Evolutionary Psychiatry Special Interest Group (EPSIG)

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Notes from the Editor

Now the Christmas and New Year's festivities are over we can both reflect on last year's activities and consider what we wish to achieve this year without being distracted by accoutrements such as mince pies or mulled wine. The EPSIG membership nevertheless had a fruitful year and collaborated with many outside agencies, researchers and authors. There were two evolutionary based conferences in Erice Sicily to which some of us went as delegates or lectured. It was slightly daunting for us lecturers to be told that we shared the stage upon which had stood 155 Nobel Prize winners previously.

We also participated in an exceptionally diverse Evolutionary Psychiatry meeting in Durham with Randolph Nesse and a host of other international evolutionists. To round off the year we had our 6th international conference on November 22nd (See Tom Carpenter's reflections on this later in the Newsletter). We then participated in a training day for psychiatrists on evolutionary psychiatry in Cambridge (Organised by Nikhil Chaudhary and Adam Hunt) which included OSCES. My view of the day was that it generated a lot of enthusiasm about using evolutionary ideas in the clinic, but I was left feeling that OSCEs or CASCEs are not the best medium with which to convey evolutionary ideas.

We have several major events to look forward to this year. First is an evolutionary psychiatry day at the RSM organised by Riadh Abed and Derek Tracy. Also, we have a possible online conference which will be due in the Autumn.

Upcoming Evolutionary and EPSIG meetings

Forthcoming Events:

The annual EPSIG Trainee event on March 14th. This will be held at the college in London. Title: EPSIG Trainee Engagement Workshop, Date: 14 March 2025, Duration: 09.30 - 17.00

Fees: £30 per ticket. It will be open to: Resident doctors/trainees/medical students/ non-training grade doctors working below the level of consultant (with the exception of speakers who will also be paying for tickets). Allied health profession students and trainees also welcome. Overview: A one- day event comprising an 'introduction and update' on evolutionary psychiatry, networking opportunities and trainee research forum.

Note: Registration is now open for the Trainee Engagement Event. Places are limited and will be allocated on first come first served basis. Visit EPSIG web pages through: www.epsig.org

There is also a conference on Evolution in Newcastle being organised by one of our former speakers Gillian Pepper. The link is: www.ehbea2025.com

EHBEA Conference 14-17 April 2025

The annual conference of the European Human Behaviour and Evolution Association is to be held at Northumbria University, Newcastle upon Tyne NE1 8ST

Plenary SPEAKERS

Lynda Boothroyd Durham University,

Christine Caldwell University of Stirling,

Susana Carvalho University of Oxford,

Heidi Colleran Max Planck Institute. I

An Important Date for your diary: On 9 June 2025 the Section of Psychiatry at the Royal Society of Medicine will be holding a 1-day major Evolutionary Psychiatry Conference. Registration will be open soon!

Speakers are:

Prof Christopher Stringer
Prof Robin Dunbar
Prof Samir Okasha
Dr Gilian Pepper
Prof Henry O'Connell
Dr Nikhil Chaudhary
Dr Annie Swanepoel

Upcoming Evolutionary and EPSIG meetings

There is also another conference of possible interest at the RSM which is being organised by one of our most helpful allies Professor George Ikkos who has chaired at every EPSIG conference since inception. The conference is titled:-

After Kraepelin: Ambitions, images, Practices and the History of Psychiatry 1926-2026

Date and time Thu 6 Mar 2025 from 9:00am to 7 Mar 2025 at 5:30pm
Location Royal Society of Medicine

Emil Kraepelin (1856-1926) is probably the single most significant figure in the history of psychiatry and, certainly, one of a handful of most impactful psychiatrists to have shaped the profession. 1926 marks 100 years since his death and this event will be an opportunity to recall his contribution and focus on significant changes since. The last century has been an incredibly fertile time for research in psychiatry but also an era during which some of its most fundamental assumptions have been challenged by its own findings in biomedical and clinical research, those of affine disciplines in social science and the humanities and the service users movement.

This two-day event will review the ambitions, images and practices of psychiatry, as they have evolved during the period under review and seek pointers for continuity and transformation in the future. It will be privileged by an exceptionally diverse group of speakers, all outstanding in their field, whether as psychiatrists, other clinicians, academics in the humanities and social sciences or service users.

By attending the meeting, you will:

- Learn about the history of psychiatry during the last 100 years.
- Be able to reflect on long term changes in the methodology and scientific approach to psychiatry.
- Find out about diverse perspectives, threats and opportunities for research and practice in psychiatry and mental health in the future.

Collaboration with Turkish evolutionary psychiatrists:

Muzaffer Kaser has promised to arrange a joint planning meeting between the EPSIG officers and their counterparts in the EP association in Turkey with a view to exploring the possibility of holding a joint EP event in Istanbul, perhaps in 2026. Henry O'Connell, chair of the Irish EPSIG expressed an interest by him and his colleagues to join such project. Once plans crystalize, we will publicise such an event in this newsletter as well as through mailings to EPSIG members.

Finally, we have, as promised, the winning essay of the one of the prize winners, of the Charles Darwin prize for evolutionary psychiatry. This was won by Riya Gosrani an FY1 doctor. Congratulations to her. I know this has extended her interest in evolution and psychiatry.

Reflections on the 6th International EPSIG Conference

EPSIG 2024 Conference Report

Dr Tom Carpenter
ST4 Doctor
Trainee Member of the EPSIG Executive Committee

This December saw the 6th International Symposium of EPSIG, held at RCPsych Headquarters, London. Dr Tom Carpenter, CT3 Psychiatry, gives his perspective.

This was the second in-person EPSIG symposium I had attended. I was expecting to be able to sit anonymously in a row somewhere, but the tables were set cabaret -style, strongly encouraging attendees to interact! This worked well with the meeting that had an informal, congenial atmosphere. It was a (spaghetti) Bolognese: informal, warm, and with depth. Dr Riadh Abed and Professor Henry O'Connell provided the onions and garlic – giving foundational talks on the scope and general utility of the evolutionary perspective. Dr Reem Abed, the celery and carrot, with a talk highlighting the potentially impactful -and currently largely underused- potential of medical students in evolutionary psychiatry. Professor Marco del Giudice brought red meat – bringing evolutionary psychiatry into hard, empirical contact with genetics.

This meeting was coming together. Professor Zanna Clay – more meat – or (more empathetically?) plant-based meat alternative of choice – in her talk on the origins of empathy. Prize winners Dr Costa Savva and Dr Riya Gosrani (basil and oregano?) gave excellent short presentations on their essays on catatonia and alcohol dependence.

The final ingredient to top the ragu was a punchy, head-spinning dose of parmesan in the form of Professor Nicholas Humphrey's perspective on the evolution of sentience. The meeting finished with a tiramisu served by Professor Simon Baron-Cohen on the relationship between autism and invention. Oh – the spaghetti! The attendees of course – who brought substance and chaos with their attention, questions and comments, and without whom the meeting would have been nothing!

How an Evolutionary Perspective can improve our understanding of Alcohol Use Disorders

Introduction

Alcohol use disorder (AUD) describes a pattern of drinking characterised by heavy episodic or continuous consumption that results in individual harm. It is estimated that 7% of the world's population are currently living with AUDs (WHO, 2024). Whilst the ICD-11 classifies AUDs into sub-categories, I will use an evolutionary lens to enhance our understanding of alcohol use in a broader context. Dependency trends are generally associated with two key behavioural patterns: intensification of use and recurrence of the habit (St John-Smith *et al.*, 2013). Biomedical narratives predominantly focus on identifying individual risk factors for AUDs, but evolutionary perspectives offer deeper insights by exploring processes affecting health and disease at a population level. This approach has the potential to inform more extensive strategies aimed at improving health outcomes by uncovering underlying evolutionary factors that influence behaviour and susceptibility to AUDs. In this essay, I will begin by offering a historical context for alcohol use. Following this, I will analyse AUDs through established evolutionary frameworks, including trade-offs, mismatches and life-history theories. Finally, I will explore how these insights can shape public health policies and summarise their wider implications.

The History of Alcohol Use

This section shifts focus from proximate questions about how behaviours occur to address Tinbergen's (1963) ultimate questions, investigating why AUDs exist in the first place. By examining evolutionary history, this approach may uncover the functions of alcohol use, offering deeper insights into its origins and adaptive significance. The earliest recorded preparation of alcoholic beverages dates back 9000 years (Dunbar, 2022), but alcohol consumption by Homo sapiens likely began prior to the advent of agriculture. In fact, the ability to metabolise ethanol in various species is strongly linked to its occurrence as a by-product of ripe fruits (Dudley and Maro, 2021). Supporting this finding, phylogenetic analyses have revealed a mutation in one of the alcohol dehydrogenase (ADH) genes, which enhances the ability of primates to metabolise ethanol (Hunt *et al.*, 2024). This genetic adaptation suggests that alcohol consumption has deep evolutionary roots.

I will now situate the history of alcohol consumption, from fruit ingestion to ethanol preparation, within the framework of two key questions posed by St John-Smith and Abed (2022): why do plants generate substances affecting the human nervous system and why are humans driven to continually obtain and consume non-nutritional substances? To address the first question, one must recognise that plants produce fruit as part of their reproductive strategy, attracting animals to consume the fruit and disperse the seeds. Alongside attracting frugivores, the sugars in fruit serve as a substrate for yeast, leading to ethanol production through fermentation (Dudley, 2002). The fermentation process benefits the plant by inhibiting bacterial growth, while the scent of ethanol could potentially assist animals in locating the fruit (Mill, 2013). The persistence of ADH in humans, as described earlier, likely reflects a physiological adaptation to metabolise alcohol, stemming from historical exposures to low concentrations of ethanol (Dudley, 2002). Regarding the second question, understanding why humans actively sought out alcohol beyond incidental fruit consumption requires exploring additional theories.

The effects of ethanol on endorphin and dopaminergic pathways explain its psychoactive impact related to pleasure, contributing to alcohol being isolated, mass-produced and concentrated over time. However, Dunbar (2022) argues that if pleasure were the sole motivator for drinking, alcohol wouldn't serve as such a key social catalyst or be used so widely in public and group settings.

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Given that humans are inherently social beings, alcohol's role in facilitating social interactions suggests that its consumption may serve as a fitness-enhancing behaviour. Furthermore, Dunbar (2022) suggests that endorphins boost the activity of natural killer cells, thereby strengthening the immune system. This effect is thought to have been relevant to low levels of alcohol intake in prehistoric times, particularly when combined with social bonding. Conversely, excessive alcohol consumption can negate these immunological benefits. With this historical context in mind, I will now situate contemporary patterns of alcohol use through the three evolutionary perspectives discussed by St John-Smith and Abed (2022).

Trade-Offs

The first evolutionary theory is the trade-off hypothesis, which encompasses both pharmacophagy and neurotoxin regulation. This concept aligns with the link between alcohol, endorphin release and natural killer cell activation. The pharmacophagy hypothesis posits that humans have evolved the capacity to consume pharmacologically active plant compounds, despite their potential toxicity, because small amounts of bioactive substances provided therapeutic benefits (St John-Smith *et al*., 2013). Building on this, the neurotoxin regulation hypothesis suggests that specialised mechanisms evolved to carefully regulate the consumption of these toxic substances, maximising benefits while minimising risks (Hagen *et al*., 2013). This evolutionary process likely occurred only if moderate alcohol consumption conferred a fitness advantage. It is unclear whether the evolutionary advantage stemmed from alcohol itself – due to its pleasurable, psychoactive, or social effects – or from adaptations to nutritionally dense foods that happen to contain alcohol. This distinction could determine whether alcohol consumption was a direct target of selection or simply a by-product of seeking calorie-rich foods.

In any case, trade-offs remain relevant, proposing that defence mechanisms like the vomiting reflex evolved to mitigate toxicity. Complementing this idea, variations in how populations metabolise exogenous substances are evident, with geographic patterns in ADH gene polymorphisms associated with dietary practices such as rice cultivation (Mill, 2013). In East Asia, a particular gene variant affects alcohol metabolism, leading to facial flushing and nausea, indicating strong selection pressures for this allele during the region's extended agricultural period. Adaptations such as ADH polymorphisms likely emerged over the past 4000 years to prevent alcoholism (Clites *et al*., 2023). In this way, neurotoxin regulation has calibrated to protect susceptible individuals from harm in specific contexts. However, recent technological advancements, such as the distillation of highly concentrated forms of alcohol, have outpaced natural selection, surpassing the limits of this trade-off theory.

Mismatch

Mismatch theory provides compelling explanations for contemporary challenges, suggesting that the rapid pace of cultural change has outstripped the evolutionary development of our protective mechanisms (St John-Smith *et al*., 2013). This is elucidated by the first domain of the two-part mismatch theory, known as the novel psychoactive substance strand, which emphasises the disconnect between our biological systems and modern environments (St John-Smith and Abed, 2022). In this essay, 'novel substances' refers to the increased availability and concentration of alcohol in comparison to prehistoric times. Our evolved capacity to regulate neurotoxins has not kept pace with rising consumption, resulting in significant risks such as toxicity, long-term harm and addiction. Evolutionary perspectives suggest that traits once advantageous, such as the ability to metabolise small amounts of alcohol, may now hinder fitness due to the strength of modern substances. This introduction of novel substances reveals a shortfall in our evolved mechanisms for

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managing reward experiences, linking to the second domain of mismatch theory.

The hijack model addresses this issue, proposing that the modern-day abundance and potency of alcohol interfere with ancient neural systems designed to mediate positive emotional responses and incentive-driven behaviours (Nesse and Berridge, 1997). Nesse (1994) emphasises the evolutionary significance of emotions, suggesting that we are naturally drawn to pleasurable experiences because they typically enhance Darwinian fitness. However, alcohol-induced euphoria illustrates how substances can exploit these evolved mechanisms by creating a false sense of fitness benefit. Ethanol activates the mesolimbic dopaminergic system (MDS), a neural circuit associated with pleasure (Dudley, 2002). By exploiting these pleasure systems, alcohol falsely signals a substantial fitness advantage, helping explain why alcohol-related behaviours are so reinforcing (Sullivan *et al*., 2008). The hijack model thus provides valuable insights into how novel substances can subvert evolutionary mechanisms, offering a framework to understand the complex interaction between biological systems and addictive behaviours. To elucidate this notion, I will provide a worked example comparing different groups.

The hijack model can offer insights into the higher prevalence of AUDs among individuals from low socioeconomic status (SES) backgrounds (Calling *et al*., 2019). This framework suggests that individuals facing challenges in social competition are more inclined to experience negative emotions (St John-Smith and Abed, 2022). Alcohol may offer a misleading sense of fitness benefit, serving as a temporary escape from unattainable rewards shaped by social circumstances. This explains the enduring appeal of drinking and its potential progression to AUDs. The increased vulnerability to substance misuse and poorer treatment responses observed in these individuals (Nesse and Berridge, 1997) can be attributed to lower daily activation of the MDS and the subsequent reduction in positive emotions. Thus, the hijack model is valuable for understanding how adverse environments and deprivation influence emotions and behaviours, contributing to higher susceptibility to AUDs among low SES populations. I believe that this perspective is crucial for fostering empathy and alleviating stigma associated with AUDs.

Life-History Theory

The final evolutionary model for understanding AUDs is life-history theory (LHT), which falls under the broader category of 'models based on risk-taking behaviour and signalling', alongside sexual selection and costly signalling (St John-Smith and Abed, 2022). For the purposes of this essay, I will concentrate solely on LHT within this evolutionary framework, because I view this as complementing the hijack model in explaining the higher prevalence of AUDs among low SES populations.

LHT describes how energy is allocated between growth, survival and reproduction throughout an organism's life, considering trade-offs between these traits (Sear, 2020). The central premise is that individuals adapt their life-history strategies based on their perceived extrinsic mortality risk. For instance, individuals who experience abusive or unstable childhoods may adopt a 'fast life-history' strategy, prioritising reproduction over survival (St John-Smith *et al*., 2013). This high perception of extrinsic mortality, especially in low SES individuals, is thought to be associated with an increased likelihood of dying before reproducing. Consequently, these individuals may prioritise early reproduction to maximise reproductive success. Furthermore, heightened perceptions of extrinsic mortality lead to a preference for immediate rewards and a propensity to engage in a constellation of risky behaviours (Pepper and Nettle, 2017), potentially explaining the demographic trends observed in AUDs.

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Recent applications of the fast-slow continuum, from interspecies to intraspecies contexts, may oversimplify trait causes and correlations, potentially resulting in misleading conclusions if genetic and phenotypic differences are not considered (Sear, 2020). Despite these criticisms, LHT remains valuable for understanding AUDs, by reframing 'harmful' behaviours in marginalised groups. It offers an alternative perspective by interpreting the immediate gratification associated with risky behaviours, such as AUDs in low SES populations, as adaptive responses to a precarious environment rather than solely dysfunctional. LHT recognises that risks associated with low SES are not merely due to individual choices but are deeply embedded in structural conditions. By challenging the individualistic focus of society, which often attributes praise or blame to individuals for their circumstances, LHT usefully highlights the adaptive nature of alcohol-related behaviours in response to environmental stressors and encourages a broader understanding of how systemic factors influence health outcomes.

Conclusion

In this essay, I explored how various evolutionary frameworks can improve our understanding of AUDs. Evolutionary perspectives surpass biomedical models in their conceptualisation of substance misuse by broadening the scope to examine the underlying reasons for such behaviours. This approach has proven useful in explaining why certain populations are more susceptible to AUDs in modern environments, a factor often overlooked by dominant discourses that view AUDs primarily as individual-level pathologies. By applying concepts such as trade-offs, mismatches and life-history theories, we move beyond viewing alcohol consumption as merely a brain disease and instead frame it as an adaptive evolutionary response to environmental pressures. This new perspective suggests that traits once advantageous in historical contexts may now interact maladaptively with contemporary drinking patterns, leading to adverse health outcomes such as AUDs.

This shift in perspective transcends the myopic medical model, potentially leading to more realistic, destigmatising and far-reaching implications for policies aimed at managing AUDs. An evolutionary approach therefore underscores the need to address broader systemic issues such as enhancing safety, reducing poverty and improving overall life satisfaction to prevent AUDs from developing in the first place. It promotes greater empathy and supports preventative strategies that extend beyond conventional psychiatric interventions. Evolutionary perspectives advocate for policies that prioritise prevention and foster healthier environments from an early age, ultimately contributing to a healthier population and a more equitable society.

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