

# Bedtime Stories or Bali?

Decisions follow a script all their own. Sometimes current facts play a role, sometimes utility is the driving force – and sometimes they are rooted deep in human evolutionary history.

**Ralph Hertwig**, Director at the **Max Planck Institute for Human Development** in Berlin, studies the dynamics of choice, uncertainty and risk. And he advises grandparents to help look after their grandchildren.

TEXT **MARTIN TSCHECHNE**

Perhaps it is of no great importance that Susanne has been to Italy, has accounting experience and previously worked at Lidl. She speaks Dutch and has a friendly nature. Maybe that's more important. Every piece of information could be the one that makes the difference. Anna also speaks Dutch, but she worked at Aldi, has advertising experience, lived abroad in Sweden and radiates authority. Anika Josef and Thorsten Pachur, psychologists at the Max Planck Institute for Human Development in Berlin, haven't made it easy for the participants in their study. They asked women and men from a variety of age groups to decide who is better suited for a job, then inundated them with information about fictitious applicants: Susanne and Anna, Julia and


Carmen, Franziska, Melanie and Vera; their foreign languages, previous employers and areas of special expertise, biographical details and character traits. In reaching a decision, the participants must either tolerate uncertainty or eliminate it. So which candidate is the best?

Is this a realistic situation? Sure, says Thorsten Pachur: processes such as organizing our personal lives; dealing with the growing complexity of the work environment, the rapid changes in technology in both domains, and the demands of an increasingly compartmentalized market; and choosing between insurance policies, investments, and even green energy or telecommunications suppliers; all require detailed knowledge of facts, a good memory and keen judgment. In his

dissertation nine years ago, Pachur already examined how the outside world is reflected in our minds. And, as doctoral student Anika Josef points out, things don't become any less demanding with age.

## DIFFICULT DECISIONS AMID INFORMATION OVERLOAD

The team of neuroscientists, economists, philosophers, biologists and mathematicians headed by psychologist Ralph Hertwig at the Max Planck Institute in Berlin is breaking new ground in the research field of adaptive rationality: How can the world be expressed in terms that can inform decisions? What level of precision is required? And how much uncertainty can be tolerated, or may even be help-



To jump or not to jump?  
Some decisions depend  
primarily on an individual's  
risk-taking propensity.



» Not many 60-year-olds will expose themselves to the risks of bungee jumping. Simply because, at their age, it's no longer necessary.

ful, when time is short, information is incomplete, or – as some of us have already noticed – it becomes increasingly difficult with age to remember names and other details? Research on adaptive rationality addresses how real people navigate the real world – a world that isn't rationally structured and manageable down to the last detail, a world inhabited by people who are sometimes overwhelmed by the sheer abundance of choices.

But wasn't it this Institute that attracted so much attention, well beyond scientific circles, by identifying strategies that empower people to make good, or at least satisfactory, decisions even under significant constraints? Namely by applying simple heuristics such as the recognition heuristic, which states that if better information isn't available or retrievable, or if the amount of information is overwhelming, it may be sufficient to choose the option you're more familiar with, the one you recognize or have heard before. Which city is larger: Detroit or Milwaukee? Regular readers of the financial pages may rack their brains weighing up the declining automotive industry on the one hand and the prospering brewing trade on the other – and come to the wrong conclusion. Whereas simply choosing the more familiar name from a European perspective, without putting great thought into details and background information, will deliver the right solution: Detroit, of course.

And wasn't it this Institute that developed the adaptive toolbox, full of easy-to-apply solutions that confirm that we really don't need to weigh up every little detail in day-to-day life in order to select a decent meal from a menu, for example? Or to get a sense of which candidate is suitable for a job after just a few moments, a few words, taking only sparingly selected data into account, based only on our experience and understanding of human nature? Surely someone who's worked in an HR department for 20 years is able to perform this feat with their eyes closed?

#### YOUNG ADULTS GET THE MOST HITS

"I worked long and hard on the adaptive toolbox with Gerd Gigerenzer," says Hertwig. "We're still working on it." The solutions Gigerenzer proposed – fast and frugal, quick and easy – retain their alluring elegance, an almost aesthetic quality, but to establish their validity, researchers now need to explore their limits. "What do you think more people in Germany die of today: cholera or botulism?" asks Pachur, with an enigmatic smile. Even the friendly hint that "botulism" means "food poisoning" doesn't stop his interviewer from backing the wrong horse. After all, we've all heard of cholera; we all have a mental picture of the terrible epidemic that wiped out millions, even if we practically only ever read about in history books. But when

was the last time you heard of a case of botulism? There you go then. Or not? Cholera is the wrong answer. Hertwig gives a satisfied nod.

And it's precisely here, he says, that his research into adaptive rationality steps in. The goal is to pave the way for widespread risk literacy – that is, the ability to recognize, accept and react appropriately to everyday uncertainties. It is against this background that Anika Josef and Thorsten Pachur asked their study participants in the Institute's research lab to perform tasks requiring mature judgment and a keen memory: Which lottery drum is the better bet? Which is more appealing – one where almost every ticket promises a small prize or one offering a large win with a frequency that can be determined through trial and error? If there are just two drums, the solution may emerge quite quickly; if there are eight, however, the numbers begin to dance. And older participants typically do less well.

"Fluid intelligence," explains Pachur, "is the ability to adjust flexibly to the demands of a new situation, to identify the key elements and be able to recall them. It peaks in young adulthood and declines steadily from then on." This finding has long been recognized in the cognitive sciences. But the declining ability to adapt to new situations is often offset by crystallized intelligence. Experience, mature knowledge of the world and a rich and nuanced vocabulary: all of



Right or left? We constantly have to make decisions, often in complex situations, under time pressure and without all the necessary information. Ralph Hertwig, Director at the Max Planck Institute for Human Development, studies which strategies people use to make these decisions.

this helps older adults to spot patterns, separate the important from the unimportant, and develop efficient strategies – provided that the task corresponds to the experiences of the world they have gradually constructed, continually revised and cleverly arranged over time. Provided, in other words, that the world doesn't consist of eight lottery drums with different chances of winning.

And yet sometimes it does. Sometimes none of our routines can help – as anyone who has ever despaired of installing the latest apps on their smartphone is painfully aware.

The experiments being run in the lab facilities at the Max Planck Institute for Human Development are thus also putting a myth to the test: an air-brushed version of aging, according to which everything gets better, big-

ger and freer after the age of 50 or 60. Secure pensions, grandchildren gurgling with delight, the freedom of long trips, the programmability of mental and physical fitness: perhaps even the image of old age itself is a product of selective, strategically chosen information.

### DECISIONS ROOTED IN EVOLUTION

"Are you familiar with the list of the most influential people in the world?" asks Ralph Hertwig. "Their average age is 61." Is that a scandal? Or an indication that long-tested techniques can outperform the pep and the mental agility of younger generations? Either way, it challenges science to examine different strategies and risk preferences as a factor of age: How do people of

different ages deal with uncertainty? And could it be that their approach to it has a function of its own – for instance, in situations where courage or coolness in dealing with risk or uncertainty promise to boost prestige? "Not many 60-year-olds will expose themselves to the risks of bungee jumping," explains Hertwig. "Simply because, at their age, it's no longer necessary."

This raises a hypothesis that could explain many differences in observable behaviors: decisions for or against taking a risk are often rooted deep in human evolutionary history. Young men have to bungee jump (or think they have to) in order to present themselves as strong and daring providers on the mating market. Older men are more relaxed in this respect. And women tend to avoid risks and dangers in order to protect their offspring. In



other words, the different propensities for risk in different phases of life correspond to functional differences in human developmental history.

## LIFE CIRCUMSTANCES DETERMINE HOW WE DEAL WITH RISK

These findings are echoed in today's more or less rationally structured society – in results from experiments with lottery drawings or fictitious job applicants, in the statistics compiled by, for instance, vehicle accident insurers, or in the analyses of data amassed in the context of SOEP, a socio-economic panel survey run by the German Institute for Economic Research (DIW Berlin), which has been surveying more than 30,000 people annually for the last 30 years. SOEP participants are also asked about their attitudes toward risk, making the dataset a valuable resource for the research team at the MPI in Berlin. An additional resource, as Ralph Hertwig emphasizes.

This data source is particularly valuable because it allows researchers to track individual and age-related changes over a period of up to ten years. "We can look at change and stability in the risk-taking propensity of people of different ages over time," says Anika Jo-

sef. The data also differentiates between different areas of life. People who report taking risks in their leisure time – jumping off bridges secured only by a rubber cord, for example – may describe themselves as rather more cautious in the work context or in their interactions with other people. Such differences needn't be preprogrammed and they may change with time. But they offer insights into personal motivations, individual structures of beliefs about how the world works, and how life events such as marriage, the birth of a child or retirement impact risk preferences.

"Our aim for future studies is to integrate the different data sources on risk behavior," reports Hertwig. Will someone who describes himself as cautious and socially reserved in the panel survey also be more likely to behave that way in the controlled situation of a game that requires mutual trust and cooperation to succeed? And will he show a similar level of risk tolerance when asked to choose between a lottery with a high hit rate but low winnings and one with a big but improbable jackpot?

"The participants in our experiments, no matter their age, have to learn," says Hertwig. "They learn the

probabilistic structure of the world – or at least of a very specific situation. They learn the possible outcomes of their choice, and the probability of those outcomes occurring. That knowledge allows them to succeed." Of course, he concedes, this is a reduced representation of reality: "In real life, we can usually only guess at probabilities. Sometimes we don't even know which outcomes could possibly occur." It is then that our own system of beliefs comes into play: our willingness to take risks, our mental representations of logical relationships from similar situations, our knowledge, experience and crystallized intelligence. What Hertwig's colleagues Anika Josef and Thorsten Pachur simulate on their computer monitors are world models of greatly varying complexity. And what they calculate are greatly varying ways of responding to that complexity.

## DEEPLY ROOTED PROGRAMS PLAY A PROMINENT ROLE

So what do you do when you realize that the mass of information is too much for your memory, your mental flexibility, your no-longer-quite-so-fluid intelligence? You choose another





International experience or computer skills? Study participants are given a number of fictitious applicants with various profiles to choose from and a limited time to make their choice. The researchers analyze how the participants deal with the glut of information.

strategy. Reduce the amount of information, search for familiar patterns and cues, block things out. And you rely on convention and habit, and if necessary on luck and instinct. As the researchers in Berlin found, relative to the younger participants in their studies, older participants were satisfied with half as many draws from the lottery drums before deciding on one of the lotteries. As a result, they lost out, going away empty handed as often as less educated younger participants with lower fluid intelligence. Taking risks may sometimes be a thrill, an ostentatious display of courage and good health – but sometimes it is the only option left. And sometimes an overly hasty choice from a mass of options is evidence only that we are aware of the limits of our capacities.

In major orchestras worldwide, it is now standard practice to have applicants for open positions audition behind a screen to ensure that evaluations of their musical talent and skill are not contaminated by knowledge of their age, gender or skin color. Literature Nobel laureate Günter Grass chose not to find out which of his friends had denounced him to the East German *Stasi*, but to leave his file closed. And physicians are constantly wrestling with the

question of whether and why they should burden seriously ill patients with the full truth. Intentionally blocking out information – deliberate ignorance – can be a conscious, even clever strategy to maintain peace of mind when nothing can be changed anyway, to focus on what matters rather than being distracted by redundancies, or to keep confusing emotions under control. Psychological research confirms that older people tend to have better balanced emotions. “If I could reliably predict the date of your death,” Hertwig offers as a thought experiment, “would you want to know?” Across all age groups, he continues, 90 percent of those asked so far have said no – with a clearly increasing tendency to shield oneself from information whose mental costs can far exceed the benefits the older we grow. And it’s here that the researchers touch on wisdom ....

After all, it’s always a matter of knowledge, its utility, its economics and strategies for applying it – which can also be a form of knowledge: higher-order knowledge. And deeply rooted programs always play a surprisingly prominent role, be it in the choice of a lottery, an investment, a car or a retirement plan. Or in the fundamental decision as to one’s role and place in life.

“What we are doing here is basic research,” clarifies Hertwig – and yet it’s no surprise to him that people whose position and situation forces them to make and commit to choices often ask him about the results of his research – managers, HR consultants, legal experts, physicians. And grandparents. Here again, Hertwig takes an evolutionary perspective.

### GRANDPARENTS’ BEHAVIOR INTERPRETED AS AN INVESTMENT

Grandparents’ investment decisions aren’t necessarily a key area of his work at the Institute in Berlin, he admits, but an area in which the courses of life paths are set and where distinct constellations of expectations and experiences can be observed. “We humans are a unique species in that there is no other species of mammal where there is such a wide gap between the end of the reproductive phase and statistical life expectancy.” Demographic change, driven by healthier lifestyles and a highly developed system of social and medical care, means that the period in which humans no longer have to look after their own children often spans 30 or 40 years or more. In this context, decisions on relation-



Head or gut? With their concept of adaptive rationality, Director Ralph Hertwig (center), doctoral student Anika Josef and senior researcher Thorsten Pachur are challenging the dominant economic and psychological ideas that human decision makers always act rationally – or are plagued by irrational biases.

ships, responsibilities and personal commitments can truly take on the character of life choices.

“What first brought our attention to this area,” explains Hertwig, “was the so-called grandmother effect, the observation that maternal grandmothers tend to display stronger emotions, invest more time and make greater sacrifices for their grandchildren than, for instance, paternal grandfathers.” This effect has been observed in all cultures – including enlightened, modern-day Europe – and it can be explained from an evolutionary perspective: a mother’s mother knows for a fact that she really is related to her grandchild, but a father’s father can’t be so certain. He has the most cause to question whether his investment will benefit the right person.

What is new about the researchers’ approach is that they interpret grandparents’ behavior as an investment,

and view caring for grandchildren as the product of a decision: bedtime stories or Bali? And if both, then in what proportion? There’s no disputing, concedes Hertwig, that social, economic and cultural factors are becoming increasingly important for life in the post-reproductive phase. At the same

time, there is no disputing that the decision to assume some degree of responsibility for others – whether they be grandchildren, neighbors, asylum seekers or people in need or nursing care – has a positive impact on our health, satisfaction, intellectual capacity and longevity. ◀

#### TO THE POINT

- Researchers are studying how people make decisions in complex situations and in the face of information overload.
- Young people are usually better cognitively equipped to cope with these conditions than older ones, who have to manage the information overload by blocking out information.
- In addition, younger people increase their chances of success by taking more risks than older people. At the same time, older people are better balanced emotionally because they can block out information that would negatively impact their feelings.

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