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**Federal Department of Defence,
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Federal Intelligence Service FIS**

Handbook

COGNITIVE BIASES

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COGNITIVE BIASES

IMPRESSUM

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Overview

Cognitive bias	Description	What I can do about it
Confirmation bias	We focus on information that corresponds to our own point of view.	• Test assumptions • 'Think the opposite' • Stress test your beliefs • Analyse competing hypotheses
Hindsight bias	In retrospect, we overestimate the predictability of a past event.	• Imagine alternative paths • Participate in a crowdsourcing platform • Write down your predictions
Outcome bias	We measure a decision by its outcome rather than the process by which the decision was made.	• Record the decision-making process in detail • Evaluate the decision-making process
Availability bias	We give more weight to information that is easily accessible.	• Consider the base rate • Red team assessment
Anchoring	We rely on the initial information we receive on a topic, even if it has no comparative value.	• Re-evaluate questions using standardised procedures • Diversify your sources and treat them equally
Overconfidence bias	We overestimate our knowledge and our ability to make predictions.	• Show intellectual modesty • Self-reflection • Be open to feedback
Sunk cost fallacy	We keep going even when the original goal is unlikely to be achieved.	• Focus on current and future costs and benefits rather than on work already done • Seek outside advice
Absence of evidence	We do not give sufficient consideration to the absence of information.	• Test assumptions • Ask yourself what you know and what you don't

Cognitive bias	Description	What I can do about it
Failure of imagination	We are quick to dismiss unlikely paths of development.	• Scenario technique • Creative thinking
Mirror imaging	We assume that others share our point of view.	• Test assumptions • Red team assessment • Peer reviewing
Groupthink	We conform to what we think the group agrees on.	• Form different groups • Red team assessment • Involve external experts
Bandwagon effect	We behave like the majority.	• Red team assessment • Slow down the decision-making process
Authority bias	We give more credibility to the opinions of authority figures, regardless of their content.	• Critically examine statements by authority figures • Slow down the decision-making process • Form teams with critical thinkers
Base rate fallacy	We ignore information about the base rate (general prevalence).	• Consider base rates • Include statistical values in the analysis
Conjunction fallacy	We tend to think that two things combined are more likely to happen than one.	• Slow down the decision-making process • Think statistically
Survivorship bias	We only see successful outcomes; failures are overlooked.	• Consciously select data • Ask yourself which data points could be missing
Clustering illusion	We see patterns where there are none.	• Be open to different possible explanations • Think statistically
Perceived central direction	We believe that there is a deliberate plan behind events.	• Be open to different possible explanations • Test assumptions

Introduction

The further we look into the future, the greater the level of uncertainty and the smaller the proportion of known certainties. Assumptions and conclusions based on cognitive processes thus play a crucial role in early detection. However, many people have little to no knowledge of how human thinking works and of the decision-making processes that affect the way we work. The main reason for this is that most of the cognitive patterns and processes that underlie our perceptions, information processing, memory and judgement are unconscious or influenced by unconscious processes.

The world can often seem confusing and chaotic. We are faced with an endless stream of stimulation and information. To cope with this complex environment and the resulting uncertainty, we try to organise how we think. Our brains use models of thought to help us process stimuli more quickly and efficiently. Although a remarkable achievement of evolution, these cognitive shortcuts – known as heuristics – can lead to the wrong conclusions. Cognitive biases are generally unconscious systematic errors in thinking, caused by our stimulus and information processing mechanisms. They lead to distorted conclusions and are a fundamental problem in working with and understanding Intelligence.

The purpose of this handbook is to raise the reader's awareness of cognitive biases and how they can affect analysis and, in particular, early detection. This knowledge should encourage self-reflection on thinking and decision-making. The handbook also presents strategies and techniques to reduce the effect of cognitive biases.

The handbook centres on a selection of 18 cognitive biases that are particularly common and relevant to intelligence work. Each is described briefly and illustrated using specific examples of situations in which it is likely to occur. Strategies and techniques for minimising bias effects are also provided.

2

How we think

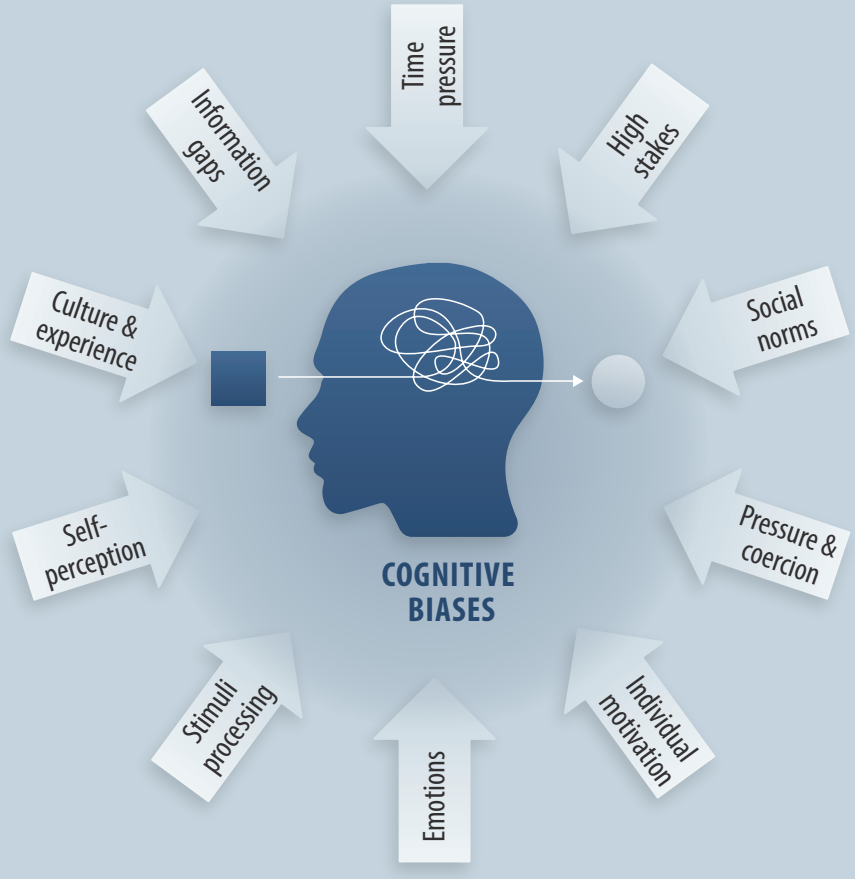

Figure 1 *Factors influencing our decision-making*

The need for order

People need order. As a result, we tend to want a sense of order in our thinking. The world is supposed to make sense: we want to be able to classify our perceptions. Fundamentally we struggle with vagueness, uncertainty, contradiction and ambiguity. Faced with open questions, we want to arrive at the clearest and most certain answers as quickly as possible. This is evolutionary and applies to almost everyone. However, the need for ‚cognitive coherence' varies from person to person. Some people have great difficulty with uncertainty and prefer quick and clear answers, even when the information situation is unclear. They also tend to stick to their opinions once formed, even when new or better information comes along. This can be exacerbated by factors such as lack of time or sleep, as well as external pressures such as those we often experience in everyday (working) life. Others may be more comfortable with uncertainty, more open to new perspectives and more willing to consider new and contradictory information. Their cognitive capacity for reflection is therefore usually more pronounced. It is important to stress that skills such as cognitive reflection or intellectual modesty can be trained and improved over time („How do I sharpen my focus?" on page 18).

System 1 and System 2 thinking

In the context of intelligence, it is assumed that our thinking is rational and our analysis objective. We evaluate information and try to deduce and understand the situation at hand. The parts of the brain we use most for these processes are relatively young from an evolutionary perspective. However, our thinking is still influenced by 'older' brain structures primarily associated with instinct and emotions. Brain research is so complex that the exact connections and processes are not yet fully known. Put simply, all the information we receive through our sensory organs is first processed and evaluated unconsciously in this instinctive part of the brain. This is often enough for us to be able to make a decision and act on it. The part of the brain that is responsible for logical and rational thinking is not involved in this process or may even be overridden. The reason for this lies in the history of human development. In the days of hunter-gatherers, the speed of decision-making could mean the difference between life and death: people who instinctively ran away from a potential wild animal attack had a better chance of survival than those who hesitated. Although these instincts ensured our survival in evolutionary terms, they are not the most appropriate in many of the situations we face in today's complex world. What is needed instead is the ability to deal with the many degrees of nuance and uncertainty, and to make decisions based on reflective and rational thinking.

Psychologist Daniel Kahneman uses a two-system model to describe the human thought process as a simplified structure. System 1, known as the intuitive system, operates completely unconsciously and is where automatic cognitive processes take place. It is our autopilot, so to speak. System 2, known as the rational system, is the area of conscious thought. We are more familiar with it: this is where we actively focus, think, plan and control. This process is slower and requires a lot more cognitive resources. The numbering of the systems is not arbitrary: System 1 always comes into play first. It is fast – because it relies on heuristics – and is constantly working in the background. New skills are first learnt through System 2 and then transfer to System 1 as they become more routine. If we know the answer to a question immediately, it is very likely to come from System 1. The role of System 2 would be to check this intuitive answer for the assumptions, reasoning and conclusions that lie behind it.

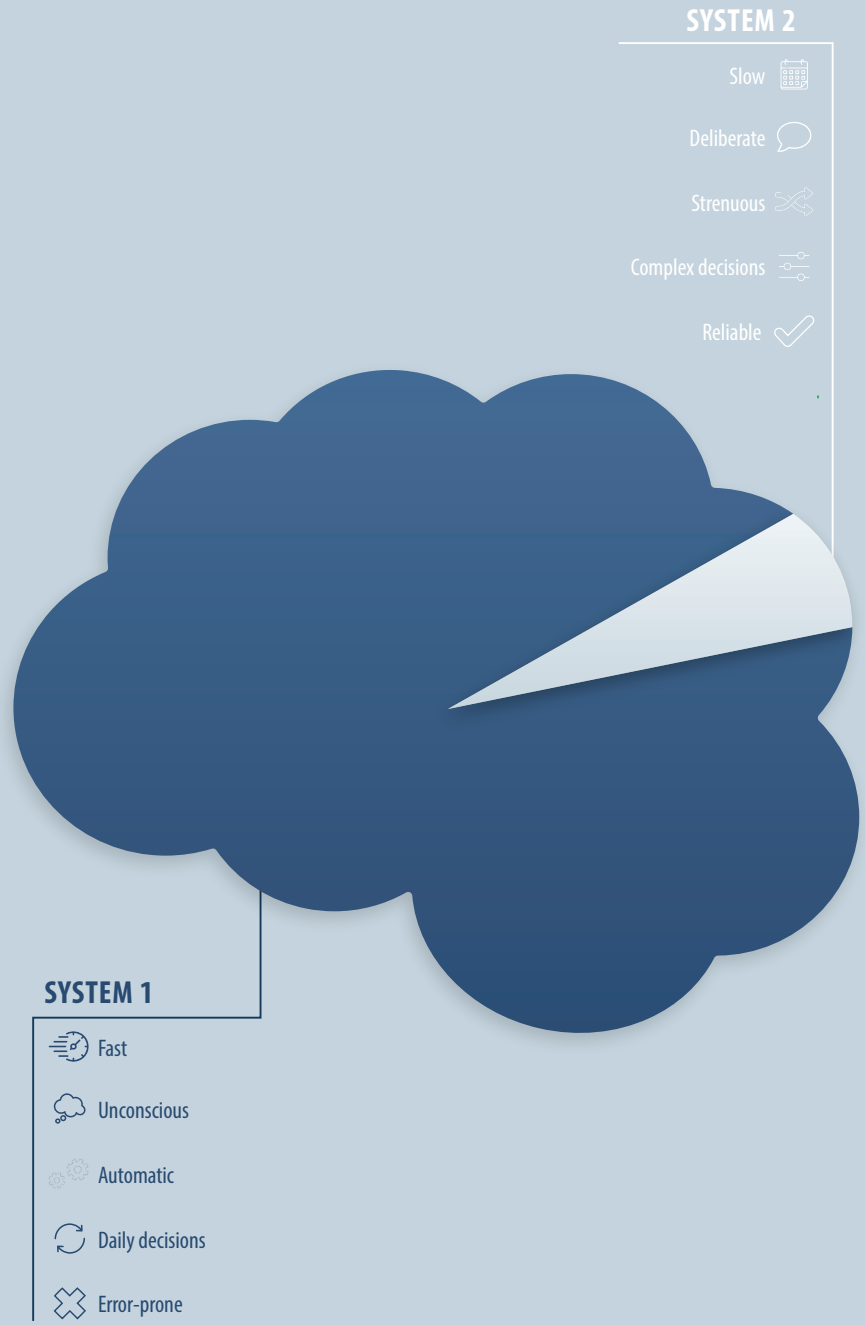

Figure 2 *Overview of System 1 and 2 thinking*

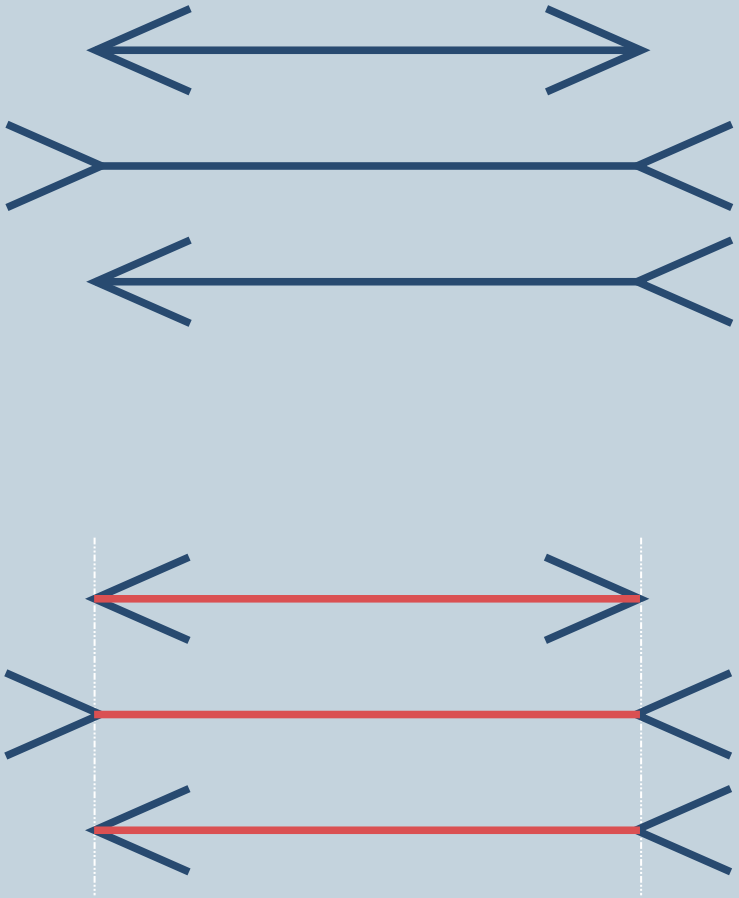

Figure 3 *Müller-Lyer illusion*

Cognitive shortcuts (heuristics)

As we have seen, our brains use mental models to cope with the flood of stimuli and information we are exposed to in our daily lives. These heuristics, which can be thought of as shortcuts, allow us to conserve our cognitive resources. Cognitive bias occurs when System 1 reaches incorrect conclusions based on shortcuts in information processing. Because System 1 processes are unconscious and automatic, we are not aware of these cognitive biases.

In intelligence analysis, cognitive bias can lead to a distorted view of the situation and the future or a biased judgement. For example, an analyst may ignore important but unlikely developments, misinterpret causal relationships, fail to critically question their own assumptions and hypotheses, underestimate chance, rely too heavily on their own judgement and knowledge, or focus primarily on what is already known. Many of these errors in thinking are so deeply ingrained that simply being aware of the various distortions in thinking is generally not enough for us to avoid them. A good example of persistent bias is the Müller-Lyer illusion.

Our brain tells us that these three lines are the same length. Even though the lines in red clearly prove the opposite, most of us cling to the illusion that the lines are different lengths. So being aware of a perceptual and cognitive bias does not automatically make you immune to it.

Since we cannot change how our brains work and are constantly exposed to these pitfalls, we must find ways to manage this risk. A first step in reducing our susceptibility to thinking errors is accepting the fact that everyone is subject to cognitive biases. It is a fallacy to believe that only other people are affected (blind spot bias). Even those with an above-average IQ and academic qualifications are not immune. For example, psychologist Keith Stanovich has studied the relationship between intelligence and rational thinking: his findings suggest that there is only a negligible correlation between the two. Other studies even suggest that people with high levels of intelligence are more prone to certain errors in reasoning than the average person. IQ alone is therefore no guarantee of rational decision-making.

How do I sharpen my focus?

Cognitive biases and other effects that negatively influence decisions are part of our lives: we cannot escape them. But being aware of your own cognitive biases, and having the courage and openness to admit when you are wrong, is important for being a critical thinker. The following are some characteristics and strategies, all of which can be acquired, to help you think more critically and make better judgements.

Cognitive reflection

Cognitive reflection is a person‘s ability to recognise and override a false gut feeling (System 1). This ability can be measured using test questions, as the following examples show:

1. A bat and a ball cost a total of 1 franc and 10 centimes. The bat costs exactly 1 franc more than the ball. How much does the ball cost?

2. If it takes 5 machines 5 minutes to produce 5 toys, how long would it take 100 machines to produce 100 toys?

3. There is a carpet of water lily pads in a lake. Every day, the area covered doubles in size. If it takes 48 days for the water lilies to cover the entire lake, how long will it take for them to cover half of the lake?

If we use System 2 thinking to challenge our intuition (which is usually wrong on these questions), we find that the correct answers are 5 centimes, 5 minutes and 47 days. It has been shown that people who perform well on cognitive reflection tests are less susceptible to cognitive biases. Therefore, when it comes to important questions, it makes sense to not just rely on your intuition, but to critically and systematically question your own assumptions.

Intellectual modesty

Another important quality that has a major impact on our decision-making, and especially our learning, is intellectual modesty. This means being aware of the limits of our knowledge and judgement. It is not about deliberate understatement, humiliation or lack of conviction. An intellectually modest person is able to assess themselves and their strengths and weaknesses appropriately. They are not afraid to admit when they lack knowledge or expertise. Even when they have strong personal convictions, they are aware of the possibility of misjudgement. Developing intellectual modesty is hard work. It requires intensive and continuous self-observation and self-reflection. It also requires honest feedback from others and dealing with misjudgements.

Actively open-minded thinking

The concept of active open-mindedness is closely related to the concept of intellectual modesty. It is the willingness to seek out alternative viewpoints and information that contradicts one‘s own or the prevailing opinion. Actively open-minded people do not jump to conclusions, but prefer reflective thinking. They are generally open to new information and are willing to reconsider their existing views when the information situation changes. An experiment has shown that when it comes to selecting articles from the press, actively open-minded people tend to prefer those that challenge their views with new information – rather than those that confirm them. Researchers measure the individual level of such thinking by agreeing with statements such as: ‘People should consider evidence that contradicts their views’ or ‘Changing one‘s mind is a sign of strength’. A number of studies have shown that a high level of agreement with such statements is correlated with greater rationality and a lower susceptibility to cognitive biases.

Curiosity

In psychology, curiosity is defined as a heightened willingness to engage with or actively seek new, unfamiliar and complex situations and objects. Studies show that curious people are less prone to polarisation. The natural urge to understand the world helps to overcome preconceived ideas. Curious people observe, question and learn continuously. They enjoy exploring unknown subjects and have little difficulty challenging the status quo. Human curiosity is usually at its most pronounced in young children and then gradually diminishes. The behaviour of parents and teachers can strengthen or weaken curiosity, e.g., by modelling curious behaviour or, conversely, by rejecting children's questions. A culture of fear in an organisation can also inhibit curiosity.

Growth mindset

According to psychologist Carol Dweck, how we perceive our own strengths has a huge impact on how we approach learning situations. With a positive growth mindset, people believe that their performance can improve with practice. Setbacks are seen as opportunities for growth. People with a growth mindset worry less about how they compare with others. Their self-esteem does not depend on what they know. They enjoy learning and have little difficulty admitting gaps in their knowledge. In contrast, people with a fixed mindset believe that strengths and weaknesses are genetic and therefore cannot be fundamentally changed. They find setbacks particularly painful because they challenge their self-image. They also tend to associate their identity with certain opinions. These are difficult to reconsider because counterarguments are often perceived as personal attacks. People with a fixed mindset also often find it difficult to accept feedback and are reluctant to admit weaknesses or gaps in their knowledge.

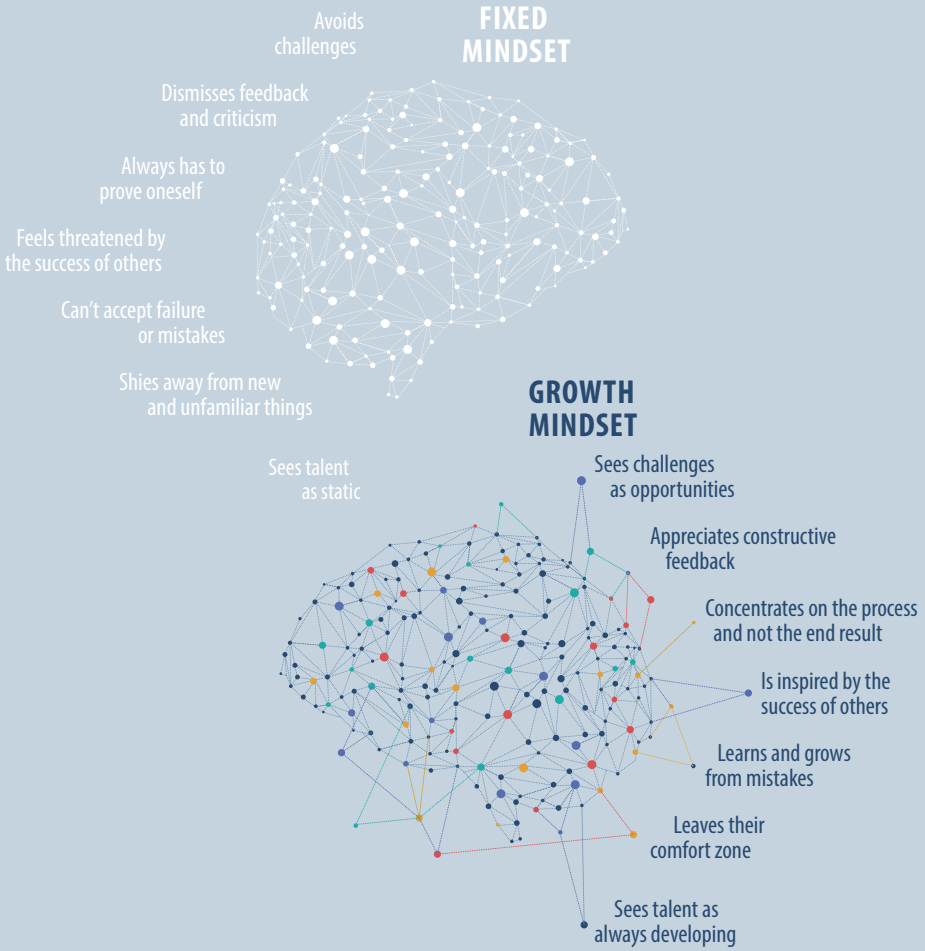

Figure 4 *Overview of fixed and growth mindset*

In addition to the above, the following approaches can be used to help minimise cognitive bias:

Structured analysis techniques

Structured analysis techniques (SAT) help to promote critical thinking and thus prevent cognitive bias. They make it possible to externalise thought processes in a way that is systematic and transparent. One of the consequences is that you need to consider facts that differ from your own opinion. SATs can also help to sharpen your questions or to consider hypotheses that might otherwise be hastily dismissed as unrealistic. They can also help to make judgement processes more easily understood. Some SATs can be used alone, others only in a group. However, when SATs are used by individuals, the persistence of certain biases means that there is a continuing risk that certain information or explanatory approaches will be consciously or unconsciously ignored and blind spots will remain undetected. This is why it is recommended to use SATs in a group. A selection of SATs is presented in the FIS manual 'Methods of Early Detection and Anticipation'.

Utilisation of cognitive diversity (swarm intelligence)

The cognitive biases that affect our thinking, and their relative strength, vary from person to person. For example, value systems are shaped and influenced by our different social and cultural backgrounds and experiences. Groups of people who think differently are an important building block for minimising the effects of cognitive bias. Here cognitive diversity, rather than external characteristics such as gender, age or ethnic origin, is central. Incorporating different perspectives and ways of thinking can help to make better assessments, judgements and decisions. Studies have shown that different cognitive biases in a group tend to cancel each other out, provided that individual members think independently, can share openly and do not influence each other too much. There is also an accumulation of individual knowledge within the group. The key is to ensure the greatest possible diversity of perspectives, as people with similar points of view are subject to similar cognitive biases (including ‚operational blindness').

Outside-in thinking

In outside-in thinking, we look at the big picture first (outside view) and only then at the details or the specific case (inside view). However, people generally start with the inside view because this corresponds to their preference for detailed stories. In order to embrace the outside view, it is important to determine a base rate – the frequency of similar events occurring over a period of time. This shows how similar situations have developed in the past. If we draw conclusions from the inside view, i.from the individual case to the general, or ignore fundamental characteristics, this can lead to distortions in our thinking. Instead, we should start with the external point of view as our point of departure. This will help us to assess and categorise individual cases correctly.

3

Cognitive biases

Confirmation bias

Confirmation bias is the tendency to interpret new information in a way that confirm our existing hypotheses, theories and world views. Information that is inconsistent with or even refutes these (disconfirming evidence) is filtered out or ignored. Confirmation bias allows our brain to satisfy its need for clarity and order. The more ambiguous a situation is, the stronger the effect of confirmation bias. The internet, social media and algorithms help us to consume more information and opinions which support our point of view. Conflicting views and opinions are often filtered out in advance. Confirmation bias is particularly strong in such filter bubbles and echo chambers, where people with similar views constantly reinforce each other.

Figure 5 *Confirmation bias*

Examples

An analyst believes that rising tensions in a political crisis pose no threat to the government. He reads reports that confirm this in detail and includes them in his products. On the other hand, he ignores contradictory information, believing that it represents only the opposition‘s point of view.

A source handler is proud of a recently recruited source. Initial information confirms exclusive access. However, a series of surprising events raises doubts about the source‘s reliability and integrity. Information that challenges the source is dismissed by the source handler as unfounded. Conversely, information that is supportive of the source is readily accepted.

What I can do about it

- Test assumptions through systematic identification and verification.[1]
- Try to disprove as many hypotheses as possible, rather than confirming the most likely one. The most likely hypothesis is the one for which there is the least amount of contradictory information – not the one for which there is the most confirmatory information.[2]
- Stress test: Write down your beliefs and actively look for counter-evidence (‘murder your darlings’). Try to disprove leading hypotheses and the central assumptions behind them.[3]
- Think the opposite: Consciously ask yourself whether the opposite could be true. This can also be done as a red team assessment in a group.
- Always ask yourself what the value of new and contradictory information might be. Force yourself not to prematurely dismiss information that contradicts your own judgement.
- Dare to change your opinion in the light of plausible new evidence, even if you have previously held it firmly.

1 Handbook Methods for Early Detection and Anticipation, p. 27.
2 Ibid, p. 97.
3 Ibid, p. 84.

2 Hindsight bias

Hindsight bias is one of our most persistent fallacies. It describes the tendency to see our decisions or events in retrospect as right, necessary, predictable or inevitable. It is often associated with the idea that things could not have turned out any other way. Alternative paths of development are dismissed as implausible. Hindsight bias also leads us to believe that we are better forecasters than we actually are. We underestimate the complexity of our environment and overestimate the predictability of events and developments. Retrospectively, our lives therefore often appear to be a logical sequence. Here, too, our brain tries to artificially create order and thus security. The hindsight bias prevents us from learning from our experiences. For example, if we always have the feeling that we are right in our judgements, it is unlikely that we will look back on them and ask ourselves whether we were wrong.

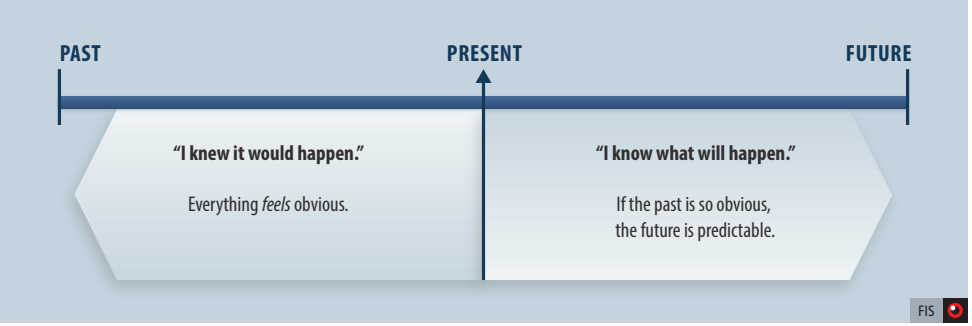

Figure 6 *Influence of hindsight bias on predictions*

Examples

An analyst believes that attacks by a terrorist group are very unlikely. When an attack happens, he is forced to change his mind. Two months later, he reports to a meeting and says, "We have always underscored the high probability of terrorist attacks." He sees no contradiction with his earlier assessment.

For a study, students were asked to predict how the US Senate would vote on the confirmation of a Supreme Court nominee. A month after the vote, they were asked to recall their predictions. While 78 per cent said they were correct, the actual figure was only 58 per cent. Many were subject to hindsight bias.

What I can do about it

- Formulate your own predictions clearly, write them down and compare them later with actual developments.
- In retrospect, consciously imagine alternative paths. This refers to developments that were possible but did not happen.
- Participate in a crowdsourcing platform. This helps you to practise your own forecasting skills and objectively check how good your own forecasts actually are.

3 Outcome bias

Outcome bias describes the tendency to judge our decisions by the outcome rather than the quality of the decision-making process. Positive outcomes are not necessarily the result of optimal decision-making. Luck and chance play a much larger role than we realise. This tempts us to repeat risky, flawed and – in some circumstances – unethical decisions. Conversely, the end result of a well thought-out and methodically sound process can still be negative. This can lead to the wrong decision to abandon the process. When evaluating our decisions, it is therefore important to record the chosen method and the thought process used to identify possible errors and opportunities for improvement. The trick is to recognise when chance (good or bad luck) has played a part in determining the outcome. Ideally, we should think about the process before making a decision and actively shape it.

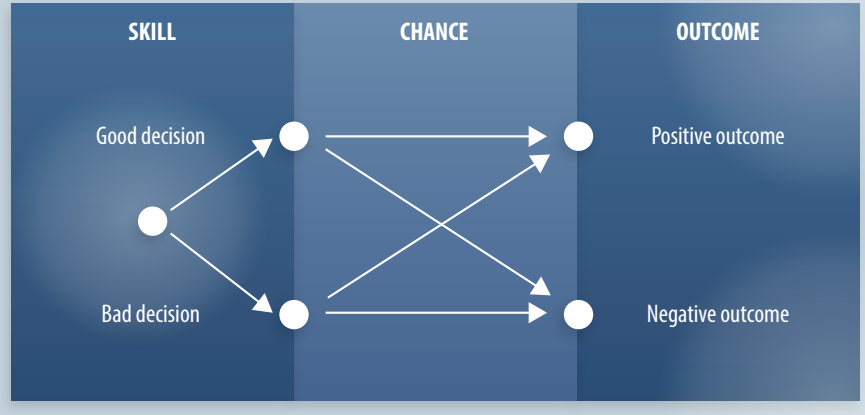

Figure 7 *Decision quality and outcome*

Examples

A counter-terrorism analyst says that terrorist attacks in the country are highly unlikely in the next few weeks. During a routine check in a neighbouring country, the police discover a large quantity of explosives in a vehicle and arrest the suspected occupants. The lack of attacks confirms the analyst's assessment.

A stakeout is meticulously planned and intensive preparations are made for all eventualities. During the execution of the plan, a blackout occurs in the area where the surveillance is taking place. The target manages to escape undetected. Although the plan was basically sound and the failure was due to an uncontrollable factor, the stakeout team is withdrawn from the field because of the failure.

What I can do about it

- Keep a detailed record of how decisions get made. This will make the decision transparent, easy to understand and verifiable. Before evaluating the outcome of a decision, look back and analyse the steps and factors that led to the decision. This can also be done as part of a team debrief.
- Ask yourself the following questions: Was the decision based on understandable, reasonable grounds? Were external perspectives considered? Were the opportunities and risks properly weighed up? What role might luck and chance have played?
- You should not be blinded by positive results or discouraged by negative ones as long as the process is right. Remember: *„You often learn more by being wrong for the right reasons than you do by being right for the wrong reasons.“*

4 Availability bias

Availability bias is a shortcut in our thinking based on the fact that we consider events more likely if a similar event happened recently or if an event left a lasting impression. We can recall such events more quickly and easily. One consequence of this is that we systematically underestimate or overestimate the probability of events because we do not base our judgements on their actual frequency. Abstract data and facts are less easily accessible to our brains than personal experiences or simple messages that are repeated often. For example, people often overestimate the risk of dying in a plane accident or being murdered because of the high level of media exposure. At the same time, they underestimate the risk of dying from a less spectacular but much more common cause of death, such as a heart attack or stomach cancer.

A subtype of availability bias is vividness bias: when selecting and evaluating information, we tend to give more weight to information that is particularly concrete and vivid. Anecdotes and case studies are more memorable than abstract relationships or statistical data.

Examples

After the 9/11 attacks, many people in the US stopped flying and started driving for longer distances. The fear of another attack was very much on their minds. Statistically, however, flying is much safer than driving. Even if terrorists were to carry out monthly attacks in the US with the same number of victims as on 9/11, the chances of dying in such an attack (1 in 135,000) would still be lower than in a car accident (1 in 6,000).

After a successful coup in a country, a partner service warns urgently and repeatedly of the danger of further coups in the region. The analyst in charge knows that there have been only two coups in the region in the last 20 years. Nevertheless, based on the alarming reports from the partner service, he considers the probability of further coups to be high.

What I can do about it

- Take the base rate and long-term trends into account when assessing probabilities.
- Carry out a Devil's advocate or a red team assessment. Someone takes on an opposing role and deliberately questions the prevailing opinion. This helps the group to recognise weaknesses in their thinking.[4]

4 Handbook Methods for Early Detection and Anticipation, p. 84.

5 Anchoring

Information that is made available to a person at an early stage in the decision-making process has a subconscious anchoring effect. Assumptions and judgements are then made on this basis. New information is also filtered and evaluated on the basis of the anchor. Once an anchor has been set, it is rarely possible to completely disengage from it. Anchors influence us regardless of our expertise or experience. They can also consist of irrelevant knowledge that has nothing to do with the question being assessed. Here is an example: in an experiment, psychologists Daniel Kahneman and Amos Tversky had participants spin a wheel of fortune. They then asked them about the number of UN member states. People for whom the wheel of fortune had stopped at a small number often gave a lower number of member states than those who had spun a large number.

Examples

An analyst changes subject areas and has to make an initial assessment. In doing so, she relies to a large extent on the assessment in her predecessor‘s products.

I want to predict how a conflict is going to develop. Rather than do my own thinking, I read a partner service‘s forecast and base my assessment on it.

When hostages are taken, the perpetrators demand a high ransom of CHF 8 million. However, this amount is not their real demand, but merely a starting point that enables to start negotiations at a high level.

What I can do about it

- Reformulate or re-evaluate questions using standardised procedures such as checklists and environmental analyses.
- Consider what the anchor is in a particular situation. How and why might it bias your judgement?
- Use multiple sources to check the facts. Give due consideration to new information, especially if it challenges your own judgement.

Overconfidence bias

The difference between what we really know and what we think we know is called overconfidence bias. We systematically overestimate our knowledge and skills. This is particularly true of predictions, since the future is open and therefore fundamentally uncertain. Studies have shown that experts are even more prone to overconfidence than laypeople when making predictions in certain situations in their field. Social psychologists explain this fallacy in terms of our need to maintain a positive self-image. The less information we have, the more likely we are to fill gaps in our knowledge with assumptions rather than facts, often mistaking these assumptions for facts.

The Dunning-Kruger effect is a particularly insidious form of overestimation: people whose knowledge is objectively low often overestimate their abilities. At the same time, they tend to underestimate the performance of more competent people. Ignorance of one's own lack of knowledge also slows down the learning process. Figure 8 below shows the four stages of such a process. At first, with our initial knowledge of a topic and early experiences, our self-confidence generally increases more than our competence. We gradually acquire more knowledge and skills. As we do so, we become increasingly aware of the complexity of the topic, which causes our confidence to decrease. If we apply the newly acquired knowledge consciously and with concentration, our self-confidence gradually increases again. However, long-term experts are at greater risk of other cognitive biases, such as confirmation bias and mirroring.[5] This is because experts can unconsciously apply their System 1[6] knowledge and skills in many situations. In doing so, they rely on heuristics [7] and intuition, which are highly susceptible to cognitive bias.

5 See also „Confirmation bias“ on page 26 and „Mirror imaging“ on page 44
6 See also „System 1 and System 2 thinking“ on page 14
7 See also „Cognitive shortcuts (heuristics)“ on page 17

Examples

When they invaded Ukraine, the Russians reportedly thought they could reach Kyiv in three days. Russian strategists were surprised by the morale and resilience of the Ukrainians and by the reaction of the international community. Moreover, they clearly overestimated their own capabilities.

Following the announcement of the US withdrawal from Afghanistan, it was clear that the Afghan armed forces would come under pressure. However, the speed with which Kabul fell after the withdrawal of US troops in the summer of 2021 surprised many observers. While the strength of the Taliban was underestimated, that of the Afghan armed forces – trained by the Western coalition – was overestimated.

What I can do about it

- Show intellectual modesty. Know the limits of your own knowledge and admit them to others.
- Reflect continuously on your own abilities and performance. This includes admitting mistakes and striving to better understand contexts and circumstances (rather than just being right).
- Be open to feedback. Don't ignore input just because it is uncomfortable or contradicts your own views.
- Develop the drive and discipline to learn new things and improve your own skills.
- Participate in a crowdsourcing platform and analyse your own results. These will show you how good your own predictions really are.

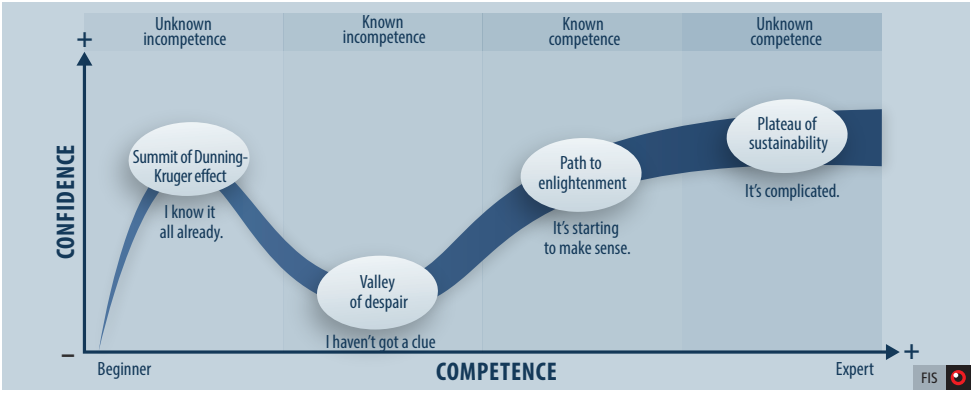

Figure 8 *Competence curve*

Sunk cost fallacy

A common misconception in many areas of life is the sunk cost fallacy. This bias often occurs when we have already invested a lot of time, money or energy in something. We use the costs incurred as a reason to continue with something even if objectively it makes little sense to do so. We ignore the fact that it is sometimes the better option for us to abandon a goal, change paths or cancel a project. However, the greater the effort already made, the stronger the urge is to continue.

An important psychological predisposition to the sunk cost fallacy is that we strive to appear consistent both internally (how we perceive ourselves) and externally (how others perceive us) in order to appear credible. This includes avoiding contradictions. However, contradictions arise when we change our minds – especially if all our previous work or even our reputation could be called into question. By continuing with a failed project, we delay this unpleasant realisation and at least maintain the appearance of consistency.

Examples

After invading Afghanistan as part of the war on terror, the US maintained a presence in the country for 20 years. More than 2,500 US soldiers lost their lives. When discussing a possible withdrawal, it was always pointed out that the country could not be left in an unstable state, as the soldiers would then have died in vain.

At a briefing, you continue to defend your own unsubstantiated hypothesis because you already invested so many hours of work in it – not because it is based on a rational consideration of the facts.

What I can do about it

- Focus on current and future costs and benefits rather than on the work already done. Consider and be aware of opportunity costs.
- Use IT systems in decision-making to increase rationality and reduce the distorting influence of our emotions.
- Seek advice from outsiders. With their unbiased view, they can usually judge the state of a project more objectively than we can. It is important not to dismiss advice prematurely just because it is not what we want to hear.

3.8 Absence of evidence

In intelligence analysis, key information is often missing (absence of evidence). This is a challenge because human thought processes are designed to reduce complexity, not increase it. As a result, our brains do not normally worry about what information might be missing, but work primarily with what is currently available. Analysts should be able to identify relevant knowledge gaps and incorporate them in their assessment. In doing so, they should be able to assess the potential impact of the missing data and adjust the confidence in their judgement accordingly. However, studies show that the adage 'out of sight, out of mind' often reflects how missing information is treated: information gaps are either not mentioned at all or only in passing. The final assessment also fails to adequately consider and prioritise knowledge gaps. There is also little consideration of whether the observed lack of information is 'normal' or, on the contrary, an indicator of unusual activity or inactivity, i.e. absence of evidence is not evidence of absence.

Examples

A country is known for its successful espionage activities. Although one's own counterintelligence resources are robust and focused on this country, no such activities can be detected. This leads to the conclusion that the adversary is not interested in local information and has probably focused its espionage activities elsewhere.

Due to a technical glitch, no recent satellite images can be taken of the disputed border area between the two countries. Despite this lack of information, a report states that the situation remains unchanged.

What I can do about it

- Ask yourself what you know and what you don't know. Make your own knowledge gaps and the resulting uncertainties transparent. Ask yourself if and how you have filled the gaps. Take this into account in your conclusions.
- Test your assumptions by systematically identifying and questioning them.[8]
- Be aware that the lack of information may also be the result of a deliberate concealment tactic. Always ask yourself whether you don't see something because the other side wants you not to.
- Missing information may also be key information (cf. Sherlock Homes' „*dog that didn't bark*").

8 Handbook Methods for Early Detection and Anticipation, p. 27.

9 Failure of imagination

Failure of imagination became best known in connection with the 9/11 Commission's report on why intelligence failed to prevent the attack. It describes the fact that no provision is made for certain developments because the event is beyond the imagination of those in charge. A major reason for this fallacy is the expectation that the opportunities and risks of the present and future are or will be similar to those of the past. This overlooks the fact that even extremely unlikely events – so-called wildcards – are fundamentally possible and can occur. Of particular relevance in this context are events that are extremely unlikely but have a very large impact, i.e. high impact low probability (HILP) events. When scenarios are being developed, the ones that are considered to be unlikely are often not worked out and tested in detail and are therefore dismissed at an early stage. As a result, the risk of falling victim to a failure of imagination is accepted. This risk is exacerbated by a lack of space and time for creative thinking.

Examples

Before 9/11, planes were hijacked for ransom or to release captured militants. But few could have imagined that planes would be used to deliberately destroy buildings.

Few political observers initially took Donald Trump's candidacy for the 2016 US presidential election seriously. Even after his nomination, it was generally not expected that Trump would actually be elected. As a result, key foreign and security policy institutions around the world did not develop strategies for a possible Trump presidency.

What I can do about it

- Use the scenario technique to describe different possible futures, including extremely unlikely ones.[9]
- Improve active open-mindedness. Seek and explore new ideas and perspectives that can and should be different from your own.
- Foster an environment that encourages creative thinking. Others should feel encouraged to share all their ideas, even if they seem unorthodox.

9 Handbook Methods for Early Detection and Anticipation, p. 92.

Mirror imaging

Mirror imaging results from people perceiving and processing information through the filter of their own experiences. This creates a tendency to believe others share our views. Gaps in our knowledge are filled with assumptions shaped by our personal views or values. This compromises the objectivity of our conclusions and findings. Mirroring our culture, views and preferences can go so far that we see developments only through this lens. We end up with a picture that makes sense to us, but does not take into account that people and groups from different backgrounds think and act differently. To put it bluntly: what is irrational behaviour for us may be a logical next step for our counterpart.

Examples

In May 1998, an Indian nuclear weapons test took the US intelligence community by surprise. Three years earlier, such a test had been cancelled, partly due to political pressure from the US government. Analysts therefore assumed that the Indian government would refrain from conducting another test. As a result, they failed to take into account the dynamics of Indian domestic politics and the newly elected government.

In the weeks and months leading up to Russia's war of aggression against Ukraine, many European intelligence agencies predicted that Russia would not launch an invasion. One of the reasons given was that an invasion of Ukraine would be at odds with a sound assessment of the costs and benefits and would therefore be irrational. This misjudgement was heavily influenced by the agencies' own rationality.

What I can do about it

- Test assumptions by systematically identifying and questioning them.[10]
- Carry out a devil's advocate exercise or a red team assessment. Someone takes on an opposing role and deliberately challenges the prevailing view. This helps the group to identify weaknesses in their thinking.[11]
- Try to disprove as many hypotheses as possible, rather than confirming the most likely one. The most likely hypothesis is the one for which there is the least amount of contradictory information – not the one for which there is the most confirmatory information.[12]
- Ensure that the products are peer-reviewed. Where possible, peer reviewers should have, or at least be able to adopt, a perspective that is clearly different from that of the author.

10 Handbook Methods for Early Detection and Anticipation, p. 27.
11 Ibid., S. 84
12 Ibid., S. 97.

Groupthink

Groupthink is when the members of a group adjust their opinions to fit the perceived consensus. It is caused by a desire for agreement, particularly in people who prioritise the desire for harmony in the group over the motivation to consider alternatives carefully. Other factors that encourage groupthink are flaws in the group structure (e.g. lack of diversity) and challenging circumstances (e.g. high stress levels or an acute threat situation).

According to Irving Janis, the psychologist who coined the term 'groupthink', these factors lead to three key patterns of behaviour:

- **Overconfidence: The group feels like a conspiratorial and invincible unit. They are under the illusion that they can achieve anything.**
- **Narrow-mindedness: People justify the (wrong) decisions of the group without reflection, think in stereotypes and systematically ignore information that contradicts the planned course of action.**
- **Pressure to conform: Members with dissenting opinions are pressured to conform or hold back so as not to undermine the group's consensus.**

Examples

The landing at the Bay of Pigs in Cuba in 1961 is considered one of the greatest fiascos in American foreign policy. All assumptions about the strength of the Cuban armed forces proved to be wrong and the contingency plans unrealistic. As the review showed, President Kennedy's advisers felt morally superior to the Cubans because of the widespread anti-communism of the time. In addition, the planning group, which always worked by consensus, acted arrogantly and failed to question critical points.

During a meeting as part of an operation, the source handler assures the team that the information provided to him is credible. In order not to jeopardise the objectives of the operation and the team, he does not dare to admit that his source has given him ambiguous answers to his questions.

What I can do about it

- Form (cognitively) diverse groups and teams. Cultivate an inclusive leadership style. Create space for reflection and internal criticism, including anonymous expression. Enable a positive failure culture.
- Carry out a devil's advocate exercise or a red team assessment. Someone takes on an opposing role and deliberately challenges the prevailing opinion. This helps the group to identify weaknesses in their thinking.[13]
- Involve external experts who can provide an outside perspective.
- Let the person at the bottom of the hierarchy speak first.

13 Handbook Methods for Early Detection and Anticipation, p. 84.

Bandwagon effect

The bandwagon effect refers to the willingness to align oneself with the majority in terms of attitudes and behaviour. The behaviour of the majority is assumed to be correct. The more people hold a particular opinion, the more credible it appears. As a result, one's own convictions are ignored or overridden. The great danger is of the bandwagon effect overriding the critical thinking of an individual, which would normally lead to good decisions. There are several reasons for the bandwagon effect. One of these is efficiency: following the crowd allows us to make a quick decision. Widespread agreement with something is taken as a sign that we should adopt a similar attitude. Another reason is that we want to be part of a community. By conforming, we avoid being excluded. A third reason is that we want to be on the winning side and reap the benefits. In the intelligence environment, for example, the bandwagon effect can occur when it is easier and more comfortable to go along with the existing opinion of a group of analysts than to develop and defend one's own point of view.

Examples

In politics, the bandwagon effect can lead voters to vote for the leading candidate in the polls simply because they want to be part of the majority.

In a status report, the analysts involved come to the same conclusion. The assessment is uncritically and superficially reviewed by management, because in this case the technical experts are in agreement.

What I can do about it

- Carry out a devil's advocate exercise or a red team assessment. Someone takes on an opposing role and consciously questions the prevailing opinion. In doing so, they help the group to recognise weaknesses in their thinking.[14]
- Slow down the decision-making process. Allowing some time to elapse between the perception of social signals and our final decision gives us a chance to reflect. It also ensures that we do not rush to adopt the ideas of others.

14 Handbook Methods for Early Detection and Anticipation, p. 84.

Authority bias

Authority bias is the tendency to give greater weight to and be more influenced by the opinions of authority figures – including experts – regardless of their content. In everyday working life, this tendency can be observed, for example, when the opinion of the team member with the most experience, the highest status or even the strongest opinion is reflexively followed when the data situation is unclear or information is not available. In addition to heuristics for faster decision-making, socialisation also plays a role in the authority bias. Most people learn to follow and trust authority as children. Experiments have shown that we tend to follow authority even when it is irrational or morally wrong. In the Milgram experiment, for example, test subjects were asked to administer electric shocks of increasing intensity to a trained actor. No electricity was administered, but the actor simulated the painful reactions. When the test subjects wanted to stop the experiment, the experimenter asked them to continue. Over half of the participants continued up to the maximum current intensity. In some cases, the authority bias also manifests itself in the fact that individuals in positions of authority are perceived as competent not only in their own field but also in areas where they have no expertise. This is a manifestation of the halo effect, where unknown characteristics of a person are inferred from known characteristics.

Examples

An analyst has recently joined an intelligence service. At the morning briefing, the Head of Section asks him if he agrees with her assessment of the latest developments in his area of expertise. The analyst agrees, although he cannot verify her assessment with his sensors.

A well-known philosopher expresses his views on the Russian war of aggression against Ukraine. Despite his lack of expertise, he is frequently interviewed by the media as the war progresses on issues relating to international law, warfare, diplomacy and international relations.

What I can do about it

- Where possible, critically examine and, if appropriate, challenge the expertise and decisions of authority figures.
- Create an inner distance between yourself and the authority figure, and only make decisions after a period of reflection.
- Aim for a diverse team with people who think critically and actively share their opinions.

Base rate fallacy

The base rate is a statistical term that describes how often a characteristic occurs in a population. When we have both specific information about a particular person or event and information about the base rate, we tend to assign a higher value to the specific information. The base rate is often omitted. This is known as the base rate fallacy. If you ignore statistical data in your analysis and instead focus solely on individual examples and anecdotes, you are at a high risk of falling victim to bias. As studies have shown, people naturally prefer stories to numbers and statistics. Because they are more abstract, we see them as less relevant. One consequence of this is that we do not, or do not sufficiently, take the base rate into account when making decisions, even though in principle we could. The representativeness heuristic, the tendency for people to see a single event or person as typical of a larger group, is a particularly important contributor to the base rate fallacy.

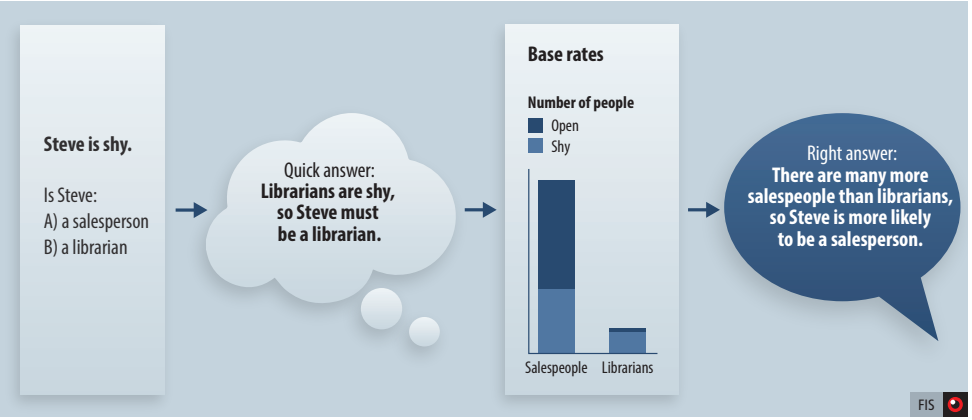

Figure 9 *Base rate fallacy*

Examples

Tensions in the South China Sea have been rising for weeks. The media is reporting a major military exercise by the Chinese armed forces, while the US president is on a state visit to Japan and has announced an increase in the US troop presence in the region. In addition, there has been a series of dangerous close encounters between Chinese fighter jets and US reconnaissance aircrafts. Against this backdrop, the analyst responsible estimates that a fatal incident is likely to occur in the next three months. This does not take into account the base rate for such incidents, which is very low.

An analyst estimates that the probability of a change of government in a country is very low because the current government has had a solid majority in parliament for three years. He forgets that, statistically speaking, there is a change of government in this country every 2.6 years.

What I can do about it

- Pay more attention to the base rates available. Start your analysis looking for different base rates. Only as a second step should situational information be included in the assessment.[15]
- Include statistical values in the analysis. Present them appropriately. For example: „On average, there is a change of government every four years in this country."

15 See also „Outside-in Thinking" auf Seite 23

Conjunction fallacy

The conjunction fallacy is an error in reasoning in which the combined occurrence of two or more traits is considered more likely than the occurrence of a single trait. Mathematically, however, the probability of the combined occurrence of two or more traits can never be greater than the probability of the individual trait. Deception occurs when a non-stereotypical trait meets a stereotypical trait. For example, Stephanie was convicted of various offences such as criminal damage and assault when she was young. Is Stephanie politically active, or is she both politically active and a member of a violent extremist group? As the violent extremism characteristic seems plausible to us, we consider the combination of the two characteristics to be more likely, even though it is mathematically less likely. Even when we are aware of the fallacy, it is difficult to overcome because the brain gives more weight to seemingly conclusive explanations than to abstract probabilities.

Examples

Which of these statements is more likely? „He disclosed classified information to the other side“ or „He disclosed classified information and is ideologically very close to the recipient“. The first is more likely, because motives other than ideology can be the trigger for such an offence, such as money, blackmail or prestige. The number of people who spy for ideological reasons is only a subset of all people who engage in espionage.

A group of experts is asked to assess the likelihood of two scenarios for the coming year. The first scenario is „The president will no longer be in office“ and the second is „The president will be replaced by a representative of his inner circle in a coup“. The second scenario is likely to be rated as more probable than the first because it contains additional information and therefore seems more plausible.

What I can do about it

- Try to think statistically and consult the base rates. Strengthen your own capacity for cognitive reflection. Take time to make decisions and do not rely on the first answer that comes to mind.
- Become aware of your own use of heuristics, stereotypes and prejudices through feedback from others.
- As a manager, ask test questions to find out what people really think.

Survivorship bias

Survivorship bias leads us to systematically overestimate the probability of success because successful projects or people are more visible in everyday life than failures. The name came about in the context of data sets that only included observations of survivors. This bias can have far-reaching consequences at the individual level, for example in financial or entrepreneurial decisions. Failures masked by survivorship bias include failed start-ups, university drop-outs, actors who fail to make it in Hollywood, and ineffective therapies.

Examples

During the Second World War, a group of researchers tried to find out how to protect fighter planes to improve the chances of survival for the crew. To do this, they analysed which parts of the returned planes had the most bullet holes in order to strengthen them. However, what they ignored was the fact that the planes with bullet holes in the most critical areas did not return at all. Consequently, those parts that remained undamaged on the returned aircraft should have been strengthened.

An IT service provider in the security industry advertises its services with a large number of case studies. They are supposed to prove how successful and secure his products and services supposedly are. For obvious reasons, he does not mention his failures.

What I can do about it

- Before making a decision, ask yourself what information might be missing and research any missing data points.
- Be careful when selecting datasets. Make sure that the source of the data is reputable and reliable. Consider the completeness of the data and identify gaps. Missing critical data points can have a negative impact on the analysis and decision-making process.

Clustering illusion

The clustering illusion describes the tendency to see supposed patterns and relationships in random and meaningless data points. The bias is another vivid example of how we seek order and coherent explanations and struggle to accept randomness and chaos. Following the same logic, the bias is that we prefer causal explanations even when there are none. When tossing a coin, even if tails comes up ten times in a row, it is still only a coincidence.[16]

We are often all too quick to assume a clear causal relationship. This assumption is known as spurious causality. Two developments may just seem to be related, they may have an invisible common cause, or they may be related in opposite directions. Moreover, correlation does not imply causation.

Clustering illusions and spurious causalities are more likely to occur when we have little personal experience or knowledge in an area or situation. The clustering illusion plays a central role in conspiracy theories. Particularly when people feel powerless, there is an increased tendency to connect unrelated events together and see an invisible hand controlling everything.[17]

16 Provided the coin is not loaded.

17 See also „Perceived centralised control“ on page 60

Examples

During the Second World War, Londoners tried to spot patterns in German bombing raids. They would then move their place of residence or the time they withdrew to an air raid shelter. However, post-war research showed that the timing and distribution of the bombings was almost random.

In the run-up to D-Day, military code names such as Overlord, Omaha, Utah and Mulberry, which were related to the Allied landings in Normandy, appeared in crossword puzzles in a British newspaper. Treason was suspected. The puzzle creator was questioned by British intelligence but nothing could be proven against him. The appearance of the codes in the crossword puzzles was subsequently chalked up to coincidence.

What I can do about it

- Raise awareness of the impact of this bias. Increase your knowledge and training in relevant areas.
- Use objective data and statistics to make decisions, rather than relying on perceived patterns or clusters. Improve your statistical reasoning.
- Be open to different possible explanations when you see apparent patterns or clusters in data. Consider whether it could be a coincidence.

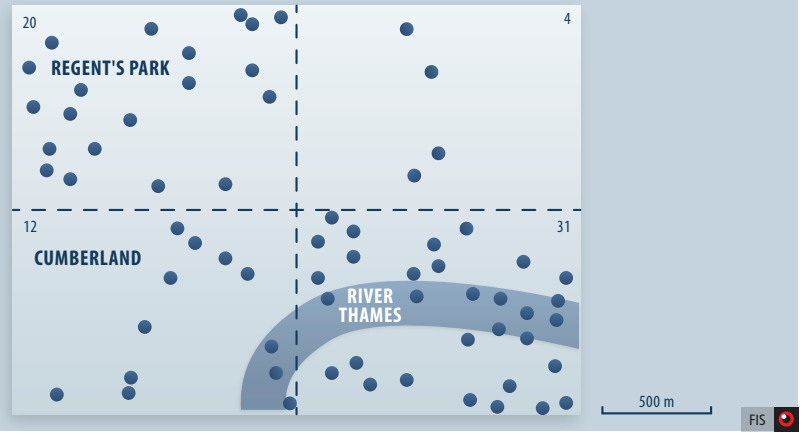

Figure 10 *Distribution of bomb hits in London*

Perceived centralised control

Closely related to the clustering illusion is the illusion of perceived centralised control. We tend to see the actions of other groups as the result of deliberate and centralised planning and control. Actors are often perceived from the outside as homogeneous, when in fact they are not. We find it difficult to see that the actions of individuals or organisations are also shaped by chance and unintended consequences. Instead, we often see power games, coordinated action or – in extreme cases – even conspiracies. In the intelligence context, for example, perceived centralised control can lead analysts to overestimate the extent to which other states are deliberately pursuing a particular policy. They may also find it difficult to account for random and unpredictable factors.

Examples

The authoritarian government of a country has a reputation for keeping a close eye on its political opponents in exile. Elections are due in the country and the government is under pressure. Suddenly, two key opposition figures die of cancer in quick succession. The analyst in charge thinks to herself: „This can't possibly be a coincidence!"

During the 1956 Suez Crisis, the North American Air Defence Command received simultaneous reports of unidentified aircraft over Turkey, Soviet jets over Syria, a downed British bomber and the redeployment of the Black Sea Fleet through the Dardanelles. Previous threats by the Soviet Union against the West led to the assumption that an offensive was imminent. In the end it turned out to be an accidental combination of false and misleading reports. In reality, it was a flock of swans over Turkey, a fighter jet escort for the Syrian president, a mechanical problem that caused the British bomber to crash, and a planned, regular naval manoeuvre.

What I can do about it

- Be open to different possible explanations when interpreting the behaviour of governments and other groups. Is there a real strategy behind it? Or perhaps just opportunism? And what role does chance play?
- Test assumptions by systematically identifying and questioning them.[18]
- Be aware that poor decision-making processes can also lead to the desired outcome.

18 Handbook Methods for Early Detection and Anticipation, p. 27.

4 Annexes

List of illustrations

List of sources

Figure 3	Illustration adapted from Fibonacci, Müller-Lyer Illusion, CC BY-SA 3.0, https://www.creativecommons.org/licenses/by-sa/3.0/>, via https://www. com-mons.wikimedia.org/wiki/File:Müller-Lyer_illusion.Svg
Figure 5	Illustration adapted from VectorMine (2021), Confirmation bias vector, https://www.depositphotos.com/vectors/overconfidence.html?qview=470191888
Figure 6	Illustration angepasst von Frontera (2022), Hindsight Bias Meaning and Examples, https://www.fronterablog.com/hindsight-bias-meaning-and-examples/
Figure 9	Illustration adapted from Frontera (2022), Hindsight bias meaning and examples, https://www.fronterablog.com/hindsight-bias-meaning-and-examples/
Figure 10	Illustration adapted from Albert Bridge Capital, adopted from Gilovich, T. (1991). *How we know what is not so: The fallibility of human reason in everyday life*, https://www.alterbridgecapital.com/post/deceived-by-non-randomness

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