



Decision Making Constraints

Reference Dependence

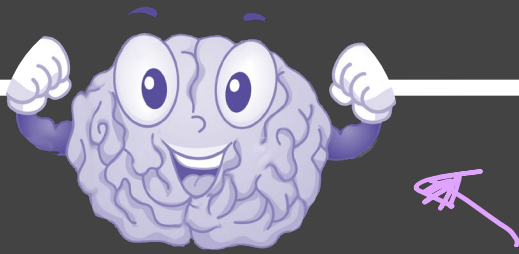
CONSTRAINTS



LARGE vs SMALL DECISIONS

Is there a difference in how people make large decisions and small decisions?





same brain
is used for both large & small decisions

Not different

The same biases are found in the small “day to day” decisions and in the larger more meaningful “once in a lifetime” decisions.

Same Brain

SAME DECISION MAKING TOOLS

Forage for food
&
Fight predators



Buy a car
&
Choose a college

TWO FUNDAMENTAL LIMITATIONS



1

- Constraints on our cognitive abilities.
- Basic limitations to intellectual capacity.
- We cannot know nor remember everything.
- We simplify decisions.

2

- We do not have unconstrained time to make decisions.
- We need to make decisions with incomplete information due to time constraints.

REFERENCE POINTS

1

- ▣ Constraints on our cognitive abilities.
- ▣ Basic limitations to intellectual capacity.
- ▣ We cannot know nor remember everything.
- ▣ We simplify decisions.

→ We don't process
information in
absolute terms.



It is all relative

Olympians - 2 place disappointment

* RELATIVE TO YOUR EXPECTATIONS

- Paradox
- Silver > Bronze
- Counter intuitive



Happiness is a function of how well you perform.*

Why Winning Olympic Silver Is More Disappointing Than Bronze- -And The Crucial Thing That Tells Us About Performance Reviews

This article is by Victoria Husted Medvec, the Adeline Barry Davee professor of management and organizations and executive director of the Center for Executive Women at Northwestern University's Kellogg School of Management.

For Olympic athletes, nothing shines quite like gold. Silver, while still impressive, is often tarnished with thoughts of what might have been. This disappointment, rooted in what is known as counterfactual thinking, is not limited to athletes who miss winning a race by 0.01 second. The same letdown is often felt by employees whose performance evaluations are just shy of excellent, like the student whose grade falls one point shy of an A.

Curiously, the opposite is generally true for bronze medalists, for whom the “what could have been” is fourth place with no medal at all. Happy to be on the podium, third-place finishers generally feel pleased with their performance—just like the employee who squeak into the good category in an evaluation, or the student who ekes out one more point to make a B. In fact, as research I conducted with my colleagues Thomas Gilovich of Cornell University and Scott Madley of the University of Toledo has shown, bronze medalists are generally happier than those who bring home silver; counterfactual thoughts lead those who perform better to feel worse than those they outperform.



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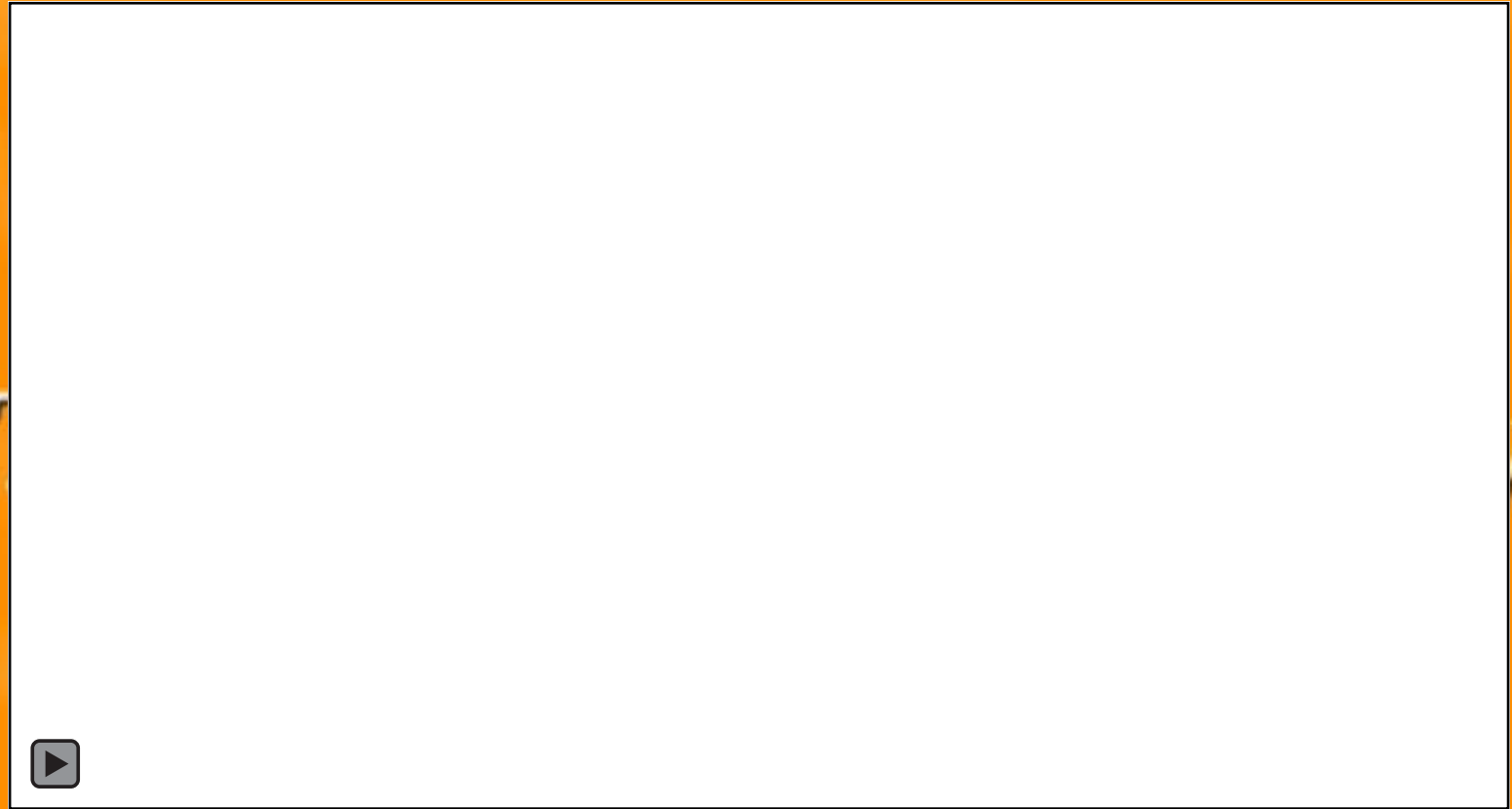
↓

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They are using different reference points!



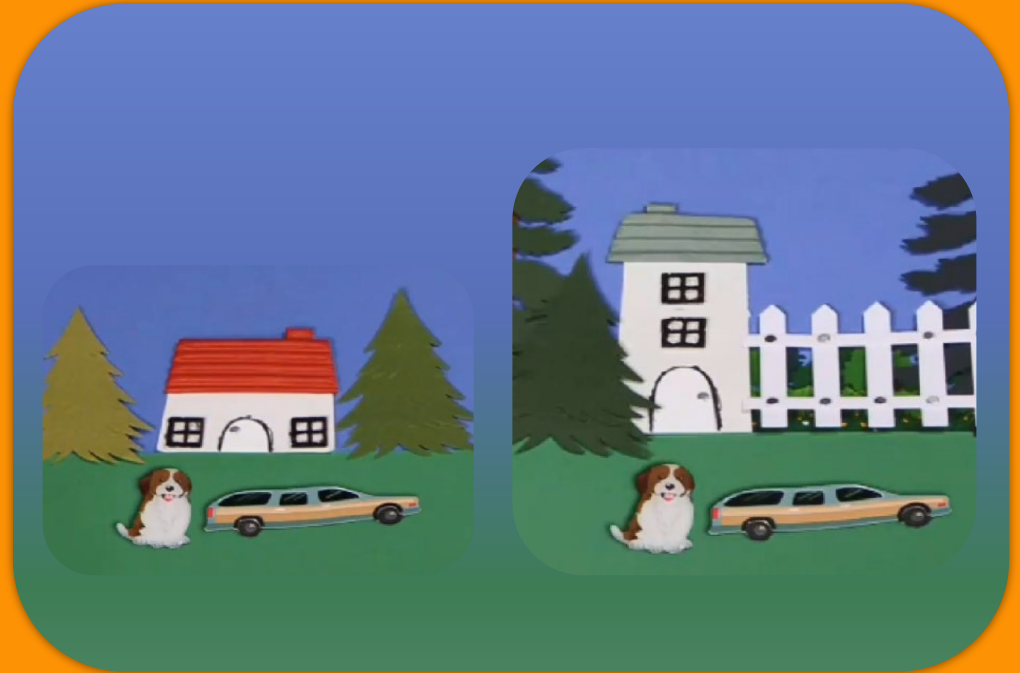
The Truth About Relativity. Dan Ariely

relativity

The tendency to estimate the value of things according to how they compare with other items.

adaptation

The process of adjusting to new conditions.





VALUE

The essence of decision making.

A roll of light-colored, textured paper is shown from a side-on perspective. A jagged hole has been cut through the paper, revealing a white surface underneath. The text "What's Important to You?" is printed on this white surface. The word "Important" is in red, while the other words are in black. The lighting is warm and soft, highlighting the texture of the paper.

What's
Important
to You?



VALUE

How is value calculated?

By understanding value
we gain insight into choices

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By understanding value
we gain insight into choices

value is an
abstract concept

↳ ECONOMICS

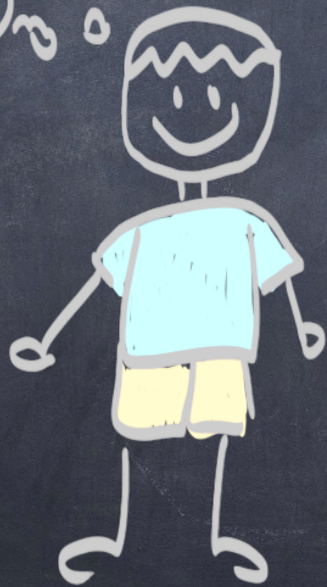
[+
value]

⇒ pleasure

[-
value] ⇒ pain

↳ how much do we benefit?

I value
that because of
it benefits me
...



But, are all choices
made solely based
on benefit?

* Value is then
measured by both
pleasure & benefit.

value? benefit?



pleasure?

value? benefit?



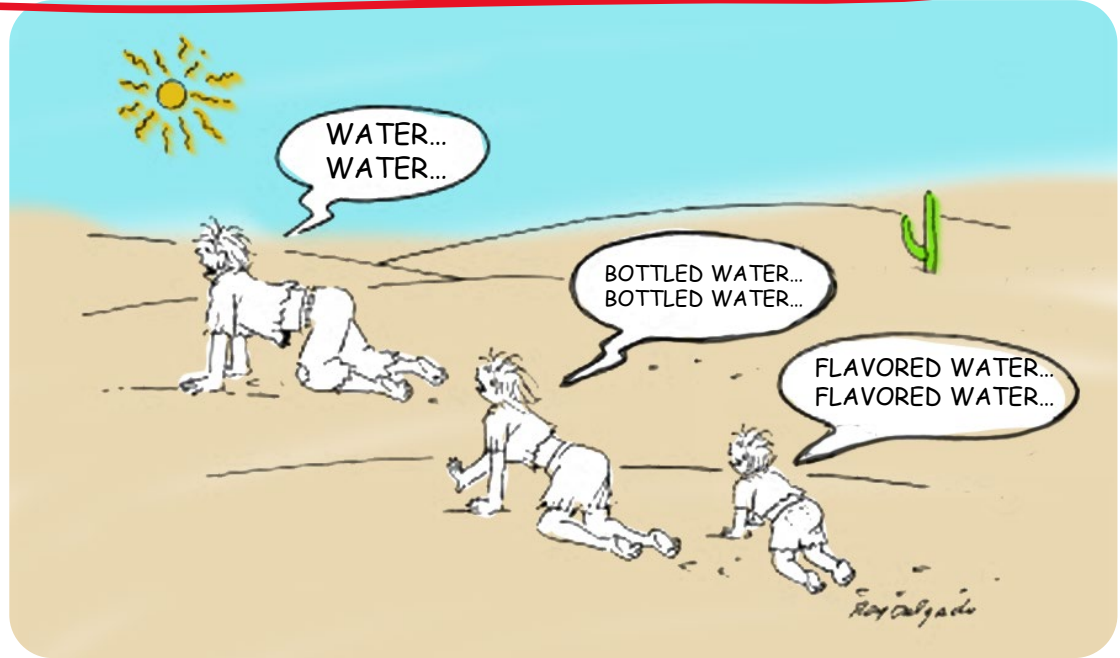
pleasure?

Value is MORE
than pleasure
and benefit.

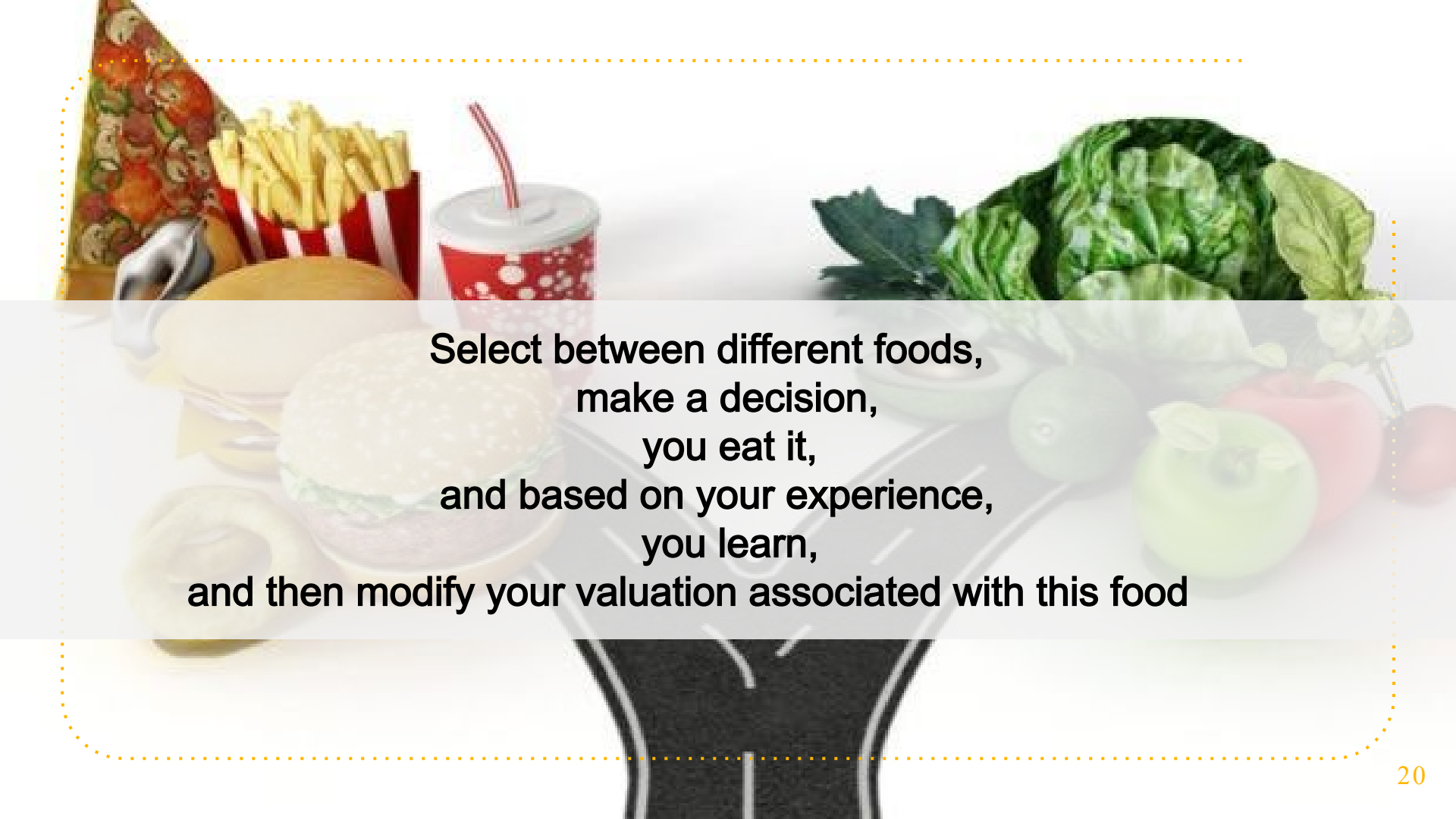
Value of something can be completely
separate from the benefit.

People are motivated to take certain actions in order to reduce the internal tension that is caused by unmet needs.

Valuation key to the decision making process



Motivation is a reason or a set of reasons for engaging in a particular behavior.

A collage of various food items. On the left, there is a slice of pizza with toppings, a red and white striped container of french fries, a red cup with a white lid and a straw, a burger on a bun, and a bowl of onion rings. On the right, there is a head of green lettuce, a green apple, a pink apple, and a red apple. At the bottom, a black road with white dashed lines leads towards the center. The entire scene is framed by a dotted orange border.

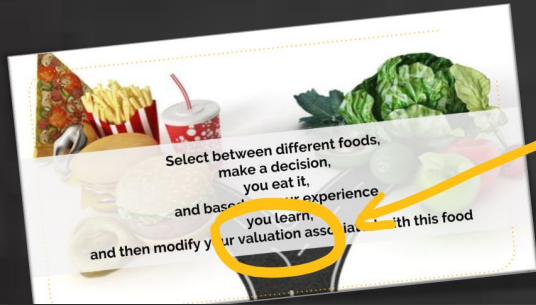
**Select between different foods,
make a decision,
you eat it,
and based on your experience,
you learn,
and then modify your valuation associated with this food**



Valuation

this is key

Q Can we understand & decode neural representation of valuation??



Valuation
this is key

← why?

We want to be able to
predict the decisions of
the decision maker.

Choice

→ utility is a measure of the desirability of consequences of an action

value = \$2

utility = X



value = \$4

utility = Y

Choice

value = \$2

utility = X



→ utility is a measure of the desirability of consequences of an action

value = \$4

utility = Y



utility fn:

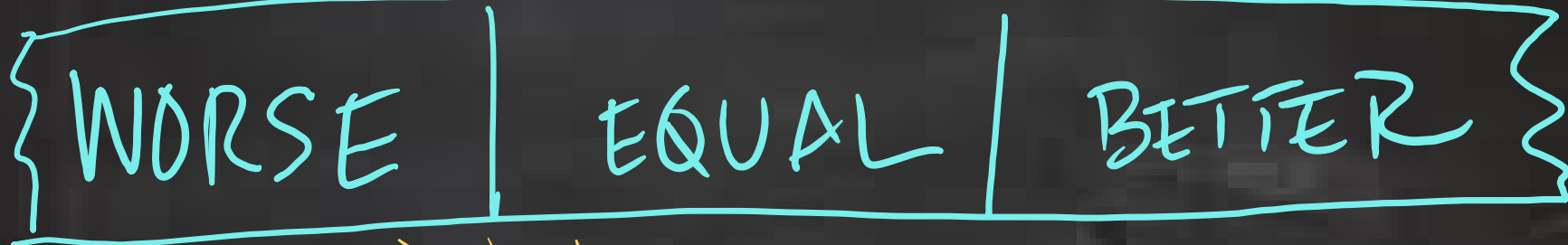
IF $x < y$

select y

The rule of maximization:
choose the option yielding the highest utility.

HOW TO MEASURE UTILITY?

PREFERENCES CANNOT BE MEASURED NUMERICALLY.



↑
SORT

ORDINAL UTILITY

↑ relative utility ordering

HOW'S YOUR
WIFE?



- Economists
- don't use absolute numbers
 - everything is relative!
 - assign relative utility to different conditions.

better

worse

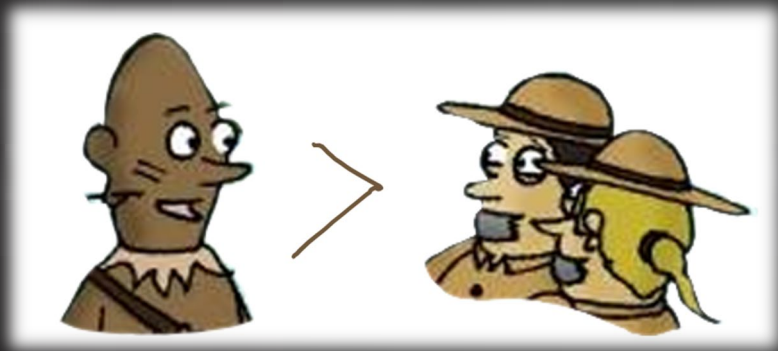


native
is in a
better
condition

relative
to
the
tourists



“But enough about me...What brings you folks to Polynesia?”

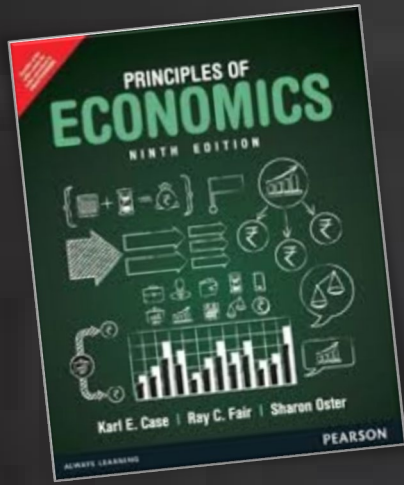


↑
100

↑
-20

Cardinal Utility

- ① the utility gained from a particular good or service can be measured
- ② the magnitude of the measurement is meaningful.



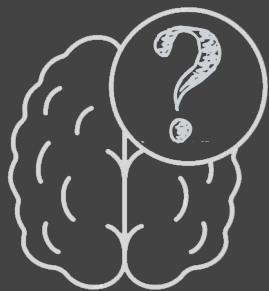
ECONOMICS BOOK:

\$150⁰⁰



* value is subjective ← for each person!

Utility is a measure of the desirability of consequences of an action.



DOPAMINE

The neurotransmitter that
determines value!