

Kaleidoscope

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The coronavirus disease 2019 (COVID-19) post-mortem will take years. Causes of variations in national mortality rates will be a prime target, and at the time of writing, the UK, unfortunately, has a sad record of the highest death rate per capita in the world. Various contributory factors are being explored: a broad expert consensus is emphasising the importance of governmental responses via policies on masks, social distancing and lockdowns, over the preparedness of healthcare systems, and other clinical and sociodemographic variables. At the interface of these factors lies the question of how populations respond to governmental policies. Gelfand et al explored the concept of ‘cultural tightness–looseness’, and how this had an impact on guideline adherence.¹ We will all intuitively recognise stereotypes related to different nations: some have cultural norms that emphasise the rule of law and order, greater central coordination and control, which leads to interesting permutations of lower levels of crime but with less tolerance of non-conformity related to creativity and learning. Others do the opposite, with each system having its attractions and limitations. The authors apply their previously derived theory to the pandemic response. Nations with high levels of ‘cultural looseness’ (examples included Italy, Spain, Brazil) had almost five times the number of cases and over eight times the number of deaths per million people of those with ‘cultural tightness’ (examples such as Japan, China, Singapore and Austria). The authors’ game theoretic model demonstrated that tight groups coordinate more quickly; this would appear to have an evolutionary advantage when facing a collective threat. No one is suggesting countries should change their character or values, but viruses, masks and vaccines remind us all that the balance between ‘social responsibilities’ and ‘individuals’ rights’ needs to operate for the benefits of all. We are not sure any of this lets politicians off the hook. ‘Freedom loving’ is a phrase perhaps irresponsibly bandied around by some of them in recent times. The authors note we need not be fatalistic: in the UK we are undoubtedly in a ‘culturally looser’ society, but, they argue that political messaging needs to be nuanced to adapt to take this, and people’s predictable behaviours, into account.

‘Memory, like liberty, is a fragile thing’ taught Elizabeth Loftus. In this time of fake news and rabid conspiracy theories, we see the societal impact of confidently held false beliefs every time we turn to the news. Although paranoia and memory impairment have long been a part of the discourse surrounding schizophrenia, delusions are dimensional. Persecutory delusions are seen in non-clinical populations, although to a lesser extent and lower intensity. Recently, they have been found to co-occur with memory deficits in the form of increased rates of false recognition in those with positive schizotypy. Feeling familiarity when presented with something new, and having a high level of confidence in that feeling, is the perfect breeding ground for creating and maintaining false beliefs – by making it more difficult to learn and adapt these beliefs on the basis of new conflicting evidence. Koller & Cannon explored novelty detection and confidence in recognition, in a sample from the general population to see how they differed between those with and without paranoia.²

Participants were given the Revised Green Paranoid Thoughts Scale, which consists of a ten-item persecution subscale and an eight-item reference subscale. Across two trials, 35% of the 392 participants scored at or above the threshold for moderate paranoia. All

participants were shown 20 real words and 20 ‘pseudowords’, matched for lexical characteristics, for 4 s each during the encoding phase. They were then tested for recognition from a bank of 80 words: the 40 studied as well as 20 new words, including lures encountered with frequency in real life, and 20 new pseudowords. With each presentation, participants had to determine if the word was old or new, and rate their confidence in that choice.

Paranoia was specifically associated with thinking a novel stimulus was familiar – the essence of false memory. This was particularly pronounced with lures where the ubiquitous-in-real-life words were judged as familiar 60% of the time, despite being absent in the encoding phase. Contextual novelty such as this is thought to be controlled by encoding systems distinct from absolute novelty, so indicate a potential neural target for future studies. Confidence was also a distinguishing feature, with higher-paranoia individuals showing heightened confidence in their assertions across misses, false alarms and correct rejections – not just associated with errors as has been seen previously. This paranoia-specific parallel impairment of novelty detection and confidence remained after controlling for age and level of education. Connecting these cognitive biases to the development and/or maintenance of paranoia provides potentially clinically relevant targets for interventions such as metacognitive training.

When to start antipsychotic treatment, and how to detect psychotic relapse, are critical questions in managing psychosis. A triple-blinded (participants, clinicians, researchers) randomised non-inferiority trial compared the intensive psychosocial intervention of cognitive-behavioural case management (CBCM) and placebo medication with CBCM and antipsychotic medication in a first-episode psychosis cohort of 90 young people aged 15–25 years.³ CBCM is a manualised intervention with a formulation-driven cognitive-behavioural therapy and psychoeducational component, including exploration of coping strategies and relapse prevention. It also included weekly meetings with case managers who offered general support and advocacy, and links to various other programmes. Across the 6-month study period, both groups showed significant improvements in social functioning, with no meaningful differences between groups; although at 12 months follow-up the placebo group had significantly greater negative symptoms. There are some inclusion and exclusion criteria that limit the generalisability of this data – participants were required to have a duration of untreated psychosis of less than 6 months, to have stable accommodation and social support, and to have low levels of suicidality and aggression. These data do not automatically diminish the importance of antipsychotics; it remains difficult to anticipate the benefits and side-effects of medication at the individual level, for the person in front of us. They show that psychosocial interventions can be enormously beneficial, including when medication cannot or is not delivered. Early prodromal stages where the medication risk/benefit ratio is perhaps more against medications feels a particularly apposite time for such robust psychosocial intervention.

Monitoring for relapse has typically relied on individuals and their families watching for established triggers and symptoms of illness, based on their experience. It is an inexact science, and more support would be welcome; Henson et al report on ‘anomaly detection’ via the use of smartphones.⁴ They found that ‘digital phenotyping’ of patterns of behaviour could pick up subtle changes in individuals with an 89% sensitivity and 75% specificity for illness relapse. The authors compared data from 83 individuals with a diagnosis of schizophrenia and 43 healthy controls. Digital phenotyping is an interesting concept, predicated on patterns in our unique activities: you will be familiar with the issue through things such as targeted ads online based on your own data (the

Kaleidoscope team have personally noticed an alarming rise in the occurrence of hair restoration products and brochures on retirement planning). A raft of technologies is now available: ecological momentary assessment, GPS data, accelerometers, call and text data, screen time and response latency in cognitive tasks/testing. These allow the mapping of personalised longitudinal trajectories that can be used as a baseline for detecting any period of significant deviation. The data offer an interesting proof of concept, but raise issues of acceptability, rights over personal data and privacy. Given the increasing interest in these data-driven technologies being applied to medicine, there needs to be a discussion on key issues of access and ownership of the data and how it might be used, and protection for those where it may tap into key concerns or beliefs about being monitored.

‘Green needle’ or ‘brainstorm’? Perhaps you haven’t seen the video where the same stimulus makes you hear whichever one of those you are reading or thinking about at the time (see <https://www.youtube.com/watch/1okD66RmktA>). It is well-established that humans are vulnerable to bias and worse still, in ways that defeat introspection and lead to limited self-awareness. This manifests across a spectrum ranging from micro- to macro-level perceptions and actions. At the micro-level, a paper by Bosker & Peeters re-examines the ‘McGurk effect’ – where an auditory stimulus ‘ba’ is accompanied by a visual stimulus of the speaker’s mouth movements that articulate a different sound ‘ga’ resulting in participants consistently reporting *hearing* ‘da’.⁵ In the McGurk experiment, the visual stimulus strongly biases the auditory percept. In Bosker & Peeters’ study, instead of using video of the speaker’s mouth movement, they examine how ‘beat gestures’ influence speech perception. Beat gestures are spontaneously-produced biphasic (up and down) hand movements that appear synchronised with prosody and emphasis in speech production. They systematically manipulate the co-occurrence of phases of the beat gesture with different spoken emphases in real and pseudowords. For example, ‘PLAto’ versus ‘plaTEAU’ with the beat gesture located on different syllable emphases. They found that, just like the McGurk effect, the timing of the beat gesture with syllable emphasis changes the percept (at least, in the two-alternative forced-choice paradigm used to indicate which emphasis was heard). An interesting proposal is that beat gesture might actually be a visual cue used when the auditory stimulus is noisy (and low-level speech processing is necessarily more dependent on multimodal cues). This may offer more power to people who actively gesticulate when they speak.

Finally, bias based on gender or ethnicity can be equally covert, but is usually far more damaging than any subtlety of gesticulation during syllable perception. Hangartner et al explore covert signals of such bias using data capturing the behaviour of recruitment agents in an online employment platform.⁶ Using a Swiss public employment service, the authors had access to data on

jobseekers’ CVs and profiles, *and* the behaviour of recruiters using the same system. They could examine searches for candidates (by occupation); time spent reviewing a CV; time elapsed until offering a contact (or not), for example that would invite the candidate to be in touch about the job. They had access to 3.4 million profile views from March to December 2017 which included over 450 000 searches and 17.4 million jobseeker profiles. The first striking result is for regional preference – when a recruiter searched for applicants, the only region that achieved the same rate of contacts as native Swiss jobseekers was those with a Southern European origin. The contact rates were consistently lower (after adjustment for demographic and work experience relevant to the job). There was no substantial differences in the time spent reviewing CV’s of immigrant and minority ethnic groups; suggesting the recruiters were not rapidly screening-out applicants on the basis of ethnicity but rather, were reviewing and then deciding *not* to contact the jobseeker on the basis of ethnicity. Hangartner et al then used the same method to analyse gender biases in applicants for 323 different jobs, they were able to collect data on profile/CV views and subsequent contacts with jobseekers while adjusting for male/female ratios in those different occupations. Here, they found no overall effect of gender on contact rates, but noted substantial heterogeneity if the analyses is confined to specific occupations with higher male/female ratios and vice versa. For example, in male-dominated occupations, women faced a 6.7% penalty (reduction in chances of being contacted) and conversely, men contacted for a female-dominated occupation had a 12.6% penalty. For this reason, they argue that gender stereotypes play a role in promoting and restricting economic and workforce opportunities. We doubt these findings are unique to Switzerland.

References

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