



**Risk management**

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**exceed** expectations

# Risk and the human psyche

## An interactive journey through science

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## Group similar words

**Improbable**

**As often as not**

**Almost never**

**Probable**

**Always**

**Impossible**

**Certain**

**Very often**

**Not often**

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# Connect words to percentages

**Very high probability**

**High probability**

**Average probability**

**Low probability**

**Very low probability**

# Determine the correct distance between these words

**A: insignificant**

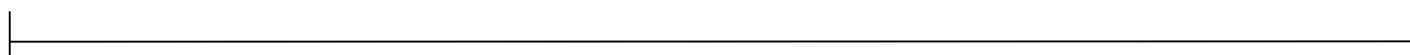
**B: marginal**

**C: critical**

**D: catastrophic**

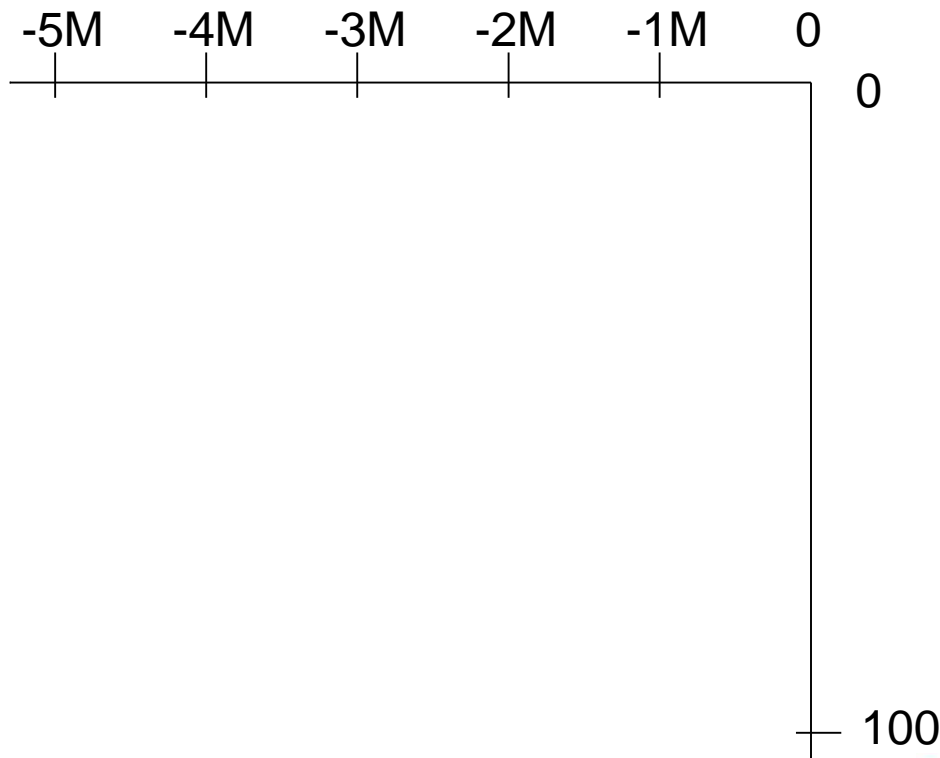
**A**

**D**



# Give weights to these euro amounts

Euro	0	-1M	-2M	-3M	-4M	-5M
Weight	0					100

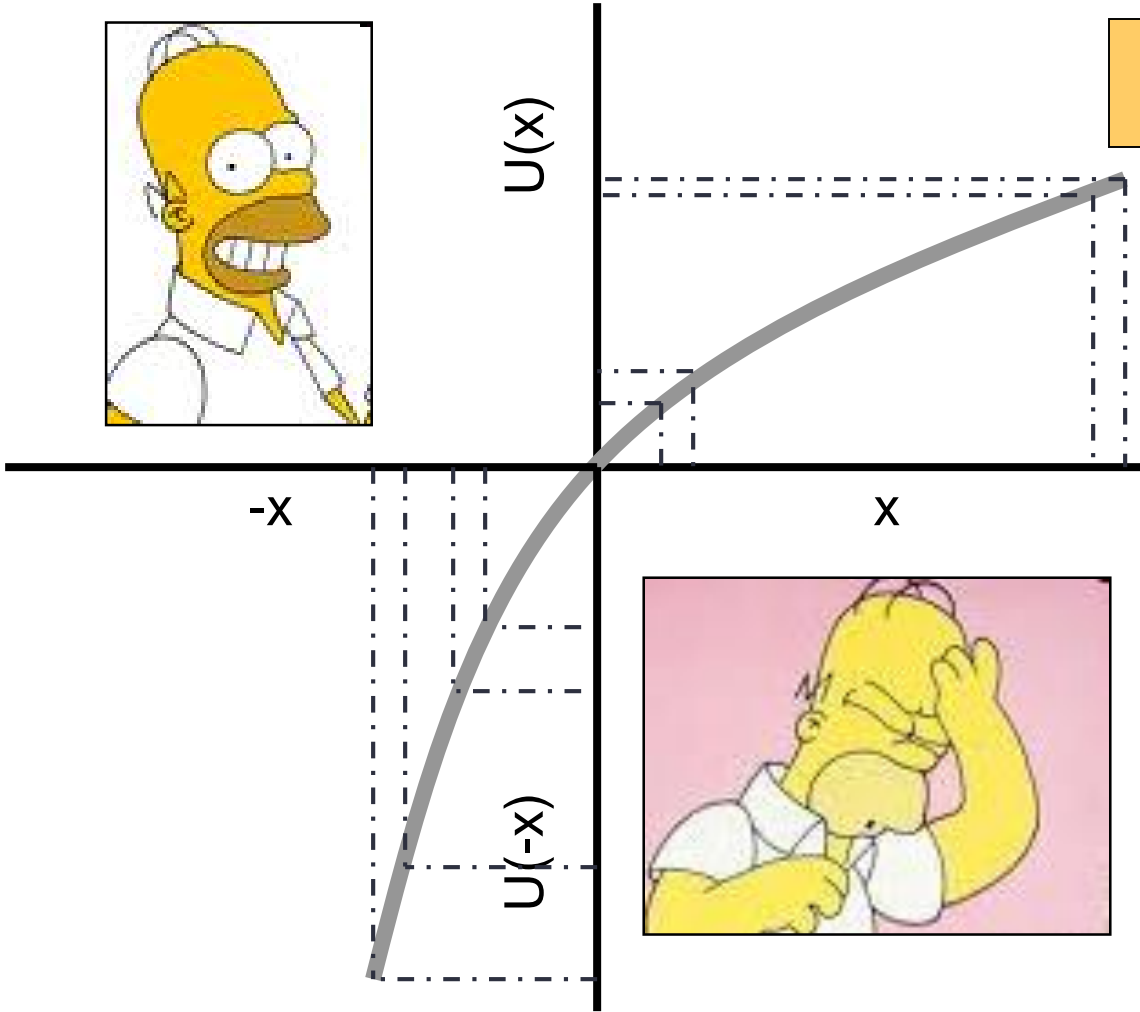


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$U(x)$  = utility = usefulness  
 $U(-x)$  = disutility = unusefulness

# Pain & pleasure curve (utility curve)

Concave utility =  
Diminishing marginal utility



# Calculate Kinney values in the matrix

	.05	.35	.65	.95
-1M				
-2M				
-3M				
-4M				

Probability	.05	.35	.65	.95
Weight	1	2	3	4

Euro	-1M	-2M	-3M	-4M
Weight	1	2	4	8

# Name the company's objectives

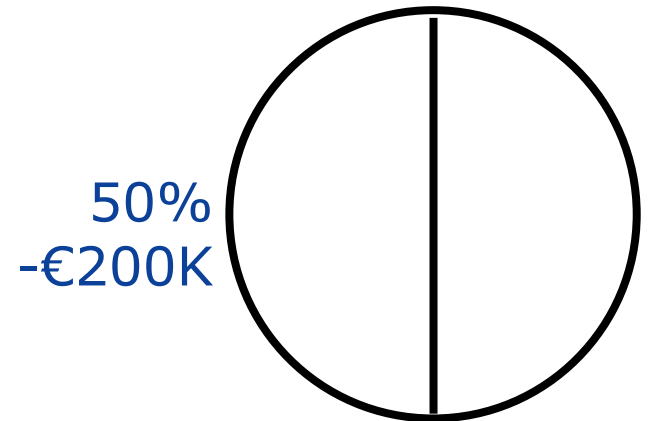
IMPACT	Key Performance Indicators (KPI)	Financial	Reputation	PROBABILITY				
				A (Unlikely) Never heard of before in this business sector	B (Likely) Does occur in this business sector	C (Incidental) Has occurred several times within organisation	D (Regularly) Has occurred many times within organisation	E (Very likely) Does occur several times per year within organisation
1. Small	Incidental small negative impact on KPI	Cost lower than €10.000	Negative local media attention	1A	1B	1C	1D	1E
2. Limited	Short negative impact on KPI	Cost between €10.000 and €100.000	Negative regional media attention	2A	2B	2C	2D	2E
3. Considerable	Prolonged negative impact on KPI	Cost between €100.000 and €1.000.000	Short negative national media attention	3A	3B	3C	3D	3E
4. Large	Limits of one or more KPI not achieved	Cost between €1.000.000 and €10.000.000	Negative national media attention, references in international media	4A	4B	4C	4D	4E
5. Very large	Limits of one or more KPI not achieved for more than one subsequent periods	Cost larger than €10.000.000	Prolonged negative media attention in (inter)national media	5A	5B	5C	5D	5E



# Determine which risk you prefer

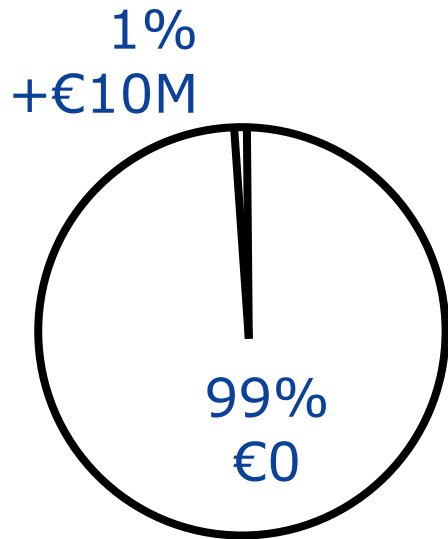


A

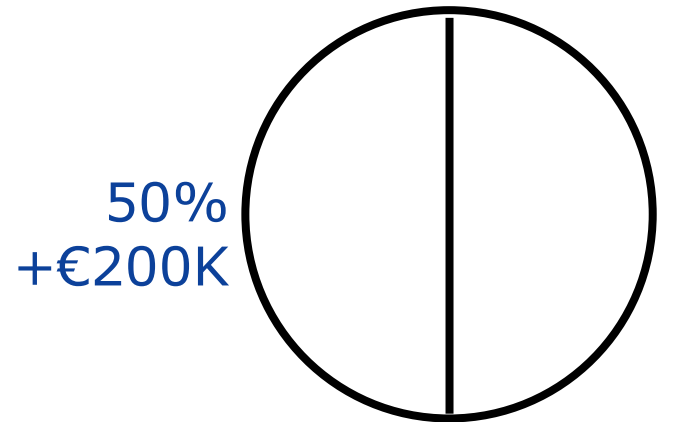


B

# Determine which risk you prefer

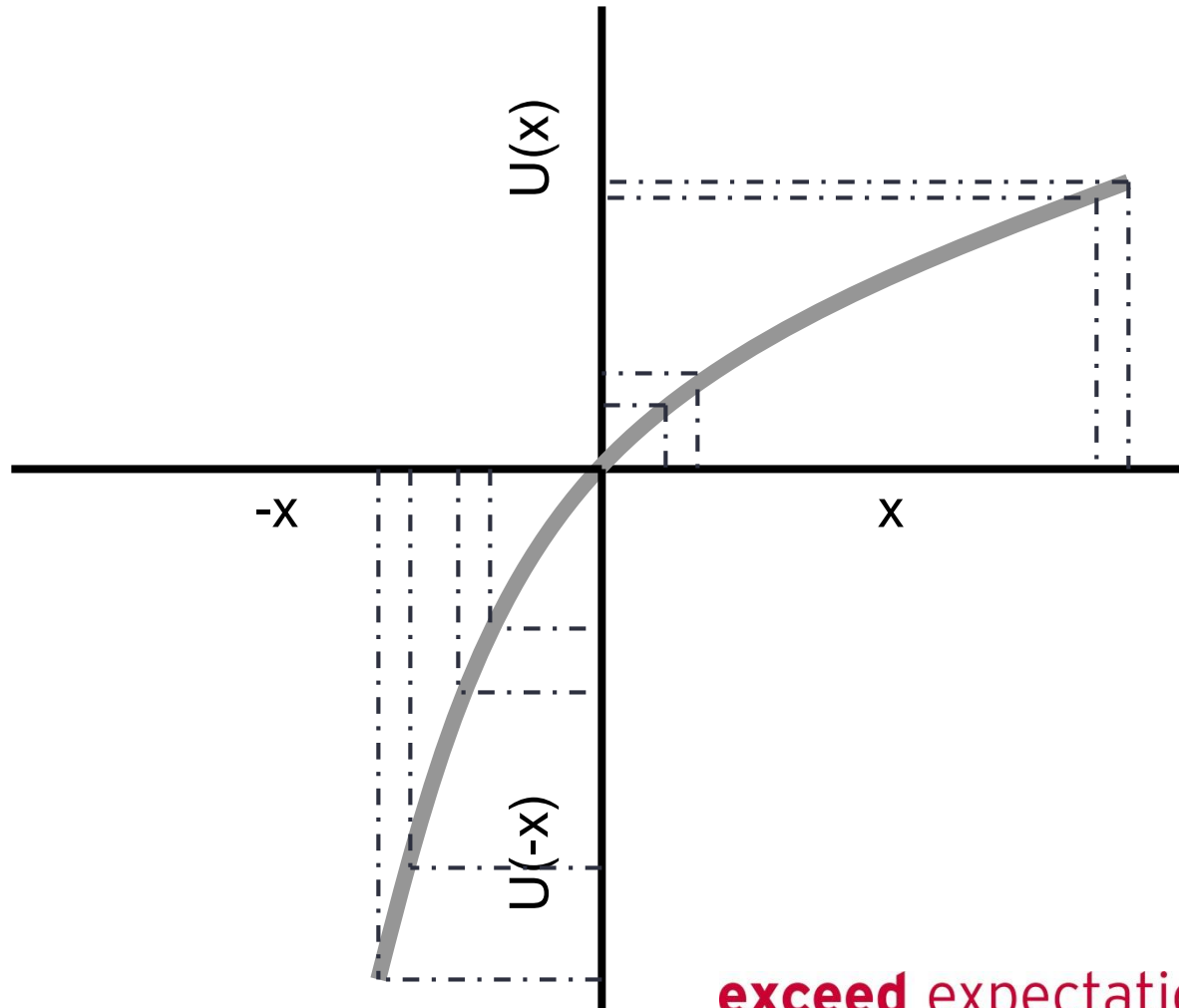


A



B

# Pain & pleasure curve (utility curve)



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# Discover the risk attitude in the risk matrix

	1%	10%	30%	50%	70%	90%
-100,000	1	1	1	1	1	1
-300,000	1	1	2	2	2	3
-1,000,000	1	2	3	4	4	4
-3,000,000	1	4	4	5	5	5
-10,000,000	3	5	5	5	5	5

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# Risk aversion = rational

→ Expected value =

$$0.9 \times |-10| = 0.1 \times |-90| = 9$$

→ Variance green cell =

$$0,9 \times (|-10| - 9)^2 + 0.1 \times (0 - 9)^2 = 0.9 + 8.1 = 9$$

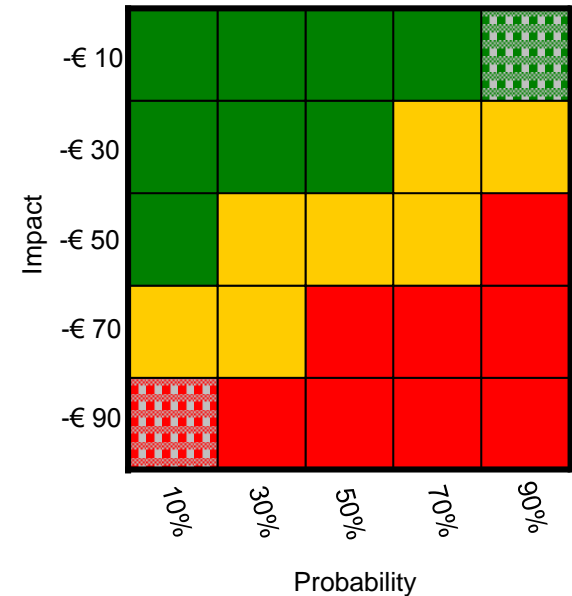
→ Variance red cell =

$$0.1 \times (|-90| - 9)^2 + 0.9 \times (0 - 9)^2 = 656 + 73 = 729$$

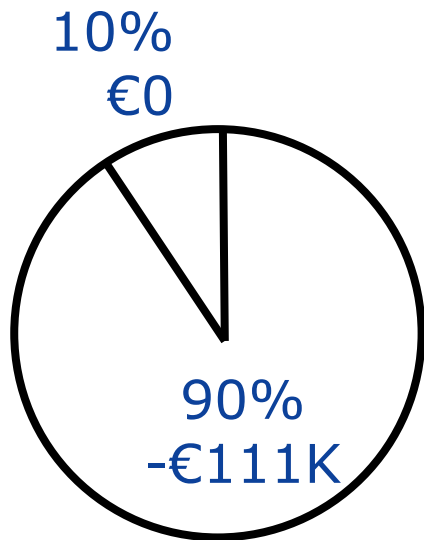
→ Rational choice =

→ Given identical expected value, choose lowest variance

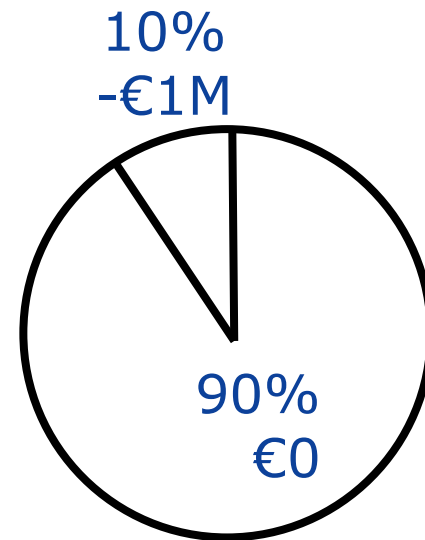
→ Preference for risk with highest loss probability = risk aversion



# Determine which risk you prefer

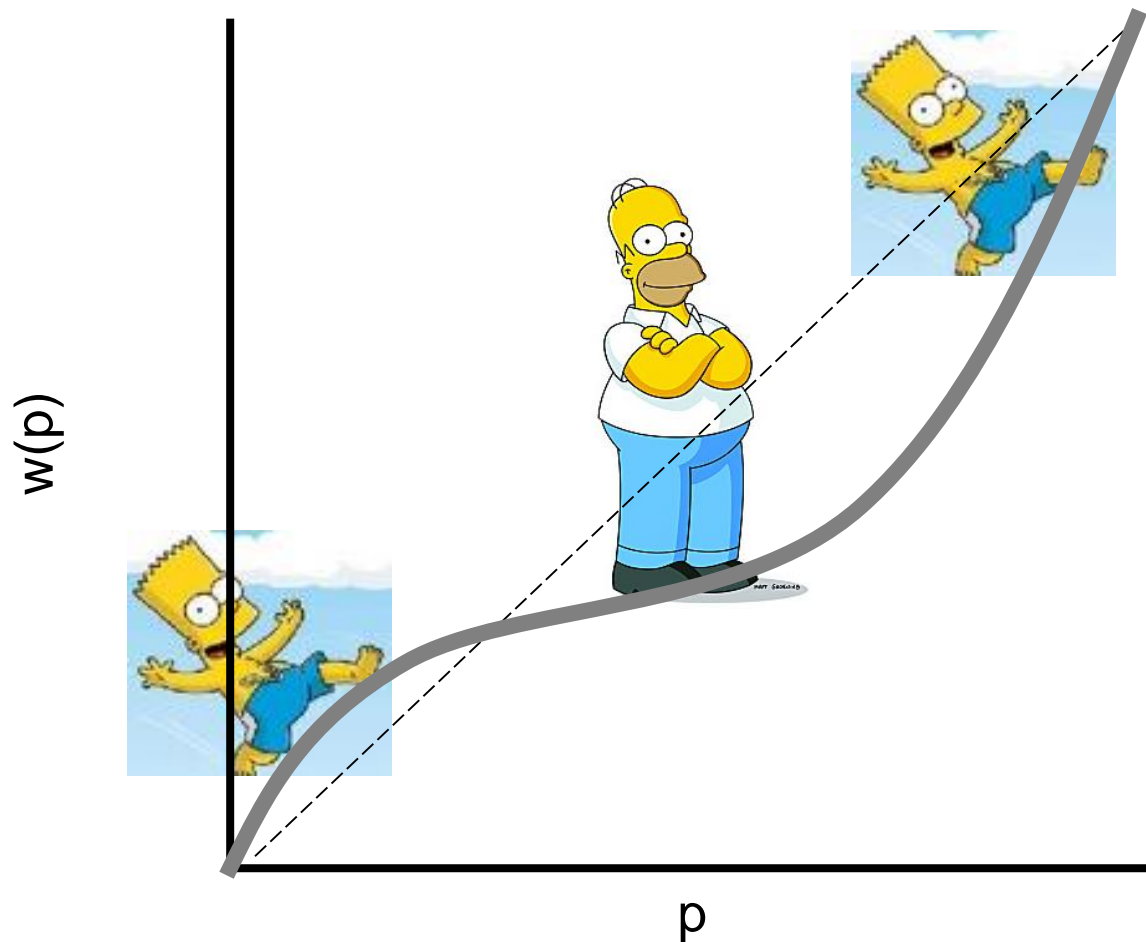


A

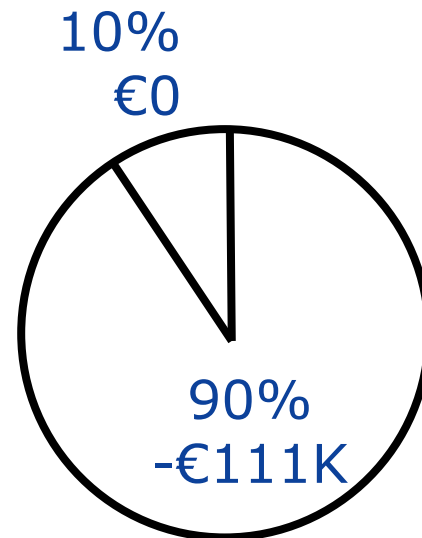


B

# Probability weighting curve



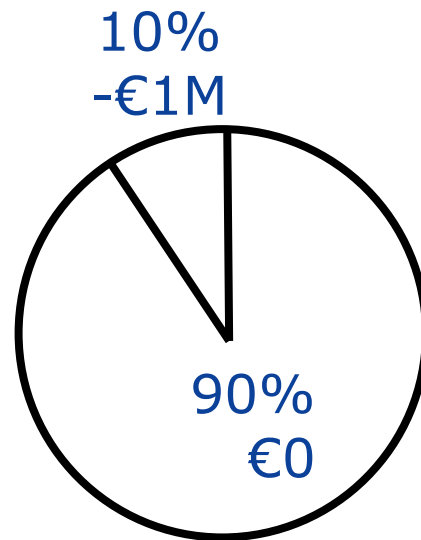
# Determine the amount of money for which you would accept the risk



A



# Determine the amount of money for which you would accept the risk



B

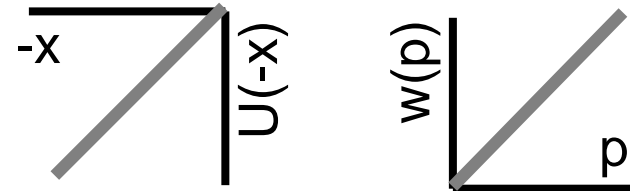
# Decision theory

→ EV = Expect Value

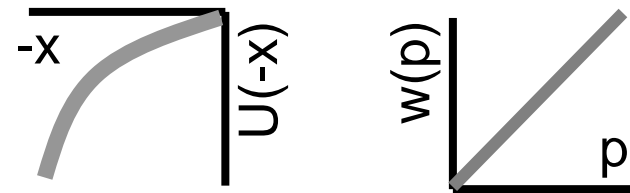
→ EU = Expected Utility

→ PT = Prospect Theory

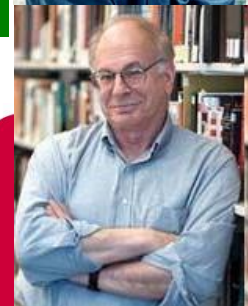
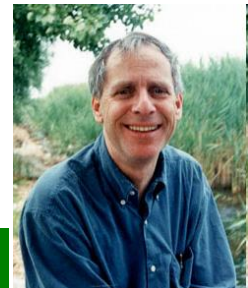
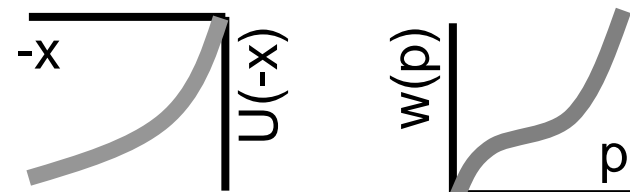
**Blaise Pascal**



**Daniel Bernouilli**



**Tversky & Kahneman**



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