

Introduction

Everyone, as the French philosopher René Descartes pointed out, thinks. That's the easy bit. The second part, which is what this book is really about, is how to make your thinking effective. Because too often we don't really engage the gears of our brain, don't really look at issues in an original or active way, we just respond. Like computers—or is it cats and dogs seeking treats?—inputs are processed according to established rules and outputs are thus largely predetermined. Yet that's not what makes us human and that's not where the big prizes in life are to be found.

The key thing about thinking is that it is really a tool: a mechanism that countless millions of years of evolution has sculpted and shaped to enable us to both make sense of and flourish within our environment. And yet, too often, both in education and practical life, thinking is really the poor relation to action. Schools privilege rote learning, repetition and recall—but not original thinking. Likewise, businesses expect their employees to perform pre-ordained rituals and routines. The end result is that *Homo sapiens*, literally the 'thinking human', rarely justifies this special biological category. Yet the ability to think, meaning the ability to imagine new possibilities and find new solutions to old problems, is our great gift as a species and where the big prizes in life are found.

In society today, though, that's not where the emphasis lies. Instead, in an increasingly totalitarian age, governments erode our sphere of control and whole populations are corralled into ever-more circumscribed roles and routines. The mass media serves up

pre-formatted opinions, which we consume passively. At the same time, when we look around us, it seems obvious that social change and technological progress makes it more important that we rethink thinking. In the Third Millennium, when we look around us, two things seem clear. First, that we need to think a bit more—not less! And the second is that (with a nod to Apple computers) we need to think differently. For both these reasons, the focus in this book will be not on airy commentary but instead on practical suggestions about ways to think differently... on thinking strategies that each have their own style, applications and benefits.

That said, any investigation of how we think, and why we think the ways we do, is at root a profoundly philosophical investigation. It is both a theoretical matter relating to the process of discovery or gaining knowledge—and a way of seeking powerful insights for everyday life. After all, it was the practical value of his sudden insight (into how to calculate the volume of irregularly shaped objects) that made Archimedes suddenly exclaim ‘Eureka!’ in his bath.

So let’s not hesitate to find time to ask questions like: Why do we think the way we do? What drives our decisions? And how do we process new ideas and information? Thinkers, ranging from philosophers like Plato to scientists like Albert Einstein—and on to social scientists like Amos Tversky (or even management gurus, like Peter Drucker)—all emphasise the importance of putting preconceptions aside and thinking things through afresh. Of course, such talk can easily become mere platitudes, easy to say but without application to real life. Yet here a favourite story of mine, about a garden equipment firm, is revealing. It’s a very short story, actually: and just records what happened when, one year, the firm’s bosses asked its engineers to come up with a new kind of lawn mower. What do you think happened next? The answer is ‘not much’. After much head-scratching, all that the engineers managed to come up with were refinements to the existing machines. But then someone suggested that they go back

one step—and rather than trying to improve the existing technology, which meant everyone's thoughts were channelled down the old paths, instead to think about completely new machines to help maintain lawns. Out of this change of approach came the concept (and eventually the product) of the 'trimmer'. Okay, it's a rather specific example, but the point is as broad as they come: the answers you find depend on the questions you ask. Or, as the old saying goes, 'If all you have is a hammer, everything looks like a nail.'

And that's why what I propose to do in the chapters that follow is to offer a whole range of new 'tools for thinking', drawn from all kinds of disciplines and activities, not just airy commentary about great thinkers, let alone about the latest science of the brain, but rather very practical suggestions about different kinds of thinking strategies. Strategies that each have their own style, applications and benefits.

The chapters are modular—feel free to dip in and out—and within them there are also distinct, modular elements such as the different kinds of fact boxes, some marking out 'interesting asides' and others working more as 'detail boxes', essentially 'a closer look' at something in the main text. In this structural sense, it is a book using the kind of devices made popular by the 'For Dummies' books, for which I have written two titles, one on thinking seen in the broadest sense, which is as mainstream philosophy, and one on a particular branch of thinking skills: *critical thinking*. These also use a modular system, with books avoiding the presumption that people pick them up and work their way progressively and linearly through them. Today's busy (distracted!) reader rarely does that. So this is a 'dip in-and-out book', with a central thread—in this case, the roots of inspiration. Throughout, my writing strategy has been to distil large amounts of information into a short space. In the Internet Age people want, indeed demand, that information be presented in an easily digested form that is yet thoughtful and scholarly. They want books that provide a good return on their time!

My first chapter, 'Thinking like a Chinese General', illustrates the breadth of possible sources for insights into thinking. Who would have thought that an ancient study of 'military tactics' could have so many other practical applications today? Yet, assuredly, it has. Don't be confused by the surface details — this is a book with insights for everyone.

Indeed, I wouldn't say the Chinese invented the art of thinking, but it certainly seems that they produced one of the first books about it when Sun Tzu compiled *The Art of War*, 2500 years ago. The book is rightly considered the classic work on thinking directed towards achieving precise ends. Military strategies, but also business strategies and life strategies. Since its 'rediscovery' in the West, in the last century or so, hundreds of books examining its insights have been published in many different languages, and its ideas have been applied to fields as diverse as business management and training in sports. In a way, this is very odd, not to say whimsical. After all, *The Art of War* is literally a guide to fighting wars using medieval techniques — and today, technology has advanced somewhat with a terrifying range of weapons seeming to make the tactics involved in warfare less about human psychology, let alone human needs and values, than who has the best missiles and computers. But that's looking at warfare at a very superficial level. When we dig deeper, we find more important truths that transcend the years. Not least because, as Sun Tzu reminds us, technology may be clever stuff but the 'greatest victory is that which requires no battle'. And so, what this Chinese classic really offers today is timeless insights into human psychology and social life.

My second chapter, 'Thinking like a Designer', attempts to reunite two very different kinds of thinking: the rational and the irrational. Now 'irrational' is a word that immediately sounds warning bells to most people, because we are taught to imagine thinking as a kind of precise, evidence-based conversation between 'higher and lower' level parts of our brains. However, there are plenty of other philosophical and cultural traditions that

treat thinking as a much broader process, encompassing thought not only as a kind of inner dialogue, but also allowing a place for sensations, emotions, feelings—and aesthetic judgments generally. Rational thinking attempts (shall we say ‘pretends’?) to be universal and transcend the individual, but irrational thinking allows a vital role for individualism and self-awareness too.

In this way, ‘design skills’ and ‘design thinking’ are part of a very old tradition that seeks to put the human factor at the heart of its solutions to problems. And so, this chapter explores a rich seam of ideas hacked from the bedrock of ideas and experience not only from design and engineering, but from social science, business studies and computer science as well.

In chapter three, entitled ‘Thinking like a Biologist’, I explore some of the latest ‘thinking about thinking’, in the sense of how the brain ‘works’. I look at thinking here as the kind of thing that neuroscientists and ‘cognitive scientists’ study because understanding the way our minds work is a vital first step towards making better use of them. Actually, this is a key thread running through the whole book. But in this chapter, I start by noting, for example, that although for many years it was assumed that, after age one, humans never made another brain cell, and instead that all the ones they would ever need were already in place in a tiny infant, nowadays, though, research indicates that human brains continue to grow—to create new neurons—even in old age. Maybe the old science idea fitted not only religious conceptions of babies as tiny people, but social prejudices favouring inherited privilege, whereas the new theories, to some extent, match economic and social forces determined to promote ‘lifelong learning’ and flexible workforces. Either way, what really seems to distinguish infant thinking from that of adults is the new pathways and links created in the brain as a result of experience. These connections represent ways of making sense of the world. But before the links are created in physical networks of neurons, they exist as playful patterns in the mind, just as daydreams or doodles can lead to puzzles solved or problems identified.

Chapter four, ‘Thinking like a Scientist Ought to Think’, investigates a thinking tool that we use every time we imagine the world as it ‘might be’. By ‘thought experiments’ I mean the distinctive kind of imaginary story that actually seems to provide a way to test out our ideas, explore relationships and even discover new information. At their grandest, they are the kinds of things that Galileo and Einstein used to explore the fundamental structure of the universe. However, despite this splendid aspect and pedigree, many philosophers don’t like thought experiments too much, saying that they overly rely on intuition rather than logic—and scientists often downplay the insights too. Nonetheless, Einstein makes a good case for why they should be part of every thinker’s toolbox.

If chapter four is about imaginary experiments, chapter five is all about gritty reality. ‘Thinking like Mission Control’, looks at a very rigorous and methodical approach to problem solving. This chapter might actually have been called ‘Thinking like a Software Engineer’, although the problem with that is that it makes it sound a bit dull, whereas, actually, a good piece of software often includes its own element of insight and inspiration. We should maybe recall that computer science is, in the phrase of Carl Sagan, ‘a way of thinking much more than it is a body of knowledge’. Put short, the space programme offers crucial insights into new ways to tackle complex, multi-dimensional problems.

Chapter six is quite a change of pace again. ‘Thinking like an Artist—or at least, a Doodler’, offers stories and insights into some very different but equally important thinking skills. However, here, the paradigm case is not Michelangelo painting the ceiling of the Sistine Chapel, but rather JFK scribbling pictures of yachts on the White House notepaper! In this chapter, I pick up a notion briefly alluded to in chapter three, that doodling is an example of the benefits of allowing experimentation. As I say, too often we lock ourselves into preconceived schemes: our thinking gets stuck in ruts. Take, for example, the success of the Google Doodle. It is one of Google’s most popular innovations—but it came about

really by accident, simply as a variation on the 'out of office' message. Or listen to the advice of an 'expert doodler', Oki Sato, the chief designer and founder of the design firm Nendo, who says that new ideas often start small and then spread. He compares them to the idea of the 'butterfly effect' in weather, where it is said that even the tiny movement of a butterfly's wing in China can, by a process of feedback and amplification, eventually create a tornado halfway across the world in Chicago. Sato is such an innovative and original thinker that we can only benefit from finding out a bit more of his personal story.

Chapter seven, 'Thinking like a Cyberneticist—or is it a Weather-Forecaster?', is in some ways the flip side of artful thinking and creative design. And, certainly, it too has its sphere of operations. The philosophy is that '[t]here are no separate systems. The world is a continuum. Where to draw a boundary around a system depends on the purpose of the discussion—the questions we want to ask.' These are the words of Donella Meadows, an American environmental scientist, teacher and writer. Klaus Mainzer offers another way to put it in his book, *Thinking in Complexity: Computational Dynamics of Matter, Mind, and Mankind*, when he says that, today, many if not most of our social, ecological, economical and political problems are essentially of a global, complex and nonlinear nature. One way or another, and like it or not, the science of complexity is likely to be among the most salient features of the twenty-first century. And so, nonlinear, complex system approaches have increasingly become the key to approaching and tackling problems in the natural sciences.

In chapter eight, 'Thinking like a Social Scientist (and not a Gambler)', I look more closely at the difference between good and bad thinking skills and why it matters that we get the 'heuristics right', to use a term popularised—in as much as such an odd word can be—by the social scientists Amos Tversky and Daniel Kahneman. The latter notes that thoughts come to mind in one of two ways: either by 'orderly computation', which involves a series

of stages of remembering rules and then applying them, or by perception, an evolutionary function that allows us to predict outcomes based on what we're perceiving. Kahneman says that perception is 'extended almost directly to intuitive thinking'.

This leads unfortunately to some very common thinking errors. Ambiguity is suppressed with the result that we see the world as much more coherent than it is. Put short, our brain, Kahneman says, is a 'machine for jumping to conclusions'! In this chapter, I look at the kinds of thinking errors that people make when evaluating their actions in terms of their expected outcomes and contribution to future happiness, whether buying a new car, dreaming of purchasing 'a place in the sun'—or deciding to vote for political extremists.

Consideration of situations where we do not have the necessary information to reach 'logical' conclusions leads finally to the topic of the final chapter, 'Thinking like a Search Engine', which is all about emergent thinking. But what's that all about then? The explanation brings us back to Google. Google is the world's most-used search engine. It has achieved that status by creating a vast network of computers that can not only keep up with all the webpages being created for the internet, but also respond in fractions of a second to human enquiries. Yet that's only the easy bit—the technological bit. Google is also about something much more subtle, which is weighing and evaluating information. And in some ways here, its methods are revealing.

Google uses an algorithm (and using algorithms is itself a powerful thinking tool) that privileges websites that lots of other, especially reputable, websites have links to—because those links represent votes in terms of quality. It also assumes that if the words in your query are in the page, in headings in the page and even in the filename for the page, then that page is likely relevant. Google's method is not actually particularly clever when taken apart—but it sure is complex when all put together.

Likewise, in living organisms, complexity emerges as the result of simple chemical reactions following certain rules. It is

these more complex molecules that later become cells, and these cells which in turn interact to become specialised organs. Organs interact to form organisms, which interact, communicate and reproduce on ever higher scales to eventually form the universe. Within Google's search engine there are virtual molecules, again guided by rules, that together create a new kind of artificial intelligence, one that increasingly guides our own thinking and behaviour. To draw the threads together, one key lesson for more effective thinking is to do simple things, indeed embrace simplicity – but to do so systematically.

I hope the above will indicate to you that this is not only a 'big ideas' book but one with a difference. Partly because my aim is to challenge some of the assumptions made by philosophers and psychologists in favour of 'logical thinking' over intuition, and instead make the case for creative insight, and partly because we live in a time when there is an exceptional social awareness of the importance of thinking skills across the whole range of political and social life and most particularly to innovation and entrepreneurial ideas.

The success of many 'new technology' companies and entrepreneurs has given a renewed emphasis to the value of original thinking, of finding new ways of looking at old problems and of generating fresh insights. Because of this, I hope my book will also mesh with current debates, the nature of education and the limits of traditional courses and exam-based learning. Here, the irony is that you can't be told how to think, you have to make the critical connections, take the final steps, yourself. Alas, too many of us emerge from formal education with our ability to think not so much enhanced, but suppressed! At the very least, we will have been channelled towards one particular and really rather narrow kind of thinking: routinised and constrained. This is why I invite the reader to join me on an active journey of discovery and research, rather than to be merely another member of an audience listening to a lecture. So my book is intended thus as a serious, practical contribution to a topic that touches everyone, but at the

same time it is definitely a book to be read for pleasure. It is also a celebration of the diversity of the human spirit, and the remarkable ability of a few people to excel—sometimes against all the odds.

In everyday life, of course, most of us have to perform tightly curtailed routines in which most of the ‘thinking’ and decisions are done by others. However, the great thing about ‘thinking’ is trying on a different thinking hat (to introduce a metaphor I will use often in this book), which will refresh the whole way you see the world. And it may only take one idea to revitalise a whole strategy, a whole life. Maybe you will find that idea in this book!

Martin Cohen

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