Loss Aversion in Riskless Choice: A Reference-Dependent Model

Paper by Amos Tversky and Daniel Kahneman
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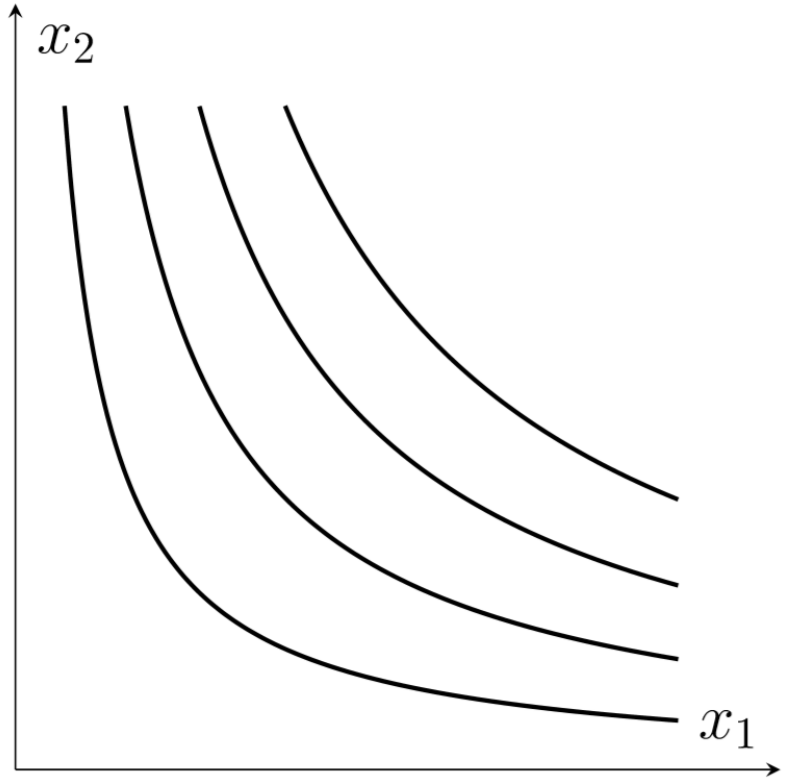
In classical choice theory it is assumed that decisions are independent from the reference point

Preferences are independent from the initial endowment:
what you have does not change what you want

No status quo bias:
on average keeping the reference position is no better than other options

Foregone gains and accounted as direct losses and thus make no difference in decision-making



Indifference map

According to prospect theory, people's decisions are based on the hypothetical value function

1. Reference dependence.
People compare gains/losses but not the final assets:

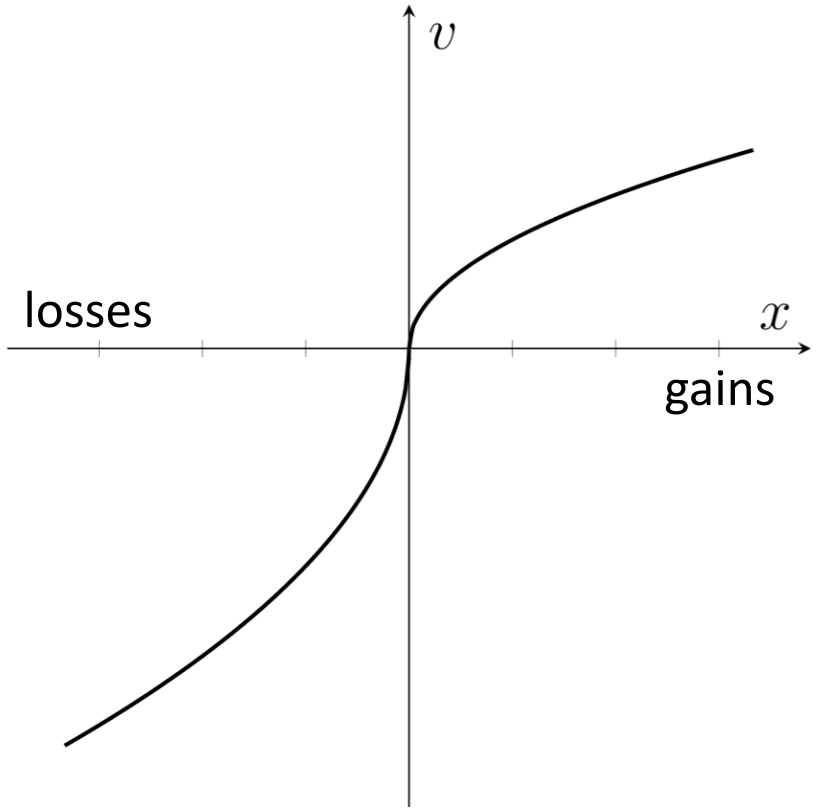
$$v(0) = 0$$

2. Decreasing sensitivity.
Responsiveness falls with amounts:

$$\begin{cases} v''(x) < 0 \text{ for } x > 0 \\ v''(x) > 0 \text{ for } x < 0 \end{cases}$$

3. Loss aversion. People dislike losses more than they like gains:

$$v(-x) < -v(x)$$

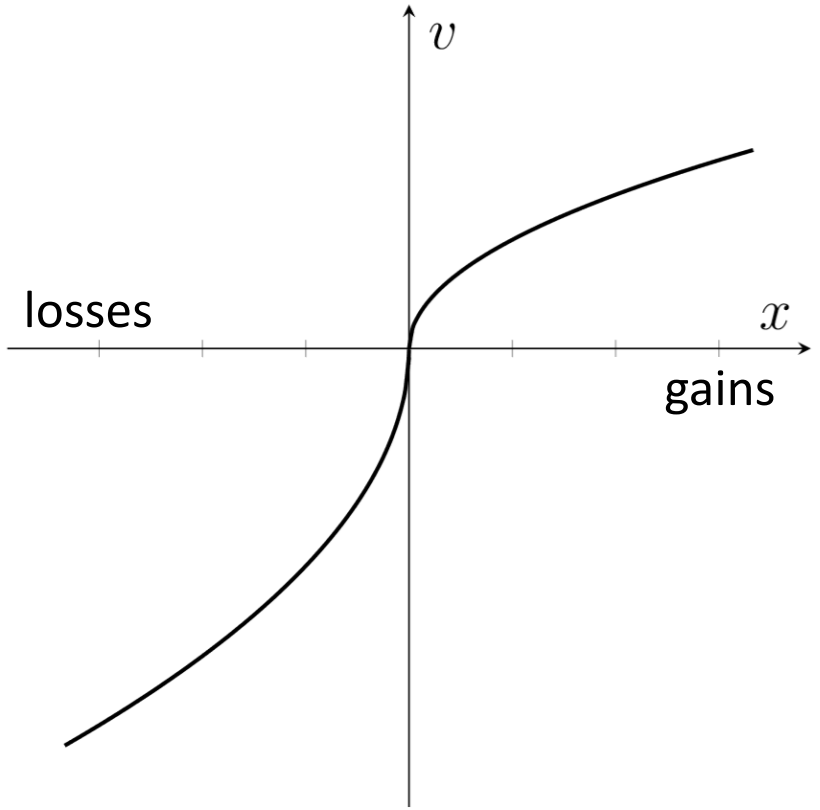


Value function $v(x)$

The goal of the paper is to formulate a theory that explains a set of decision-making anomalies

List of experiments:

1. Instant endowment
2. Status Quo Bias
3. Improvements versus Tradeoffs
4. Advantages and Disadvantages



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Experiment 1: Instant endowment

Mugs and money: classroom setting

For each price from \$0.50 to \$9.50 with a step of \$0.50 what do you choose?

- **Sellers** (from y): sell the mug and receive the price (x) OR keep the mug (y).
- **Choosers** (from t): receive the price (x) OR receive a mug (y)

Median value of mug (in two experiments):

- for sellers – \$7.12 and \$7.00
- for choosers – \$3.12 and \$3.50

Result: **ownership adds value**.

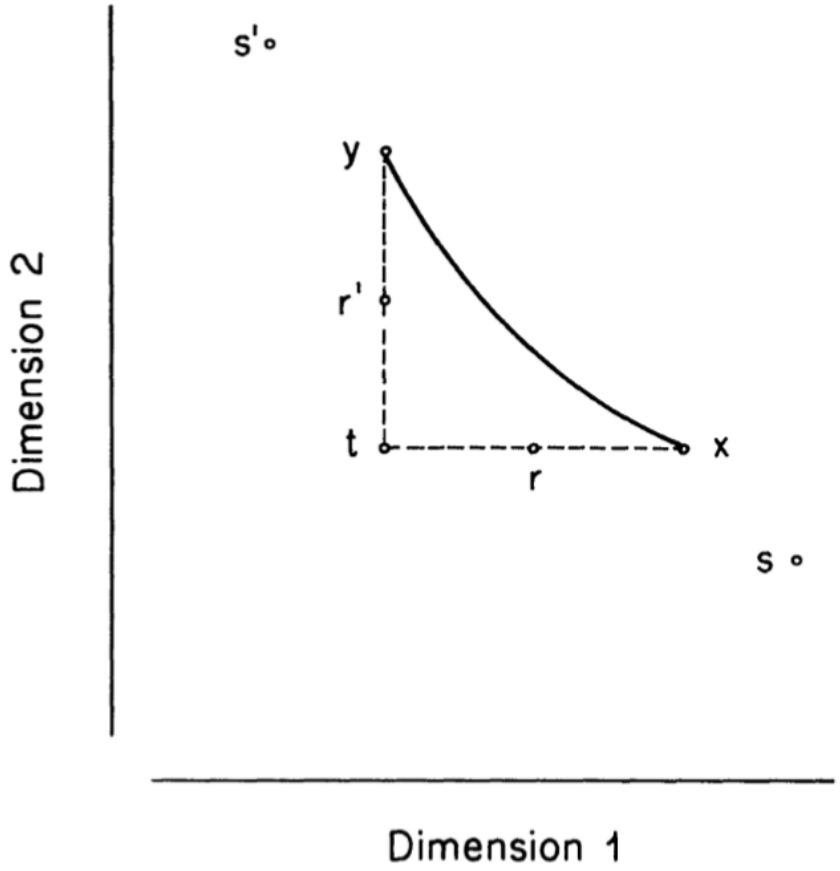


FIGURE II
Multiple Reference Points for the Choice Between x and y

Experiment 2: Status Quo Bias

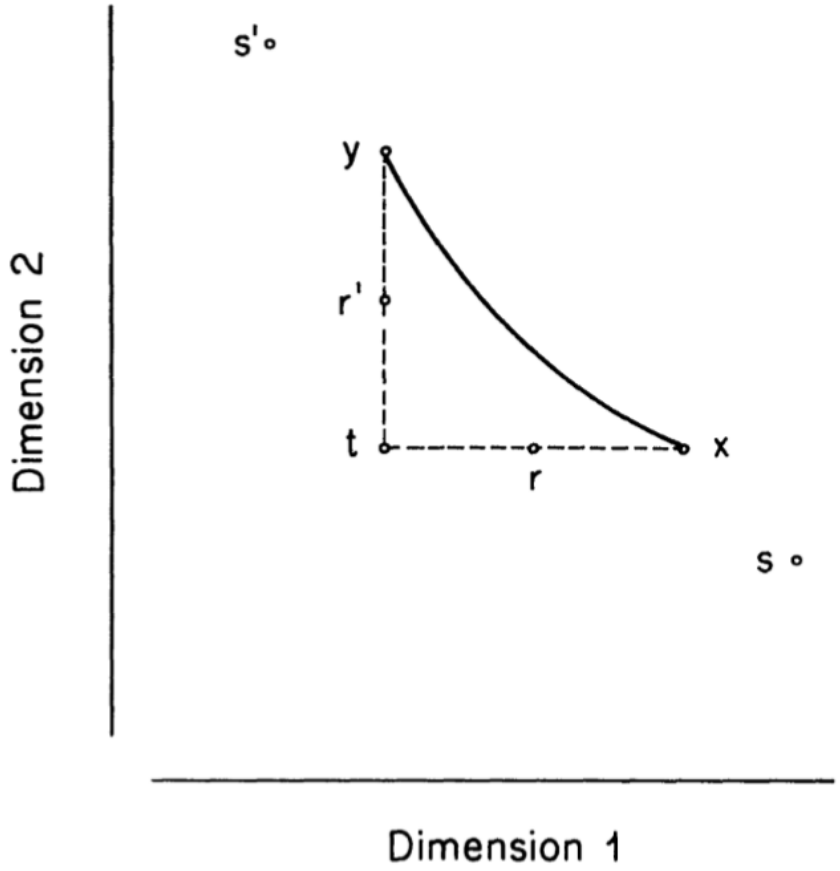
Assume x and y are liked equally.

- From x people prefer x to y.
- From y people prefer y to x.

Setting:

- Undergraduate students
- Decorated mug and Swiss chocolate
- Assigned to gifts randomly
- Opportunity to trade (exchange)

Result: 90% (instead of 50% expected) of participants retained the gift they received



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Multiple Reference Points for the Choice Between x and y

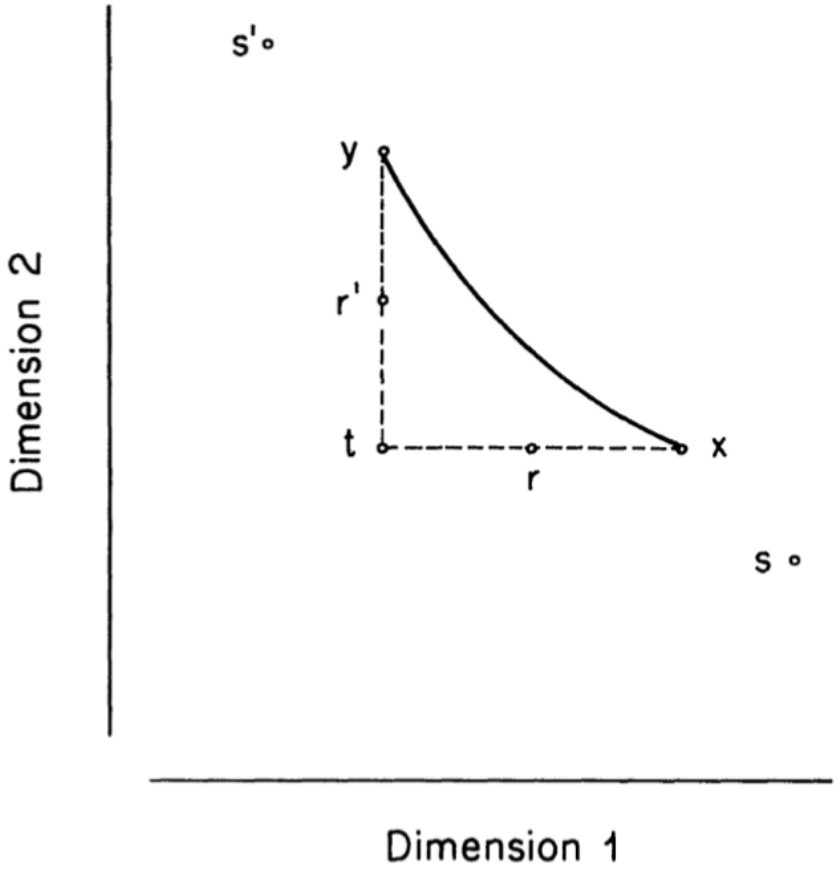
Experiments 3 and 4

Improvements versus Tradeoffs:
evaluation of x and y from r and r'

- x over y is more likely to be preferred from r rather than from r'
- Reason: changes in both dimensions are gains, not losses

Advantages and Disadvantages:
evaluation of x and y from s and s'

- x over y is more likely to be preferred from s rather than from s'
- Reason: difference between two losses has higher weight than a difference between two gains



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Coefficient of loss aversion is estimated to be about 2-2.5

Results of the Experiment 1 about Instant endowment:

Median value of the mug:

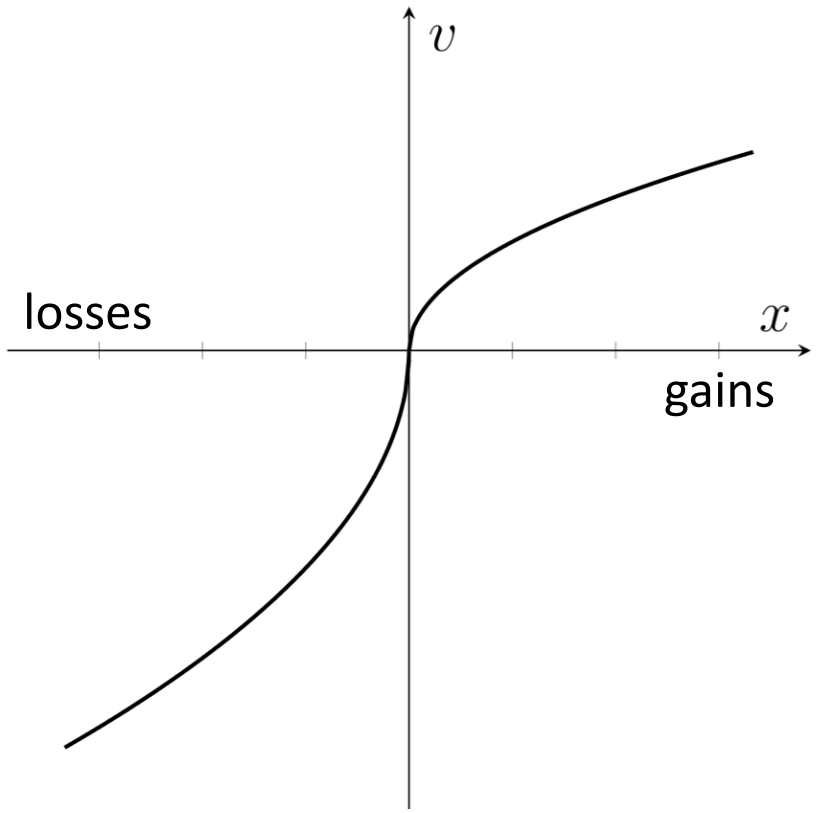
- for sellers – $7.12 and $7.00
- for choosers – $3.12 and $3.50

Conclusion:

If the value of money is linear in this range,
then the coefficient of loss aversion is **slightly greater than 2**.

This results are consistent with estimates in the realm of risky choice.

Coefficient of loss aversion is estimated to be about 2-2.5



Value function $v(x)$

Table 2.3 Estimates of loss aversion in various studies. The two estimates in Bleichrodt et al. (2001) are based on two different datasets. The two estimates in Booij and van de Kuilen (2009) are based on high and low monetary amounts.

Study	Definition of loss aversion	Estimate
Fishburn and Kochenberger (1979)	$\frac{v'(-y)}{v'(y)}$	4.8
Tversky and Kahneman (1992)	$\frac{-v(-1)}{v(1)}$	2.25
Bleichrodt et al. (2001)	$\frac{v(-y)}{v(y)}$	2.17, 3.06
Schmidt and Traub (2002)	$\frac{v'(-y)}{v'(y)}$	1.43
Pennings and Smidts (2003)	$\frac{v'(-y)}{v'(y)}$	1.81
Booij and van de Kuilen (2009)	$\frac{v'_{\uparrow}(-y)}{v'_{\downarrow}(y)}$	1.79, 1.74

Source: Abdellaoui et al. (2007).

Source: The Foundations of Behavioral Economic Analysis, Sanjit Dhami, 2016

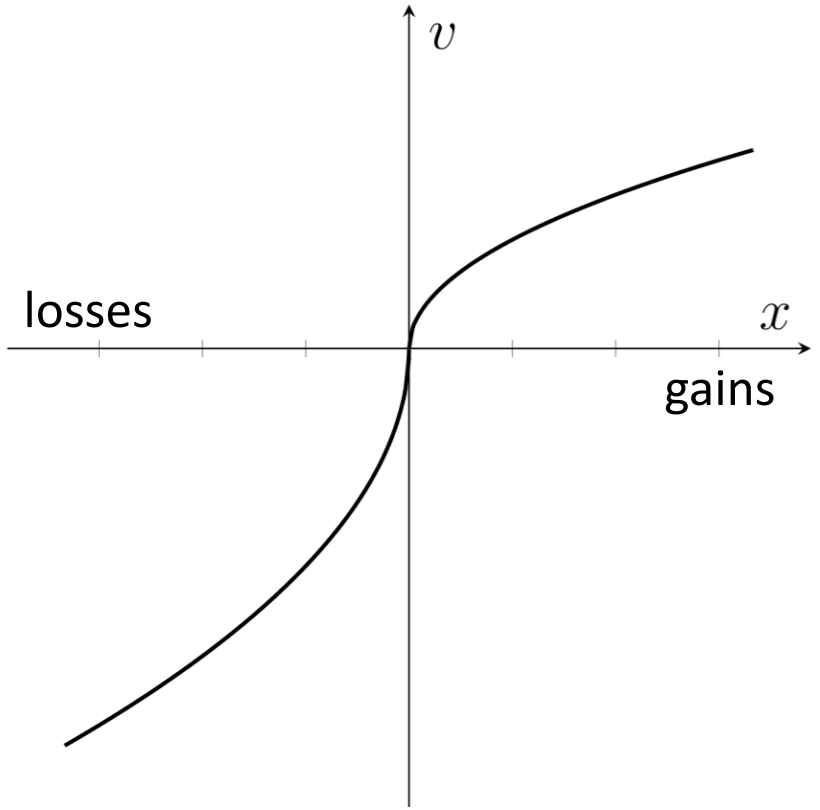
The proposed theory can be used to explain various phenomena from economics and business

1. Buying-selling discrepancy
inhibits trade:

$$min\, WTA > max\, WTP$$

2. Losses and foregone gains are perceived differently:

- Increases in prices are unfair unless costs are increased.
- Reduction in wages is unfair unless there exists a bankruptcy threat.
- Firms may not share benefits from decreased costs and higher profits with their employees.



Value function $v(x)$

Axioms of choice postulate key empirical patterns of behavior but do not explain their essence

- **Variability** of people's choice is not explained.
  - Why not all respondents choose the same alternative?
  - **Timing** of choice and **attention** variable are omitted.
- People are reasonably **accurate in predicting their choices** – does this crucial assumption hold in reality?
  - It is assumed explicitly that value assigned to an alternative can be viewed as an estimate of the future experience.
  - Later in the article "Back to Bentham? Explorations of Experienced Utility" (1997) Daniel Kahneman et al. make distinction between the notions of **decision utility and experienced utility**.
- Fundamental assumptions **lack psychological justification**: what are the reasons for reference dependence, decreasing sensitivity, loss aversion?
  - Axiomatization does not solve this issue.