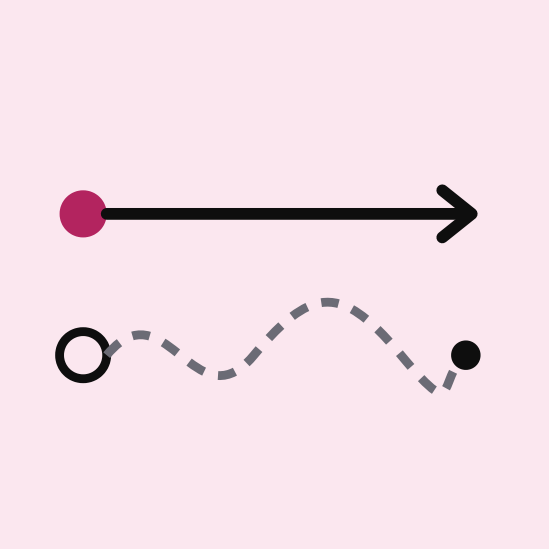
Theory

System 1 and System 2

A way of describing two modes of thinking: one fast, automatic, and intuitive, and the other slow, deliberate, and effortful.



In Spanish
Sistema 1 y Sistema 2

Origin
Stanovich and West (2000); popularized by Kahneman (2011)

What problem it addresses

Explains why we often answer with the first thing that comes to mind, even though we could reason better if we stopped to think.

An example

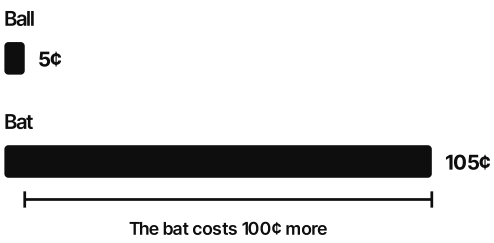
A bat and a ball cost $1.10 in total. The bat costs $1 more than the ball. How much does the ball cost?

The fast answer



$0.10. But then the bat costs only $0.90 more. **It does not add up.**

The considered answer



$0.05. The bat costs $1.05, and together they add up to $1.10. **It adds up.**

The fast answer appears on its own and seems obvious. Checking it takes an effort we often do not make.

Why it happens

1

System 1 answers instantly with what seems obvious.

2

System 2 could check it, but that takes effort and it often does not kick in.

3

If nothing slows us down, we accept the first answer.

Applications in design

Use it like this

For frequent tasks, design for fast thinking, with clear, recognizable elements.

Avoid

Taking advantage of haste to get people to accept something they would reject if they were calm.

Don't fall for it

In important decisions, add a pause, such as a summary or a confirmation to review.

Over 50%

What the research says

That is the share of students at Harvard, MIT, and Princeton who gave the intuitive, wrong answer (Kahneman, 2011, based on Frederick, 2005).

●●○ **Debated evidence.** The "two systems" are a useful simplification. Specialists debate whether they really are two separate processes (Evans and Stanovich, 2013).

Connections

Used in

- Behavioral design

Related to

- Cognitive load
- Behavioral economics
- Bounded rationality
- Confirmation bias

Authors and works

2000	**Keith Stanovich and Richard West**	First used the names System 1 and System 2.
2005	**Shane Frederick**	Created the cognitive reflection test, which includes the bat-and-ball problem.
2011	**Daniel Kahneman**	Popularized the distinction in Thinking, Fast and Slow.

Sources

Original sources

- Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? Behavioral and Brain Sciences, 23(5), 645–665. View source (https://doi.org/10.1017/S0140525X00003435)
- Frederick, S. (2005). Cognitive reflection and decision making. Journal of Economic Perspectives, 19(4), 25–42. View source (https://doi.org/10.1257/089533005775196732)

Academic reviews

- Evans, J. St. B. T., & Stanovich, K. E. (2013). Dual-process theories of higher cognition: Advancing the debate. Perspectives on Psychological Science, 8(3), 223–241. View source (https://doi.org/10.1177/1745691612460685)

Secondary sources

- Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus and Giroux.

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