

Kaleidoscope

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The Russian invasion of Ukraine has wrought untold suffering on tens of millions of people, and one can anticipate acute and chronic mental health impacts. The editorial in *Lancet Psychiatry* by Liebrez et al¹ reflects a broad range of mental health needs: of the prisoners of war (POWs), those living in detention during the conflict, and patients with mental health disorders. They promote the protection of the most vulnerable at times when human rights are often an early casualty of war. We are reminded that being a POW can of itself cause post-traumatic stress disorder (PTSD), and this conflict has had additional exposure through having POWs on both sides frequently shown on viral social media clips. There have been arguments about whether this is propaganda or counters propaganda in the era of #fakenews, but it would seem in conflict with the Geneva Convention's assertion that POW's should be shielded from 'public curiosity'. Their welfare must be upheld, and assessed by an appropriate international organisation such as the Red Cross. We have seen distressing footage of non-military sites being attacked, including schools, psychiatric hospitals, care homes and prisons, further limiting access to necessary therapeutic and medical care. Humanitarian corridors are urged for those currently kept in detention, and the authors repudiate as morally unjustifiable the allegations that both sides have offered pardons to criminals who join their armies to fight. Much of this response is politically determined, but mental health professionals can and must influence this dialogue.

We only see what we see. What happens to those who attempt suicide but do not subsequently present to hospital? Jollant et al² undertook a telephone survey of over 100 000 representative individuals in France aged 18–75 years, identifying 6500 (6.4%) with a lifetime history of suicide attempt. Almost two-fifths did not seek any immediate hospital help after their previous attempt. Factors significantly associated with this lack of help-seeking included being male, living with someone, being a non-smoker and being younger at the time of the attempt. Just over a third of that group sought *any* subsequent healthcare support (compared with two-thirds of those who got that initial assessment at an emergency department), and only about half disclosed to anyone what they had done. The prevalence rates of suicide attempts in this survey were 4.6 times greater than those recorded in the relevant hospital databases. Beyond the bare demographics described, what drives non-attendance at hospital after an attempt to end one's life? It remains unclear, and the study was not designed to unpick 'motive'. The authors discuss several potential hypotheses, including: a 'catharsis' following the act, receiving necessary emotional support at home, perceived medical 'non-seriousness' of subsequent risks, stigma, practical issues of emergency department waits and/or poor past experience of such care, and a lack of understanding of available help. The emergency department can and should be an opportunity to review, support and arrange appropriate care for those who have self-harmed, but these findings remind us that this only accounts for some individuals. Suicide attempts are the strongest predictor of future death by suicide, and we need to consider how to redress this unmet, and unseen, need.

Psychedelics might be overhyped as treatments, but there's also neuroscientific interest and incomplete understanding of how they induce mind-altering states. The recent focus has been on

their action at the serotonergic 5HT_{2a} receptors. However, similar hallucinogenic experiences have been reported across pharmacologically distinct drugs that have little influence on this receptor. This is complicated by the highly individualistic and subjective nature of the perceptual experiences, as well as variability in drug potency and purity. Precision medicine requires a novel approach, and a *Science Advances* article³ does just that, using linguistic analysis of reported drug experiences and linking these via drug affinity to known receptor effects and locations to create a three-dimensional map of specific types of hallucinogenic experiences in the brain. Nearly 7000 first-person narratives of drug-induced experiences from the Erowid Center's Experience Vault (<https://erowid.org/experiences/>) were used. These covered 27 different psychedelic compounds, each of which have well-characterised binding affinities. Latent semantic analysis distilled the testimonials down to the experiential core components, and a pattern learning algorithm paired these with the known drug receptor modulation profiles. These experience-based activation patterns spanned individual drugs to create a fingerprint of activity across neurotransmitter systems during altered consciousness. The authors found common patterns across drugs for several distinct states including ego dissolution, visual distortions and experience of time, which dovetailed with other experimental findings and, further, indicated new receptor associations for future exploration. While correlational, this novel data-driven investigation cuts through the noise of drug type and individual subjective effects to find common links between experience and receptor profiles. This approach provides a unique way of exploring the top-down control of associative networks over subordinate systems related to consciousness and hints at the possibility of designing targets for specific aspects of hallucinogenic states to benefit mental health treatment.

Optimisation is the task of finding the best solution to a problem subject to some constraints. From a mathematical or science perspective, the problem can be formulated as: (a) a number of candidate solutions, which are (b) 'tested' by subjecting them to an objective function which returns a single number measuring their 'goodness' (generally, a lower number means a better solution). For example, you have a rucksack that has a fixed volume of 10 L, and you have 50 different objects each of varying sizes (volumes). The objective function dictates that you should maximise the *number* of objects you carry subject to the total volume being less than or equal to 10 L. Now, make a hypothetical graph by arranging your solutions on the horizontal axis and plot the corresponding value of the objective function on the vertical, and you'll see something like a wavy line with peaks and troughs. Hopefully, there will be one trough much lower than all the others – this is your global minimum representing the very best solution, and the other troughs are local minima (good solutions, but not quite the best). This metaphor (sometimes called hill-climbing) describes how when you systematically try out your solutions – by modifying one of them slightly – you do so in the hope that each time you are moving away from a local minimum and toward the global. In a recent paper, Moreau and Wiebels⁴ describe the search for psychological constructs using this same optimisation metaphor. They argue that initial 'operationalisations' of psychological constructs (e.g. cognitive performance, psychopathology) – derived from careful observation of people – are local minima but probably not the global minimum. They then argue that to refine our 'solution' we often require that future research (a new psychometric scale, for instance) is validated with reference to the existing (initial) operational concept. In doing so, they argue, we are modifying our theory (solution) in such a way that it is always close to the same initial local minimum, and this inhibits our ability to 'get out' of these local troughs and move toward a global minimum. Keen

readers of Kaleidoscope will recall previous discussion of exploration versus exploitation dichotomies. This is the same argument; currently we are *exploiting* existing solutions by gradual refinement but not exploring the wider ‘landscape’ of solutions. In our metaphor, the way to do this is to add some noise that ‘shunts’ us out of local minima and encourages us on our way to the global minimum. The authors propose that this requires us to start from different locations in our hypothetical ‘landscape’ by interrogating what they call the ‘dynamics of cognitive performance elicited by environmental factors’ to generate falsifiable predictions and help develop competing theories. This is all a bit meta – though that’s how we roll sometimes – but a nice take on the progress of psychological sciences.

Kaleidoscope has invested a fair amount of word-count on the null-hypothesis significance testing debate, especially as it relates to reproducibility crises. We do the hard work so you don’t have to – and we like to imagine you appreciate our graft. One particular degree of researcher freedom – available to those committed to dichotomising their statistical inferences – is to argue that while a null hypothesis test didn’t result in rejection (by virtue of having a *P*-value less than the (arbitrary) 0.05), instead, there was a ‘trend toward significance’. The prevalence of this pernicious practice is the subject of an analysis by Otte et al⁵ of 567 758 randomised controlled trials (RCTs) available on PubMed between 1990 and 2020. They identified a number of phrases to describe ‘trend’ to significance – finding that ‘marginally significant’ was the most commonly used phrase in 7735 RCTs. They then analysed a sample of the RCTs over time to see whether either the range of *P*-values reported in this way or the language/phrasing used had changed. They found that a majority (68%) of *P*-values ranged from 0.05 to 0.15 with a median of 0.06. The language used – over time – had shifted away from phrases like ‘not quite significant’ and ‘approaches statistical significance’, being replaced with ‘a numerical trend’, ‘positive trend’ and ‘nominally significant’. For those interested, the history of how Ronald Fisher described *P*-values as a continuous concept – whereas Neyman and Pearson tended to view the outcome as a dichotomised ‘reject’ decision – is described by Lehmann.⁶

Finally, ‘my body, my choice’ has been one covid anti-vaccination argument, countered by how one’s decision affects others. Where does the needle lie in the complex area of mothers’ decisions affecting fetal health? Bennett and Bowden⁷ ask about alcohol consumption during pregnancy to help prevent fetal alcohol spectrum disorder (FASD). The backdrop includes proposals in the UK that alongside current advice to avoid all alcohol during pregnancy (the ‘abstinence-only approach’ predicated upon there being no known safe level), there should be greater screening and potential use of blood tests and other biomarkers. The National Institute of Health and Care Excellence has just published guidance⁸ on this, increasing the frequency of questions on alcohol consumption asked by midwives and healthcare visitors, from the initial

booking assessment through every follow-up appointment during pregnancy. Indeed, draft guidance had gone further, but attracted some opprobrium, for proposing that a woman’s alcohol consumption be transferred to her child’s health records. This was not adopted in the final published document. The intent is all good, trying to mitigate harms that we know can occur from heavy alcohol consumption, though data are more ambiguous for light or moderate consumption. Further, alcohol consumption is typically only recorded in about 60% of initial assessments, and there would seem to be good opportunities to offer helpful professional guidance. But what are the ethical issues around this? Bennett and Bowden note that fewer than 3% of pregnant women consume even one unit of alcohol per week, but the policy is targeted at all and does not differentiate those who drink heavily from those who drink modestly. The authors highlight the lack of any good evidence that such screening aids diagnosis or treatment of FASD, or that these routine biomarkers have any validity. They also argue that this ‘precautionary approach’ undermines women’s autonomy and their right to be sufficiently informed to consent. Behind this is the fact that the sometimes contradictory evidence on low–moderate consumption has been ‘simplified’ in the consent-to-screening information, but this results in factually debatable statements on ‘abstinence only’. Perhaps of most concern, the authors suggest that by potentially increasing fear of judgement and undermining trust from women who might be at risk of heavy alcohol consumption, such screening might paradoxically serve to increase future harms to children through maternal non-disclosure and non-engagement with healthcare.

References

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