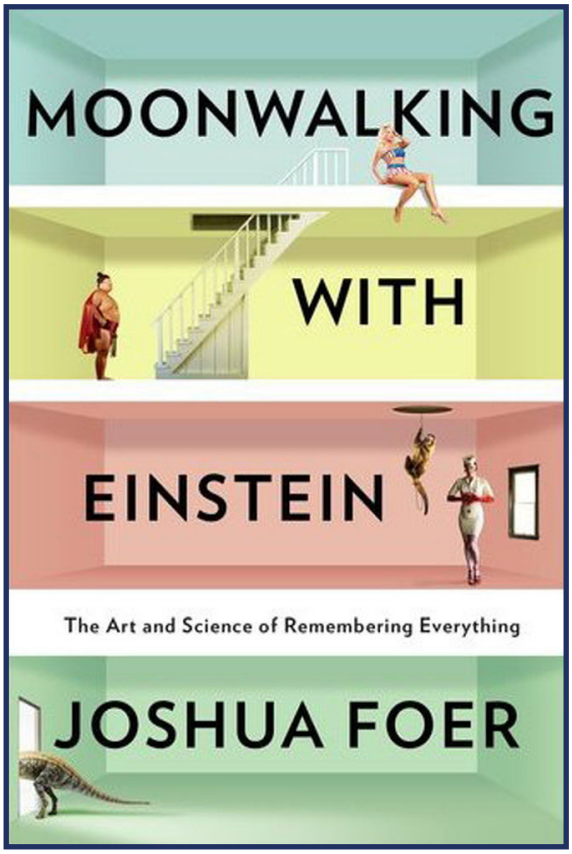
THE BUSINESS SOURCE

Moonwalking with Einstein

The Art and Science of Remembering Everything



By Joshua Foer

Science writer and New York Times contributor Joshua Foer used to be just like the rest of us: constantly losing his car keys and forgetting important phone numbers. Then one day, while researching an article for the Times, Foer stumbled upon the lost art of memory training, first practiced by the Ancient Greeks. Unlike so many other “forgettable” articles he’d written in the past, after his piece on the science of remembering things was put to bed, Foer had trouble moving on. He felt oddly compelled to learn more about these fascinating memory techniques.

One year later, after a lot of hard work, Foer – a memory training neophyte – found himself in the final round of the U.S. Memory Championships, alongside veteran competitors who could, for example, memorize the precise order of ten shuffled decks of cards in under an hour. Then, to everyone’s surprise, Foer actually won!

In just one year, Foer had managed to transform himself from an absent-minded freelance journalist to a veritable “mental athlete,” while improving his personal and professional life in a few rather important ways. How did he do it?

In *Moonwalking with Einstein*, Joshua Foer shares his firsthand account of his year-long quest to improve his memory under the tutelage of top mental athletes – people like Tony Buzan, the 70-year old British memory guru and founder of the World Memory Championships. As you may have guessed, the unusual title of the book refers to a memory trick Foer used to win the memory competition (picture Albert Einstein sliding backwards across a dance floor wearing a white glove; that’s pretty unforgettable). And so, with that goofy image in mind, and before we forget why we’re all here, let’s jump right into today’s summary…

Forgetting How to Remember

“Our culture constantly inundates us with new information, and yet our brains manage to capture so little of it,” writes Foer. “A lot just goes in one ear and out the other. If the point of reading were simply to retain knowledge, it would probably be the single least efficient activity [we] engage in.”

Now more than ever, because of the ubiquitous presence of smart phones and social media, we’re absolutely inundated with information. Yet we actually retain very little of it. We don’t tend to get too fussed about it, because we all tend to forget things. But it hasn’t always been that way. Over the last 1,000 years or so, we humans have forgotten how to remember.

In pre-historic times, humans evolved to become quite good at remembering things. Beginning in the Pleistocene Era – a time which began nearly two million years ago and only ended ten

thousand years ago – our species made its living as hunter-gatherers. Tribes were largely nomadic, rarely staying in one place for too long. It was the demands of that lifestyle, which necessitated great spatial and environmental awareness that sculpted the minds we have today.

Needless to say, our early ancestors didn't need to recall things like phone numbers, or word-for-word instructions from their bosses, or the names of dozens of strangers at a cocktail party. What early humans did need to remember was where to find food and resources, the route home, which plants were edible and which were poisonous. Those are the sorts of vital memory skills that they depended on every day so that's why human memory evolved as it did.

Even as humans became more civilized, and began to live together in larger groups, starting out in small villages, and eventually forming cities,

we were still pretty good at remembering stuff. We know from well-preserved historical records maintained by the Greek philosopher Simonides of Ceos, that roughly 2,500 years ago, many citizens of Ancient Greece practiced a mnemonic technique known as the “memory palace.” The techniques of the memory palace – which more recently became known also as the journey method – were refined and codified over the years in an extensive set of rules and manuals by great Romans like Cicero. These techniques remained popular throughout the Middle Ages as a way for Christians to memorize sermons and prayers. These were the same tricks that Roman senators used to memorize their speeches, that the Athenian statesman Themistocles had reputedly used to memorize the names of twenty thousand Athenians, and that medieval scholars had used to memorize entire books.

But when the fifteenth century rolled around,

the memory palace basically collapsed. This is because Gutenberg came along and turned books into mass-produced commodities. Within just a couple of generations, it was no longer all that important to remember what the printed page could remember for you. In fact, it could even be dangerous to be seen as having too good of a memory.

“Memory techniques that had once been a staple of classical culture suddenly got wrapped up with the occult,” writes Foer. And even after people stopped worrying so much about witches and warlocks, that stigma never really went away. By the nineteenth century, people with fantastic memories were no longer feared, but nor were they admired.

“The externalization of memory not only changed how people think; it also led to a profound shift in the very notion of what it means to be intelligent,”

writes Foer. Having a good memory became devalued. This realization led Foer to ask himself certain questions. He wondered: “As our culture has transformed from one that was fundamentally based on internal memories to one that is based on memories stored outside the brain, what are the implications for ourselves and for our society?”

Finding answers to this and other existential questions drove Foer on his year-long, transformational journey to become a national memory champion.

Our Brains are Plastic

Over the last decade or so, memory training has been undergoing something of a renaissance. And as Foer came to learn while researching his article for the Times, the undeniable leader of this movement is Tony Buzan. Buzan founded the World Memory Championship in 1991, and

he has since franchised it in more than a dozen other countries. Buzan has been working with a missionary's zeal since the 1970s to popularize his memory techniques, and get them into elementary and high schools. He has called for a "global education revolution focusing on learning how to learn."

Buzan believes that most schools go about teaching all wrong. They pour vast amounts of information into students' heads, but don't teach them how to retain it.

Thanks in large part to the groundwork that Buzan and a few others like him have laid, there's now a serious market in memory improvement tools. Memory boot camps are a growing fad, and brain training software is a multi-million dollar industry, in part because of research that shows that seniors who keep their minds active with crossword puzzles and chess can stave off Alzheimer's and

progressive dementia.

Foer approached Buzan to find out whether it's really true that anyone could learn to quickly memorize huge quantities of information. Before he met with Buzan, Foer was willing to believe that there were probably certain techniques that one could learn to marginally improve one's memory, but he didn't believe that "any schmo off the street could learn to memorize entire decks of playing cards." The alternate explanation just seemed a whole lot more plausible to Foer – i.e. that people like Tony Buzan had some freakish innate talent that was "the mental equivalent of André the Giant's height or Usain Bolt's legs."

After speaking with Buzan and others – and more importantly after putting the techniques into practice for himself – Foer came to see that our memories can be dramatically improved, and that the skills taught by folks like Buzan can be learned

by anyone. How can this be? Because, as Foer learned, our brains are incredibly elastic.

“The three-pound mass balanced atop our spines is made up of somewhere in the neighborhood of 100 billion neurons, each of which can make upwards of five to ten thousand synaptic connections with other neurons,” explains Foer. “A memory, at the most fundamental physiological level, is a pattern of connections between those neurons. Every sensation that we remember, every thought that we think, transforms our brains by altering the connections within that vast network.” What this means is, by the time you read this sentence, your brain will have physically changed.

Still, for all the remarkable scientific advances that have been made in recent decades, it’s still the case that no one has ever actually seen a memory in the human brain. Though advances in imaging

technology have allowed neuroscientists to grasp much of the basic topography of the brain, and studies of neurons have given us a clear picture of what happens inside and between individual brain cells, science is still relatively clueless about what transpires deep in our inner circuitry.

One very important thing has become clear, however: The nonlinear associative nature of our brains makes it impossible for us to consciously search our memories in an orderly way. A memory only pops directly into consciousness if it is cued by some other thought or perception. By implication, therefore, it seems that our memories can easily get lost if they're not well organized.

Some of us are better than others at organizing our memories, even when it happens unconsciously. For example, if you visit London, England, you may cross paths with young men and women on motor scooters, darting in and

out of traffic while studying maps affixed to their handlebars. These riders are training to become London cabdrivers. Before these wannabe cabbies can receive accreditation from London's Public Carriage Office, they must spend two years memorizing the locations and traffic patterns of all 25,000 streets in the vast city, as well as the locations of 1,400 landmarks. Their training culminates in an infamously daunting exam called "the Knowledge," in which they not only have to plot the shortest route between any two points in the metropolitan area, but also name important places of interest along the way.

In 2000, a British neuroscientist named Eleanor Maguire wanted to find out what effect, if any, all that driving around the labyrinthine streets of London might have on the cabbies' brains. When she brought sixteen taxi drivers into her lab and examined their brains with an MRI, she found that not a single significant structural difference turned

up between the cabbies and a random control group of average subjects. The brains of the mental athletes were indistinguishable from those of the control subjects.

The difference was, the cab drivers had (subconsciously) learned to rewire the mental pathways in their brains in order to access their memories more effectively. The cabbies were able to do this because the human brain is almost entirely “plastic” – or changeable.

Plasticity is a technical term used to denote that the brain is highly malleable, and able to re-wire itself. According to scientists, the primary way our brain “grows” is by creating new and complex pathways that connect different areas to one another. All of the things we learn and the events we experience throughout our lives create connections between brain cells, or pathways. Only 20% of our pathways are “hard-wired” from

birth and not subject to change. That means the vast majority of our brain can actually be reconfigured, through practice and experience, to work better.

The point of memory techniques that Buzan and his disciples teach is to take the kinds of memories our brains aren't good at holding on to and transforming them into the kinds of memories our brains were built for. One of the most effective tools for doing just that involves building what's often called a "memory palace."

Building a Memory Palace

As we've already heard, memory training was once considered a centerpiece of classical education in the language arts, on par with subjects like spelling and grammar. Students were taught not just what to remember, but how to remember it.

The most common mnemonic technique practiced by our ancestors involved building artificial creations called “memory palaces.”

A memory palace has two basic components: images and places. Images represent the contents of what one wishes to remember (e.g. someone’s name, or address). Places – or loci, as they’re called in the original Latin – are the imaginary spaces in the memory palace where those images are stored. Typically, these artificial spaces are based on real-world ones that you know well and can easily visualize, such as your office building, or a favorite museum or art gallery.

Memory palaces don’t have to be palatial. They don’t even need to be buildings. They can be routes through your home town, for example. So long as they are spatial constructs, and there’s some semblance of order that links one locus to the next. (The four-time U.S. memory champion

Scott Hagwood uses luxury homes featured in Architectural Digest to store his memories.)

Also, once you get good at building them, you might find you soon have dozens, or even hundreds of memory palaces, each built to hold different sets of memories.

The memory palace technique works as well as it does because it works with how our brains are naturally hard-wired to remember things. The thing to understand is that humans are very good at remembering spaces, and not as good at remembering most other things.

The principle behind the memory palace is to use our naturally exquisite spatial memory to structure and store information.

Having learned about the memory palace technique from one of the memory gurus he spoke with, Foer set about finding and stockpiling memory palaces. He went for walks around the

neighborhood and simply observed things. Then he visited places like Oriole Park at Camden Yards in Baltimore, and the East Wing of the National Gallery of Art, carefully making mental notes all along the way. Once he felt sufficiently familiar with the real-world terrain of these places, Foer began mentally carving each place into discreet loci that would eventually serve as little "cubbyholes" for his memories. Then, in the early going, whenever someone gave Foer a phone number, he would install it in one of his custom-built memory palaces. After he'd mastered the storing of phone numbers, he moved on to shopping lists, and then to license plates.

Foer makes no bones about how demanding all of this practicing was, especially in the early going. It sucked up a lot of his spare time, and almost all of his surplus mental energy. Foer would often ask himself whether his mind was truly up to the task, and there were many points along the

journey where he admits he was nearly ready to throw in the towel. But then he would think about something Buzan had told him in the early going. “Deliberate practice must be really hard.”

With that advice in mind, Foer stuck with it. And after a few months, it got easier.

Having a Great Memory Pays Dividends

The principles of the memory palace technique are quite simple, but as we’ve seen, putting those principles into practice takes a lot of work. Is it really worth it?

Most of us would agree that it’s little more than a neat parlor trick to be able to memorize long strings of numbers, or decks of cards backwards-and-forwards. None of that is terribly useful. But what if you used the same memory techniques

to hold onto important facts, such as bits of information that are relevant to your work? That's where all the hard work starts to pay off, because having a stellar memory can actually lead to more on-the-job creativity and innovation.

"In our gross misunderstanding of the function of memory, we thought that memory was operated primarily by rote," explained Buzan to Foer. "In other words, you rammed it in until your head was stuffed with facts. What was not realized is that memory is primarily an imaginative process." What this means is that memory and creativity are actually two sides of the same coin.

Indeed, the art and science of "memory" is about developing the capacity to quickly create images that link disparate ideas, whereas "creativity" is the ability to form connections between disparate images and to forge something entirely new. And so it follows that if the essence of creativity is

linking disparate facts and ideas, then the more facility you have making associations – and the more facts and ideas you have at your mental disposal – the better you'll be at coming up with new ideas.

Foer acknowledges that the notion that memory and creativity are two sides of the same coin may seem counterintuitive to some. At first glance, remembering and creativity seem like very different processes. But the idea that they are actually one and the same is actually quite old, and was once even taken for granted. In fact, the Latin root inventio is the basis of two words in our modern English vocabulary: inventory and invention. Invention is largely a product of inventorying.

The Memory of a Champion

The Latin roots of common English language

words were not exactly at the top of Joshua Foer's mind that fateful day in 2006 when the U.S. Memory Championships got underway. The first event of the morning involved remembering names and faces. The point of the game was to take a packet of ninety-nine head shots and memorize the first and last name associated with each of them. Foer did this by dreaming up an unforgettable image that linked each face to the name. "Take, for example, Edward Bedford, one of the ninety-nine names that we had to remember," writes Foer. "Edward was a black man with a goatee, a receding hairline, tinted sunglasses, and an earring in his left ear. To connect that face to that name, I tried to visualize Edward Bedford lying on the bed of a Ford truck … then to remember that his first name was Edward, I put Edward Scissorhands [in the image] with him."

After that first event, when Foer put down his pen and handed in his recall sheet, he reports that he

felt good about his performance. But still, Foer modestly assumed that his score was going to be somewhere in the middle of the pack. “The names of Sean Kirk and Edward Bedford had come right back to me,” writes Foer, “but I’d blanked on the cute blonde and the toddler with the French-sounding name, and a handful of others, so it was hard to imagine I’d done all that well.” To his surprise, the 107 first and last names he was able to recall perfectly were good enough for a third place finish, for a total score of 107 out of a possible 198 points.

After showing well in that first event of the day, Foer began to pick up steam, and after a couple of days of intense competition, he emerged the U.S. national champ.

“The U.S. memory champion turns out to be a minor (OK, very minor) celebrity,” jokes Foer. “All of a sudden, Ellen DeGeneres wanted to talk to

me, and Good Morning America was calling to ask if I'd memorize a deck of cards on the air. ESPN wanted to know if I'd learn the NCAA tournament brackets for their morning show. Everyone wanted to see the monkey perform his tricks." Foer just took it all in stride.

Of course, when Joshua Foer started on his amazing memory journey little more than a year earlier, he didn't know where it would lead, or how thoroughly it would take over his life. But after having learned how to memorize poetry and numbers, cards and biographies, Foer became convinced that remembering more is only one of the many benefits of the intense training he put himself through. Foer realized that what he had really trained his brain to do was to be more mindful, and to pay attention to the world around him.

Conclusion

For better or for worse, most of us have gotten pretty good at outsourcing our memories. For example, if you're like most working people, when you wake up, the first thing you do is check your day planner, which remembers your schedule so that you don't have to. Then, when you climb into your car to head to a business meeting across town, you enter your destination into a GPS device, whose spatial memory supplants your own.

You have folders on your computer that store digital photographs to hold onto the important life images you want to remember. You have books on your shelf to store knowledge. And of course, thanks to companies like Google you can access so much of humankind's collective memory easily online.

"These and other technologies of storing

information outside our minds have helped make our modern world possible," writes Joshua Foer. "But along the way, they've also changed how we think and how we use our brains." *Moonwalking with Einstein* is about one man's incredible journey to re-wire his brain, one circuit at time. Along the way, he became not only a memory champion and a minor celebrity. More importantly, Foer also became a more mindful, more creative, and perhaps better human being. And if that's what his journey was truly all about, then let's all aspire to be memory champions.