

What's cooking in the Euro kitchen?

Jon Sutton introduces his coverage of the European Congress of Psychology in Stockholm

Welcoming delegates to Stockholm, Lars Ahlin – President of the 13th European Congress of Psychology – speculated that if one of Stockholm's most famous sons, Alfred Nobel, was writing his last will and testament today, 'we would definitely see a Nobel Prize in Psychology'. This was to be an event guided by humanism, knowledge and utility.

Lars-Göran Nilsson, Chair of the

Scientific Committee, gave a special mention to the 50 per cent of delegates from non-European countries, and then Robert Roe (President of the European Federation of Psychologists' Associations: EFPA) said that the conference was a real opportunity to look into the European kitchen. At a time of economic crisis, political and religious conflict, he was expecting 'controlled fighting between different factions'. With the promise of 'cognitive and emotional fireworks', the conference was under way.

Harrowing and humbling

On 22 July 2011 Anders Breivik bombed government buildings in Oslo, resulting in eight deaths, and then carried out a mass shooting at a camp of the Workers' Youth League on the small island of Utøya, killing a further 69 people, mostly teenagers. The follow-up of

survivors and the bereaved was a challenge for the healthcare system in Norway

at all levels, and the Directorate of Health quickly established an expert group to plan an outreach model for individual and collective follow-up at national and regional level. The Center for Crisis Psychology in Bergen was part of that group, and here the Center's Marianne Straume described their interventions.

Taking the 650 survivors and the bereaved relatives and friends to the island was clearly a massive undertaking, in practical and emotional terms. Meticulous planning was necessary, with written material to prepare victims for their visit. The island was cleared, buildings washed, and places where the bodies were found marked. A photo display on the mainland aimed to show that the scene of such a terrible tragedy was now clean and safe. On the island, each family was followed by a police officer to the site and given individual information on how their relatives were killed and how they were found. A collective follow-up with survivors allowed them to reconstruct how they fled. Meetings between the bereaved and survivors sounded particularly sensitive to me: 'Don't tell more than the bereaved person asks you', the survivors were told.

Harrowing work for a psychologist, but no doubt rewarding: of the 190 participants in the first of the weekend



The Congress in Stockholm presented a promise of 'cognitive and emotional fireworks'

Appeal of the puppet master

Tony Wainwright (University of Exeter) reports on a keynote by Henrik Ehrsson (Karolinska Institutet, Stockholm)

When I was sitting through the presentation by Henrik Ehrsson, entitled 'Two Legs, Two Hands, One Head, Who Am I?', I thought 'Don't try this at home!'. But then I did anyway. Getting a rubber glove filled with dried cat food and a towel, I tried to create the 'rubber hand illusion' with two teenagers who were staying.

In this body illusion, people view a dummy hand being stroked with a paintbrush, while they feel a series of identical brushstrokes

applied to their own hand, which is hidden from view. If this visual and tactile information is applied synchronously, and if the visual appearance and position of the dummy hand is similar to one's own hand, then people may feel that the dummy hand is, in some way, their own hand. My willing volunteers said it was weird. I tried it on myself, and indeed it was. I didn't quite feel the rubber glove was my hand, but it was getting there. Ehrsson

showed that some participants not only report the fake hand feeling like their own, their emotional and neuronal responses demonstrate that ownership too. The experience can apparently be very strong – watch an extract from *Horizon* illustrating the effect where the hand is hit with a hammer at tinyurl.com/32vmxsv.

In other illusions healthy volunteers came to experience a mannequin as their own body, the so-called 'body swap

illusion', or that they are outside their own physical body. One sequence showed people shaking hands with themselves. I found this jaw dropping as the effects were so powerful, but I am not sure, on reflection, quite why I wouldn't have expected it to be the case. I had known if you wear a pair of inverting goggles you start by seeing the world upside down, but after a few days, the world turns the right way up. Our brains are really good at this sort of thing.

gatherings for the bereaved, 90 per cent were satisfied or very satisfied with the benefits.

What about a rather different type of traumatic event, the 2004 Asian tsunami? In terms of deaths per million inhabitants, Sweden was the Western country most affected, and the city of Stockholm was the worst hit capital city. Eva Håkanson, from Sweden's CeFAM Crisis and Disaster Psychology, described how 4239 residents of Stockholm were registered at the airport during the first three weeks after the disaster. The psychological and somatic health of survivors in relation to exposure was investigated in more than 1500 questionnaire respondents who had been in the tsunami area, over a six-year period.

Eight different 'exposure groups' were identified, according to whether, for example, they had been present on the beach, suffered serious injury or bereavement. The psychological experience of life threat turned out to be a significant factor for the risk of mental ill health. Six years post-disaster, 60 per cent reported physiological symptoms. The most severely exposed had more sick leave, but interestingly the least exposed actually had less sick leave than matched controls not involved in the disaster.

Håkanson reported that most of the recovery seemed to occur during the first three years, with type of exposure important for somatic and mental health three years after the disaster but no longer three years further down the line. Time, as they say, is a great healer: just as well given the terrible incidents many have to cope with.

Ehrsson was out to test a theory of body ownership experience that suggests that the brain uses correlated patterns of information being received from different sensory modalities (vision, touch and muscle-sense) to create the experience. Using fMRI scanning while participants were having these various illusions he has been able to pin down which brain regions are key players in both the experience of body ownership and also of where body parts

are in space; in particular, the integration of multisensory information across body segments by ventral premotor neuronal populations. Ehrsson was able to present a very convincing case that it is indeed this correlated input from different modalities that underpins the experience we have of both being in and having ownership of our bodies and knowing where it is in space.

Ehrsson has that Brian Cox superstar sort of appeal. He is

NO TIME TO WASTE

Getting older isn't all that bad, reassured Wandi Bruine de Bruin (Leeds University Business School) and colleagues. In fact, there are areas of decision making where older adults outperform their youthful counterparts.

Few studies have examined the relationship between age and decision making, Bruine de Bruin reported, and most studies either focus on young adults or muddy the waters by selecting the different age groups from different backgrounds (a sample of university students versus a community sample of older adults, for example). The tasks that do show a negative relationship with age are generally the more cognitively demanding ones.

But now imagine this scenario. You and your friend have driven halfway to a vacation destination. Your goal is to spend time together. Both you and your friend feel sick. You both feel that you would have a much better weekend at home. What do you do?

Here we are dealing with 'sunk costs': prior investments that are irrecoverable. According to Bruine de Bruin, it is not

logical to base your decision on these: whatever you do, you can't get that time back. It turns out that older adults are more willing to cancel their plans: in fact, even more so in this 'high sunk cost' condition than in a 'low sunk cost' version where you and your friend haven't set out yet. She argued that coping mediates this relationship between age and resistance to sunk costs, in that older adults engage in more positive reappraisal, which is related to more positive affect.

This relationship was unpicked further by JoNell Strough (West Virginia University), who suggested that ageing 'limits our future time perspective'. She found that older adults' limited time horizons and their tendency to ruminate less in the face of obstacles increases their tendency to resist sunk cost bias. Indeed, simply by restricting young people's time horizons – for example by saying 'Imagine that because of a critical illness you do not have much time to live' – you can reduce the sunk cost bias.

So is ageing characterised by this carefree, no time to waste attitude? Surely we're more

likely to accumulate and report regret as we age, unless we're Frank Sinatra (who, as one delegate commented, runs the risk of sounding somewhat like a psychopath). In fact, as Daniel Västfjäll (Linköping University) reported, both cognitive and motivational theories suggest that regret should diminish with age, whereas much of the available empirical data points towards the opposite. He hypothesised that with increasing age, the decreased time available to undo the consequences of a major event will lead to an amplification of regret. However, due to older adults' selectivity in their emotional responses, their diminished cognitive resources, and greater experience with decisions over a lifetime, Västfjäll predicted that ageing will be related to less intense regret for minor everyday events. In a sample of 825 adults (18–85 years), this was the pattern he found: the frequency and intensity of experienced regret for everyday events decreased with chronological age, while the intensity of life regrets increased with age. In both cases, an open-ended future time perspective led to less intense regret: it helps to feel you have more time to make amends.

"whatever you do, you can't get that time back"

The humanity behind the brain-machine interface

Picking up the Aristotle Prize from EFPA, Niels Birbaumer (University of Tübingen, Germany) noted that his own work is standing on the shoulders of such philosophical giants. According to Aristotle, the body is the pump behind the thoughts, the emotions. Throughout Birbaumer's work on brain-machine interfaces in paralysis and behavioural disorders, he has been struck by the realisation that 'losing the capacity for communication', if the body shuts down, 'means losing life'.

Birbaumer ran through his development of 'cortical neuroprostheses' for restoring motor functions. Stemming from the finding that with feedback and reward you can make rats learn to increase or decrease activity in individual neurons, he highlighted the role of psychology in teaching these patients to communicate again. 'It's a very demanding

task,' he said, 'but if you're completely paralysed you have all the time in the world'.

The temptation, Birbaumer said, has been to see the problem as a technical one of needing to go further and further into the brain. 'Sometimes the last thing you think about is psychology'. But approaches such as deep brain stimulation are unrealistic in the long run, Birbaumer opined, and have to be combined with the psychological approach.

In addition to restoring some form of communication in locked-in patients, techniques from an instrumental learning approach can also be applied to motor rehabilitation following stroke. 'Constraint-induced movement therapy' involves immobilising the healthy arm for long periods each day, and is

thought to work by overcoming learned non-use and by facilitating use-dependent cortical reorganisation.

As impressive as these techniques are, for me the most striking aspect of Birbaumer's work is the humanity of it all. It's always heartbreaking to watch a locked-in patient apparently doing nothing in an attempt to control a cursor on a screen, when you are imaging the internal struggle. But Birbaumer says it is a mistake to project our own predictions of what such a life would be like... in fact, their depression tends not to reach clinical levels and the views on significant others on how they are feeling turns out to be a very bad source of information. 'Don't complete a living will,' Birbaumer advised, 'because whatever you write down now is completely irrelevant in the future'. In fact, chillingly, the best predictor for the decision of whether such a patient wants to stay alive turns out to be their answer to the question 'Do you think you will become a burden?'



'Losing the capacity for communication...means losing life'

STAY ASLEEP AND SMELL THE COFFEE

I had once read that smell is the one sense that is switched off while you sleep, and the phrase 'wake up and smell the coffee' would back that up. Not so the research, according to Anat Arzi (Weizmann Institute of Science, Israel). Although odorants presented during sleep don't wake, they nevertheless drive a stimulus-specific sniff response that can be used as a measure of information processing and learning.

To test the hypothesis that humans can learn new information during sleep, Arzi presented tones followed by pleasant or unpleasant odours, and



later measured the sniff response following the tones alone. Consistent with stimulus-specific olfactory processing during sleep, subjects sniffed more vigorously following pleasant versus unpleasant odours during sleep. Also, during sleep subjects sniffed more vigorously to

a tone that had been previously paired during sleep with a pleasant odour, versus a tone that had been paired with an unpleasant odour.

These newly acquired tone-induced sniffs remained when the participants awoke: they sniffed to a tone, without ever knowing that tones and odours were paired in sleep. Arzi even found differential consolidation of learning during REM versus non-REM sleep: superior processing during REM results in robust learning during REM, but there's greater consolidation to waking life if that learning occurs during non-REM.

HOSTILITY AND UNEMPLOYMENT

In 'these troubled times', the threat of redundancy and unemployment is a constant for most, and when it strikes it can seem random - why me? But the uncomfortable truth, said Christian Hakulinen (University of Helsinki) is that there is some evidence individual differences in personality characteristics may be related to 'self-selection into unemployment'. The 'Young Finns' prospective longitudinal study started in 1980 measured cynicism and paranoia: do these dimensions predict the odds of becoming unemployed?

Results showed that high hostility is associated with higher risk of becoming unemployed and having longer unemployment duration. Being unemployed predicted higher hostility in the short term, but did not contribute to clear personality change over a longer follow-up period.

Securely attached to science

I get the impression there is not much that Marinus van IJzendoorn (Leiden University, the Netherlands) wouldn't take on. His title for this keynote – 'Attachment across the lifespan: Neurobiological and developmental perspectives' – certainly suggests a man unfazed by the challenges of a broad theoretical and experimental overview of his subject.

Beginning with Bowlby's definition of attachment as an infant's strong disposition 'to seek proximity to and contact with a specific figure and to do so in certain situations, notably when he is frightened, tired or ill', van IJzendoorn moved to the level of attachment representation in adults. Our conscious and unconscious rules for organising attachment-related information can be assessed via the Adult Attachment Interview: how coherent are the stories we tell about our attachment biographies, and can we back up what we say with specific examples?

Studies show that there is continuity of attachment across the lifespan, and the key for van IJzendoorn is how our own attachment histories might impact upon how we respond to the attachment behaviours of our own infants. Take crying for example: an important and evolutionarily adaptive behaviour, but no

doubt an aversive one to most parents! Through a series of ingenious experiments, van IJzendoorn and colleagues (notably Marian Bakermans-Kranenburg) found that insecurely attached adults report more irritation and grip more tightly on a joystick in response to crying, while also displaying more amygdala response (although amygdala hyperactivity was not a significant mediator). There is no single attachment neural construct, van IJzendoorn concluded, and brain connectivity is clearly important.

In fact, van IJzendoorn is keen to focus on oxytocin as a possible 'attachment hormone'. He feels oxytocin experiments might shed light on mechanisms leading to (in-)sensitive parenting, and that it could even play a part in parenting interventions. Although results in studies using oxytocin

are notoriously inconsistent, van IJzendoorn has demonstrated some promise – for example, oxytocin reduced amygdala activation in response to infant crying, while increasing insula and inferior frontal gyrus activation. This suggests less anxiety and aversion, and more empathy, according to van IJzendoorn.

So is oxytocin 'mother's little helper', asked van IJzendoorn, ready to be distributed by the truckful? This would be far too simple a conclusion for a man with van IJzendoorn's nuanced approach, and tying it all together he revealed that parental rejection or 'love withdrawal' appear to decrease the impact of oxytocin, perhaps via insecure attachment. This points the way to developmental behavioural epigenetics, an eclectic approach which suits the fascinating van IJzendoorn down to the ground.

I An interview with Marinus van IJzendoorn will appear in a forthcoming issue



Oxytocin reduced amygdala activation in response to crying

Walk this way

What can we do about the ageing brain? That was the question occupying Carl-Johan Olsson (Umea University) in convening this symposium. There is longitudinal evidence for diminished frontal cortex function in ageing, he said, and tests of free recall can predict dementia up to 20 years prior to clinical diagnosis. 'We must find ways to preserve our brain structure and function', he challenged.

A healthy diet is thought to be important, but could weight loss actually improve cognitive function? Olsson put 20 post-menopausal women on either the Paleolithic diet (lots of meat and berries) or the Nordic nutrition recommendations. fMRI during a face-name task showed decreased frontal gyrus activity during retrieval, suggesting that the task post-diet is less cognitively demanding. Weight loss may improve brain efficiency during episodic memories, Olsson concluded.

Another target for intervention is a person's social relationships. Hui-Xin Wang (Karolinska Institute, Stockholm) found that those whose level of social engagement

decreased were at higher risk of dementia, and that the level of satisfaction with those networks was also important.

Perhaps most persuasive were the University of Illinois' Art Kramer's exhortations to 'go for a walk'. Across international studies with the normal elderly, we find that cognitive 'brain

training'-type effects are pretty specific. Not so for physical activity, where we see broad transfer. For an inspirational case study, just Google Olga Kotelko, the incredible flying nonagenarian, who has 26 world records since she reached 75 years of age. Kramer presented evidence of a correlated change in the integrity of the brain's white matter as a function of walking, but not of stretching. Functional connectivity changes in favour of the walking group, mostly in the brain's 'default mode network'. There are still effects with resistance training, but not as great. So start pounding the streets, and start young: Kramer ended with evidence

from a creative video simulation study, showing that fitter kids are more able to deal with cognitive challenges such as crossing a street while talking on the phone.



AGE AND EYEWITNESSES

Eyewitness testimony is a feature of memory that has a long and impressive history. Psychologists have been important in influencing the way that those in the legal profession treat witnesses and the evidence they provide. Less studied is the effect our ageing population may have on such accounts. Amina Memon (Royal Holloway) has been interested in this for several years, and brought us up to date here with a lifespan approach to the role of age effects in eyewitness accounts and accuracy.

We know that there are age-related differences in memory performance, and this has sound theoretical explanations, but what about when it comes to using one's memory in an eyewitness setting? Memon began by discussing her studies that have looked at age-related declines in face recognition. Depressingly, we learnt that there is a linear decline in face recognition from as early as age 32. However, the pattern is less than straightforward and there are several moderating factors: these include exactly how old you are (the old/old do very much worse), and the precise instructions given to participants in taking part in line-up identifications.

Memon went on to talk about the 'own-age bias' in face recognition, whereby, in simple terms, you are better at remembering a face from your own age group. Certainly she was clear that this is true for young adults, but the picture is more complicated for older adults. In particular, they make more false identifications to a face that was not presented in the study phase.

Finally, Memon talked about the use of video parades with children. These are increasingly being used in the Scottish and English legal systems in order to protect vulnerable witnesses (a group that includes children below the age of 18). Memon and her colleagues suggest that video parades work well for helping child witnesses and are a positive move in the legal process of eliciting more accurate memories from children than simply showing them static images of faces alone.

Catriona Morrison
University of Leeds

SUE sweeps up lying suspects

People are not very good at detecting deception. We know this from stacks of studies, suggesting rates of little above chance. But, explained Pär-Anders Granhag (Gothenburg University) in this 'state of the art' lecture, almost all of this research involves passively watching brief video clips without any background information. 'There's little need for more of this research, so we set out in a new direction 10 years ago: how to *interview* to detect deception.'

There are three different lines to this research: imposing a cognitive load on the interviewee; asking unanticipated questions; and using background information in a strategic manner. Granhag focused on

this last line, giving us the Strategic Use of Evidence (SUE) technique. Suspects tend to use counter-interrogation strategies, but psychologists can help to find ways to trip them up.

Granhag says that all evidence needs to be considered in terms of a matrix: does it have low or high diagnostic value (i.e. is it central to proving the interrogator's case?), and is there a low or high probability that the suspect knows that you know? Take Assad Sarwar, convicted of the so called 'liquid bomb' plot. Confronting him with a piece of evidence such as 'we have recent CCTV footage of you buying a suitcase' would 'burn' this piece of evidence at too early a stage, as Sarwar could

immediately counter with 'I buy lots of things for lots of people'. Instead, begin from a position of weak specificity, and low strength of source – 'we have information that you recently visited a luggage store' – and build up to the big reveal. 'Lying suspects tend not to go beyond what is presented to them,' said Granhag, 'and they will tend to change their story as the evidence is disclosed.'

Granhag admits that the technique brings no solution for the silent suspect, but he claims that it protects the innocent by inviting the suspect to tell their story *before* the evidence is disclosed. Overall, it brings a 'judicial dimension which most lie detection techniques are missing'.

A critical thinker

A true democracy requires an 'educated citizenry', argued Diane Halpern (Claremont McKenna College, United States) in this fascinating invited lecture on the final day of the conference. Yet Halpern pointed to a survey suggesting that employers feel 31 per cent of employees lack the critical thinking skills necessary for employment, and examples ranging from 'power balance' wristbands to the Flat Earth Society suggest a need to sort the good from the bad in a time of increasing amounts of information.

According to Halpern, the effortful, careful, consciously controlled processing of critical thinking is crucial. We need to teach thinking skills such as understanding how cause is determined, how to recognise and criticise assumptions, to point out circular reasoning.

Such thinking is both a skill and a disposition: it's an attitude and approach to information that Halpern is trying to teach, which she describes as 'sceptical not cynical'. And much of this is grounded in psychology: for example, Halpern can discuss newspaper articles with her students and point out where

control groups are lacking, or causal statements are presented with correlational evidence. 'Once you sensitise them, they start bringing their own examples in', Halpern said. You will never see the world in the same way again: in particular, George W. Bush (always a favourite in psychology presentations) appears to be something of a walking cognitive bias. For example, his argument for leaving troops in Iraq, focusing on the thousands of American troops lost to that point – 'We owe them something. We will finish the task that they gave their lives for' – is a good one for teaching the sunk-cost fallacy.

All this leads to the Halpern Critical Thinking Assessment, and she describes the goal of teaching critical thinking as 'the most difficult and important thing we do as teachers. It puts a value on science, which many people do not understand and value.' Perhaps we should all engage in some critical thinking around our own critical thinking: as Halpern concluded, 'People are happy to say "I have a bad memory". Nobody wants to say "I'm a bad thinker".'

A roadmap to resilience

There is a simple question at the heart of Elaine Fox's work: Why are some people emotionally vulnerable? The University of Oxford professor shows that how we process information is an important component.

Even an earthworm will move towards the warmth, Fox said, so it is no surprise that reward and fear systems are crucial motivators. But our attention 'is not held captive by every blade of grass moving in the wind': the automatic mechanisms guiding attention can be overcome by 'goal-directed, volitional control of attention'. And this is where people differ in profound ways: in the degree to which their attention is drawn and held by negative or positive material, and in how well we can control and regulate attention.

Psychologists can measure these emotion-related cognitive biases, with reaction time measures indexing the allocation of attention; measures of selective recall of past events; measures of selective interpretation of ambiguous social situations; and measures of neural reactivity to specific events. But do such biases play a causal role in emotional vulnerability and resilience? Yes, says Fox, finding that the only thing that predicted cortisol response to a stress task four and eight months later was the participants' negative bias to masked stimuli.

The obvious next step is to reduce these 'toxic' biases via 'cognitive bias modification' (CBM). Repetitive, computer-based training can teach people to avoid threat, 'retraining the brain' in a more enduring way to help control stress reactions. Fox presented studies showing CBM to be effective in reducing clinical symptoms in anxiety and depression. The reduction in bias is

correlated with a reduction in the intensity of emotional reactions to stressful situations.

What determines the magnitude and direction of these cognitive biases? Until recently, there has been an emphasis on adversity in gene x environment work, for example the role of the serotonin transporter gene in Caspi's 23-year study. The short form of the gene facilitates the negative consequences of adverse environments. But more recent work suggests that the same variant is associated with positive outcomes in supportive environments: Is it a risk gene, or a 'for better for worse' gene, asked Fox?

Recent research from Thalia

Eley even suggests that people with the short form of the gene benefit more from CBT (although this interaction only emerged at the six-month follow-up). Fox's own study, involving 800 trials of CBM with emotion-based pictures, found that those with the short version of the serotonin transporter gene were more malleable, developing a bias to both positive and negative stimuli after training.

Fox concluded that what was designed as an experimental tool might be therapeutic, but that we need larger-scale studies that aggregate a cumulative genetic score across several polymorphisms, rather than a single candidate gene. This requires collaborations among experimental psychologists, molecular geneticists, cognitive neuroscientists and clinicians (among others). It's a big undertaking, but according to Fox a model that incorporates cognitive, genetic, neurobiological and social levels of analysis could provide a vital roadmap to better understand emotional vulnerability and resilience.



Cognitive bias modification was effective at reducing clinical symptoms in anxiety

Nice results for anti-bullying

Bullying is known to have severe short- and long-term consequences, not only for targeted children but also for the perpetrators and even bystanders merely witnessing the bullying. Psychology has an important role to play in intervention, but not all actions are equally effective: despite good intentions, we may be wasting resources or even causing harm with practices that are not evidence-based, says Christina Salmivalli (University of Turku, Finland).

In 2006 the Finnish government invested in the development and evaluation of a research-based programme, KiVa (an acronym for *kiusaamista vastaan* or 'against bullying', which

also means 'nice' in Finnish). KiVa is based on Salmivalli's Participant Role approach, which states that peer bystanders play a crucial role in bullying. It therefore uses 'universal interventions', directed at the whole class, to influence the group norms and to build capacity in all children to behave in constructive ways.

KiVa is now in use in 90 per cent of Finnish comprehensive schools, and a randomised controlled trial showed reductions in bullying and victimisation during the first year equivalent to 7500 fewer bullies and 12,500 fewer victims.

! An interview with Christina Salmivalli will appear in a forthcoming issue

IN BRIEF

Most assessment practices in UK universities have not changed to equip students for the skills they need for employability, according to Nick Lund (Manchester Metropolitan University). He described his department's move towards 'authentic assessments', namely presentations of their final-year project at an undergraduate conference. Accounting for 25 per cent of the project mark, Lund says the day can create considerable anxiety amongst the students, but it develops their confidence, points to postgraduate study, develops professionalism and provides 'social closure' at the end of the final year.

What happens when workaholics go cold turkey? Jessica de Bloom (University of Tampere, Finland) looked at rumination and well-being in 54 Dutch workers before, during and after vacation. Forty-three per cent of workaholics worked during their vacation, compared with 18 per cent of non-workaholics. Increases in positive affect during vacation, as well as decreases after, were larger in workaholics than in non-workaholics. This led de Bloom to describe holidays as a double-edged sword for workaholics.

How does noise in open-plan offices affect employees? Helena Jahncke (University of Gavle, Sweden) found that memory performance decreased when the background sound level increased. Tasks particularly affected involved searching, rehearsal and memorisation of information. Jahncke suggested that in an organisation with 110 employees, even a 2 per cent performance reduction translates to a €120,000 hit.