lighter people?
- People make riskier decisions when it is
 - described as having an 80% chance of success compared to being
 - described as having an 80% chance of success and 20% chance of failure.
- When discussing rates of false reports of sexual assault,
 - 5% of reports of sexual assault by men on women are false there is much sympathy for the men compared to
 - 5% of reports of sexual assault by men on women are false and 95% are true, there is less sympathy for men.

Paradox of Choice

The presence of more choices leads to less satisfaction and less likely someone will make a choice.

6 varieties of jam	24 varieties of jam
	Attracted More shoppers
 <p data-bbox="779 1044 1010 1073"><small>Psychological Science, Fifth Edition Copyright © 2015 W. W. Norton & Company</small></p>	 <p data-bbox="1535 1032 1766 1062"><small>Psychological Science, Fifth Edition Copyright © 2015 W. W. Norton & Company</small></p>
30% bought jam	3% bought jam

When will we use heuristics to make decisions?

Heuristics are short cuts in the decision-making process. When will we use heuristics such as the availability, representativeness, confidence or price rather than systematic decision-making processes?

We will use them when

- (1) we don't have the time to think carefully about the issue, it becomes impossible to process it fully,
- (3) we believe that the issues at stake are not very important,
- (4) we have little knowledge or information to base a decision, and
- (5) a given heuristic comes quickly to mind as we are confronted with a problem.