

## **Book Summary**

D. Kahneman - Thinking Fast and Slow

Virtual Organization in a Dynamic Context  
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## D. Kahneman - Thinking Fast and Slow

### **Introduction**

Daniel Kahneman summarizes decades of research he conducted with his colleague Amos Tversky into cognitive bias, prospect theory and happiness. The aim of the book is to provide a language for analyzing errors of judgment. He describes two systems of thought and the biases that stem from them, such as framing effects or substitution. The overall conclusion is that people are too confident in human judgment.

### *Part 1 Two Systems*

Kahneman starts off with an explanation of two modes of thought, intuitive versus intentional thought, and the errors that derive from this dichotomy.

### **Chapter 1 The Two Systems**

On every occasion your brain shifts between fast thinking (henceforth System 1) and slow thinking (henceforth System 2). System 1 is an intuitive response to your surroundings and sensory input based on mental conventions both learned and natural, and cannot be turned off. System 2 however is a deliberate effortful thought process that normally runs in low priority mode, is able to make limited computations, and monitors your behavior. These two systems work together as System 1 triggers System 2, while System 2 is able to program System 1 with a task set of overriding instructions. Conflicts may arise when System 2 programs System 1 but the tasks of both systems are contradicting, for example in a winter driving course you are trained to steer into a skid, while your intuition tells you to do the opposite. We should compromise in our vigilance of the two systems' shortcomings and be wary when stakes are high.

### **Chapter 2 Attention and Effort**

While System 1 can only do simple relations and not statistics, System 2 is able to follow rules, make comparisons and choices, but at a price and to a limited capacity. When your System 2 activates this takes a lot of effort. You will experience 'blindness' or lack of attention during mental sprints as will your pupils dilate. Your brain works very economical and subscribes to the law of least effort, which biases your mental processes toward the easiest or most obvious decisions. Skill and talent may release mental effort, but investing in skill development is also selective. Mental efforts may be compounded by switching between tasks or time pressure, so our brain prefers to take its time and utilize its long term memory to avoid mental effort.

### **Chapter 3 The Lazy Controller**

Your System 2 has a low natural speed and physical activity drains the ability of intricate thought, i.e. the law of least effort means coherent thoughts require discipline and self-control. The law of least effort thus leads to a propensity for intuitive answers, but self-control allows for more critical thinking. When System 2 is busy this leads to temptation, since the cognitive loads

weakens your self-control or ability to direct your thoughts. Unless you are in a state of flow, which means effortless deep concentration that requires no self-control, thus leaves more resources for ponderous thinking. Also, cognitive, emotional and physical effort all draw from the same energy source (glucose), hence non-cognitive activity leads to ego depletion or diminishing self-control. For example, hungry parole judge were less eager to grant parole before lunch than after. More self control is associated with higher intellect, luckily control can be trained as well. One could say ‘System 1 people’ are intuitive and ‘System 2 people’ are more cautious.

#### **Chapter 4 The Associative Machine**

Remember System 1 enables involuntary mental relations and comparisons. This includes a process of associative activation, which means System 1 input from observing your environment triggers cascading memories and physical responses. In other words, System 1 subconsciously sparks associatively coherent physical, cognitive and emotional responses to make sense of the world and provide a context for future events. Interestingly, this process treats written words as reality, for example after you have read the word “old” you are likely to associate seniors (the Florida effect). This consequence of such a network of ideas is called priming, i.e. associations in memory effectuate thoughts, actions and emotions. Reciprocal priming also occurs, for example if you act calm and nice, you effectively become more calm and nice. Priming determines our decisions as well, for example after being primed with money by seeing or hearing something that relates to money we exhibit more selfish or individualist behavior.

#### **Chapter 5 Cognitive Ease**

Following the above, cognitive strain, the level of effort and unmet demands, is not valued over cognitive ease meaning a more comfortable effort, which leads to illusions. Illusions of Remembering occur when recognizing visual or any other memory leads to a false sense of familiarity that’s difficult to trace back, e.g. familiar words are read more clearly. Illusions of Truth occur when System 2 assumes truth if System 1 detects familiarity, e.g. when a statement is repeated often we are more likely to accept it as truth. So one simply write a more persuasive statement by maximizing legibility, using simple language, repetition (mere exposure effect), memorable illustrations and easily pronounced sources. Moreover, cognitive strain is both caused by and mobilizes System 2 activity, coherent word combinations induce ease, and a good mood improves System 1 operation but loosens System 2.

#### **Chapter 6 Norms, Surprises, Causes**

It is clear mental associations shape our representation of the world. Surprises, unexpected events or expectations that do not happen, become normal if they manifest more than once. This may also unfold passively, for example shared norms evolve in this way as little social behavior is actively discussed. This limits System 1 because we automatically assign causality, but this causality may be wrong. We are very much predisposed to ascribe intentions and personalities to

objects and events in our surroundings, for example recognizing some enemite force that is against you after a streak of bad luck, while such agents do not exist.

### **Chapter 7 A machine for jumping to conclusions**

System 1 jumps to a conclusion if it saves time and effort, is likely to be right, and mistakes are not too harmful, which is risky with uncertainty, high stakes and little time. System 1 creates context where it is missing but neglects ambiguity and alternatives, whereas System 2 is able of conscious doubt. System 1 comes up with a first interpretation, while System 2 determines the unbelief of this interpretation. So when System 2 is engaged you are more likely to accept a biased perspective, e.g. commercials work better when you are tired. Moreover, System 2 applies a positivist test strategy of finding confirmation rather than refutation which leads to uncritical acceptance of suggestions. The Halo Effect, liking one thing because you associated things, enables exaggerated emotional coherence. This means first impressions spoil further information, and the resolution is to seek independent judgment of observations. Furthermore, System 1 does not allow absent information, neglects quality and amount of information and affects System 2. Some consequences of a biased System 1 are overconfidence, framing effects and base rate neglect.

### **Chapter 8 How Judgments Happen**

System 1 continuously processes your surroundings through basic assessments of messages and events, such as assessing representativeness, causality and availability. This System 1 process aids substitution, just as intensity matching and the mental shotgun. Intensity matching concerns matching values across dimensions (“just as smart as tall”). The mental shotgun happens when System 2 intents to answer a question which triggers other computations such as basic assessments.

### **Chapter 9 Answering an Easier Question**

To come up with intuitive answers to complex questions, System 1 answers a different but easier question that is related and it has ready answer to. This process is called substitution, a heuristic or simple procedure to imperfectly answer difficult questions. Note that this is a consequence of a mental shotgun (not targeted) and that off the shelf answers need to be refitted to the original question by System 2. One example is the 3D heuristic, an illusion of 3D impressions of 2D images, e.g. in the case of forced perspective. The mood heuristic means the current state of mind (priming) affects substitution. The affect heuristic entails your emotional attitude affects your opinion of the world, e.g. in the case of politics. Your opinion may change as you learn new information, your System 2 is in charge of self-criticism, but System 2 is an enabler of System 1 and tries to seek coherence.

### *Part 2 Heuristics and Biases*

In this section Kahneman explains the heuristics or cognitive problem solving techniques and biases that the two systems underlie.

## **Chapter 10 The Law of Small Numbers**

System 1 tends to automatically assign causal relations and neglects statistics, so the larger variability of small populations leads to sample size artifacts. This is the law of small numbers; our intuition ascribes the same statistical reliability to small samples as to large samples. This is part of larger bias of confidence over doubt, we focus on the content of a story rather than its reliability. Also, our associative machine perceives statistical patterns in random events, for example basketball players are deemed 'hot' based on random variance in their individual scores.

## **Chapter 11 Anchors**

The anchoring effect constitutes that when we are presented with a particular value (anchor) for an unknown value we stay closer to that first value when actually estimating the unknown value. Anchoring evolves from an adjustment process by System 2 and a priming effect in System 1. The adjustment process is the premature conclusion of an iterative estimation of a value, whereas the priming effect is System 1's tendency to find compatible evidence for a suggestion. The anchoring effect can be measured by calculating the ratio of the differences between two anchors and estimates respectively. Examples are arbitrary rationing as a marketing ploy, making sure to be the first in a price negotiation, or caps on insurance claims. Messages influence your associative systems regardless of reliability, but although System 2 cannot control the anchoring effect you are advised to mobilize your System 2 and find alternative explanations to combat it.

## **Chapter 12 The Science of Availability**

People are predisposed to account for a category by the ease or fluency with which they are able to retrieve instances from memory, for example when asked to name 12 accounts of them being assertive they are biased to consider themselves meek. As a type of substitution, this availability heuristic is biased, for example memory retrieval depends on salience, dramatic events and personal experiences. Although vigilance of bias is a chore, it may be important, for example awareness of your own biases has been shown to improve cooperation. Since fluent retrieval of instances influences your judgment of a category, the availability heuristic leads to paradoxical results, e.g. you have difficulty thinking of instances of assertiveness so you consider yourself meek. The first few instances often come easy, but fluency decreases steeply. Reversal of the heuristic also occurs when an explanation for this surprise of unavailability after a few instances is presented. Since the availability heuristic is about causes and expectations System 1 is able to handle it, but System 2 may enact resetting expectations; the ease with which instances come to mind is a System 1 heuristic, which is replaced by a focus on content when System 2 is more engaged.

## **Chapter 13 Availability, Emotion and Risk**

Perceptions of risk are affected by availability, for example after disasters people increase insurance and always prepare for the worst scenario to witness but no worse. This is also an example of an affect heuristic of making decisions informed by emotions. Estimates of tragedy

are exacerbated by media coverage, while frightening thoughts are more easily and vividly imagined. Slovic purports risk perception is always subjective and risk experts should therefore not exercise power. Sunstein suggests erratic responses to risk transcend into policy through the mechanism of an availability cascade wherein media reports entice public panic that demands government intervention (note that this is related to agenda setting theory). Through a probability neglect minor threats thus evolve into exaggerated policy. Kahneman agrees with both; that policy should not be too involved with irrational fears, but governments should not ignore the public fears either.

#### **Chapter 14 Tom W's Specialty**

An automatic activity of System 1 is to activate any association with a stereotype, even in the face of contradictory odds (statistical probabilities or 'base rates'), for example given a nerdy description of character one would assume a more beta field of study even when the proportion of beta students is small. This representativeness heuristic tends to neglect common statistics and the quality of any evidence provided. Enhanced System 2 activity aids to increase predictive accuracy to overcome the automatic process of System 1. Following Bayesian reasoning you should discipline your judgment of probability to stay close to the base rate and question the diagnosticity of the evidence.

#### **Chapter 15 Linda: Less is More**

When you specify a possible event in greater detail you can only lower its probability, since that event will always be a subset to a more general category. For example, a butch woman is more probable to be a bank teller than a feminist bank teller, but this creates a conflict between the intuition of representativeness and the logic of probability. This is deemed a conjunction fallacy wherein two events are considered more likely than one in a direct comparison. This mistakes plausibility for probability and has a profound effect on judgment, for example in forecasting. Although in the absence of competing intuition or joint evaluation of all options, especially of prices, people do choose the logical option. The conjunction fallacy again denotes the weakness of System 2.

#### **Chapter 16 Causes Trump Statistics**

There are two types of base rates; statistical base rates about a population to which a case belongs and causal base rates that change your view of that case. Statistical base rates are underweighted or neglected in the face of causal base rates. System 1 represents categories as norms and prototypes, when applied to a social group or individual these representations of categories are called stereotypes. In a sensitive social context however, we tend to ignore stereotypes so as not to offend groups or individuals which leads to erroneous judgment. Moreover, people neglect base rate information when it conflicts with their beliefs or personal experience, for example few people accept a low statistic for giving first aid applies to themselves. This failure to use Bayesian logic and correct your judgment also means that teaching psychology may be fruitless.

## **Chapter 17 Regression to the Mean**

Our System 1 false obsession with causal explanation applies to statistics as well. Random fluctuations in variables such as outliers typically regress to the mean, which means they naturally approach the average. For example, we tend to praise or punish extreme behavior, although it would improve or deteriorate naturally according to regression to the mean. In sports performance luck would create temporary jolts that will over time regress to the mean, but we tend to attribute some causal explanation for an exceptionally good or bad sportsman. Whenever the correlation between two scores is imperfect, there will be regression to the mean. But our System 2 finds that difficult to accept, partly because of System 1's insistent demand for causal interpretations.

## **Chapter 18 Taming Intuitive Predictions**

Some intuitions draw on skill and expertise acquired by repeated experience, e.g. such as chess moves, but most intuitive predictions are overconfident and insensitive to the predictive quality of evidence, or non-regressive. For example estimating someone's GPA based on your own experience. Evidence is evaluated using norms, substitution and intensity matching, causing to answer the wrong question using the wrong scales. This bias could be partially resolved by calculating the discrepancy between your intuition and a base rate and adjust your estimate depending on your expectation of the correlation. Similarly, an intermediate value between your intuition and some base rate could improve probability judgment. Clearly, this reduction of intuitive prediction faults stemming from System 1 is a System 2 task, but regression remains difficult to accept for System 2. Sometimes errors of prediction could be allowed, for example when the error of omission is greater than the error of prediction (think of venture capital) or to avoid paralysis.

### *Part 3 Overconfidence*

## **Chapter 19 Illusion of understanding**

In his book *The Black Swan* Taleb describes how flawed stories of the past shape our views of the world and our expectations for the future by using the notion of narrative fallacy. Narrative fallacies arise from people's continuous attempt to make sense of the world. Explanatory stories that people find compelling are simple and concrete stories that assign a larger role to intentions, talent and a few events that happened. This is in contrast to more abstract and detailed stories that future countless events that failed to happen, which are more close to what actually occurred. So when reconstructing the past, humans fool themselves by constructing less detailed accounts of the past of believe that they are true. This leads to the illusion of understanding that we understand the past, which would also imply that the future should be knowable, but in fact we understand the past less than we believe we do.

Also when reconstructing our past state of knowledge or believes we used to have earlier, the ability of humans turns out to be imperfect. Once we adopt a new view of the world, we

immediately lose much of your ability to recall what you used to believe before our mind changed. When people are asked about their previous beliefs when they have changed it due to newly received information, they are unable to recall their previous beliefs and can only recall their new current belief. People feel as though their new current belief has been their believe all along. This leads to hindsight bias (the “I-knew-it-all-along effect”).

### **Chapter 20 Illusion of Validity**

The illusion of validity is a cognitive illusion where we think we are measuring phenomenon A, thinking it holds valid predictive power for phenomenon B, while this is not the case. Someone can have high confidence in the validity, but this subjective judgment does not positively influence the probability that this judgment is correct. Another illusion is the *Illusion of Skill*. The stock market industry is one that seems to be built on the illusion of skill. An interesting conclusion of a study was that the most active traders yielded the poorest results while the least active trader had the best. From a research body of over 50 years of research, the evidence shows that for a majority of fund managers, selecting stocks is like rolling dice. It is mostly a game of luck. Traders think their experience allows them to make the right educated guesses, however in highly efficient markets these guesses prove to be about as accurate as blind guesses. As for the reason why this illusion of skill still exists, Kahneman reasons that cognitive illusions can be more stubborn than visual illusions and that the illusions of validity and skill are supported by a powerful professional culture.

### **Chapter 21 Intuitions vs. Formulas**

Statistical algorithms are better predictors than experts. Experts are generally inferior to algorithms because experts try to think outside the box, try to be clever and consider complex combinations of features in making predictions. While this may work from time to time, but in general this reduces validity. Simple combinations are better. Even when humans get a suggestion score or answer from a formula, they still perform worse because they feel they can overrule the formula because they have additional information. But they are wrong more often than not. Also human consistency plays a role. When someone is asked to judge the same complex situation twice, they frequently give different answers. Even when it comes to selecting the right candidates for a job, formulas outperform expert. This is because people tend to emphasize interview too much. While algorithms and formulas can be very helpful, there is still a certain hostility towards them because humans have a natural tendency to prefer the judgments of human experts, especially when the decisions or diagnoses come with consequences, such as surgery or not being accepted into an institution.

### **Chapter 22 Expert Intuition: When can we trust it**

There are also occasions on which expert intuition is a trustworthy skill. As said before, the confidence people have in their intuitions is not representative for the validity. So when can expert intuitions be trustworthy? It can be trustworthy when there is an environment that is sufficiently regular to be predictable. The second is when it is possible to learn these regularities

of the environment through prolonged practice. If these conditions are met, we can qualify these intuitions as skilled. An example that is given is chess. It is also important to know that experts may not know the limits of their expertise and can claim to be able to succeed at impossible tasks.

In a less regular (low validity environment), the heuristics of judgment (see part 2) are invoked once again, meaning that system 1 is often able to produce quick answers to difficult questions by substitution and in turn creates coherence where none can be found. The answer that is generated by system 1 is however not the answer to the original question but the answer to a simpler one.

### **Chapter 23 The Outside View**

Forecasts about the outcome of projects are mostly too optimistic. The Planning Fallacy: plans and forecasts that are unrealistically close to best-case scenarios, and/or could be improved by consulting the statistics of similar cases. Aside from projects that are forecasted too optimistically on purpose (to get it approved for example), it is due to people having a tendency to ignore data that does not coincide with their beliefs. The treatment for this fallacy is for planners to make every effort to frame forecasting problem to facilitate utilizing all the distributional information of similar projects that is available. It has been dubbed *reference class forecasting*. And it entails identifying the appropriate reference class (kitchen renovations, railway projects etc.), then obtaining the statistics of the reference class and using it as baseline and lastly to use specific information about the case to adjust the obtained baseline.

### **Chapter 24 Engine of Capitalism**

Planning fallacy is only one of the manifestations of a pervasive optimistic bias. Some people are naturally more optimistic than others. It can both be a blessing and a risk. Optimistic individuals play a disproportionate role in shaping our lives. They are inventors, entrepreneurs, etc. and risk takers. Optimistic people underestimate the odds of failing or overemphasize their own chance of succeeding. A benefit that stems from this is that it encourages persistence in the face of obstacles. This is also the main benefit of optimism: the resilience in the face of setbacks. For organizations, having these optimistic people can be a double edged sword. Overconfident and optimistic CFOs are too optimistic about the prospects of their own firm and take excessive risks.

## *Part 4 Choices*

### **Chapter 25 Bernoulli's Errors**

Before Bernoulli, it was assumed that gambles are assessed by their expected value, which is a weighted average of the possible outcomes, where each outcome is weighted by its probability. An example is an 80% chance to win \$100 and a 20% chance to win \$10 is \$82 ( $0.8 \times 100 + 0.2 \times 10$ ). However most people dislike risk and if they are offered a choice between a gamble and an amount equal to its expected value they will pick the sure thing. In fact a risk-averse decision

maker will choose a sure thing that is less than expected value, in effect paying a premium to avoid the uncertainty, which can be transposed on some forms of insurance. Bernoulli's theory looks at the utility of wealth. He assumes that the utility of wealth is what makes people more or less happy. The flaw in his theory is however that happiness is also determined by the recent change in their wealth. For instance, yesterday person A currently has 9 million dollars and person B currently has 1 million dollars. Today they both have 5 million dollars. According to Bernoulli's theory they should both be equally happy, which is of course not the case. The theory also does not take into account reference points.

### **Chapter 26 Prospect Theory**

Risk aversion in the utility theory functions differently concerning potential gains and potential losses. People tend to be more risk averse when it comes to betting for extra gains opposed to a sure gain which is lower. For losses this functions the opposite. People are less risk averse in this case. This is a flaw in Bernoulli's model. It is missing a reference point from which gains and losses are evaluated. Kahneman distinguishes three factors in prospect theory that are linked to system:

- Evaluation is relative to a neutral reference point (or adaption level)
- A principle of diminishing sensitivity applies to both sensory dimensions and the evaluation of changes of wealth.
- Loss aversion. When directly compared or weighted against each other, losses loom larger than gains.

### **Chapter 27 Endowment Effect**

The endowment effect: people ascribe more value to things merely because they own them. This is illustrated by the fact that people will pay more to retain something they own than to obtain something owned by someone else—even when there is no cause for attachment, or even if the item was only obtained minutes ago. The (emotional) response to a loss is stronger than the response to a corresponding gain.

Old economic theory didn't look at the difference in how people value money, time, etc based on their current access to money and time. Behavioral economics fixed this. For the poor, costs are losses. Money that is spent on one good is the loss of another good that could have been purchased instead.

### **Chapter 28 Bad Events**

The concept of loss aversion is certainly the most significant contribution of psychology to behavioral economics. The brain processes threats and bad news faster (brain can detect angry faces faster than happy ones; it gives priority to bad news, a system 1 function). The same holds for words that have a negative emotional association. When discussing the relocation of resources in a company (in a scenario budget cuts), the debates are more heated than when more resources are allocated, because this is about an allocation of losses and the loss aversion

mechanisms kick in. Because the previous reference point makes everything seem like a loss agreements are difficult to make.

### Chapter 29 Fourfold Pattern

When evaluating an object, people assign weights to its characteristics. Weights are related to the probabilities, but are not identical. The weight of good but improbable outcomes is irrationally high, this is the possibility effect. An example is the chance of winning the lottery. The chance is miniscule, but people still buy tickets due to this effect.

	GAINS	LOSSES
HIGH PROBABILITY Certainty Effect	95% chance to win \$10,000 Fear of disappointment RISK AVERSE Accept unfavorable settlement	95% chance to lose \$10,000 Hope to avoid loss RISK SEEKING Reject favorable settlement
LOW PROBABILITY Possibility Effect	5% chance to win \$10,000 Hope of large gain RISK SEEKING Reject favorable settlement	5% chance to lose \$10,000 Fear of large loss RISK AVERSE Accept unfavorable settlement

The fourfold model is presented, which shows that people attach values to gains and losses rather than to wealth and the decision weights that they assign to outcomes are different from probabilities. In the top row each cell shows an illustrative prospect. The second row characterizes the focal emotion that the prospect provokes. The third row indicates how most people behave when offered a choice between a gamble and a sure gain (or loss) that corresponds to its expected value. The fourth row describes the expected attitudes of a defendant and a plaintiff as they discuss a settlement of a civil suit.

When people face a very bad option (such as a severe illness), they take desperate gambles, accepting a high probability of making this worse in exchange for a small hope of avoiding a large loss. Risk taking of this kind often turns manageable failures into disasters. This is where businesses that are losing ground to a superior technology waste their remaining assets in futile attempts to catch up.

### Chapter 30 Rare Events

The Psychology of terrorism is similar to that of high-prize lottery. System 2 may “know” that the probability is low, but this knowledge does not eliminate the self generated excitement in case of the lottery ticket or the self generated discomfort in case of terrorism. System 1 cannot be turned off. The level emotion is not proportionate to the probability. People tend to overestimate

the probabilities of unlikely events and overweight the unlikely events in their decisions. This is because of focused attention, confirmation bias and cognitive ease.

### **Chapter 31 Risk Policies**

When approaching multiple paired risks with a narrow frame, one evaluates each risk separately to find the best one. With a broad frame all the risks are considered in one decision, which can change the outcome of a decision. A risk policy is a broad frame that helps with making decisions routinely (never buy extended warranties is an example). A risk policy can help to alleviate the effects of loss aversion and exaggerated optimism of the planning fallacy.

### **Chapter 32 Keeping Score**

Except for the very poor, for whom income coincides with survival, the main motivators of money-seeking are not necessarily economic. For instance for a billionaire looking for the extra billion, money is a proxy for points on a scale of self-regard and achievement. This is another method of keeping score than just the monetary number. We create mental accounts in our heads next to physical accounts. We for instance make mental accounts for products we are saving up for or for household income, this while there might be an outstanding debt.

There is a bias in finance research called the disposition effect. People have a massive preference for selling winners (stock that currently has a higher price than when purchased) than losers. This is an instance of narrow framing. When someone needs a certain amount of money, let's say 50.000 dollars and has two stock portfolios of 50.000, he will prefer the sell the one that is at a win at the moment than the one that is at a loss

Another fallacy is the sunk-cost fallacy. This fallacy is the decision to invest additional resources in a losing account, when better investments are available. A reason this might occur at a project is because it leaves a permanent stain on the executive's record or company record and his personal interests are perhaps best served by gambling further in hope of recouping original investment or at least in an attempt to postpone the day of reckoning This sunk-cost fallacy keeps people for too long in poor jobs, unhappy marriages, and unpromising research projects.

Fear of regret is a factor in many of the decisions that people make. Regret is one of the counterfactual emotions that are triggered by the availability of alternatives to reality. People make choices in anticipation of the painful emotion that is regret. Consumers who are reminded that they may feel regret as a result of their choices show an increased preference for conventional options, favoring brand names over generics. Losses are weighed about twice as much as gains in several contexts: choice between gambles, the endowment effect, and reactions to price changes. Dilemma between intensely loss-averse moral attitudes and efficient risk management does not have simple and compelling solution.

You can take steps to inoculate yourself against regret—most useful is to be explicit about anticipation of regret. If you can remember when things go badly that you considered the possibility of regret carefully before deciding, you are likely to experience less of it. Regret and hindsight bias will come together so anything you can do to preclude hindsight is likely to be helpful. Saying “I almost made a better choice”.

### **Chapter 33 Reversals**

Preference reversals should not exist in economic preference theory, but psychologists have shown that individual choice depends on the context in which the choices are made. When assessing a pair of options (broad frame) the decision can be different from a narrow frame perspective. The chapter focuses on illustrating context dependency when choices are made.

Experiments show that there is reason to believe that the administration of justice (at least in the US system) is infected by predictable incoherence in several domains. Context can alter opinions drastically. When two cases are taken together, the context of each other influences the decisions about the cases. These decisions about punishment or monetary are different than when two cases were evaluated separately.

### **Chapter 34 Frames and Reality**

Framing effects are the unjustified influence of formulation on beliefs and preferences. For instance; Would you accept a gamble that offers a 10% chance to win \$95 and a 90% chance to lose \$5? Or would you pay \$5 to participate in a lottery that offers a 10% chance to win \$100 and a 90% chance to win nothing? Most people will prefer the second. But both problems are actually the same, it is the framing effect at work. When the \$5 is framed as a lottery ticket, the loss is seen as the cost of a lottery ticket and therefore seen as less bad. Losses evoke stronger emotions than costs. Decision makers tend to prefer the sure thing over the gamble (they are risk averse) when the outcomes are good. They tend to reject the sure thing and accept the gamble (they are risk seeking) when both outcomes are negative.

When it comes to frames that consider good initiatives, there are still biases. The frame of miles per gallon (mpg) provides very poor guidance to decisions. Consider two drivers who both travel the same amount of miles each year. Driver A buys a new car and goes from 12 mpg to 14 mpg. Driver B buys a new car and now goes from 30 mpg to 40 mpg. Which driver will save more gas? Instinctively by using system 1, you will say driver B. However, when you think about it, in a scenario of 10,000 miles, driver A goes from 833 gallons to 714 gallons, which is a saving of 119 gallons. Driver B goes from 333 gallons to 250, which is a saving of 83 gallons. The small 2 mpg difference instead of the 10 turns out to be a lot more meaningful. This is also the effect of framing. It should be gallons per mile and not miles per gallon.

#### *Part 5 Two Selves*

In his later work Kahneman researched happiness and found that our decisions are guided by memory rather than lived experience.

### **Chapter 35 Two Selves**

Pain and pleasure is deemed experienced utility and decision utility is that what we desire. We make decisions based on experienced utility, e.g. we want lowest number of injections. One could develop a hedonimeter that totals pleasure and pain. However, the peak-end rule prescribes our memory is determined by the average between the peak (best/worst moment) and end total,

neglecting duration altogether. So the hedonimeter totals and retrospective assessment are conflicting decision factors. The experienced self prefers the first to be decisive, the remembering self prefers the second. The remembering self is in control and the confusion of experience and memory are a cognitive illusion. We aim to maximize the quality of future memories at the cost of enduring experience, this is the tyranny the remembering self. System 2 chooses a better memory over a better experience, unless intuition decides, an example of the less-is-more effect discussed above. Our System 1 memory evolves over time and neglects duration, which does not serve our immediate preferences for long pleasure and short pain.

### **Chapter 36 Life as a Story**

A story is about significant events and memorable moments, not about time passing, and especially so the narrative of our own life. This reflects duration neglect and a peak-end effect. We evaluate our life by time-slices and not the sum of happiness, pointing to a less-is-more effect where the a prototype is substituted for a sum. Duration matters only if it changes the happiness at the end. Our remembering self makes decisions based on the memories we expect to create, e.g. when choose vacations. Similarly, when deciding to repeat experiences we look to our memories. However, only when the prospect of memories is removed (amnesic) we tend to choose based on lived experience.

### **Chapter 37 Experienced Well-Being**

There are some experiences we would rather continue than stop, this resistance means a good time. Kahneman developed a measure of well-being of experiencing self, firstly by sampling surveys from a cell phone, and later the superior Day Reconstruction Method of periodical recollection. They measure emotional well-being and life satisfaction, which are two distinctively different things. People are able to recover their feeling for a particular episode in life. The U-index measures dominant negative feelings, and proved quite a distributed measure. People's mood fluctuate and attention to activities is key. Personal implications are to invest in time management and societal implications are that these measures may inform policy. For example, religion reduces stress, whereas children and education induce unhappiness. Poverty increases bad feelings as well, but money has a limited effect on experience, although satisfaction may still improve.

### **Chapter 38 Thinking about Life**

Satisfaction of marriage drops dramatically after some years, showing an error of affective forecasting. However, most people do not have a quick answer to questions of life satisfaction so substitute for easy questions, i.e. a mood heuristic of a lucky recent incident. You tend to remember few important ideas. So the marriage question depends on the salience of the novelty of marriage and says little about actual overall happiness. This constitutes a focusing illusion since nothing is as important as you think it is, because you use heuristics when you think about a question. Life satisfaction is influenced by genetics of temperament and goals set, and both experience and remembrance matter. However, pain and noise are biologically set to be signals

that attract attention, and depression involves a self-reinforcing cycle of miserable thoughts. The remembering self is often subject to a massive focusing illusion about the life that the experiencing self endures quite comfortably, e.g. when judging how winning the lottery will affect your life. The focusing illusion creates a bias in favor of goods and experiences that are initially exciting, even if they will eventually lose their appeal. Time is neglected, causing experiences that will retain their attention value in the long term to be appreciated less than they deserve to be.

## **Conclusion**

The book introduces the two selves that are the experiencing self and the remembering self, the two species that are Econs and Humans, and two characters that are System 1 and System 2, all three imposing their own effects on judgment.

The remembering self is a construction of System 2. However, the distinctive features of the way it evaluates episodes and lives are characteristics of our memory. Duration neglect and the peak-end rule originate in System 1 and do not necessarily correspond to the values of System 2. The remembering self and the experiencing self must both be considered, because their interests do not always coincide.

Rationality is logical coherence—reasonable or not. Econs are rational by this definition, but there is overwhelming evidence that Humans cannot be. An Econ would not be susceptible to priming, WYSIATI, narrow framing, the inside view, or preference reversals, which Humans cannot consistently avoid. Reasonable people cannot be rational by that definition, but they should not be branded as irrational for that reason. Although Humans are not irrational, they often need help to make more accurate judgments and better decisions, and in some cases policies and institutions can provide that help. Humans, more than Econs, also need protection from others who deliberately exploit their weaknesses—and especially the quirks of System 1 and the laziness of System 2.

The way to block errors that originate in System 1 is simple in principle: recognize the signs that you are in a cognitive minefield, slow down, and ask for reinforcement from System 2. Organizations are better than individuals when it comes to avoiding errors, because they naturally think more slowly and have the power to impose orderly procedures. Ultimately, a richer language is essential to the skill of constructive criticism. They will make better choices when they trust their critics to be sophisticated and fair, and when they expect their decision to be judged by how it was made, not only by how it turned out.