

led to clashes between different cultural groups. Safe places, make-shift mosques, churches and children's centres had been destroyed or relocated and yet the number of camp inhabitants had continued to increase, including numbers of unaccompanied children. News reports in early 2017 suggested that following closure of 'The Jungle' in October 2016, the numbers of refugees arriving in the area continues to increase and more informal camps have since appeared. A prediction of one of the participants seems accurate, that the camp's closure would leave refugees more vulnerable, as they would lose their community-volunteer links and neighbourhood watch system of 'The Jungle' and the media would lose interest.

My learning

It is tempting to focus on refugees' countries of origin and imagine what political and social difficulties they may have faced there. Meeting the refugees in Calais I understood how key refugees' journeys are in shaping their lives and experience of trauma. Now, when considering a patient's story, I need to ask not only why they left home, but also how.

Although it is possible to be critical of some aspects of MHPSS in Calais, there was a caring and supportive community of volunteers. When refugees find some stability or a new home in Europe, they may lose this support and feel

isolated. Service providers need to help to empower communities and build trusting relationships with refugees, such as those between volunteers and refugees in 'The Jungle'.

Moving forward

Volunteers in the UK may be willing and ready to help refugees arriving from Europe; it would be useful for them to be trained to support refugees effectively, for example in PFA.

Refugees are unused to stable long-term therapeutic relationships; this is something that the NHS and NGOs in the UK can offer.

Refugees remain vulnerable even after reaching the UK, especially women and children. Tracing their families and loved ones needs to be a priority. Putting them in touch with other refugees may be empowering and protective for their mental health.

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Pandora searches the world literature for evidence, news and other sources on matters of interest (doesn't shy away from controversy) to bring to the reader. She welcomes comments and suggestions (via ip@rcpsych.ac.uk)



The puzzle of adolescent brain development solved

The hitherto accepted view that both brain volume and cortical thickness decline from childhood to young adulthood is re-examined in a recent study. The researchers evaluated over 1000 young people (8–23 years old) who had taken part in the Philadelphia Neurodevelopmental Cohort, a community-based study of brain development, using neuroimaging and cognitive data. They examined age-related effects and gender differences in four measures of grey matter from 1625 brain regions: grey matter density (GMD), grey matter volume (GMV), grey matter mass (GMM) and cortical thickness (CT).

They found that while GMV and CT generally decrease with age and GMM shows a slight decline overall, in contrast GMD increases. Females have lower GMV but higher GMD than males throughout the brain. These results suggest that GMD is 'a prime phenotype for assessment of brain development and likely cognition'. Very importantly, the finding that GMD increases with age explains why cognitive performance improves from childhood to young adulthood despite the decline in brain volume and cortical thickness.

Gennatas, E. D., Avants, B. B., Wolf, D. H., *et al* (2017) MRI-derived gray matter measures, density, volume, mass, and cortical thickness, show distinct age and sex effects, as well as age-dependent intermodal correlations around adolescence. *Journal of Neuroscience*. <https://doi.org/10.1523/JNEUROSCI.3550-16.2017>.

Can we stop ourselves ageing?

As we age in years the ability of our body cells to divide and grow deteriorates, causing our body to degrade and letting diseases of senility creep in. Getting old is a biological reality and an irreversible process, or at least so we believed until now.

Not so, say a Korean research team from DGIST (Daegu Gyeongbuk Institute of Science and Technology), who are working on reversing the ageing process. In the process of screening for compounds that can alleviate senescence, they identified the ataxia telangiectasia mutated (ATM) inhibitor KU-60019 as a possible agent. The researchers found that ATM interacted with the subunits of vacuolar adenosine triphosphatase (v-ATPase), which is involved in the regulation of lysosomal activity. As cell ageing progresses, the ATM protein phosphorylates v-ATPase, weakening the binding force between the v-ATPase subunits and causing the function of the lysosomes to deteriorate. They also demonstrated that by inhibiting ATM with KU-60019 they reduced the phosphorylation of v-ATPase, hence inducing recovery of cell mitochondrial function, functional recovery of the lysosome and autophagy system and metabolic reprogramming and promoting wound healing in animal ageing models.

Could ATM inhibitors be effective in preventing brain ageing or promote repair of brain damage?

The authors are planning to extend their work on increasing the human life span, using animal models.

Kang, H. T., Park, J. T., Choi, K., et al (2017) Chemical screening identifies ATM as a target for alleviating senescence. *Nature Chemical Biology*. <https://doi.org/10.1038/nchembio.2342>.

Sour grapes?

Choosing is easy when we clearly prefer one option over another, but what if both options appeal? The latter creates cognitive dissonance, psychological tension and a mental discomfort, which drives people to readjust their preferences or values in order to restore 'mental balance'. A study investigated this process by means of electro-encephalography, using a rest and free-choice paradigm. They found that choices which evoke stronger cognitive dissonance triggered a larger negative fronto-central evoked response, similar to error-related negativity. The amplitude of the evoked response was correlated with the re-evaluation of the alternatives. They also found a link between individual neural dynamics (long-range temporal correlations – LRTC) of the fronto-central cortices during rest and the follow-up neural and behavioural effects of cognitive dissonance. Those with stronger resting state LRTC showed larger evoked brain responses, associated with stronger cognitive dissonance and greater post-decisional re-evaluation of the alternatives.

The authors conclude, 'Contrary to traditional decision theory, our preferences are modulated by the mere act of choosing. Difficult choices generate psychological (cognitive) dissonance, which is reduced by the post-decisional de-valuation of the unchosen options'. Not quite the same, but some similarity with Aesop's myth of 'sour grapes'?

Colosio, M., Shestakova, A., Nikulin, V. V., et al (2017) Neural mechanisms of cognitive dissonance (revised): an EEG study. *Journal of Neuroscience*. <https://doi.org/10.1523/JNEUROSCI.3209-16.2017>.

Breaking down the barrier between body and mind

A recently published paper claims to have got us closer to solving the mysteries regarding the tight connection between physical and mental health. The authors identify a neural system which represents sensations from within the body, called interoception, analogous to the large-scale intrinsic brain systems for exteroceptive senses (sight, hearing, touch, etc.) and they claim to have demonstrated its relation to regulating peripheral body systems.

They analysed anatomical data that trace the connections between brain regions to verify the existence of the circuitry and evaluated nearly 700 human brain scans to assess how the regions regulating the body relate to each other. They identified two networks, which loop through various brain regions and overlap with each other and are responsible for regulating the body and generating feelings.

They validated their results by measuring skin conductance and asking about the level of arousal in people when shown evocative pictures. Those with stronger connections between the two networks experienced more subjective arousal when their physiological arousal was higher.

The researchers claim that these findings provide important insights into the brain's functional architecture and unify mental and physical states, removing the artificial boundary between body and mind.

Kleckner, I. R., Zhang, J., Touroutoglou, A., et al (2017) Evidence for a large-scale brain system supporting allostasis and interoception in humans. *Nature Human Behavior*. <https://doi.org/10.1038/s41562-017-0069>.

Expressive writing healing body and mind

Psychologists are familiar with the healing effects of expressive writing on mental wounds but did you know it has therapeutic value in physical wounds too?

Researchers in Auckland report that people who wrote emotionally about previous stressful events prior to having a skin biopsy healed faster than those who wrote about factual events. They recruited 122 participants aged 18–55 years and randomly allocated them to one of four groups: expressive writing pre-biopsy; expressive writing post-biopsy; control writing pre-biopsy; and control writing post-biopsy. The expressive writing groups were asked to write about their 'deepest thoughts and feelings about a traumatic, upsetting experience of your entire life'. The control groups were asked to write factually about their daily activities. A 4mm punch biopsy was performed by a dermatologist in the participants' inner upper arm. After 10 days, 52% of those who had written expressively before the biopsy were healed compared with 27% of those who wrote expressively after the biopsy. Only 15% of the controls who wrote factually before the biopsy and 23% of those who wrote factually after it were healed.

The authors are planning to examine the effects of expressive writing on chronic wound healing.

Robinson, H., Jarrett, P., Vedhara, K., et al (2017) The effects of expressive writing before or after punch biopsy on wound healing. *Brain, Behaviour and Immunity*. <https://doi.org/10.1016/j.bbi.2016.11.025>.

Does inflammation have a role to play in schizophrenia?

Inflammatory processes have been targeted for some time as possible markers of some mental disorders. A meta-analysis of 18 studies found that patients with schizophrenia had moderately increased blood levels of C-reactive protein (CRP). They found a regional and age influence, with patients from Asia or Africa and those younger than 30 being more likely to have higher blood CRP levels.

Further studies are needed to examine the possible relevance of these findings.

Wang, Z., Li, P., Chi, D., et al (2017) Association between C-reactive protein and risk of schizophrenia: an updated meta-analysis. *Oncotarget*. <https://doi.org/10.18632/oncotarget.17995>.