

Kaleidoscope

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Is counselling as effective as CBT for depression? Data from 103 Improving Access to Psychological Therapies (IAPT) services across the UK showed that the therapy type (CBT *v.* counselling) did not predict outcome¹ and, regardless of intervention, only half of all patients showed any reliable improvement. Clearly in the mood for some fairly frank debate with colleagues, this work by Pybis *et al* reported on secondary analyses of data from over 33 000 patients – around half the country's IAPT total – as part of the second UK National Audit of Psychological Therapies. CBT was given about twice as often, but counselling, sometimes referred to as non-directive supportive therapy, received more patients with moderate to severe depression. Those receiving counselling generally received fewer sessions, and only where patients received 18 or 20 sessions of CBT (which occurred in just 3% of cases) was the structured intervention more effective. Orford's paradox of outcome equivalence might be applied here, and the authors propose that other factors should be explored in future, including why there was such variation between some sites. NICE guidelines recommend CBT as a first-line psychological therapy, with counselling second-line and counsellors are *mandated* to discuss its uncertain effectiveness with patients.

Antidepressants can reduce emotional pain, but problematic emotional blunting has been a recognised side-effect. Interestingly, although commonly described, the frequency of blunting has not been well established. Goodwin *et al*² developed a questionnaire on the emotional side-effects of antidepressants and conducted an internet survey on 800 patients. They found an overall rate of emotional blunting of 46%, which was higher in men and in those with greater levels of anxiety; having this symptom was also associated with poorer remission. There were no differences between individual drugs, except that rates were lower with bupropion. However, importantly, overall scores on the novel scale were highly correlated with Hospital Anxiety and Depression (HAD) scores, inferring that emotional blunting is not just a side-effect of antidepressants but a symptom of depression. The scale was not designed to unpick the cause of the phenomenon, though the authors suggest that if secondary to medication, one might anticipate greater differences between individual drugs. They pose the challenging question of whether emotional blunting might be an illness symptom that most current medications are unable to treat.

We remember, with fondness, the London Olympics of 2012. Part of all Olympic bids are proposed 'legacy' aspects; might these positively impact locals' mental health? The Olympic Regeneration in East London (ORiEL) study³ surveyed over two thousand 11- to 12-year-olds in the host borough of Newham and three adjacent comparator boroughs prior to, and 6 and 18 months after, the games. Participants were clustered by school (6–7 per borough) and analyses additionally calculated 'exposure' to regeneration through distance of these schools to the Olympic park. There were no differences in well-being between the groups or across the time frames, but those from the host borough were more likely to have 'remained depressed'. It is difficult to say why those in Newham showed worse mental health, but the

authors note the potential environmental stresses of regeneration, gentrification and reduced social capital, changes to social networks, displacement, loss of amenities for some, and a sense of a lack of control over planning. Despite glossy promotion, to date there has been little hard scientific evidence that urban regeneration legacy programmes do what they propose. Although endorsed as a local gain, regeneration plans perhaps do not really address residents' priorities or factors that actually promote neighbourhood psychosocial and economic issues.

4% of 10- to 19-year-olds will have emergency hospital admissions for *adversity*-related injuries: their risk of death in the subsequent decade is double that of those with *accident*-related injuries. Writing in the *Lancet*, Herbert and colleagues⁴ undertook an impressive retrospective nationwide cohort study – encompassing over one million adolescents – looking at these causes of death, with a particular focus on the former group, who have previously suffered self-inflicted, drug- or alcohol-related, or violent injury. The risk of subsequent suicide and drug- and alcohol-related deaths all increased by a similar magnitude in this cohort over those who had earlier accidental injuries (except for suicide risk in girls who had suffered violent injury; while boys who had suffered *adversity*-related injuries also had increased risk of future death by accidental injuries). Guidelines for self-harm in adolescents specify evaluation of psychosocial circumstances and suicide risk; guidelines for drug- and alcohol-related presentations do not. The authors propose that these alcohol and drug emergency injuries should be treated as seriously and consistently as a public health intervention target as self-harm in young people. It is difficult to disagree.

The literary critic Barbara Johnson proclaimed that '**A balanced diet is a cookie in each hand**'. The neural basis of **binge eating is poorly understood**, but is thought to involve a network of subthalamic and reward pathways; their incidental activation with deep brain stimulators (e.g. for the amelioration of movement disorders) can lead to the development of binge eating behaviours. From this, Zhang & van den Pol⁵ specifically explored the zona incerta (ZI) as a target for modulating food consumption in mice. The ZI is located in the subthalamic region and projects throughout the brain, including the hypothalamus and striatum – both areas implicated in appetite- and reward-driven behaviours. By optogenetically labelling GABAergic neurons, they then used laser stimulation to reliably drive depolarisation of ZI neurons. These mice then consumed 35% of their 24 hour limit of high-fat foods in 10 minutes, versus 4% in control mice. By intermittently stimulating the same region four times (10 minutes stimulation with 30 minute breaks), the mice consumed 74% of their total 24 hour limit compared with controls who consumed only 22%, suggesting that constant over-activation drives consumption behaviour. Zhang & van den Pol also found that when starved, the consequent release of the hormone ghrelin (signalling reduced gut energy) physiologically excited these GABAergic neurons in the ZI.

But the real question is how this can lead to obesity – to answer this, they induced chronic overstimulation of the ZI neurons by photostimulating the same area for only 5 minutes, every 3 hours over a period of 2 weeks. As predicted, the mice food intake and body weights systematically increased during this 2-week period; when the stimulation ceased, these behaviours decreased and food consumption and weight returned to baseline. As binge eating is suggested to be reward-driven, they also tested the mice in a two-chamber preference test with no food. Given free reign, the mice consistently prefer the chamber associated

with the laser stimulation condition – suggesting that drive from ZI neurons leading to food consumption becomes rewarding.

Author inclusion and order on scientific publications is always a sticky academic topic. Publishing is an essential part of scientific career advancement, but who goes on a paper and where? At Kaleidoscope we routinely settle this with a game of rock-paper-scissors (best of three), but we recognise that not everyone might consider this rational or fair. Johal and colleagues⁶ – we can only assume they're happy with their author order and that Johal thus deserves to be first among equals – examine this thorny issue in their paper ‘“Political co-authorships” in medical science journals’. They quote earlier work noting that ‘Authorship is a political problem; it involves staking and maintaining territorial rights, colonisation, and empire building’. The temptations and motivations for author manipulation are numerous, including building collaborations (or fear of jeopardising them), and including expert authors to add gravitas to a work and enhance publication prospects. Sometimes, the intent can be more benign, if still ethically dubious, such as trying to support a junior researcher at an early but critical career stage. There are guidelines on authorship, notably the 2004 International Committee of Medical Journal Editors’ statement, to which most reputable journals stick, though beyond insisting authors declare their adherence, there is little way to check. The authors conclude somewhat pessimistically that any system changes just offer another layer open to manipulation and gaming. Is this a problem we can solve scientifically, or is it just down to ethics?

Scarlett Johansson said that monogamy is not a natural state for a relationship – who are we to argue with her? Statistically 50% of marriages fail and, indeed, socially monogamous relationships occur in less than 5% of mammalian species. However, our old friends the prairie voles are monogamous, unperturbed by the moral, philosophical and social debates of romantic and sexual relationships of humans; perhaps they're also unfamiliar with Scarlett's work and musings. The more we value someone, the more the medial prefrontal cortex (mPFC) and nucleus accumbens (NAcc) are activated. Amadei *et al*⁷ implanted electrodes in the mPFC and NAcc of female prairie voles and studied their mating and ‘huddling’ behaviour to look at their putative role in bonding. They observed that individual prairie voles varied in how quickly they began huddling – it was not simply explained by their quantity or timing of mating or self-grooming – and cohabitation, mating, self-grooming and huddling had different electrophysiological characteristics. Net modulation was high during cohabitation while low-frequency coherence and low-frequency drive from mPFC to NAcc was more during *mating* not huddling. Thus huddling did not increase connectivity between mPFC and NAcc but the specific modulation of NAcc activity by the mPFC throughout the full cohabitation, except during huddling, explained how quickly individuals bonded and huddled.

Amadei *et al* then expressed channelrhodopsin-2 (ChR2) or a control fluorophore (enhanced yellow fluorescent protein (EYFP)) in mPFC projection neurons, using a virus vector. As ChR2 protein is light sensitive, it offers a way to optically stimulate the neurons in which it is expressed. EYFP is also light sensitive but does not stimulate the neurons in which it is being expressed.

They optically stimulated the mPFC–NAcc network when the female prairie vole entered a ‘social zone’ containing a caged male. Thus they were stimulated during restricted cohabitation that prevented mating. Such cohabitation normally does not lead to pair bonding. On the following day the ChR2 group showed significantly greater preference for the partner than the stranger, showing that low-frequency oscillatory drive from mPFC to NAcc was sufficient to bias the emergence of bonding. The authors suggest that the rhythmic action of mPFC on NAcc perhaps increases the value of the partner and could also engage oscillatory-based plasticity mechanisms to alter how NAcc responds to partner representations from other brain areas to foster monogamous *love*.

Finally, ‘mate copying’ is not a GSCE exam excuse, but a complex evolutionary behaviour. Across species, our pick of a mate is influenced by our perceptions of others' choices. It has been demonstrated in both men and women, but it appears to be more prevalent in the latter: the classic research paradigm is that pictures of men identified as married are typically rated as more attractive than those labelled single. Zhuang and colleagues⁸ investigated the neural basis of this in an fMRI study. Consistent with earlier work, men observed romantically paired were themselves deemed more attractive by women study participants, particularly so if the man's partner was also considered good looking. The neuroimaging data found this associated with increased activation in areas including the putamen, middle cingulate, bilateral fusiform gyrus – overlapping, the authors argue, with areas involved in empathy and social learning; with *decreased* activation in a fronto-parietal network – cognition. Mate copying has been proposed to be evolutionarily adaptive by allowing an independent discriminating evaluation of potential suitors by a (presumably sensible) ‘rival’: try before you buy, if you will. However, the fMRI findings also appear to add succour to the motif that such thoughts are driven by our hearts, not our minds.

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