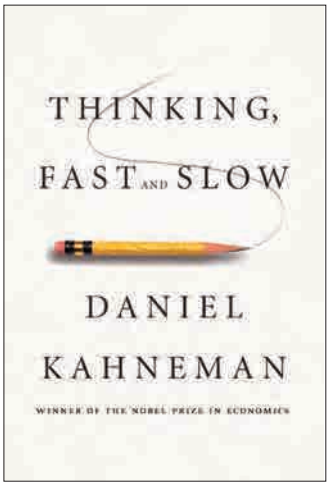
We Are of Two Minds

By Shayne Kavanagh



Thinking Fast and Slow

By Daniel Kahneman

Farrar, Straus, and Giroux

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Thinking Fast and Slow explores the differences between the two types of thinking we all engage in. System 1 could be described as "intuitive"; it works "automatically and quickly, with little or no sense of voluntary control." System 2 is more rational and "allocates attention to the effortful mental activities that demand it, including complex computations." System 2 provides a check against the impulsive character of System 1. Of course, a person is generally not aware of when they are using System 1 or System 2 thinking, but the distinction is important because, as Kahnmen points out, System 1 generally provides easier answers than complex problems demand and is prone to systematic biases. System 1 has little grounding in logic and statistics. It also can't be turned off. All of these features present challenges to complex problem solving and decision making.

To further complicate the issue, System 2 is lazy. To illustrate this point, Kahneman asks the reader to consider this question. A bat and ball cost $1.10. The bat costs one dollar more than the ball. How much does the ball cost?

The intuitive answer is 10 cents. The correct answer is 5 cents. When this question was posed to students at leading universities, more than half gave the intuitive and incorrect answer, meaning that they failed to engage their System 2 to check System 1. The failure rate was more than 80 percent at less selective universities. The point is not necessarily that people who answer incorrectly aren't intelligent, but rather that they not engaged and are more willing to go with the first answer that comes to mind.

BIASES AND MENTAL ERRORS

After introducing System 1 and System 2, *Thinking Fast and Slow* describes a number of biases and mental errors that people are commonly subject to. Some of the most interesting are briefly described below.

Law of Small Numbers. Kahneman cites research findings that counties where the incidence of kidney cancer is lowest are mostly rural, sparsely populated, and located in traditionally Republican states in the Midwest, the South, and the West. What inferences might you draw from this information? Kahneman then tells us that the incidence of kidney cancers is also highest in counties that fit this same description. The reason for this apparent contradiction is the law of small numbers — these counties are sparsely populated, so even a relatively small number of cases in one such county could translate to a relatively high incidence. By the same token, if there are just a few or even no cases in such a county, the incidence will be very low. In contrast, heavily populated counties tend to have a more "average" number of cases each year, avoiding extremes. The law of small numbers, then, is that small sample sizes often produce

results that are extreme, yet are accepted as representative or descriptive of a larger trend or cause.

In another example, the Gates Foundation found that the best-performing schools were smaller in size, so the Gates Foundation spent a great deal of resources in promoting smaller schools. However, the fact is that small schools simply exhibit greater variation — meaning the worst schools are also small. It is tempting and easy to generate plausible-sounding narratives to explain what the numbers appear to be telling us, further reinforcing the erroneous conclusion suggested by the small numbers. Hence, Kahneman warns us, we must be more conscious of the reliability of the data from which we draw conclusions and resist the temptation to construct causal explanations for events that simply don't merit it.

Anchoring. Kahneman describes an experiment in which he and a colleague rigged a wheel of fortune, which was numbered 0 to 100, to land only on 10 or 65. They then spun the wheel in front of a group of students, who they asked to write the number down. They then asked the students two questions: 1) Is the percentage of African nations in the United Nations larger or smaller than the number you just wrote? 2) What is your best guess of the percentage of African nations in the United Nations?

The spin of the wheel did not, of course, provide any useful information to the students for answering these questions, but it influenced their answers nonetheless. For the students who saw 10 and 65, the average estimates for the second question were 25 percent and 45 percent, respectively. This effect is known as "anchoring": Estimates tend to stay close to information initially presented to us. As Kahneman's experiment demonstrated, the anchoring effect occurs even when the anchor is completely irrelevant to the decision at hand.

The anchoring effect has also been shown to operate in situations more like those found in the real world — for example, real estate agents' opinions about a reasonable buying price for a home is strongly influence by the asking price (even though the agents deny it). Anchoring is not always a negative phenomenon; if the anchor is reasonable, it can ground estimates in reality. But as Kahneman's experiment shows, irrelevant information that happens to be presented when a decision is being made can also exert a powerful influence.

Overconfidence. Overconfidence is one of the most common biases, and it receives the deepest treatment in Kahneman's book. Overconfidence takes many forms. Some of those that Kahneman explores are:

- *Illusion of Understanding.* Rich causal explanations are often constructed for complex phenomena, creating the illusion of understanding the phenomenon. Kahneman points to the popular business literature genre that profiles the success of particular companies as models for others to follow — even though long-term analysis of the success of these companies shows them to be rather average. The problem is that a temporary period of good performance is taken as evidence of that company's inherent superiority, and causal narrative is constructed to explain the success. That narrative leads us to believe we understand the reasons for success and can replicate them.
- *Illusion of Validity.* This illusion is similar to the preceding one. We are prone to believe that our own skill or expertise in a particular field is an explanation for success, when in fact, forces outside of our control have a larger influence than we understand. Kahnemen cites a large body of literature showing that the performance of mutual fund managers is little better than random, yet the conventional wisdom is that the skill of the individual managers matters a great deal. The illusion of validity often leads us to trust expert judgment or intuition when we would be better off relying on a formula or algorithm.
- *The Planning Fallacy.* Overly optimistic forecasts and plans are ubiquitous. Kahneman believes that many plans and forecasts are closer to best-case scenarios and could be improved by consulting the statistics on actual performance associated with similar cases.

PROSPECT THEORY

Following the discussion of cognitive biases, *Thinking Fast and Slow* introduces prospect theory — another manifestation of how our two systems of thinking produce results that are not always entirely logical. Prospect theory is a departure from traditional economic theory, where individuals are rational and make choices based solely on economic gain and loss. Some of the primary insights of prospect theory are:

- Individuals weight losses much higher than gains (often twice as much), so we are not only loss-

averse but will actually take on greater risk to avoid a potential loss, compared to the risk we would be willing to take on in order to realize a comparable gain.

- Once a person has gained something, he or she becomes less willing to be without it — its value increases beyond what the person was originally willing to pay for it. A common manifestation of this is the individual investor's hesitance to sell off underperforming stocks, instead wanting to hold them until they "come back."
- Rare but spectacular events are over-weighted in decision making. For example, sales of insurance against extreme natural disasters go up after such an event occurs.

BETTER DECISION MAKING

Kahnemen is not optimistic about our ability to eliminate or even mitigate the biases and logical failings he describes. But the good news is that organizations are generally better at avoiding these problems than individuals because they are naturally more prone to take decisions slowly, giving System 2 the opportunity to do its work. Kahneman also provides a few recommendations to help organizations improve decision making:

- Promote discussions of biases and their impact on decision making. Observers are better than actors at recognizing biases, so individuals may be able to help each other recognize when they are approaching areas that are prone to bias.
- Wherever possible, adopt formulas and algorithms to guide decision making. These algorithms do not need to be overly complex to provide useful guidance; even a simple algorithm could provide a reasonable anchor for decision makers to start from.
- Engage in a "pre-mortem." When the organization has come to an important decision but has not formally committed itself, hold a brief meeting of individuals who are knowledgeable about the decision. The participants imagine that it is a year in the future and the outcome of the decision has been a complete disaster, and they are to write a brief history of the disaster. The pre-mortem helps temper uncritical optimism and forces people to consider ways in which their initial estimates might be wrong.
- Use reference case forecasting. Before committing to a major decision, examine similar projects or cases from other organizations or instances to see how they turned out. Are these experiences consistent with your expectations for how your decision will work out?

CONCLUSIONS

While Kahneman's book might contain less advice than we'd like on tempering the effects of our propensity for poor decision making, it does provide unparalleled insight into how we think. While we may not be able to consciously manage our two minds, knowing how we think does give us the power to develop systems and procedures to help guard against the worst excesses of our two thinking systems.

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