Think Twice: Review of *Thinking, Fast and Slow* by Daniel Kahneman (2011)

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Abstract

Daniel Kahneman. *Thinking, Fast and Slow* (New York, NY: Farrar, Straus and Giroux) 499 pp. ISBN 978-0374275631.

In *Thinking, Fast and Slow*, Nobel Prize-winning psychologist Daniel Kahneman significantly sharpens our understanding of human decision-making and the systems of thinking that underlie it. He offers a compelling critique of the rational-agent model, arguing that, while we can and do use reason, we often fall back on a type of thinking that operates quickly and requires less cognitive effort but is vulnerable to faulty belief.

Keywords

cognition, decision-making, heuristics, cognitive bias

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Cover Page Footnote

Anne Kelly is a professor of behavioral sciences and chair of the psychology department at Dakota Wesleyan University. Her research focuses on the causes, treatment and prevention of suicide, the psychological mechanisms underlying suicide ideation, and the cognitive and social factors that influence detection of suicide risk in others.

In his 2011 book, *Thinking Fast and Slow*, Nobel Prize-winning psychologist Daniel Kahneman significantly sharpens our understanding of human decision-making and the systems of thinking that underlie it. He offers a compelling critique of the belief that we are, generally, rational decision makers, and, in its place, presents a much fuller theory that, while acknowledging our ability to think rationally, emphasizes our vulnerability to cognitive processes that lead to lazy thinking and faulty belief.

The theory that Kahneman presents had its origin in research he undertook and published with Amos Tversky and others in the 1970s. Having first noticed that people's decisions were prone to mistakes, the researchers sought to isolate and analyze the participants' intuitive thinking and often-incorrect judgments. This research changed widely held assumptions about human nature, according to which behavior normally and usually proceeded from reason, except for those occasions on which reason was overcome by emotion. People used slow and deliberate thinking to evaluate possible solutions before making decisions, so said the near-consensus view. Tversky and Kahneman argued, however, that, while we can and do use reason, we often fall back on a type of thinking that is quick, requires less effort than rational thought, and is prone to error. Although these intuitive judgments were the focus of their research and its findings, they did not deny that rational thinking has a place, but, instead, argued that depending on intrinsic and extrinsic factors, both thought processes influenced decision-making. In *Thinking Fast and Slow*, Kahneman described these dual modes, or processes, as System 1 and System 2.

System 2 will here be considered first, because it is the very model of reasoned deliberation Kahneman and colleagues challenged and then refined. It is the familiar model and, as it is the loftiest, it is the one with which most people self-identify.

This kind of thinking attempts objectivity, and, in it, we take our time to weigh explicitly known evidence and consider alternatives before choosing a solution. When we use System 2, we are less likely to make mistakes. Unfortunately, it requires selective and sustained attention, which can be depleted by difficult cognitive reasoning as well as changes in motivation and self-control. Sometimes, people are too lazy to use System 2 thinking. It is at these moments, and when circumstances do not allow for deliberation, that we fall back on System 1.

System 1 thinking is associated with intuition. It operates quickly and requires less cognitive effort, thus providing certain advantages. It is efficient in that it speeds up the decision-making process, often necessary, Kahneman argues, considering the many decisions we have to make every day in a world that bombards us with information. This type of intuitive thinking is governed by heuristics, or mental shortcuts, that we use to think and act quickly. Judgments

and decisions we make with heuristics can be good—or good enough—but heuristics can also lead to incorrect judgments. Kahneman cites examples of these heuristics. Among those he cites are the representativeness heuristic and the availability heuristic.

The representativeness heuristic is used when making judgments about the probability of an event. It allows us automatically and easily, but sometimes erroneously, to identify causal connections between events. We prefer an ordered existence of causation and pattern to one of chance and random sequence, and, when such order is not present, we will intuitively impose it. With this distortion, subsequent mistakes are more likely. Kahneman illustrates his point using the example of the sex of six babies born in sequence at a hospital, which is, of course, random. The events are independent of each other, and the sex of one baby does not determine and cannot predict the sex of another. When asked to consider the possible birth gender sequences of BBBGGG, GGGGGG, and BGBBGB, we intuitively do not think that these three are equally likely. People tend to judge the last sequence as random because it "looks" random; however, probability theory is not concerned with what may appear random but with how events in a sequence are actually produced.

As if errors resulting from this heuristic were not enough on their own, they can be magnified by the faith we place in small sample sizes: small samples contain greater variability than large samples, and, if we neglect to consider this fact, we inflate the significance of the information conveyed. An example Kahneman gives for this particular System 1 thought flaw is $1.7 billion ineffectively spent by the Gates Foundation to improve high-school student achievement and boost graduation rates by creating smaller schools, often splitting larger schools into smaller units. This initiative came as a result of the Foundation having observed the disproportionately large number of small schools ranked among the highest-achieving. What the Foundation neglected to consider was the equal overrepresentation of small schools among the lowest-achieving, as well. This overrepresentation on both ends results from the greater variability in small samples.

There may have been an evolutionary advantage to System 1's quick pattern recognition/imposition and response. Quickly grouping stripes into a tiger without pausing for contemplation may indeed cause us to flee sooner and save our necks. But when misapplied, System 1 thinking can contribute to faulty judgments that can, as in the small schools example, prove very costly.

Kahneman also explains what he and Tversky labeled the availability heuristic. This heuristic is the mental shortcut that arises from examples related to a particular problem or event coming immediately to mind. Although this example is not presented in the book, the availability heuristic can be seen in the belief one forms after reading a series of news stories about terrorist attacks, that

terrorist attacks are more common than they actually are. Yet, as a widely read article (Zenko 2012) demonstrated in recent years, Americans have the same odds of being killed by their own furniture as by terrorism (and, no, furniture deaths are not likely, either). The heuristic can also be seen at work in a related phenomenon: that of people who watch more than four hours of television a day believing, as they can easily bring to mind many particular examples of lawyers, physicians, and professional athletes, that more people are employed in these professions than is the case (Cantor 1994).

Or consider an "availability cascade," in which the media presents a story highlighting a risk that elicits concern from the public. Feelings of concern and fear shape how people will react to additional information and the decisions they will make, which itself is the affect heuristic, or a mental shortcut that relies on emotion to guide decision-making. Competing media outlets continue to cover not only the original story but also the emotional response to it, increasingly sensationalizing and exaggerating its significance. According to Kahneman, when experts or dispassionate voices then attempt to correct these distortions, they are either ignored or met with hostility.

The availability heuristic also relates to judgments we make about ourselves. If asked to list six instances in which you were aggressive and to determine how aggressive you are, six instances probably come to mind fairly easily. Given the ease with which they came to mind, you would be more likely to describe yourself as aggressive. However, if asked to list twelve times you have behaved aggressively, the task becomes a little tougher. Because you cannot immediately recall twelve, you are less likely to describe yourself as aggressive, even if you recalled more than six.

System 1 can also trip us up with a phenomenon known as the "peak-end rule." This heuristic evaluates a past experience based chiefly upon our feelings at its most intense and at its end. This reconstruction, in which we make an entire experience align with its two most easily remembered moments, whether or not these moments were in fact typical, even helps determine our happiness—regardless of its accuracy. In one case, patients who each underwent a colonoscopy that lasted for a short time but ended at a point of peak pain were compared to patients for whom the procedure lasted longer and had the same pain intensity but ended with no pain after having peaked relatively earlier. One might suspect, and rationally so, that a quick ending to a painful procedure is most appreciated by such patients, but the results Kahneman presents are surprising. Patients who endured the greater suffering of a longer procedure that ended without pain reported it as more pleasant than did those who underwent a shorter procedure that ended at the time of greatest pain.

The many glitches of System 1 form some of the most interesting content in *Thinking Fast and Slow*; every bit as fascinating are the ways in which Systems 1

and 2 interact and work in tandem to minimize effort and optimize performance. System 1 generates impressions and feelings. If System 2 endorses them, these become beliefs, which in turn drive subsequent decisions and behavior. More often than not, System 2 simply accepts what System 1 sends it, and all runs smoothly enough. When, however, System 2 registers error or its potential, it asserts itself and summons more cognitive resources. System 2 can fail and, when it does, we fall back on System 1, all the while conning ourselves with a freshly created narrative that argues our reason is, in fact, in control. This rationalization is as quick as it is easy.

Although not presented in the book, it is interesting to note here that this automatic tendency to create a story and even invent missing details to fill in the gaps in our memory has also been observed in split-brain patients (Gazzaniga 1998). Split-brain procedure is used to treat severe epilepsy by cutting the corpus collosum, the bundle of fibers connecting the right and left hemispheres of the brain. One's left hemisphere processes information presented to the right visual field, but it is also responsible for speech production; one can say what this hemisphere sees. Information presented to the left visual field, however, is processed by the right hemisphere, but because in the split-brain procedure the fibers connecting hemispheres have been cut, this sensory data cannot be transferred to the left hemisphere for speech. In an experiment with a split-brain patient, researchers presented a picture of a snow scene to the patient's right hemisphere and a picture of a chicken foot to the left hemisphere. Four cards were placed in front of the patient, and he was asked to pick a card with his left hand and a card with his right hand related to what he saw. His left hand pointed to a shovel, and his right hand pointed to a chicken. When asked why he chose those items, his left hemisphere said that the chicken went with the chicken claw, and, without missing a beat, said that he picked the shovel because you need to clean out the chicken shed. The left hemisphere, having no plausible explanation, invented one. We create consistent and believable narratives that make sense of our experiences and memories. Gazzaniga's examples confirms, with physiology, the very thing Kahneman argues in *Thinking Fast and Slow*, which is the strength and quickness of our readiness to creatively resolve dissonance and lacunae.

Thinking Fast and Slow presents, in a highly accessible manner, a practical theory of human cognition and behavior, incorporating research that spans a generation. A fascinating text for both laymen and professionals, it has rightly earned much acclaim and leaves the reader with a solid foundation in intuition and reasoning. The importance of this book cannot be overstated, and it should be read by anyone who wishes to understand the dual processes underlying human decision-making and judgment.

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