# Grey Matter: How Managing Other Affect Brain Power - Positively!

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Management presents ongoing and well-documented challenges, not least the need to deal with others' demands and monitor their output. But new research from the University of New South Wales (UNSW) appears to have uncovered a hidden benefit in later life from embracing the responsibility of rising through the corporate ranks – it boosts brain power.

For the first time, researchers have identified a clear link between managerial experience throughout a person's working life and the integrity and larger size of the hippocampus – the area of the brain responsible for learning and memory. It seems managing other people at work triggers structural changes in the brain, protecting its memory and learning centre well into old age.

Using MRI imagery, on subjects between 75 and 92 years of age, scientists discovered that the rate of shrinkage (of the hippocampus) with age, in those with challenging careers, was much lower than those who were engaged in less complex, daily tasks.

The findings refine the understanding of how staying mentally active promotes brain health, potentially warding off neurodegenerative diseases such as Alzheimer's, says Michael Valenzuela, leader of the School of Psychiatry's Regenerative Neuroscience Group at UNSW. "We found a clear relationship between the number of employees a person may have supervised or been responsible for and the size of the hippocampus," he says. "This could be linked to the unique mental demands of managing people, which requires continuous problem solving, short-term memory and a lot of emotional intelligence, such as the ability to put yourself in another person's shoes."

While you don't have to be managing director of a top-performing company to get the cognitive benefits, Valenzuela says the brain-enhancing effect was particularly strong in those who had been in charge of more than 10 people. And while it's men, statistically, who head some of the largest business empires, researchers also found that it wasn't necessary to have followed a traditional management career trajectory to have a more resilient brain. In fact, larger hippocampal volumes were also seen in women who had taken on managerial roles in nursing or teaching, for example.

These results align with research into ageing and employment by Peter McDonald, director of the Australian Demographic and Social Research Institute at the Australian National University and deputy director of the UNSW-based ARC Centre of Excellence in Population Ageing Research.

A study of older workers by McDonald for the National Centre for Vocational Education Research, based on 2006 Census data, showed that, for men, as age progresses beyond age 65, managers and professionals make up increasing proportions of those employed, while technicians and trades workers, clerical and administrative workers, and machinery operators and drivers make up decreasing proportions. For women, the increase is also strong for those who are managers.

This would seem to indicate that those at a higher level in their career, who are forced to use their brain to solve complex issues, are mentally active, as well as fully employed, for longer.

"Cognitive ability is very likely to be a feature of people working longer at older ages," says McDonald. "Certainly the reverse would be true (low cognitive ability would lead to people not working)."

## Hanging in at Work

These findings in the area of brain health are encouraging for Australian policymakers facing the challenge of a rapidly ageing workforce and escalating rising health costs. The recent *Intergenerational report* (2010) on population ageing estimates that between now and 2050, the number of people aged 65-84 years will double, and the number of people aged over 85 will quadruple. This will have a huge impact on the worker/non-worker dependency ratio. Currently, there are five working aged people for each Australian aged 65 years and over, but by 2050 this is set to drop to 2.7.

One long-touted solution to the dilemmas presented by the ageing population is keeping older workers in the workforce for longer. Part of the challenge is maintaining mental muscle: it is estimated that about 250,000 people in Australia have dementia but by 2030 that number may swell to more than half a million.

Dementia is an umbrella term that refers to symptoms caused by changes in the functioning of the brain. These can include alterations in memory, personality and behaviour. UNSW is actively involved in contributing to the development of social policy for older citizens with brain disorders and promoting education about the brain and ageing through its Brain and Ageing Research Program, of which Valenzuela's study was a part. The program, led by Perminder Sachdev, has been actively monitoring the cognitive function of 1000 people for five years, with various research objectives and outcomes.

One of the most significant, yet to be published studies, shows that being socially and physically active, as well as mentally active, protects against cognitive decline, says Sachdev. Staying socially active has previously been linked to a lower risk of dementia by researchers at the Karolinska Institute in Sweden. In 2009 it reported that socially active people who were not easily stressed had a 50% lower risk of developing dementia compared with men and women who were isolated and prone to distress.

At a recent UNSW conference, Henriette van Praag, from the US National Institute on Aging, presented research showing a causal link between exercise and brain regeneration, or neurogenesis (which continues throughout life, until the age of about 70), in the learning and memory centre in the brains of mice. "What is most exciting is that a cheap, simple, lifestyle intervention like exercise can influence the production and integrity of new nerve cells in the brain, which suggests our behavioural choices have influence over the functionality of our brains," she said. "This is especially important as obesity rates continue to rise. And, as neurogenesis continues throughout life, the findings suggest significant cognitive benefits from exercise across all age groups." How much exercise is required is uncertain though.

**Train the Brain**

Actively training the brain is also beneficial. Acclaimed scientist and author Ryuta Kawashima, who developed Nintendo's Brain Training programs, suggests the brain is a muscle like anything else – if you don't use it, it is going to get flabby and out of shape. Kawashima's programs concentrate on what he believes are the most challenging brain tasks, including verbal, numerical and memory games – much like life in upper management.

McDonald points out that international literature suggests a strong positive relationship between education and cognitive ability at older ages.

In the debate about what causes, or prevents, cognitive decline, one of the most interesting concepts that may be especially relevant to senior professionals and others who function at a heightened cognitive level, is brain reserve.

In a 2009 editorial in the American Journal of Geriatric Psychiatry, Sachdev and Valenzuela reported that "people with high levels of Alzheimer's-type pathology in their brains escaped dementia and that this was related to a high count of neurons in the cerebral cortices". They concluded from a meta-analysis of the literature relating brain reserve to incident dementia, including 22 studies comprising 29,000 individuals followed up over a median of 7.1 years, that higher brain reserve was associated with a lowered risk for incident dementia.

The theory of a cognitive buffer, built up through complex mental tasks such as those involved in a challenging career, is moving rapidly from basic biology and epidemiology to clinical medicine, confirms Sachdev. Today, while managing directors or even mid-level managers are busily trying to stay ahead of the competition, they may be building up a brain bank that keeps their faculties above baseline.

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