

## 1. Outcome Bias

- **Definition:** Outcome bias happens when we judge the **quality of a decision** based on its **outcome**, rather than on the information and reasoning available at the time the decision was made.
- **Key point:** Focus is on **decision evaluation after the fact**.

### Example:

- A doctor prescribes a risky but reasonable treatment.
    - If the patient recovers → people say “Great decision!”
    - If the patient dies → people say “Terrible decision!”
  - In reality, the decision-making process (weighing risks/benefits) may have been the same and perfectly rational. The outcome is coloring our judgment.
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## 2. Hindsight Bias

- **Definition:** Hindsight bias is the tendency to see events as having been **more predictable** after they have already happened. People think “I knew it all along,” even if they didn’t.
- **Key point:** Focus is on **predictability after the outcome**.

### Example:

- Before an exam, you’re unsure which topics will be asked. After the exam, when you see the questions, you think:  
→ “Of course those topics were going to be on the test, I knew it!”

- But in truth, you didn't know for sure — you just perceive it as obvious in hindsight.
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## Difference Between the Two

- **Outcome bias:** Misjudges the **decision-making process** because of the outcome. (Good outcome = good decision, bad outcome = bad decision).
  - **Hindsight bias:** Misjudges the **predictability** of an event, believing it was obvious all along.
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## Quick Comparison Table

Aspect	Outcome Bias	Hindsight Bias
Focus	Evaluating the <b>decision</b>	Evaluating the <b>predictability</b>
Driven by	Good/bad outcome	Knowledge of outcome
Example	"That was a stupid bet since you lost."	"It was obvious the team would win."
Distortion type	Decision quality	Memory / foresight

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👉 In short:

- **Outcome bias** = judging the **decision** by the **result**.
- **Hindsight bias** = believing you **knew the result** all along.

## **Scenario:**

Alex invests in a start-up company after researching its strong fundamentals. A year later, the company fails and Alex loses money.

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## **Outcome Bias in this case:**

- People say:  
→ “That was such a dumb decision! You should never have invested.”
  - Why? Because they are judging the **decision** solely based on the **bad outcome**.
  - But at the time, with the info Alex had, it might have been a perfectly reasonable investment.
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## **Hindsight Bias in this case:**

- After the company fails, people say:  
→ “It was obvious this start-up was going to fail. I knew it all along.”
  - Why? Because knowing the outcome makes it feel **predictable**, even though beforehand it wasn’t obvious at all.
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## **Side-by-Side Contrast**

- **Outcome bias:** “*Bad decision, because it failed.*” (Judging decision quality based on result).

- **Hindsight bias:** “*It was obvious it would fail.*”  
(Overestimating how predictable it was).
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☞ Both distort how we look back at events, but in different ways:

- **Outcome bias** = unfair judgment of decisions.
- **Hindsight bias** = false sense of predictability.

## Prospect Theory (Kahneman & Tversky, 1979)

### What it is:

Prospect theory describes how people actually make decisions under risk and uncertainty.

It challenges the idea that humans are fully rational (as in classical economics).

### Key ideas:

1. **Reference point:** People evaluate outcomes as gains or losses relative to a reference point (e.g., current wealth), not in absolute terms.
2. **Loss aversion:** Losses hurt **more** than equivalent gains feel good. (Losing ₹100 feels worse than gaining ₹100 feels good).
3. **Diminishing sensitivity:** As the amount increases, the subjective value increases but at a decreasing rate. (Going from ₹0 → ₹100 feels big, but ₹1000 → ₹1100 feels small).

4. **Probability weighting:** People tend to overweight small probabilities and underweight large probabilities. (We buy lottery tickets but ignore real risks like car accidents).
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## The Prospect Theory Value Function

Here's the typical **graph** (explained since I can't literally draw here, but I can also generate one for you if you'd like ):

- **X-axis:** Gains (right) and losses (left).
- **Y-axis:** Subjective value (how people feel about it).
- **Shape:**
  - **Concave for gains** → diminishing sensitivity.
  - **Convex for losses** → diminishing sensitivity to losses.
  - **Steeper for losses than gains** → loss aversion.

So it looks like an **S-shaped curve**, but asymmetrical: steeper on the loss side.

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## Examples

### 1. Loss Aversion (Simple Example):

- Flip a fair coin:
  - Heads → you win ₹500.
  - Tails → you lose ₹500.
- Most people **reject** this gamble, even though the expected value = 0.

- Why? Losing ₹500 hurts more than winning ₹500 feels good.
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## 2. Diminishing Sensitivity:

- Winning ₹100 vs. winning ₹200 feels like a big difference.
  - Winning ₹1000 vs. ₹1100 feels much smaller, even though both are a ₹100 gain.
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## 3. Probability Weighting:

- Lottery ticket: Small chance to win ₹1 crore → people overvalue the tiny probability.
  - Insurance: Small chance of disaster → people overweight the small risk, so they buy insurance.
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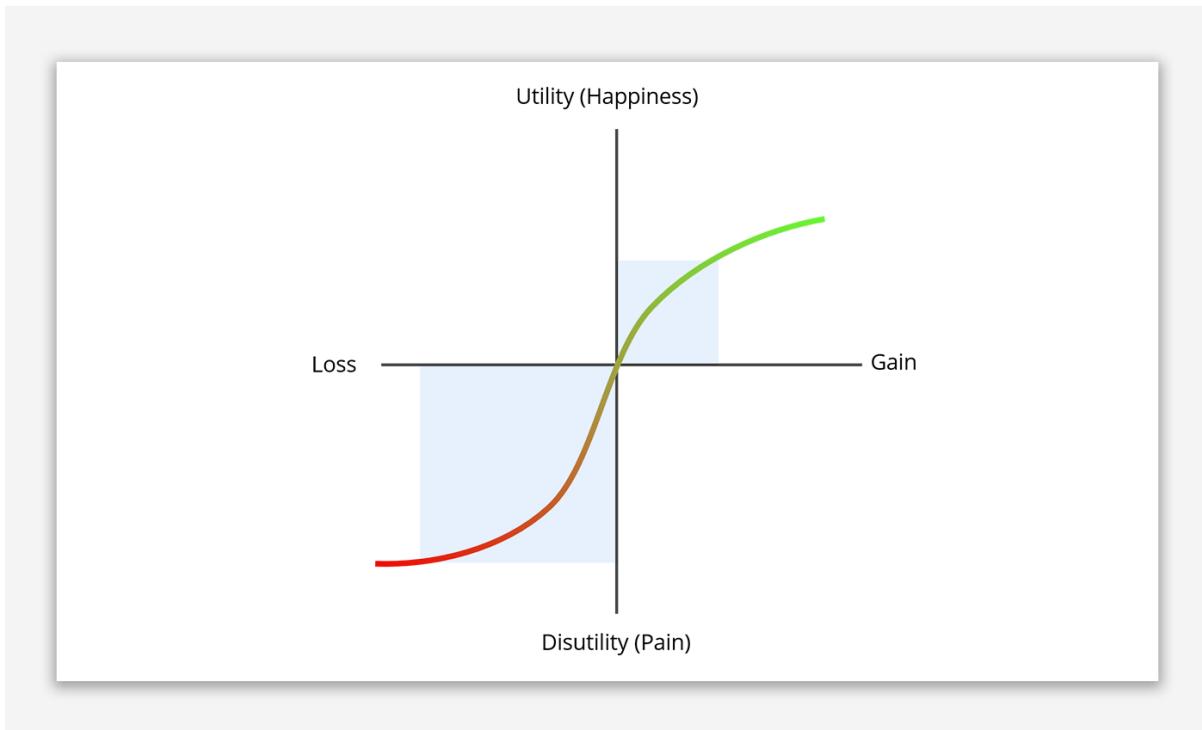
## 4. Real-life application:

- **Marketing:** “Save ₹100 by buying today” works better than “Avoid spending ₹100 later.”
  - **Finance:** Investors often hold losing stocks too long (to avoid realizing a loss) and sell winning stocks too quickly.
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✓ So in short:

- People care about gains/losses relative to a reference point.
- Losses feel worse than gains.
- Sensitivity diminishes with size.

- Probabilities are perceived in a biased way.



## Wisdom of Crowds

### Definition:

The idea that the **collective judgment of a large group of people** can be surprisingly accurate — often **more accurate than individual experts** — as long as certain conditions are met.

This happens because individual errors **tend to cancel out**, and the group average moves closer to the truth.

### Conditions for Wisdom of Crowds (James Surowiecki, 2004):

1. **Diversity of opinion** – People have different perspectives.
2. **Independence** – People make decisions without being overly influenced by others.

3. **Decentralization** – People use their local knowledge and unique information.
4. **Aggregation** – There's a way to combine individual judgments into a collective decision (e.g., averaging).

If these conditions hold, the crowd's answer can be highly accurate.

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### **Classic Examples:**

1. **Ox Weight Guessing (Francis Galton, 1907):**
  - At a fair, ~800 people guessed the weight of an ox.
  - Individual guesses were all over the place.
  - The average guess was **1,197 lbs**, while the actual weight was **1,198 lbs** — almost exact.
2. **Who Wants to Be a Millionaire (Audience Poll):**
  - Contestants can ask the audience.
  - The audience is correct about **91% of the time**, far more reliable than calling a single expert.
3. **Jellybeans in a Jar:**
  - People guess how many beans are inside.
  - The average of all guesses tends to be much closer to the true number than most individual guesses.

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### **Counterexample (When It Fails):**

- If **independence is lost** (people copy each other, herd behavior, groupthink), then errors **don't cancel out** — they amplify.
  - Example: Stock market bubbles, where everyone rushes to buy because others are buying, pushing prices far from reality.
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### ✓ In short:

- Wisdom of crowds = collective intelligence that emerges when independent, diverse judgments are aggregated.
- Works best when people think for themselves.
- Fails when people blindly follow others.

## Wisdom of Crowds

- **Definition:** Collective judgments, when independent and diverse, are often more accurate than individual judgments.
- **Key Idea:** Errors cancel out → truth emerges.
- **Conditions:** Diversity, independence, decentralization, aggregation.
- **Outcome:** Smarter, more accurate decisions than most individuals.

### Example:

- A crowd estimating jellybeans in a jar → average guess is usually very close to the actual number.
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## Groupthink

- **Definition:** A psychological phenomenon where people in a group conform to each other to avoid conflict, leading to poor decisions.
- **Key Idea:** Errors amplify → truth is lost.
- **Causes:** Pressure to agree, suppression of dissent, strong group identity, overconfidence.
- **Outcome:** Biased, irrational, often disastrous decisions.

### Example:

- The **Bay of Pigs invasion (1961)**: U.S. advisors didn't voice doubts to President Kennedy, fearing disagreement. Result: a major failure.
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### Side-by-Side Comparison

Aspect	Wisdom of Crowds ☐	Groupthink 
Diversity	Encouraged, essential	Suppressed
Independence	High (people think for themselves)	Low (people conform)
Process	Aggregate different views	Pressure to agree
Error handling	Errors cancel each other	Errors amplify
Outcome	Often accurate, smart	Often flawed, irrational

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 In short:

- **Wisdom of Crowds** = many independent voices → better decision.
- **Groupthink** = one dominant voice, everyone conforms → worse decision.

## 1. Social Media

- **Wisdom of Crowds:**
  - On platforms like Reddit or Quora, when people independently upvote answers, the top-voted response often turns out to be the most accurate or useful.
  - Example: A Reddit “AskScience” thread on climate change where independent experts and enthusiasts contribute — the collective vote surfaces a solid, science-backed answer.
- **Groupthink:**
  - Twitter pile-ons: once a narrative catches fire, everyone retweets/echoes it without fact-checking.
  - Example: A celebrity rumor spreads quickly because no one wants to be the lone voice questioning it. Errors amplify instead of canceling out.

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## 2. Financial Markets

- **Wisdom of Crowds:**

- Prediction markets (like stock markets or sports betting markets) often aggregate diverse views into accurate price predictions.
  - Example: Before elections, betting odds often predict winners more accurately than individual pollsters.
- **Groupthink:**
    - Stock bubbles or crashes.
    - Example: The Dot-com bubble (late 1990s) — investors kept buying internet stocks because *everyone else was buying*, not because fundamentals supported it. Once reality hit, the bubble burst.

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### 3. Cricket

- **Wisdom of Crowds:**
  - Crowd-based predictions (fantasy cricket apps, polls, commentary forums) often give surprisingly accurate predictions of “player of the match” because thousands of independent fans weigh in.
  - Example: Before an IPL final, most independent fans might correctly predict that the pitch will favor spinners — crowd averaging gives useful insights.
- **Groupthink:**
  - Inside a team dressing room, if the captain strongly pushes one strategy and teammates don’t want to contradict, the team may follow a poor plan.

- Example: Persisting with an out-of-form bowler just because “the team believes he’ll come good,” ignoring data. Everyone conforms → weak strategy.
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 **Takeaway:**

- **Wisdom of Crowds (independent voices)** → accuracy improves (truth emerges).
- **Groupthink (conformity, no dissent)** → accuracy worsens (errors amplify).