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Editorial

Evolution: the bridge between 'biological' and 'social' psychiatry

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Abstract

'Biological' and 'social' perspectives in psychiatry have exchanged dominance at different times in the history of our field and are sometimes erroneously viewed as being contrasting and mutually exclusive paradigms. We argue that the arbitrary 'biological/social' divide in psychiatry is misleading, unhelpful, and ultimately a false one. We propose that the evolutionary perspective provides a necessary framework and metatheory that can bridge this apparent schism in psychiatric thinking, providing novel and useful insights into how we can better assess, diagnose, and treat our patients.

Keywords: Biopsychosocial model; evolution

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Introduction

Psychiatry is a complex and pluralistic discipline that allows for neuroscience where medication is the primary treatment approach and psychosocial theories where interventions are based on psychological therapies as well as various forms of social and practical support.

While pluralism is essential for the understanding of mental health problems, it can become an impediment in the absence of a unified framework. We suggest that the evolutionary perspective can bridge the gap and unite the multiple psychiatric approaches and schools of thought. In this brief editorial, we illustrate the benefits of evolutionary thinking through the application of two core evolutionary concepts: natural selection and evolutionary mismatch and briefly discuss how they can illuminate a range of common psychiatric diagnoses.

Natural selection

Every living organism has an unbroken chain of ancestors stretching right back to the beginning of life on earth some 3.5 billion years ago. Also, all humans alive in the world today belong to a single species of great apes (*Homo sapiens*) that arose in Africa some 300,000 years ago and shared a common ancestor with chimpanzees some 6–7 million years ago (Tracy, 2022) We have all inherited our genes from ancestors who were successful in surviving and reproducing. Charles Darwin and Alfred Russel Wallace were the first scientists to propose a coherent theory of evolution by natural and sexual selection (Darwin, 2011). Those who had beneficial minor genetic modifications that helped them gain a competitive edge, were more likely to survive and reproduce and those genes then become more prevalent compared to other alleles. Therefore, organisms possessing traits that conferred the best 'goodness of fit with their environment' were most likely to survive and reproduce. Hence it can be said that the environment (Including the social) selected the best genes for the organisms concerned and therefore the genes' functioning is closely related to that environment.

Thus, evolutionary perspectives inform us that genes and their phenotypic end-products are shaped by the environment (past and present). Our genetic and biological make-up are not independent of the environment – on the contrary, they are deeply embedded within it. It also teaches us that it is not a choice between nature ***or*** nurture, but that both are inextricably intertwined. Recent advances in epigenetics (Grunau et al., 2019) provide further evidence that environmental effects strongly influence which genes are switched on or off, and proof that gene expression is inextricably linked to environmental factors, beginning in utero. We also know that many effects which were originally thought to be purely genetic, are subject to gene-environment interactions. Hence, designating human experiences as either 'biological' or 'psychosocial' becomes an obvious false dichotomy.

We have inherited genes from our ancestors together with a range of epigenetic modifications, which can and do influence the functioning of our brain and consequently, the way we think, feel and act. It follows that medication that influences brain neurotransmitter levels or receptor functioning, (including the placebo effect which triggers internal feelings of hope and self-healing) can indeed be beneficial even in situations where the cause of the problem is psychosocial or environmental.

Evolutionary mismatch

For well over 95% of our existence as a species (approximately 250,000 years) we lived in small groups of 50–150 closely-knit

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individuals who spent their days together living communally, hunting and gathering (Chaudhary & Salali, 2022).

The development of agriculture and the emergence of towns and cities from a mere 10,000 years ago was followed by rapid technological and societal developments, leading up to the industrial revolution of just two centuries ago. This has been followed by further rapid and intense urbanisation, social upheaval and technological innovations that have irrevocably transformed the way humans live their lives.

Meanwhile, in contrast to these recent rapid and dramatic technological, social and cultural developments, our evolution as a species has been slow (sometimes referred to as 'genome lag') (Li et al., 2018). Living under such novel environmental conditions (never encountered by our ancestors) has created the possibility of our bodies and/or brains becoming mismatched to aspects of the modern environment leading to various health problems (Nesse, 2019).

Applying these principles in everyday clinical practice

Adopting an evolutionary perspective prompts us as clinicians to think as engineers as well as mechanics, asking why we become unwell in the ways we do and what underlying evolved systems are affected when we do become unwell. It also helps us acknowledge the often-blurred boundaries between normative psychological states, 'helpful' symptoms and mental illness.

For example, a proportion of children who manifest features of **ADHD** may be suffering because they have evolved to wander freely in open spaces where activity and adventure are rewarded, but when constrained within modern classrooms are perceived as having a disorder. This evolutionary mismatch has important implications for how childhood education is delivered (Swanepoel et al., 2017).

Humans have long evolved the taste for and ability to metabolise the small amounts of alcohol contained in highly calorific ripe and over-ripe fruit (Dunbar, 2022). However, when some of us partake of the novel and highly potent distilled alcoholic spirits, our natural reward systems can become 'hijacked' leading to **alcohol use disorders**. This perspective has potential to help destigmatize those struggling with addictions, and it also has obvious public health implications for access to and availability of alcohol; particularly of strong spirits.

The evolutionary perspective prompts us to ask two kinds of questions in relation to mood disorders. One is why has the capacity for low mood been preserved by selection in humans and the second is why is the mood system so vulnerable to dysregulation (Nesse, 2019)? Nesse refers to the hypothetical mood regulatory system as a 'moodostat' (Nesse, 2019) which has the function of adjusting mood states in accordance with environmental context and challenges. This perspective has given rise to a number of fruitful models. For example, in times of threat, conflict or loss it may be helpful to become mildly **depressed**, withdrawn, avoidant of conflict with a superior adversary and more objectively thoughtful. Another model is the analytical rumination hypothesis that suggests that depression is an evolved adaptation that served in the past to help process and resolve complex interpersonal issues (Hollon et al., 2021). Additionally, Soper suggests the reduced energy and cognitive ability of depressed individuals may be an adaptation to reduce the risk of suicide (Soper, 2023). However, when this system becomes dysregulated, we are at risk of becoming clinically depressed, a state that does not confer any obvious benefits and often requires therapeutic intervention.

The 'smoke detector principle', developed by Nesse (Nesse, 2019), helps explain why **anxiety** is so common in humans. The principle is based on signal detection theory and applies to all defence systems, biological or man-made, and follows the rule: 'better safe than sorry'. It states that whenever there is a major discrepancy between the consequences of erroneous activation of an alarm system and the failure to activate when the hazard is present the system will be designed to allow for false alarms. In the ancestral environment the cost of the occasional erroneous panic or anxiety state was miniscule in comparison to the risk of failing to experience anxiety when encountering life-threatening dangers. In many modern environments, however, much of the anxiety and panic we experience is unnecessary and yet very distressing and disabling. Highlighting to patients how anxiety and panic may indicate overactive threat detection systems can be very powerful in a psychotherapeutic context. Furthermore, this approach is consistent with antidepressant treatment of disabling and distressing anxiety symptoms, thereby disrupting overactive and potentially harmful systems. This is similar to using analgesia or anti-inflammatories in disrupting endogenous 'protective' pain systems that can become harmfully dysfunctional.

With these examples in mind, it becomes possible to appreciate how the evolutionary perspective has the potential to help reconceptualize psychiatric diagnosis and offer useful and destigmatising explanatory models of mental disorder to patients and families.

Helping patients and their families

Hunt et al. (2022) have also outlined how the current 'biopsychosocial' model employed in psychiatry is limited in its scope and should be extended to a broader, 'evobiopsychosocial' model that incorporates both ultimate and proximate perspectives, along with consideration being given to individual (ontogenetic) and species level (phylogenetic) development. Insel, the former NIMH director is often quoted as not 'moving the needle' in the management of mental disorders despite decades of cost and time intensive research (Twenty Billion Fails to "Move the Needle" on Mental Illness | Psychology Today n.d.). There have been failures to make significant progress in the understanding of mental disorders (Brüne et al., 2012) coupled with no major breakthroughs in the treatments of schizophrenia and depression in the last half-century and twenty years respectively (Akil et al., 2010).

As in other fields of medicine, psychiatrists need to distinguish between symptomatic and curative treatments. The evolutionary perspective alerts us to the importance of understanding our patients' life and social context as well as their functional capacity that goes beyond symptom checklists. The evolutionary perspective seeks to add that psychiatric symptoms/syndromes are 'context-dependent' arising from adaptations to environments. This transdiagnostic view reconceptualises psychiatric disorders as aggregates of behavioural systems in a state of dysfunction, rather than the limited drug-centred model view of neural circuit dysfunction leading to symptoms requiring psychopharmacological management (Troisi, 2022). The SOCIAL and GOAL systems proposed by Nesse and Troisi, respectively, demonstrate how an evolutionarily informed approach to assessment and diagnosis can be employed.

Nesse's SOCIAL system

A truly biopsychosocial view of an individual and their health which can be performed by exploring the individual's background

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in terms of **S**ocial situation, **O**ccupational status, **C**hildren and family, **I**ncome, **A**bilities and **L**ove. This method of social system review follows a medical model, summarising closely related categories of human resources that impact functioning informed by behavioural ecology (Nesse, 2023).

Troisi's GOAL system

Another useful approach to assessment in psychiatry that is informed by an evolutionary perspective and ethology principles:

Give less weight to symptoms; **O**bserve actual behaviour; **A**ssess functional capacities; **L**eave your office (to observe patients' behaviour in their natural environment). This approach suggests replacing symptoms with functional capacities for diagnosis and as primary targets for management. (Troisi, 2022).

Conclusion

Just as in the past debate of 'nature versus nurture', in which more knowledge helped us realise that both were valid and important, we propose that an evolutionary perspective can bridge the gap that currently exists between predominantly biological and social perspectives in the understanding of mental disorder. We refer to the dodo bird verdict in Alice in Wonderland: 'Everybody has won, and all must have prizes'.

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