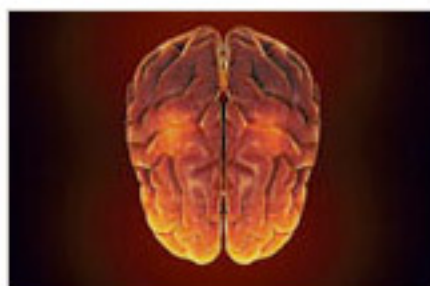


Get smarter

Tuesday, October 10, 2006

New research is providing the keys to unlock the full potential of the brain and turbo-boost the IQ. The best news is, it's never too late to learn how. Joshua Gliddon reports.



Everyone wants to be smarter. But until recently, we thought the brain was set in concrete and there was nothing you could do to improve your intellect and creativity. Now we know otherwise. We're born with about 80% of our intelligence, but the other 20% is wide open.

Allan Snyder thinks he can utilise that 20%. He's working on a thinking cap, an electronic device that at the flip of a switch will let you access the parts of your brain you're not normally allowed into - parts that can unlock your creativity, improve your thinking and create an advantage for you in the office. Prototypes, used as part of his work at Sydney University's Centre for the Mind, have already shown great promise. "What we have is a proof of concept," says Snyder. "The breakthrough is that we can turn off part of the brain to turn on a skill."

And it's not just thinking caps that will help you improve your mind. You can try everything from meditation and regular sleep, to eating food rich in omega three acids, to puzzles and brain teasers. And then there's simply sticking at your strengths, refining what you're good at, and really hitting your straps later in life.

Take the artist Cezanne. His later paintings were more celebrated, and fetched higher prices, than his early works. "It's a myth that everyone does their best works early in life and achieves nothing later on," says Snyder. Cezanne is an example of what the American economist David Galeson calls an experimental innovator - people who work slowly, refining their vision over their entire lives. They're usually successful and productive well into old age. The flipside are the people Galeson dubs conceptual innovators. Picasso did his most remarkable paintings in his 20s, and although he never stopped working he never hit the same highs again. Galeson's work suggests the idea of age is all in our heads. It's easy to think that as we get older, we're losing our edge. Often we can't even remember people's names. "What people overlook as they get older is that they don't have difficulty with things that they're motivated to remember," notes Dr Peter Birrell, honorary visiting fellow at the University of NSW school of psychology.

Even better, it turns out that the brain is a lot like a TV left on standby. "The brain's an expensive organ to run," says Professor Lindy Rae, global professor of brain sciences at the University of NSW. "It uses 20% of our energy, but only weighs 2% of our overall body mass."

Using functional magnetic resonance imaging, Rae's team has been able to observe how blood flows in the brain. Overlapping fMRI brain maps with charts showing the brain's electrical activity give us an idea of what parts of the brain are being used.

The problem most of us have is that it takes the brain time to come up to speed when you need it. It's why we can't remember names when we need them. The maps we use in our heads to remember things - some people call them mindsets or crystallised memories - can be slow to come on line.

One simple technique to get around this lag is to develop mnemonics and associations for things you want to recall. "It's a technique the ancient Greeks developed," says Birrell.

The idea is to visualise things you want to remember as objects scattered around a room. A person's name, Birrell for example, might make you associate him with a barrel on a chair in the corner of the room. Once you've created the association, recall is a matter of pulling the picture back into your mind's eye and zeroing in on the barrel.

"You have to actively give your attention, and then actively process the material," Birrell says. American psychologist Anders Ericsson calculated that achieving a virtuoso performance in anything requires about 10,000 hours of practice. We accept this is true of sporting prowess but, as Ericsson writes, "the role of acquired skill for the highest levels of achievement has traditionally been minimised".

Tiger Woods' father had him practising golf from the age of three, and he has continued to use coaches to improve his game. What is acceptable for sporting success should also be utilised for mental muscles. "The accumulated amount of deliberate practice is closely related to the attained level of performance of many types of experts," Ericsson writes.

Virtually all top-flight sportspeople are intensely interested in the food they eat, but diet can also make a difference to IQ. Because the brain is mainly fat, and the neurons are surrounded by fatty membranes, omega three fatty acids can help the brain create new connections between neurons. "They maintain the integrity of the membranes in the neurons," says Professor Simon Easteal, from the John Curtin School of Medical Research.

"Eating oily fish, or consuming fish oil, will have a positive effect on your heart and brain," says Associate Professor Peter McLennan, director of research at the University of Wollongong's graduate school of medicine. "The omega three is incorporated into the cell membranes. It controls what goes in and out of the cells. Neurons are all about letting chemicals in and out to control the electrical activity in the brain. What's odd is that we'd always heard that fish was brain food. Now we're slowly starting to see evidence of it."

It's also possible to get a boost from other foods, including creatine, a substance beloved of bodybuilders and fitness fanatics. The body makes its own creatine in the liver, but we can get

it from meat and fish, or as a nutritional supplement. "The creatine gives a burst on signal paths," observes Rae. "It boosts your fluid capabilities."

What about the humble cup of coffee? There's a reason we crave it first thing in the morning. It's a stimulant which helps focus our attention and boost our mental performance. If you want a short-term hit, forget creatine. Get into caffeine instead.

Alternatively, get a good night's sleep. The brain spends all that time you're sleeping processing the day's information. People that don't get enough sleep have falling cognitive performance. Stay up long enough, and you'll even start to hallucinate.

Scientist and author Tim Flannery describes himself as "an average bloke who doesn't have any habits that I consider a recipe for success - except getting eight to nine hours' sleep per night."

Communications minister Helen Coonan has the challenge of information overload: "As a lawyer and barrister and now minister, it is important to be able to retain large amounts of complex information. I find that being blessed with a retentive memory and not needing a lot of sleep lets you get the most out of the day."

Watching smart people is another positive. Our brains light up in the appropriate areas when we watch someone who's skilled. Watch Tiger Woods play golf, and your brain unconsciously mimics the activity. Watch a gifted speaker on stage, and you'll unconsciously pick up their cues.

Another option is meditating, to get yourself into what some sportspeople call The Zone, where time appears to become compressed. You look up, and what felt like half an hour was actually four hours. Better still, recent studies using fMRI have enabled us to look inside the brain and find out what's going on when we're in that zone.

Two years ago, a study compared Tibetan monks who had spent more than 10,000 hours meditating with novices. The monks were asked to practise compassion meditation: attempting to generate feelings of kindness and well-being. What the study found was, literally, mind-blowing. The monks generated high-frequency gamma waves at very high levels - much higher than had been seen before. It's thought gamma waves are the underlying force in our consciousness. The monks' brains also lit up in their pre-frontal cortex, which is the seat of positive emotions, says Associate Professor Marc Cohen, from RMIT's school of complementary medicine. "Meditation is really a discipline of focus. And in this day and age, when we're constantly distracted and multi-tasking, focus is something that can be invaluable."

Prize-winning novelist Kate Grenville is a believer: "I find that simply looking out the window, and having time to daydream makes a real difference. I also try to play the cello a few times a week. I find that there's a kind of meditation in concentrating on the effort to find the exact pitch of B-flat."

But it's easy to feel intimidated by meditation. If you've tried it, you'll know the feeling of trying to clear your head of thoughts, while pesky chatter tries to force its way back in. "You have to think of meditation as not being a single practice, but a group of things. If you can achieve that flow doing gardening, then that is a form of meditation," says Cohen.

The important thing is to make sure we try to achieve these states every day, doing something we enjoy and learning how to focus. And that's where Snyder's braniac cap comes in.

Pictures of giant horses adorn Allan Snyder's office walls. The pictures are rough, drawn by kids - one of them isn't much more than six blobs joined together - but it's still clear what they are. Two stand out. One is a hyper-real graphic of a horse in motion. The other, an impressionistic view of a horse and rider. "They were drawn by autistic kids," he says. "Why is it that I can see you as you are, yet I can't draw you?" he asks. "It's because our brains filter out the extra information."

The thinking cap he's working on temporarily shuts down the left temporal lobe, which is responsible for filtering out all that unwanted information. Our brain can now access the mindsets it has created that link all the information we have about a subject.

Normally, the brain uses templates that incorporate mental shortcuts. When we think of a horse, we think of something similar to what the kids drew: an elongated body, legs, head, a tail and mane. We don't need to go and reprocess all the additional information and fine detail. It's what makes most of us shocking artists.

In a paper published in the journal *Perception*, Snyder and his team demonstrate that it's possible to induce these autistic-like abilities in test subjects using trans-cranial magnetic stimulation. Shutting down the left temporal lobe gives us access to the literal parts of our brain that let us see things as they are. Suddenly, all the detail becomes clearer.

"We're too busy thinking about other things," says Robyn Young, a researcher at Flinders University who specialises in studying savant syndrome. "There's too much noise and chatter in our heads. One of the reasons these skills show up in autistic people is because they repeat them over and over again. We'd get too bored."

"Autism is the state of being totally literal," Snyder says. "And of being able to read all the low-level sensory information. But it's different for us. If things don't conform to what our higher-level brains say it should be, then our brains tend to shove things around so they fit anyway."

Which is what the thinking cap is designed to subvert. But there's one easy way to break through the mindsets: embrace change. "If you're at the top of your profession, then that's not the time to sit there and enjoy the view. It's time to change." **Additional reporting by Patrick Carlyon and Nick Tabakoff**