

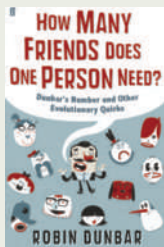
Some of our biggest decisions are made without conscious awareness, argues *Washington Post* columnist Shankar

Vedantam in *The Hidden Brain* (Spiegel & Grau, 2010). Using powerful case studies, Vedantam examines with a light touch unconscious bias and sexism; why we seem to care more about animal welfare than genocide; and how decisions taken by those on the 88th and 89th floors of the World Trade Center's South Tower on 11 September 2001 determined whether they lived or died.



Practising what he preaches, journalist Jeff Wise jumped out of a plane and was fired on by missiles while researching his book *Extreme*

Fear (Palgrave Macmillan, 2009). Taking a hands-on approach, Wise offers a series of gripping tales to illustrate how our brains function when we are exposed to mortal danger and how we can learn to control anxiety. Using the experiences of people who have averted lion attacks, wildfires and plane crashes, as well as of stage performers and top athletes, Wise explains how to stay cool under pressure.



From why we kiss to how religious we are, we can't escape our evolutionary history, explains anthropologist Robin Dunbar in *How Many*

Friends Does One Person Need? (Faber & Faber, 2010). With clear descriptions of groundbreaking experiments in evolutionary biology aimed at a popular audience, he explains why all babies are born premature, the science behind lonely hearts columns and why, even in the era of Facebook, we can never be acquainted with more than 150 people.

Learning to read Mandarin Chinese takes longer than acquiring Italian because of its more complex system of characters.



Deciphering the printed word

Reading is a vital portal to knowledge. Unique to humans, this evolutionarily recent invention intertwines language and vision in such a new way that years of education are needed to become fluent. The written word occurs in a dazzling variety of writing systems, from Roman and Greek alphabets to Chinese and Japanese characters, reflecting both universal similarities and the idiosyncratic evolutions of different languages. In his accessible and provocative book *Reading in the Brain*, cognitive neuroscientist Stanislas Dehaene explains how our brain empowers us to read.

A leading researcher in this field, Dehaene views reading as a tour de force of the human brain that is intellectually fascinating and important for education. Understanding how we read requires consideration of many themes: psychology, the organization of vision and language in the brain, primate neurophysiology and its evolution, the history of writing, the development of the child's mind and brain, and cultural variation. The book weaves these aspects into a compelling synthesis.

Dehaene describes pertinent neurological cases, such as that of a man with word blindness. After having a stroke, the man's vision was

intact and he could hear, speak and write down dictated words, but he couldn't read words, not even those he had written himself. Dehaene explains that when we read, we visually process about 12 letters at a time. He reveals the neural architecture of reading, describing the role of brain regions such as the 'letterbox', in which printed words are recognized as the gateway to meaning.

A theme throughout the book is how reading involves a balance between evoking the sound of a word in spoken language and rapidly translating print to meaning. The competing auditory and visual demands produce two interactive pathways in the brain — a phonological route that translates printed words to sound and then meaning, and a direct route that translates print to meaning. The reading system is so impressive that we can identify a word, from among the 50,000–100,000 words that we know, in a mere 50 thousandths of a second.

Dehaene then takes us on a global tour. Languages vary markedly in how they are written down and how that print relates to sounds and words. In Italian, letters or small groups of letters — known as graphemes — correspond almost on a one-to-one basis to the smallest

Reading in the Brain: The Science and Evolution of a Human Invention by Stanislas Dehaene
Viking; 2009. 400 pp. \$27.95, £17.45

J. GUARIGLIA/CORBIS