

Can a brain scan tell us anything about the art of creative writing?

When an accomplished creative writer gets on with their craft, their brain operates in a somewhat different way to a novice's. A new imaging study suggests that the expert approach may be more streamlined, emotionally literate, and initially unfiltered.

Katharina Erhard with her colleagues from the German universities of Greifswald and Hildesheim asked participants to read a fragment of a story, to brainstorm what could continue the narrative, and then, for two minutes, to write a continuation of the story. Their brains were scanned throughout. This is an improvement on previous studies that have simply involved participants imagining a story while lying in a scanner.

Participants were 20 experts – students on competitive creative writing courses with over 10 years' experience and a weekly average of 21 hours' practice – and 28 novices practising less than an hour per week. Independent judges considered the experts' writing significantly more creative: 'unmade laundry, unloved days' was how one expert closed his response to an account of a bitter bachelor killing himself in a laundry, whereas a tale of a violinist losing his instrument in the snow conjured this image: 'the glacier, winding its tongue around the sounds, suddenly gulped the violin'. The differences between expert and novice brain activation during the writing phase offers some tantalising clues to how such quality emerges.

In the frontal cortex, expert brains showed greater activity in areas crucial to language and goal selection, including across the inferior frontal gyri (IFG). Verbal creativity has been associated with left-IFG activation many times before, but involvement of the right IFG was unexpected. The area is associated with emotional language processing, such as interpreting expressive gestures, so this may suggest that experts are attending more deeply to the emotional currents of text and their ideas. Together with recent evidence that

metaphor comprehension recruits the right temporal lobe, this suggests a role for processes housed in the right hemisphere when a verbal task is more abstract and less factual.

Expert writing also involved more activation in the left caudate. This is part of the basal ganglia, long known to be critical to learning and expert performance, and seems to reflect ordinarily cortical cognitive processes becoming automatised and bundled together within the deeper brain. In this case, these may be to do with visually processing text, as the experts showed less activation in occipital areas involved in visual and perceptual processing.

One final finding: during brainstorming, expert brains showed increased activation relative to novices in several regions associated with speech production. Taking these findings together, they paint a picture of expert creative writers: ideas bubble within them, already on the road from concept to expression, readily communicable, almost rising into their throats. These are handled by neural systems streamlined to take care of the basics, while the writer devotes greater attention to the emotional interpretation of their text. It will be down to future researchers to verify or reject this characterisation – and hopefully, some great future writers to tell us about it. Maybe you. *AF*



In *NeuroImage*

High emotional intelligence linked with more delinquency among young women (but not men)

In the *Journal of Forensic Psychiatry & Psychology*

If, as research suggests, the psychological trait of sensation seeking is the catalyst for youthful delinquency, might high emotional intelligence (EI; having empathy for other people's emotions and good control over one's own) act as a calming restraint? That was the question Alison Bacon and her colleagues posed in their study of 96 undergraduates (average age 20; 48 women).

Their 'surprising and unprecedented' discovery was that for women, not only did high EI not moderate the link between sensation seeking and delinquency, in fact high EI went hand in hand with higher rates of self-reported delinquency, including playing truant from school, taking drugs and violence.

Why should this be? The researchers are left speculating. They think high EI might fuel acts of indirect aggression like 'psychological bullying, deliberate social exclusion or malicious gossip' that tend to be performed more by young females than males. Unfortunately the researchers' measure of delinquent behaviour didn't include these kinds of behaviours, but they reasoned perhaps the same young women who perform these less visible acts were also more likely to commit the forms of delinquency that were on the scale, such as rowdy behaviour and smoking cannabis. If so, this would help explain the high EI/delinquency link in women.

'A high level of trait EI may facilitate an enhanced ability to present Machiavellian behaviour in a positive light, understand victims' emotions and predict likely responses in order that social manipulations are successful,' Bacon and her team said.

What about the male students? Their answers were more in line with the researchers' predictions. For men, higher EI acted as a moderator, weakening the link between sensation-seeking traits and delinquency. High EI also had its own direct inverse relationship with delinquency – that is, men with higher EI tended to be less rebellious.

'Trait EI is known to predict a wide array of positive, practical and health-related life outcomes,' the researchers concluded. 'Understanding how the perpetration of negative behaviours is linked to trait EI may be an important step towards promoting well-being.' *CJ*



Publication bias afflicts the whole of psychology

In *PLoS One*

In the last few years the social sciences, including psychology, have been taking a good look at themselves. While incidences of fraud hit the headlines, pervasive issues are just as important to address, such as publication bias, the phenomenon where non-significant results never see the light of day, thanks to editors rejecting them or savvy researchers recasting their experiments around unexpected results and not reporting the disappointments. Statistical research has shown the extent of this misrepresentation in pockets of social science, such as specific journals, but a new meta-analysis suggests that the problem may infect the entire discipline of psychology.

A team of psychologists based in Salzburg looked at 'effect sizes', which provide a measure of how much experimental variables actually change an outcome. The researchers randomly sampled the PsycINFO database to collect 1000 psychology articles across the discipline published in 2007, and then winnowed the list down to 395 by focusing only on those that used quantitative data to test hypotheses. For each main finding, the researchers extracted or calculated the effect size.

Studies with lots of participants (500 or more) had an average effect size in the moderate range $r = .25$. But studies with a smaller sample tended to have formidable effect sizes, as high as .48 for studies with under 50 participants. This

resulted in a strong negative relationship between number of participants and size of effect, when statistically the two should be unrelated. As studies with more participants make more precise measurements, .25 is the better estimate of a typical psychology effect size, so the higher estimates suggest some sort of inflation.

The authors, led by Anton Kühberger, argue that the literature is thin on modest effect sizes thanks to the non-publication of non-significant findings (rejection by journals would be especially plausible for non-significant smaller studies), and the overrepresentation of spurious large effects, due to researchers retrospectively constructing papers around

surprising effects that were only stumbled across thanks to inventive statistical methods.

The analysts rejected one alternative explanation. To detect powerful effects a small sample is sufficient, so researchers who anticipate a big effect thanks to an initial 'power analysis' might deliberately plan on small samples. But only 13 per cent of the papers in this report mentioned power, and the pattern of correlation in these specific papers appears no different to that found in the ones who never mention power. Moreover, the original 1000 authors were surveyed as to what they expected the relationship between effect size and sample size to be. Many respondents expected no effect,

and even more expected that studies with more participants would have larger effects. This suggests that an up-front principled power analysis decision is unlikely to have been driving the main result.

Kühberger and his co-analysts recommend that in future we give more weight to how precise study findings are likely to be, by considering their sample size. One way of doing this is by reporting a statistic that takes sample size into account, the 'confidence interval', which describes effect size not as a single value but as a range that we can be confident the true effect size falls within. We all want to maintain confidence in psychological science, so it's worth considering. **AF**

The psychology of 'mate poaching' – when you form a relationship by taking someone else's partner

In the *Journal of Research in Personality*

According to one estimate, 63 per cent of men and 54 per cent of women are in their current long-term relationships because their current partner 'poached' them from a previous partner. Now researchers in the US and Australia have conducted the first investigation into the fate of relationships formed this way, as compared with relationships formed by two unattached individuals.

An initial study involved surveying 138 heterosexual participants (average age 20; 71 per cent were women) four

times over nine weeks. All were in current romantic relationships that had lasted so far from 0 to 36 months. Men and women who said they'd been poached by their current partner tended to start out the study by reporting less commitment to their existing relationship, feeling less satisfied in it, committing more acts of infidelity and looking out for more alternatives. What's more, over the course of the study, these participants reported progressively lower levels of commitment and



satisfaction in their relationships. They also showed continued interest in other potential romantic partners and persistent levels of infidelity. This is in contrast to participants

who hadn't been poached by their partners – they showed less interest in romantic alternatives over time.

The researchers led by Joshua Foster attempted to replicate these results with a second sample of 140 heterosexual participants who were surveyed six times over 10 weeks. Again the participants who said they'd been poached by their partners tended to report less commitment and satisfaction in their current relationships, and more interest in romantic alternatives. However, unlike the first sample, this group did not show deterioration in their relationship over the course of the study. The researchers speculated this may be because the study was too short-lived or because deterioration in these relationships had already bottomed out.

It makes intuitive sense that people who were poached by their partners showed less commitment and satisfaction in

their existing relationship. After all, if they were willing to abandon a partner in the past, why should they not be willing or even keen to do so again? This logic was borne out by a final study of 219 more heterosexual participants who answered questions not just about the way their current relationship had been formed, but also about their personalities and attitudes.

Foster and his team summarised the findings: 'individuals who were successfully mate poached by their current partners tend[ed] to be socially passive, not particularly nice to others, careless and irresponsible, and narcissistic. They also tend[ed] to desire and engage in sexual behaviour outside of the confines of committed relationships.' The last factor in particular (measured formally with the 'Socio-sexual Orientation Inventory-revised') appeared to explain a large part of the link between having been

poached by one's partner and having weak commitment to the new relationship.

Across the three studies, between 10 and 30 per cent of participants said they'd been poached by their current partners. This shows again that a significant proportion of relationships are formed this

way, the researchers said, and that more research is needed to better understand how these relationships function. 'We present the first known evidence [showing] specific long-term disadvantages for individuals involved in relations that formed via mate poaching,' they concluded. CJ



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LINK FEAST

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tinyurl.com/mo487px

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Moving, graphic first-person account of a young man's descent into a psychotic episode and his subsequent recovery.
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Beware, Playing Lots of Chess Will Shrink Your Brain!

A new study compares the brain structure of chess grandmasters and amateurs.
tinyurl.com/owclvyy

Is Social Psychology Biased Against Republicans?

Maria Konnikova outlines multiple strands of evidence suggesting that social psychology is biased against conservatives and conservative ideas. The introduction of blind peer-review may be one part of the solution.
tinyurl.com/k4lxrd5



We Are All Confident Idiots

Thomas Jefferson had it right, argues psychologist David Dunning at the Pacific Standard – someone 'who knows nothing is closer to the truth than he whose mind is filled with falsehoods and errors'.
tinyurl.com/oz9ogvw

Magic May Lurk Inside Us All

'Several streams of research in psychology, neuroscience and philosophy are converging on an uncomfortable truth: We're more susceptible to magical thinking than we'd like to admit.'
tinyurl.com/p7r9s8z



You've heard of 'Owls' and 'Larks', now sleep scientists propose two more chronotypes

In *Personality and Individual Differences*

For many years psychologists have divided people into two types based on their sleeping habits. There are Larks who rise early, feel sprightly in the morning, and retire to bed early; and Owls, who do the opposite, preferring to get up late and who come alive in the evening.

Have you ever thought that you don't fit either pattern; that you're neither a morning nor evening person? Even in good health, maybe you feel sluggish most of the time, or conversely, perhaps you feel high energy in the morning and evening. If so, you'll relate to a new study published by Arcady Putilov and his colleagues at the Siberian Branch of the Russian Academy of Sciences.

The researchers invited 130 healthy people (54 men) to a sleep lab and kept them awake for just over 24 hours. The participants were asked to refrain from coffee and alcohol, and several times during their stay they filled out questionnaires about how wakeful or dozy they were feeling. They also answered questions about their sleep patterns and wakeful functioning during the preceding week.

By analysing the participants' energy levels through the 24-hour period and their reports about their functioning during the previous week, Putilov and his team identified four distinct groups. Consistent with past research, there were Larks (29 of them), who showed higher energy levels on the first and second mornings at 9am, but lower levels when tested at 9pm and

midnight; and there were Owls (44 of them), who showed the opposite pattern. The Larks also reported rising earlier and going to bed earlier through the previous week, whereas the Owls showed the opposite pattern. There was an average two-hour difference between the sleep and wake cycles of these two groups.

The researchers also identified two further chronotypes. There was a 'high energetic' group of 25 people who reported feeling relatively sprightly in both the morning and evening; and a 'lethargic' group of 32 others, who described feeling relatively dozy in both the morning and evening. Unlike the Owls and Larks, these two groups didn't show differences in terms of their time to bed and time of waking – their habits tended to lie mid-way between the Larks and Owls.

The researchers said their results support the idea of there being 'four diurnal types, and each of these types can...be differentiated from any of three other types on self-scorings of alertness-sleepiness levels in the course of 24-hours sleep deprivation.'

Part of the title of this new paper is 'A search for two further "bird species"'. I was hoping the authors might propose two new bird names for their high energy and lethargic categories, but sadly they don't. What about Swift for the high energy category? I'm not sure about a lethargic bird: Dodo? Pelican? Over to you for suggestions! **CJ**

DIGEST DIGESTED

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An analysis of 12 widely used university textbooks on the topics of sex and gender has found that misconceptions about evolutionary psychology are commonplace. There was an average of 5.75 errors per book. Benjamin Winegard and his colleagues branded the treatment of their discipline 'shoddy'. *Evolutionary Psychology*

Decades of lie detection research has been unrealistic, according to Tim Levine and colleagues, because the approach has always been to have the lie detector in a passive role. Levine's team found that professional interrogators were highly successful at identifying cheats and liars when they were allowed to ask strategic questions. *Human Communication Research*

Students trained on a treadmill to walk in a happy style showed a bias for remembering positive words. The researchers, based in Germany and Canada, believe their study could have implications for helping people with depression. *Journal of Behavior Therapy and Experimental Psychiatry*



Insecure managers are less likely than their more confident counterparts to listen to feedback from subordinate staff. Nathanael Fast and his colleagues believe that insecure managers are motivated by defensiveness and a desire to protect their own status. *Academy of Management Journal*

A replication of Milgram's classic electric-shock studies has found that people who score more highly on the traits of agreeableness and conscientiousness are more likely to obey the instruction to electrocute another person. The research involved re-creating the Milgram paradigm in the context of a French TV quiz. *Journal of Personality*

A study of American and German bereavement cards has found that the former tend to avoid negative sentiments and imagery. US participants, more than Germans, also tended to favour cards that contained a more upbeat message. The researchers argue this reveals cultural differences in attitudes towards suffering. *Journal of Personality and Social Psychology*



Medical students who had more dreams about an important exam tended to perform better in that exam when they eventually took it. Isabelle Arnulf and her colleagues say this is consistent with threat simulation theory – the idea that dreams help prepare us for real-life challenges. *Consciousness and Cognition*