

January 3, 2021

## “Thinking, Fast and Slow” — Book Summary & Review —

### Overview —

This summary is a little more detailed than usual in the hopes that Alumni Book Club members who are not able to obtain the 500 page book may review this summary and join the January 27th Zoom conversation.

I've provided two reviews: one published in the NYTs and the other in The Guardian. Each summarizes the book's principle points. A succinct outline of the book can also be found by Googling “Thinking, Fast and Slow - Wikipedia”. At the end of each of the 30+ chapters Kahneman provides a short bullet list of his key points. On-line there are many videos of Kahneman presentations and interviews.

I recommend the Audible version if available. The reader/performer is excellent. I adjusted it to 90% of normal speaking speed to absorb more as I walked. The audible version also includes a PDF attachment with the book's several illustrations. The Appendix consists of two influential articles that Kahneman wrote earlier, but they are not included in the Audible versions, nor are the 33 pages of footnotes printed at the end of the book.

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In 2002 mathematician/psychologist Daniel Kahneman received a Nobel Prize for integrating economic science with the psychology of human decision-making. His “Prospect Theory” contradicted some basic assumptions of classical economics. Among other findings he and his close friend and collaborator, Amos Tversky, proved that the Econ 101 utility assumption and ‘Indifference Curves’ were flawed and that individuals give more weight to potential losses than gains of equal value. Many consider him a founder of Behavioral Economics.

Then in 2012 Kahneman published “Thinking, Fast and Slow” which sold over 2 million copies and has been translated into 35 languages. It’s a serious book that summarizes his 30+ years of research. To gauge Kahneman’s influence a quick search at “[scholar.google.com](https://scholar.google.com)” revealed over 37,000 references since 2000.

To quote Harvard’s Stephen Pinker [author of ‘How the Mind Works’ and ‘The Better Angels of our Nature’]: “Daniel Kahneman is ... certainly the most important psychologist alive today. He has a gift for uncovering remarkable features of the human mind, many of which have become textbook classics and part of the conventional wisdom. His work has reshaped social psychology, cognitive science, heuristics, research into happiness, and ‘behavioral economics’ .... The appearance of ‘Thinking, Fast and Slow’ is a major event.”

We saw the author’s influence in last month’s book club selection. “Good Economics for Hard Times” employed key Kahneman ideas with significant policy implications; e.g., a) financial incentives are often overrated in economic policies; b) consumer preferences are not fixed as assumed often but malleable; c) human dignity is often more important than money in response to policy incentives; and d) economists are deeply mistrusted because they often engage in “the fool’s game” of making too many predictions.

Below are some highlights of the book which summarize his own research on human decision-making, as well as the research of other pioneers in decision theory. I include only a few of the many memorable examples described in the book.

Kahneman is now 86, and his next book, “Noise”, is scheduled for publication in May, 2021. Reportedly it will deal with similar issues, but focus more on organizational behavior rather than individuals’ decisions.

### **Summary and Highlights —**

The overall intent of the book is to convince readers that, while we think of ourselves as rational beings, the truth is we make many decisions unconsciously on an irrational base. It catalogues numerous ex-

amples of irrational thinking and together represents a humbling comment on human fallibility. Being aware of these distorting influences in ourselves will reduce judgement errors in our personal lives, in financial and legal matters and in leadership & management.

The book's 5 Parts describe the mechanics of how judgements become distorted and error-prone more often than we admit or realize. Part I describes the 2 systems of thinking - the fast System1 and the slow System2;

Part II describes many of the biases that both systems generate; Part III deals with our strong tendency to be overconfident and unaware of our thinking errors;

Part IV shows how we eschew statistics and probabilities, and describes the different ways that humans and "Econs" think;

Part V presents a 'two selves model' - our "experienced self" versus the "remembered self".

## **PART I —Fast and Slow Thinking**

Part I presents the elements of a two-systems categories of thinking. It distinguishes between the automatic operations of the fast System1 and the control operations of the slow, rational' System2. It explains how associative memory, the core of System1, continually tries to construct a coherent interpretation of the world around us.

System1 operates automatically with little or no effort and with no sense of control. It is fast, automatic, frequent and unconscious. Generally we are unaware of its influence on our judgements. It is impulsive and generates impressions, feelings and emotions and makes many decisions for us. A very simple example of System1 in operation: If I ask you "What is 2 plus 2?", you answer instinctively and without conscious thought - "Four!" No deliberate thought involved.

Slow System2 thinking requires concentration and effort. It is conscious, deliberate, logical, rational, orderly and calculating, and it is used more infrequently than we realize. We use it only when absolutely necessary. An example of your System2 in operation: If I ask you "How much is 17 X 34?", you will have to stop and make a deliberate,

effortful, step-by-step attempt to arrive at the correct answer. As you work out the problem you will be unaware of the physical changes to your body: your eyes will dilate noticeably, your pulse rate will increase slightly, and your blood pressure will increase measurably. Because System2 is so effortful, we seldom employ it, preferring instead the easier “intuitive” System1 path to judgements and choices.

Malcolm Gladwell’s 2007 book, “Blink: The Power of Thinking without Thinking”, also deals with intuitive, System1 thinking, or, as Gladwell put it, “How we know things without knowing why or how we know them”. Kahneman disagrees with Gladwell’s over-the-top praise of intuition: “Malcolm Gladwell did us a great disservice with ‘Blink’ by giving us the sense that there is some kind of magic to intuition. There is not.” While Kahneman marvels at the vast amount of information System1 manages, he is skeptical of many intuition choices and emphasizes the strong biases and flaws that it often delivers. But Kahneman does believe that some intuition can be accurate, particularly expert intuition developed after a great deal of practice in certain defined domains [e.g., driving a car, playing the piano, the moves of a chess Grand Master].

Another example of System1 at work on a small problem.

“— A bat and a ball together costs \$1.10.

— The bat costs a dollar more than the ball.

— How much does the ball cost? “

The obvious answer is 10 cents. But that would be wrong. Fifty percent of the Harvard, Princeton and MIT students who were asked this question, and about 80% of all study subjects, gave this wrong answer. They used their fast thinking intuition, and they were wrong.

The marvels of ‘priming’ - Kahneman describes how your thoughts and choices can be “primed” by events, sights, words, etc. One famous experiment of priming is now called the “Florida Effect. Young men and women from NYU were split into separate groups in separate rooms, and each group was asked to assemble four-word sentences from sets of five scrambled words. e.g., “finds he it yellow instantly”. For one group of students the scrambled sentences contain words associ-

ated with the elderly such as “Florida, forgetful, bald, gray, wrinkle”. When they had completed this task, which takes some System2 thinking, “the young participants were sent out to do another experiment down the hall. That short walk was what the experiment was about. The researchers unobtrusively measured the time it took people to get from one end of the corridor to the other room. As predicted, the people who fashioned a sentence from words with an elderly theme walked down the hallway significantly more slowly than the others”, yet they were unaware they had done so.

Kahneman used many other experiments to understand more precisely how System1 works quietly in the background and how it succeeds in running the show most of the time. The unconscious, fast System1 is both the hero and the villain of the book. It is more in charge of our decisions and behavior than the rational System2. System1 is the star and leading actor of the show, but our supporting actor, System2, is still under the delusion that it has first billing.

Part I concludes [on page 105, chapter 9] with a useful reference list of 21 "**Characteristics of System 1**".

## **PART II — Heuristics and Biases in Our Thinking**

Part II deals with both System1 and System2 heuristics and biases. An “heuristic” is a mental shortcut that allows us to solve problems and make judgments quickly and efficiently. These rule-of-thumb strategies shorten decision-making time and allow us to function without constantly stopping to deliberately decide the next course of action. Often, however, they produce reasoning errors.

Part II also explores a major puzzle: Why is it so difficult for us to think statistically?” As Part I described, we easily think associatively, metaphorically and causally. But statistics and probabilities require thinking about many things at once, which is something that System1 is not designed to do. Our brains *do* take numbers seriously, but we often misuse them to find causes and develop coherent stories. When exposed to new information our bias is to find the causal story it tells, rather than examine its factual or statistical reliability. Causes trump statistics.

Example: When news of Saddam Hussein's capture was announced, the US bond market rose sharply and news commentators instantly linked the two events causally. Later the same day the market dropped sharply, and the network again linked the 2 events, concocting a different causal link.

Understanding Regression — The phenomenon of regression is so strange to the human mind that it was not discovered until 200 years after Newton discovered the laws of gravity and Calculus. Regression effects can be found everywhere, “though we rarely recognize them for what they are. They hide in plain sight.” Regressions measure correlations between variables that are measured on different scales. For example:

- The correlation between income and the last 4 digits of their phone number is 0. [That is, there is zero correlation.]
- The correlation between income and education levels is .4.
- The correlation between SAT scores and college GPA scores is .6.

To illustrate how regression is rarely used instinctively, consider this statement that is sure to enliven any dinner party. “Proposition: Highly intelligent women tend to marry men who are less intelligent than they are.” Most interpret that assertion and search for a story to bolster their case. But if it is also true [and it is] that on average men and women do not differ in intelligence, then it is a mathematical certainty that highly intelligent women will be married to husbands who are, on average, less intelligent than they are [and vice versa of course.]

To illustrate the “Framing Effect” subjects were asked whether they would opt for surgery if the “survival” rate is 90%, while others were told that the “mortality” rate is 10%. The 90% framing dramatically increased the acceptance of the surgery option, even though it's the same as the 10% “framing”. Also, recall that “90% fat free” sells much better than “10% fat”.

Numbers and statistics are also used as anchors and ‘primes’ that unconsciously distort judgment. An example: You tell someone, “Gandhi died at age 144.” The person knows that is not true, but if you then

ask her to guess at what age Gandhi *did* die, the chances are that her answer will be closer to 100 than to 50. If you first tell her, “Gandhi died at age 23”, her answer will be closer to 50 than to 100.

This anchoring distortion happens with numbers, but also with words, thoughts and actions. Unless System2 makes an effort, it is unaware of many anchors and primes, and it has no control over their effects on choices.

Kahneman describes many other heuristics and biases. For example, the tendency to like or [dislike] everything about a person, including things you know nothing about, is known as the “Halo Effect”. It’s another System1 bias that results in unwarranted confidence in one’s judgement. Psychologists identified it more than a century ago.

An example of a cascading Halo Effect: “You meet a person named Joan at a party and find her personable and easy to talk to. Now her name comes up as someone who could be asked to contribute to charity. What do you know about Joan’s generosity? The correct answer is that you know virtually nothing, but there is reason to believe that agreeable people are also generous contributors to charities. And you like Joan, and you will retrieve the feeling of liking her when you think of her. You also like generosity and generous people. By association, you are now predisposed to believe that Joan is generous. And now that you believe that she is generous you probably like Joan even better than you did earlier, because you have added generosity to her good attributes.” [Much later, however, you find out that Joan is actually miserly, corrupt and cruel.]

A second Halo Effect example: —Illusory certainty is seen often in histories and popular genres of business writing. e.g., histories of the rise [usually] and fall [occasionally] of particular individuals and companies. “These stories of success and failure consistently exaggerate the impact of leadership style and management practices on firm outcomes. Imagine that business experts, such as other CEOs, are asked to comment on the reputation of the chief executive of a company. They are keenly aware of whether the company has recently

been thriving or failing, and this knowledge generates a Halo Effect. The CEO of a successful company is likely to be described as ‘flexible, methodical and decisive’. Imagine that a year has passed and the firm’s fortunes have gone sour. The same executive is now described as ‘confused, rigid and authoritarian’. Both descriptions sound right at that time, but because of the “Halo Effect” we get the causal relationship backwards: we are prone to believe that the firm fails because the CEO is rigid, when the truth is that that CEO appears to be rigid because the firm is failing. This is how illusions of understanding are born.” [Recall the oft-mentioned truth that history is written by the victors.]

A final Halo Effect example: “Bill Gates was a successful computer engineer and businessman, so whatever he says now must be true.”

The Sunk Cost fallacy. “We’ve sunk so much money into this USAID project it must be preserved and continued.”

The “Availability Heuristic” is another System1 shortcut that bases judgments and predictions on how available other unrelated facts are. For example, 30 years ago people believed car accident deaths were 100 times more likely than death by diabetes. But the true ratio was 1 car death for every 4 diabetes deaths. Why? Because at the time news about accident deaths was far more *available* than news about diabetes deaths. [I recall the hourly news updates on the escalating number of car accident deaths during every Memorial Day, July 4th and Labor Day weekend in the 1950s and 60s — before seatbelts.]

The “Substitution Heuristic” substitutes a simpler question for a more difficult one. For example, a difficult question, “How should financial advisors who prey on the elderly be punished?”, is translated by System1 into a simpler one, “How much anger do I feel when I think of financial predators?”

In what Kahneman calls his "best-known and most controversial" experiment, subjects were told about an imaginary Linda — a young, single, outspoken and intelligent person, who, as a student at UC Berkeley, was very concerned with discrimination and social justice.”

[This was during the 1960's 'feminist' movement.] Kahneman then asked the study subjects [all college students] whether it was more likely that Linda was now a bank teller or a bank teller & active feminist. "The overwhelming majority responded that Linda was a "feminist bank teller", even though there was no information provided about Linda being a feminist. Nevertheless they felt "feminist bank teller" was more likely than she was a "bank teller," thus also violating basic probability laws. [Every feminist bank teller is a bank teller.]

To counteract distorting heuristics and biases of Kahneman advocates using systems, formulas, algorithms and artificial intelligence to make better decisions. Recently he noted that AI capabilities are accelerating more rapidly than anticipated, and he expects AI to replace many white collar management jobs in the near future. We already see this happening in the finance, banking and insurance industries, and Kahneman sees the pace accelerating in the near future.

### **PART III —Overconfidence**

Part III describes more puzzling limitations of our minds: our excessive confidence in what we believe we know, and our frequent inability to acknowledge the extent of our ignorance and the uncertainty of our world.

The "Coherent Story Bias" — As noted above System1 prefers to downplay probabilities and focus instead on creating a good story that satisfies our need for causal coherence. We prefer certainty and tend to disregard randomness. This illusion shows up when a stock market investor is lucky more than once, or when a couple constructs an overly confident, happily-ever-after story while ignoring the probabilities of an unhappy marriage and divorce. Unwarranted optimism often indicates that someone has a "coherent story bias".

Kahneman suggests that this tendency to seek causal linkages and stories is behind many religious beliefs, though he attributes this idea to another psychologist, Peter Bloom. Bloom's idea is that evolution produced our innate, unconscious System1 impulse to find causes and coherent stories, and this "explains the near universality of many religious be-

liefs. It is natural for us to accept the central beliefs of many religions: that an immaterial divinity is the ultimate cause of the physical world”, and that souls exist separate from our bodies and live on after death. The origins of religion may be built into System1 intuitive thinking.

The Hindsight Bias — System1 uses “hindsight bias” which also impairs our ability to make good decisions about the future. Once in the past you used effortful, System2 analysis to adopt a decision about a particular subject. Now, years later, you use the same conclusion on a similar issue, even though the variables have changed and you’ve lost much of your ability to recall the System2 data you used to form that initial judgment. Example: 10 years ago you wisely considered all the variables before deciding to invest in Apple, Inc. Today you use that same bottom line conclusion to invest in Apple again. The illusion is that because you studied and understood the past, you now understand the present and can predict the future without additional effort. This hindsight bias sees the world more simply and predictably than it actually is.

Irrational Optimism —System1 can also be irrationally optimistic, such as when a person buys a lottery ticket. Even as the pot grows, the pool of bettors increase and the odds *against* winning soar dramatically, the irrationally optimistic gamblers place more and more bets. Las Vegas counts on irrational optimism for its guaranteed profits.

Kahneman also points out that irrational optimism is also a powerful force for good. It drives innovation, capital markets, marriages and small business start-ups. [even though 50% of small US businesses fail within 5 years.] Economist John Maynard Keynes pointed out often that irrationally optimistic “animal spirits” drive many investment decisions and capitalism in general.

## **PART IV - Choices**

The focus of Part IV is the discipline of economics. This section provides a current view of the key concepts of Kahneman’s 1979 Prospect Theory model of choice for which he received the Nobel. It deals with the tendency of System1 to treat problems in isolation and with

framing effects, and explains how this presents a challenge to the rationality assumption favored in standard economics.

The "Endowment Effect" - We are wired to endow more importance to some things while discounting others. For example, people ascribe more value to things merely because they own them. In general, people are more likely to retain an object they own [e.g., a choice bottle of wine] than sell it, even if the market price offered is twice the amount they paid for it and twice the amount they know it is worth.

The "Certainty Effect" —Potential negative outcomes are given more weight in our instinctive decision-making. System 1 is loss adverse, and pays more attention to eliminating uncertainty and worry. For example, we are more adverse to *losing* \$1,000 than to *gaining* \$1,000. We prefer the safe, certain bet, even if the odds strongly favor a bet with better odds. This instinct is the backbone of the insurance industry. Preferring certainty and fearing bad outcomes, many over-insure, even if events are unlikely to occur. This fear dominates people's decisions to buy 'crash & die' insurance before boarding a plane.

A good test of your loss aversion tendency: On the flip of a coin, if it's heads you would win \$150, but if it is tails you would lose \$100. Would you take the bet? Most people would not make that bet. Would you risk that \$100 loss for a 50-50 chance of winning \$200 or \$300? Would you take the bet then? How high would the heads-you-win dollar number have to go before you would be comfortable making the bet? [A friend said he'd never make the bet, no matter how high the heads dollar amount, admitting that he is extremely loss-averse. Another friend — a mathematician and physicist — wisely replied that he would make the \$150 bet, but only if he could repeat the same bet another 50 successive times.]

Another example of loss aversion: There are now masses of data that prove that professional golfers make more putts for Par than putts of an equal distance for Birdie. They fear making the dreaded one-over-par Bogey, and therefore try much harder to make that Par putt. Until the data was collected PGA professionals were unaware of this bias.

## **PART V — Our Two Selves**

Part V describes recent research that introduced the idea of two distinct selves — the ‘Experiencing Self’ and the ‘Remembered Self’. The fast System1 determines which is which by deciding what goes into our memory. He calls it “the tyranny of the remembering self.”

Memories shape our tastes, decisions and choices, yet memory gives great attention to certain moments, while completely ignoring most others. Judgement errors occur when we base our decisions on memories while ignoring all the other experiences that occurred around the memories. For example, we remember certain moments of a 2-week vacation taken 30 years ago, but the actual experiences during that 2-week vacation have vanished completely. You might have actually experienced a very unpleasant, unhappy 2-week vacation in India 30 years ago, but you *remember* only the happy 20 minutes of white water rafting down the Ganges. The entire tourist industry is based on providing “remembered” moments.

Elsewhere Kahneman notes that we each have about 600 Million, 3-second ‘psychological moments’ in our wakeful lifetime, but we remember only a tiny fraction of those “experienced” moments — much less than 1%. Kahneman writes "Odd as it may seem, I am my remembering self, and the experiencing self, who does most of my living, is like a stranger to me."

Happiness Research — The “two-selves” distinction complicates the measurement of well-being and happiness, and this has significant policy implications. How the 2 selves within a single body can pursue happiness “raises difficult questions for societies that view the well-being of its citizens as a policy objective.”

Kahneman has largely abandoned his research in this area because of the technical difficulties in separating ‘remembered’ happiness from ‘experienced’ happiness. Still, he has some interesting comments that relate back to the Banerjee/Duflo book we discussed last month.

In 2007 the Gallup-Healthways Well Being Index conducted a *daily* survey of 1,000 people, gathering 600,000 responses to questions about their experienced well-being. The survey found that people below an income of \$75,000 per household were unhappy and became more unhappy the further their incomes fell below \$75,000. But the really startling finding was that above \$75,000 ‘experienced’ happiness did not increase at all, no matter how high their incomes. Above \$75,000 it was a very robust flat line. [In an interview he said “It couldn’t have been flatter. An absolute flat line”.] Conclusion: more money above \$75,000 does not buy more “experienced happiness”, but lack of money below \$75,000 certainly buys you misery. He stresses, however, that these findings do *not* hold for the ‘remembered’ happiness/wellness.

In the concluding chapter Kahneman summarizes the implications of a) the two systems of thought; b) the the two selves [the experienced self and the remembered self]; and, c) the different ways that “Humans and Econs” think. In the section entitled “Humans and Econs”, he speculates on the political implications of his findings. Even though he won a Nobel Prize in economics he places himself in the company of “humans” as opposed to “Econs”. He then makes an important bottom-line political point: “Although humans are not irrational, they often need help in making more accurate judgements and better decisions, and in some cases [government] policies and institutions can provide that help. Humans, more than Econs, need protection from others who deliberately exploit their weaknesses, especially the quirks of System1 and the laziness of System2.”

This sounds a bit paternalistic to me and raises several fundamental issues. Does this mean that we need government to protect us from ourselves and from politicians, advertisers, the news media, social media, etc.? Should ‘the state’ protect citizens from the gambling industry that, not long ago, was illegal in most states but now raises tons of cash for all state and local governments? Should the hugely profitable state lotteries be banned? Should ‘the state’ protect citizens from these regressive taxes?

Like a good economist Kahneman also presents an “on-the-other-hand’ response to his bold political assertion. He notes that the Chicago School of Economics [e.g., Milton Friedman, Arnold Harberger, Friedrich Hayek, James Buchanan, etc.] has more faith than Kahneman in human rationality, and they deeply distrust the involvement of ‘the state’ in our choices. They fear giving ‘the state’ the authority to guide our thoughts, decisions and choices. Fearing the ‘tyranny of the state’, these economists believe that citizens should be [as Milton Friedman’s classic book title said] “Free to Choose” as they see fit, and they should take responsibility for their choices and decisions.

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“Noticing biases in others is easy. Noticing biases in yourself is harder but has a much higher pay-off.”

## Thinking, Fast and Slow

Review & Summary by NYT's Jim Holt, Nov. 25, 2011

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In 2002, Daniel Kahneman won the Nobel in economic science. What made this unusual is that Kahneman is a psychologist. Specifically, he is one-half of a pair of psychologists who, beginning in the early 1970s, set out to dismantle an entity long dear to economic theorists: that arch-rational decision maker known as Homo economicus. The other half of the dismantling duo, Amos Tversky, died in 1996 at the age of 59. Had Tversky lived, he would certainly have shared the Nobel with Kahneman, his longtime collaborator and dear friend.

Human irrationality is Kahneman's great theme. There are essentially three phases to his career. In the first, he and Tversky did a series of ingenious experiments that revealed twenty or so "cognitive biases" — unconscious errors of reasoning that distort our judgment of the world. Typical of these is the "anchoring effect": our tendency to be influenced by irrelevant numbers that we happen to be exposed to. (In one experiment, for instance, experienced German judges were inclined to give a shoplifter a longer sentence if they had just rolled a pair of dice loaded to give a high number.) In the second phase, Kahneman and Tversky showed that people making decisions under uncertain conditions do not behave in the way that economic models have traditionally assumed; they do not "maximize utility." The two then developed

an alternative account of decision making, one more faithful to human psychology, which they called “prospect theory.” (It was for this achievement that Kahneman was awarded the Nobel.) In the third phase of his career, mainly after the death of Tversky, Kahneman has delved into “hedonic psychology”: the science of happiness, its nature and its causes. His findings have proved disquieting — and not just because one of the key experiments involved a deliberately prolonged colonoscopy.

“Thinking, Fast and Slow” spans all three of these phases. It is an astonishingly rich book: lucid, profound, full of intellectual surprises and self-help value. It is consistently entertaining and frequently touching, especially when Kahneman is recounting his collaboration with Tversky. (“The pleasure we found in working together made us exceptionally patient; it is much easier to strive for perfection when you are never bored.”) So impressive is its vision of flawed human reason that the New York Times columnist David Brooks recently declared that Kahneman and Tversky’s work “will be remembered hundreds of years from now,” and that it is “a crucial pivot point in the way we see ourselves.” They are, Brooks said, “like the Lewis and Clark of the mind.”

Now, this worries me a bit. A leitmotif of this book is overconfidence. All of us, and especially experts, are prone to an exaggerated sense of how well we understand the world — so Kahneman reminds us. Surely, he himself is alert to the perils of overconfidence. Despite all the cognitive biases, fallacies and illusions that he and Tversky (along with other researchers)

purport to have discovered in the last few decades, he fights shy of the bold claim that humans are fundamentally irrational.

Or does he? “Most of us are healthy most of the time, and most of our judgments and actions are appropriate most of the time,” Kahneman writes in his introduction. Yet, just a few pages later, he observes that the work he did with Tversky “challenged” the idea, orthodox among social scientists in the 1970s, that “people are generally rational.” The two psychologists discovered “systematic errors in the thinking of normal people”: errors arising not from the corrupting effects of emotion, but built into our evolved cognitive machinery. Although Kahneman draws only modest policy implications (e.g., contracts should be stated in clearer language), others — perhaps overconfidently? — go much further. Brooks, for example, has argued that Kahneman and Tversky’s work illustrates “the limits of social policy”; in particular, the folly of government action to fight joblessness and turn the economy around.

Such sweeping conclusions, even if they are not endorsed by the author, make me frown. And frowning — as one learns on Page 152 of this book — activates the skeptic within us: what Kahneman calls “System 2.” Just putting on a frown, experiments show, works to reduce overconfidence; it causes us to be more analytical, more vigilant in our thinking; to question stories that we would otherwise unreflectively accept as true because they are facile and coherent. And that is why I frowningly gave this extraordinarily interesting book the most skeptical reading I could.

System 2, in Kahneman's scheme, is our slow, deliberate, analytical and consciously effortful mode of reasoning about the world. System 1, by contrast, is our fast, automatic, intuitive and largely unconscious mode. It is System 1 that detects hostility in a voice and effortlessly completes the phrase "bread and. . . ." It is System 2 that swings into action when we have to fill out a tax form or park a car in a narrow space. (As Kahneman and others have found, there is an easy way to tell how engaged a person's System 2 is during a task: just look into his or her eyes and note how dilated the pupils are.)

More generally, System 1 uses association and metaphor to produce a quick and dirty draft of reality, which System 2 draws on to arrive at explicit beliefs and reasoned choices. System 1 proposes, System 2 disposes. So System 2 would seem to be the boss, right? In principle, yes. But System 2, in addition to being more deliberate and rational, is also lazy. And it tires easily. (The vogue term for this is "ego depletion.") Too often, instead of slowing things down and analyzing them, System 2 is content to accept the easy but unreliable story about the world that System 1 feeds to it. "Although System 2 believes itself to be where the action is," Kahneman writes, "the automatic System 1 is the hero of this book." System 2 is especially quiescent, it seems, when your mood is a happy one.

At this point, the skeptical reader might wonder how seriously to take all this talk of System 1 and System 2. Are they actually a pair of little agents in our head, each with its distinctive personality? Not really, says Kahneman. Rather, they are "useful

fictions” — useful because they help explain the quirks of the human mind.

To see how, consider what Kahneman calls the “best-known and most controversial” of the experiments he and Tversky did together: “the Linda problem.” Participants in the experiment were told about an imaginary young woman named Linda, who is single, outspoken and very bright, and who, as a student, was deeply concerned with issues of discrimination and social justice. The participants were then asked which was more probable: (1) Linda is a bank teller. Or (2) Linda is a bank teller and is active in the feminist movement. The overwhelming response was that (2) was more probable; in other words, that given the background information furnished, “feminist bank teller” was more likely than “bank teller.” This is, of course, a blatant violation of the laws of probability.

(Every feminist bank teller is a bank teller; adding a detail can only lower the probability.) Yet even among students in Stanford’s Graduate School of Business, who had extensive training in probability, 85 percent flunked the Linda problem. One student, informed that she had committed an elementary logical blunder, responded, “I thought you just asked for my opinion.”

What has gone wrong here? An easy question (how coherent is the narrative?) is substituted for a more difficult one (how probable is it?). And this, according to Kahneman, is the source of many of the biases that infect our thinking. System 1 jumps to an intuitive conclusion based on a “heuristic” — an easy but imperfect way of answering hard questions — and System 2 lazily endorses this

heuristic answer without bothering to scrutinize whether it is logical.

Kahneman describes dozens of such experimentally demonstrated breakdowns in rationality — “base-rate neglect,” “availability cascade,” “the illusion of validity” and so on. The cumulative effect is to make the reader despair for human reason.

Are we really so hopeless? Think again of the Linda problem. Even the great evolutionary biologist Stephen Jay Gould was troubled by it. As an expert in probability he knew the right answer, yet he wrote that “a little homunculus in my head continues to jump up and down, shouting at me — ‘But she can’t just be a bank teller; read the description.’ ” It was Gould’s System 1, Kahneman assures us, that kept shouting the wrong answer at him. But perhaps something more subtle is going on. Our everyday conversation takes place against a rich background of unstated expectations — what linguists call “implicatures.” Such implicatures can seep into psychological experiments. Given the expectations that facilitate our conversation, it may have been quite reasonable for the participants in the experiment to take “Linda is a bank clerk” to imply that she was not in addition a feminist. If so, their answers weren’t really fallacious.

This might seem a minor point. But it applies to several of the biases that Kahneman and Tversky, along with other investigators, purport to have discovered in formal experiments. In more natural settings — when we are detecting cheaters rather than solving logic puzzles; when we are reasoning about things rather than symbols; when we are assessing raw numbers rather than

percentages — people are far less likely to make the same errors. So, at least, much subsequent research suggests. Maybe we are not so irrational after all.

Some cognitive biases, of course, are flagrantly exhibited even in the most natural of settings. Take what Kahneman calls the “planning fallacy”: our tendency to overestimate benefits and underestimate costs, and hence foolishly to take on risky projects. In 2002, Americans remodeling their kitchens, for example, expected the job to cost \$18,658 on average, but they ended up paying \$38,769.

The planning fallacy is “only one of the manifestations of a pervasive optimistic bias,” Kahneman writes, which “may well be the most significant of the cognitive biases.” Now, in one sense, a bias toward optimism is obviously bad, since it generates false beliefs — like the belief that we are in control, and not the playthings of luck. But without this “illusion of control,” would we even be able to get out of bed in the morning? Optimists are more psychologically resilient, have stronger immune systems, and live longer on average than their more reality-based counterparts. Moreover, as Kahneman notes, exaggerated optimism serves to protect both individuals and organizations from the paralyzing effects of another bias, “loss aversion”: our tendency to fear losses more than we value gains. It was exaggerated optimism that John Maynard Keynes had in mind when he talked of the “animal spirits” that drive capitalism.

Even if we could rid ourselves of the biases and illusions identified in this book — and Kahneman, citing his own lack of

progress in overcoming them, doubts that we can — it is by no means clear that this would make our lives go better. And that raises a fundamental question: What is the point of rationality? We are, after all, Darwinian survivors. Our everyday reasoning abilities have evolved to cope efficiently with a complex and dynamic environment. They are thus likely to be adaptive in this environment, even if they can be tripped up in the psychologist's somewhat artificial experiments. Where do the norms of rationality come from, if they are not an idealization of the way humans actually reason in their ordinary lives? As a species, we can no more be pervasively biased in our judgments than we can be pervasively ungrammatical in our use of language — or so critics of research like Kahneman and Tversky's contend.

Kahneman never grapples philosophically with the nature of rationality. He does, however, supply a fascinating account of what might be taken to be its goal: happiness. What does it mean to be happy? When Kahneman first took up this question, in the mid 1990s, most happiness research relied on asking people how satisfied they were with their life on the whole. But such retrospective assessments depend on memory, which is notoriously unreliable. What if, instead, a person's actual experience of pleasure or pain could be sampled from moment to moment, and then summed up over time? Kahneman calls this "experienced" well-being, as opposed to the "remembered" well-being that researchers had relied upon. And he found that these two measures of happiness diverge in surprising ways. What makes the "experiencing self" happy is not the same as what makes the "remembering self" happy. In particular, the

remembering self does not care about duration — how long a pleasant or unpleasant experience lasts. Rather, it retrospectively rates an experience by the peak level of pain or pleasure in the course of the experience, and by the way the experience ends.

These two quirks of remembered happiness — “duration neglect” and the “peak-end rule” — were strikingly illustrated in one of Kahneman’s more harrowing experiments. Two groups of patients were to undergo painful colonoscopies. The patients in Group A got the normal procedure. So did the patients in Group B, except — without their being told — a few extra minutes of mild discomfort were added after the end of the examination. Which group suffered more? Well, Group B endured all the pain that Group A did, and then some. But since the prolonging of Group B’s colonoscopies meant that the procedure ended less painfully, the patients in this group retrospectively minded it less. (In an earlier research paper though not in this book, Kahneman suggested that the extra discomfort Group B was subjected to in the experiment might be ethically justified if it increased their willingness to come back for a follow-up!)

As with colonoscopies, so too with life. It is the remembering self that calls the shots, not the experiencing self. Kahneman cites research showing, for example, that a college student’s decision whether or not to repeat a spring-break vacation is determined by the peak-end rule applied to the previous vacation, not by how fun (or miserable) it actually was moment by moment. The remembering self exercises a sort of “tyranny” over the voiceless experiencing self. “Odd as it may seem,” Kahneman writes, “I am my remembering self, and the experiencing self, who does my

living, is like a stranger to me.” [ edit: and the experiencing self constitutes approx. 99.9% of your psychological life ]

Kahneman’s conclusion, radical as it sounds, may not go far enough. There may be no experiencing self at all. Brain-scanning experiments by Rafael Malach and his colleagues at the Weizmann Institute in Israel, for instance, have shown that when subjects are absorbed in an experience, like watching the “The Good, the Bad, and the Ugly,” the parts of the brain associated with self-consciousness are not merely quiet, they’re actually shut down (“inhibited”) by the rest of the brain. The self seems simply to disappear. Then who exactly is enjoying the film? And why should such egoless pleasures enter into the decision calculus of the remembering self?

Clearly, much remains to be done in hedonic psychology. But Kahneman’s conceptual innovations have laid the foundation for many of the empirical findings he reports in this book: that while French mothers spend less time with their children than American mothers, they enjoy it more; that headaches are hedonically harder on the poor; that women who live alone seem to enjoy the same level of well-being as women who live with a mate; and that a household income of about \$75,000 in high-cost areas of the country is sufficient to maximize happiness. Policy makers interested in lowering the misery index of society will find much to ponder here.

By the time I got to the end of “Thinking, Fast and Slow,” my skeptical frown had long since given way to a grin of intellectual satisfaction. Appraising the book by the peak-end rule, I

overconfidently urge everyone to buy and read it. But for those who are merely interested in Kahneman's takeaway on the Malcolm Gladwell question it is this: If you've had 10,000 hours of training in a predictable, rapid-feedback environment — chess, firefighting, anesthesiology — then blink. In all other cases, think.

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**Correction:** This Nov. 27 review “Thinking, Fast and Slow” erroneously attributes a distinction to the book's author, Daniel Kahneman, who won the Nobel in economic science in 2002. His being a psychologist was indeed unusual, but it did not make his award “unique in the history of the prize.” Another psychologist, Herbert A. Simon, won the award in 1978. Simon, a polymath and inter-disciplinarian, was also an economist, a political scientist and a sociologist.

## “Thinking, Fast and Slow” - by Daniel Kahneman A review by Galen Strawson, December, 2011

An outstandingly clear and precise study of the 'dual-process' model of the brain and our embedded self-delusions

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A human being "is a dark and veiled thing; and whereas the hare has seven skins, the human being can shed seven times seventy skins and still not be able to say: This is really you, this is no longer outer shell." So said Nietzsche, and Freud agreed: we are ignorant of ourselves. The idea surged in the 20th century and became a commonplace, a "whole climate of opinion", in Auden's phrase.

It's still a commonplace, but it's changing shape. It used to be thought that the things we didn't know about ourselves were dark – emotionally fetid, sexually charged. This was supposed to be why we were ignorant of them: we couldn't face them, so we repressed them. The deep explanation of our astonishing ability to be unaware of our true motives, and of what was really good for us, lay in our hidden hang-ups.

These days, the bulk of the explanation is done by something else: the "dual-process" model of the brain. We now know that we apprehend the world in two radically opposed ways, employing two fundamentally different modes of thought: "System 1" and "System 2". System 1 is fast; it's intuitive, associative, metaphorical, automatic, impressionistic, and it can't be switched off. Its operations involve no sense of intentional control, but it's the "secret author of many of the

choices and judgments you make" and it's the hero of Daniel Kahneman's alarming, intellectually aerobic book *Thinking, Fast and Slow*.

System 2 is slow, deliberate, effortful. Its operations require attention. (To set it going now, ask yourself the question "What is 13 x 27?" System 2 takes over, rather unwillingly, when things get difficult. It's "the conscious being you call 'I'", and one of Kahneman's main points is that this is a mistake. You're wrong to identify with System 2, for you are also and equally and profoundly System 1. Kahneman compares System 2 to a supporting character who believes herself to be the lead actor [System 1] and often has little idea of what's going on.

System 2 is slothful, and tires easily (a process called "ego depletion") – so it usually accepts what System 1 tells it. It's often right to do so, because System 1 is for the most part pretty good at what it does; it's highly sensitive to subtle environmental cues, signs of danger, and so on. It kept our remote ancestors alive. *Système 1 a ses raisons que Système 2 ne connaît point*, as Pascal might have said. It does, however, pay a high price for speed. It loves to simplify, to assume WYSIATI ("what you see is all there is"), even as it gossips and embroiders and confabulates. It's hopelessly bad at the kind of statistical thinking often required for good decisions, it jumps wildly to conclusions and it's subject to a fantastic suite of irrational biases and interference effects (the halo effect, the "Florida effect", framing effects, anchoring effects, the confirmation bias, outcome bias, hindsight bias, availability bias, the focusing illusion, and so on).

The general point about the size of our self-ignorance extends beyond the details of Systems 1 and 2. We're astonishingly

susceptible to being influenced – puppeted – by features of our surroundings in ways we don't suspect.

One famous (pre-mobile phone) experiment centred on a New York City phone booth. Each time a person came out of the booth after having made a call, an accident was staged – someone dropped all her papers on the pavement.

Sometimes a dime had been placed in the phone booth, sometimes not (a dime was then enough to make a call). If there was no dime in the phone booth, only 4% of the exiting callers helped to pick up the papers. If there *was* a dime, no fewer than 88% helped.

Since then, thousands of other experiments have been conducted, right across the broad board of human life, all to the same general effect. We don't know who we are or what we're like, we don't know what we're really doing and we don't know why we're doing it. That's a System-1 exaggeration, for sure, but there's more truth in it than you can easily imagine. Judges think they make considered decisions about parole based strictly on the facts of the case. It turns out (to simplify only slightly) that it is their blood-sugar levels really sitting in judgment. If you hold a pencil between your teeth, forcing your mouth into the shape of a smile, you'll find a cartoon funnier than if you hold the pencil pointing forward, by pursing your lips round it in a frown-inducing way. And so it goes. One of the best books on this subject, a 2002 effort by the psychologist Timothy D Wilson, is appropriately called *Strangers to Ourselves*.

We also hugely underestimate the role of chance in life (this is System 1's work). Analysis of the performance of fund managers over the longer term proves conclusively that you'd do just as well if you entrusted your financial decisions to a

monkey throwing darts at a board. There is a tremendously powerful illusion that sustains managers in their belief their results, when good, are the result of skill; Kahneman explains how the illusion works. The fact remains that "performance bonuses" are awarded for luck, not skill. They might as well be handed out on the roll of a die: they're completely unjustified. This may be why some banks now speak of "retention bonuses" rather than performance bonuses, but the idea that retention bonuses are needed depends on the shared myth of skill, and since the myth is known to be a myth, the system is profoundly dishonest – unless the dart-throwing monkeys are going to be cut in.

In an experiment designed to test the "anchoring effect", highly experienced judges were given a description of a shoplifting offence. They were then "anchored" to different numbers by being asked to roll a pair of dice that had been secretly loaded to produce only two totals – three or nine. Finally, they were asked whether the prison sentence for the shoplifting offence should be greater or fewer, in months, than the total showing on the dice. Normally the judges would have made extremely similar judgments, but those who had just rolled nine proposed an average of eight months while those who had rolled three proposed an average of only five months. All were unaware of the anchoring effect.

The same goes for all of us, almost all the time. We think we're smart; we're confident we won't be unconsciously swayed by the high list price of a house. We're wrong. (Kahneman admits his own inability to counter some of these effects.) We're also hopelessly subject to the "focusing illusion", which can be conveyed in one sentence: "Nothing in life is as important as you think it is when you're thinking about it." Whatever we focus on, it bulges in the heat of our

attention until we assume its role in our life as a whole is greater than it is.

Another systematic error involves "duration neglect" and the "peak-end rule". Looking back on our experience of pain, we prefer a larger, longer amount to a shorter, smaller amount, just so long as the closing stages of the greater pain were easier to bear than the closing stages of the lesser one.

Daniel Kahneman won a Nobel prize for economics in 2002 and he is, with Amos Tversky, one of a famous pair. For many in the humanities, their names are fused together, like Laurel and Hardy or Crick and Watson. *Thinking, Fast and Slow* has its roots in their joint work, and is dedicated to Tversky, who died in 1996. It is an outstanding book, distinguished by beauty and clarity of detail, precision of presentation and gentleness of manner. Its truths are open to all those whose System 2 is not completely defunct; I have hardly touched on its richness. Some chapters are more taxing than others, but all are gratefully short, and none requires any special learning.