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Research highlights

Brain drain and brain gain in the workplace

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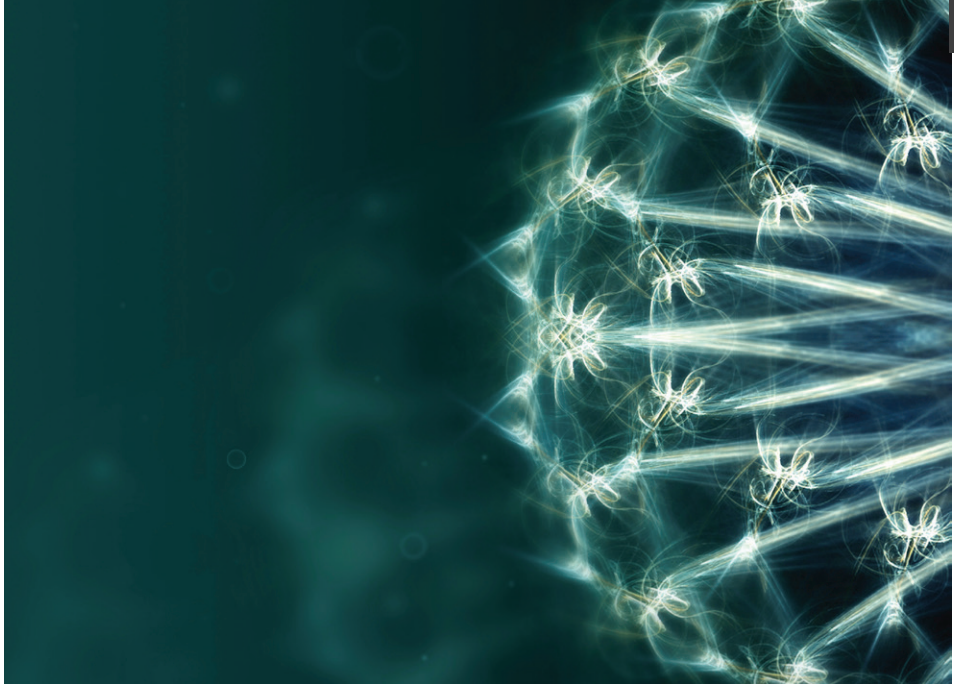
Dr Stefan Volk's research journey has taken him from economics to organisational neuroscience. He seeks to understand the biological foundations of human behaviour in the workplace by focusing on the individual as a micro-structure of the organisation.

Taking a road less travelled, Stefan describes himself as a "disciplinary boundary spanner" drawing together biological and medical research on the human brain to inform organisational research and practice.

By studying what is already known about brain structures and processes, he believes we can improve employees' performance in a myriad of ways, including, but not limited to, workplace intelligence, working cross-culturally and working in teams.



The human brain is capable of processing thousands of functions automatically, yet most of us have trouble recalling a shopping list of five items. Without automatic processes we would not survive, because we would be overwhelmed by all the decisions to be made and processes to be regulated – most importantly – just to keep breathing.

While we can consciously override certain automated processes with controlled processing – for example holding our breath when jumping into a pool – the capacity of our working memory which is required for this, as in the shopping list example, is limited. Working memory capacity is further reduced when the mind is busy because additional cognitive loading occurs, perhaps due to stress, being tired, hungry or distracted, or having to keep ourselves in check for some reason through self-regulation.

By augmenting organisational behaviour research with neuroscientific methods, which demonstrate the brain's activities behind a particular behaviour, researchers are finding out exactly why a person displays a particular behaviour at work.

Dr Stefan Volk, who is from the Discipline of International Business at the University of Sydney Business School, explores the implications of neuroscience for understanding and improving the performance, productivity and wellbeing of employees in the workplace. He is particularly interested in investigating how workers can make best use of their mental capacities, for example, by actively managing their cognitive resources throughout the working day.

By understanding cognitive and biological systems, Stefan believes workplace performance can be better managed to achieve a wide range of improved outcomes, arguing that neuroscience research is not so complicated that it cannot be digested and incorporated into any stream of organisational research.

For example, he investigates how firms can design work environments that help their employees to increase their available cognitive capacities and quickly restore depleted mental resources.

In doing so he draws from research in environmental psychology that has shown how simple things – such as recreational activities including nature walks or meditation during lunch breaks, offices equipped with plants or photographs of nature, and complimentary fruit or soft drinks – can help employees to regularly restore their depleted mental resources at work.

In a welcome addition to organisational behaviour research, Stefan asks how the human brain and body affect individual and team performance by drawing on findings from neuroscience. As he explains, neurons make up the brain of an individual, and a collection of individuals makes up a firm, so neurons are, in fact, the micro- structure of an organisation. By extension, the brain functions of a CEO arguably form the micro-foundations of many organisational outcomes.

Although it may be tempting to subject CEOs to neurological experimentation, and soon discreet wearable technology (eg smart watches, fitness trackers and smartphones) may make this a realistic possibility, according to Stefan, this is often not necessary. He has found ways of working conceptually rather than empirically, as a great deal of externally valid data already available from biology and medicine can be applied to the firm context. What follows are brief descriptions of three areas of Stefan's research: intelligence testing, peak-time performance, and foreign language use.

Intelligence testing

According to new research published by Stefan and his co-authors W.J. Becker and M.K. Ward in 'Leveraging neuroscience for smarter approaches to workplace intelligence' (2015), neuroscience is revolutionising our understanding of intelligence in the workplace.

Traditional intelligence tests commonly used in personnel selection have come under fire for disadvantaging certain groups, and without a strong theoretical foundation for the use of these psychometric measures, they are difficult to defend.

For a stronger basis on which to advance intelligence research, the authors advocate defining intelligence as "the biological ability to reason, solve problems, think abstractly and learn quickly" (Gottfredson, 1997). Intelligence seen in this light relies on recognising a problem and consciously directing and maintaining available brain resources towards solving it, while ignoring distractions which can limit working memory and slow cognitive processing.

A resounding advantage of a biological definition of intelligence is that it is broader, encompassing not only intelligence capacity, often used for employee selection via traditional intelligence testing, but also realised intelligence, that is, the degree to which intelligence capacity can actually be applied in practical workplace situations.

For example, when a job candidate takes an intelligence test, they typically do not have to multitask. However, in real-world settings, multitasking and other cognitively demanding tasks reduce available intelligence resources. As a result, employees who are best at multitasking, and therefore the demands of the job, are often not those who score well on tests. Yet firms often make the mistake of hiring people who perform best in intelligence tests (high intelligence capacity) instead of those who might perform worse in intelligence tests but better in real-world settings (high realised intelligence).

Neuroscience has inspired new measures of intelligence that have real potential to improve personnel selection:

1. measures of working memory (store and access)
2. measures of executive functions (govern and regulate)
3. measures of fluid intelligence (apply, reason and solve).

Neuroscience also has the potential to push organisational intelligence research and practice in new and exciting directions, including dealing well in highly demanding intelligence-related tasks even in the face of job stress and emotional demands.

Becker, Volk and Ward (2015) are moving forward at an opportune time – the dawning of organisational neuroscience, a marriage of neuroscience and organisational science– by breaking new ground with a fresh perspective on intelligence. They are shifting focus from debating about existing intelligence assessments to investigating a nuanced view of intelligence in which specific interactions between the person, environment and job tasks are taken into consideration.

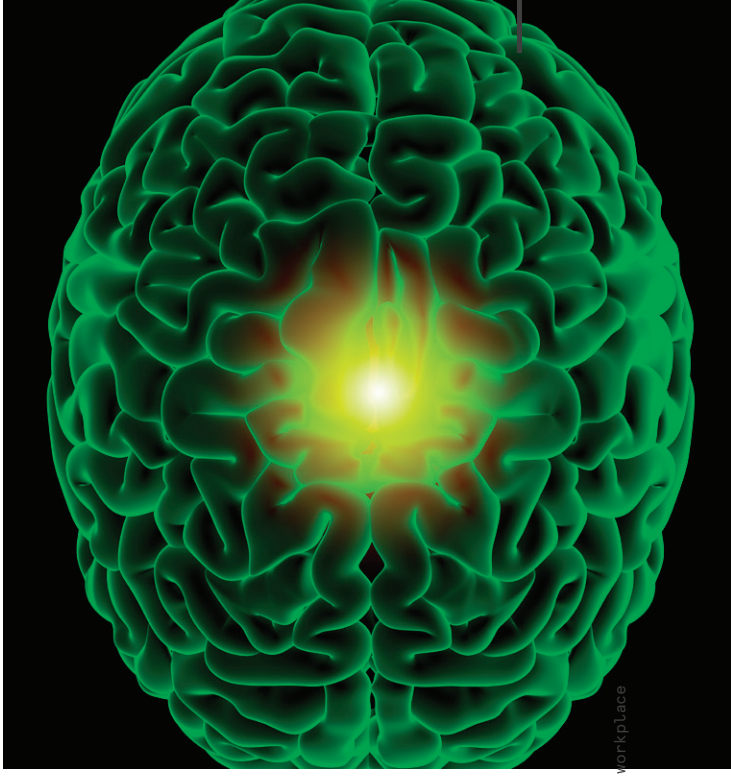
Biological rhythms and peak-time team performance

Are you a morning or an evening person? People differ in terms of their preference for late nights or early mornings as their peak time to work. Is it better for you to work with a homogeneous group including all morning people, or mix it up with a diverse group?

Volk, Christian and Becker (work in progress) examine the effects of biological rhythms on team performance. They ask "what are the consequences for team performance when individual team members have different daily performance cycles?" In answer, they have devised the concept of *chronotype diversity*, which represents the level to which a team is diverse in terms of its members leaning towards earlier or later peak-time performance.

The chronotype to a large extent controls a person's daily periods of activity and rest, but it is not only about sleep/awake patterns. Different chronotypes also vary substantially in terms of their daily performance cycles and achieve their peak attentional and cognitive performance levels at different times during the day. So there are different cycles of sleepiness, alertness and cognitive performance with peaks and troughs located at different points along a 12-hour continuum.

To achieve maximum performance in complex tasks, such as brainstorming an innovative solution for a complicated problem, the authors conclude that teams should be composed of members who have similar chronotypes, but are diverse in other attributes related to task-relevant information and perspectives.



In contrast, to achieve maximum performance in tasks requiring sustained attention, such as those performed in police surveillance, nuclear power plant operations, nursing and industrial quality control, teams should be composed of members who have different chronotypes but are similar in other attributes. The researchers argue that diversity in circadian rhythms and chronotypes has important implications for specific task performances, but also for the ideal timing when these tasks are performed.

Foreign language processing in multinational companies

Many multinational companies have implemented a common corporate language, usually English. However, at the same time, when it comes to top-level decision making they rely on experts for whom English is a second language. Will this combination of language policy and non-native English-speaking experts have the desired performance outcomes? In their 2014 study 'Brain drain: The cognitive neuroscience of foreign language processing in multinational corporations', Volk, Kohler and Pudelko raise some surprising notions for consideration.

While a native language, learned before five years of age, is automatically processed, foreign language use is a controlled process that draws heavily on working memory. When experts are called on to perform high-level processing in a second language, as in strategic decision making, a decrease in working memory capacity can occur. The fallout of this depletion may be an increased risk of ill-considered decisions based on 'gut-reactions', or a loss of self-regulation, eg control over one's emotions.

In a radical departure from common corporate language policies, Stefan and his colleagues recommend, among a number of other things, allowing experts working in a second language to decide when to use their native language to optimally process information for demanding tasks. They argue this flexibility improves high-level decision making and increases creativity and innovation.

Organisational neuroscience is in its infancy, yet exciting times are ahead if boundary spanners like Dr Stefan Volk and his colleagues continue to develop theoretical research and practical applications to benefit organisations. Stay tuned to learn more from neuropharmacology about the risks of a frightening new trend of doping in the workplace involving the consumption of performance-enhancing drugs by an increasing number of employees.

About the author

Dr Stefan Volk is a Senior Lecturer in Management at the University of Sydney Business School. He studied business administration at Humboldt University Berlin and received his PhD in management from the University of St Gallen in Switzerland. Stefan gained professional experience with several companies including Simon-Kucher & Partners, Daimler Group Research and Mercedes Benz Cars Development, and the Economics Department of the Embassy of the Federal Republic of Germany in Bangkok, Thailand.

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More information
Postgraduate Research Studies
+61 2 9036 5372
business.pgresearch@sydney.edu.au

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sydney.edu.au/business

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