

Future events

1. EPSIG 4th Trainee engagement Day:

Whole-day F2F event planned at the college on Friday 13 March 2026. Prior registration and payment will be required.

Contact Tom Carpenter on carpenter.te@gmail.com . Details to follow.

2. Philosophy SIG virtual drop-in:

A virtual drop-in session is organised by PhilSig with participation from EPSIG on January 28thg 2026 12 -13:30 The title of the session is: Biological Psychiatry and the philosophy of biology

Link for registration.

Charles Darwin Essay Prize Winners

Medical Student Entry, Isaac Grennan, WINNER

Medical Student Entry, Shao Junzhe, RUNNER-UP

Resident Core Entry, Rana Çağla Akduman Kurtaran WINNER

Resident Core Entry, Ben Griffin. RUNNER-UP

Resident Higher Entry, Loraine Marnicki WINNER

Resident Higher Entry, Matthew Hastings RUNNER-UP

Staff Grade Entry, Proonima Khadanga WINNER

Staff Grade Entry, Krishna Prakash RUNNER-UP

Finally, two of these prize-winning essays are also here in full, (Loraine Marnicki and Rana Çağla Akduman Kurtaran). Thank you to all the entrants, especially the winners and speakers at the conference. Also thank you to the team who organised and judged the essays and college staff who administered all the tasks. We will publish the other winners and runners up essays in subsequent letters.

November 2025—Online Conference Report

By Paul Keedwell

This year's meeting at the Royal Society of Medicine was a hard act to follow, but the 2025 EPSIG conference didn't disappoint in its depth and scope, illustrating the growing maturity, breadth and clinical relevance of evolutionary psychiatry. It successfully brought together emerging and established thinkers with a good balance of the conceptual and the heuristic.

The meeting opened with an overview from Dr Riadh Abed, who charted EPSIG's rapid development over recent years, from trainee engagement days, collaborative events with the RSM and ISEMPH, international links, particularly with Ireland and the World Psychiatric Association, a digital presence with its website and YouTube channel, the newsletter, and the College's first edited volume on evolutionary psychiatry.

Continuing the theme of growth, Dr Gurjot Brar explained how evolutionary psychiatry's unifying framework is appealing to trainees. He described ongoing efforts to embed evolutionary science in medical curricula internationally, and showcased emerging educational resources, including The Evolving podcast and the fast-growing Evolutionary Psychiatry Substack, which are helping to build a global learning community.

Dr Adam Hunt argued that traits linked to autism, ADHD and psychopathy reflect enduring forms of cognitive and behavioural diversity shaped by evolutionary pressures in small ancestral groups. He outlined how adaptive trade-offs, niche specialisation and frequency-dependent selection help maintain such diversity. For example, detail-focused systemising (associated with autism) could aid toolmaking or tracking, while novelty-seeking and rapid attentional shifts (seen in ADHD) may have

supported exploration or vigilance.

Dr Loraine Marniki, winner of the 2025 Charles Darwin Essay Prize, turned to the evolutionary logic of dissocial personality disorder and psychopathy. Traits such as fearlessness, impulsivity and manipulative social strategies can be understood as fast life-history or cheater strategies that once conferred advantages in harsh or unpredictable environments. However, in modern forensic contexts, these same dispositions manifest as exploitation, boundary-testing and high violence risk. Marniki emphasised the role of early adversity in shaping expression ("evolution builds tendencies, not destinies"), which should guide methods of risk reduction.

A joint presentation by Dr Vaishnavi Sornarajah and Dr Anna Eaton examined self-harm through the lens of cultural evolution, whereby emotional regulation problems, arising from attachment disruptions, serve not just as a form of emotional regulation, but a communication strategy and a means of belonging within peer groups. Thus, self-harm can spread socially, echoing the logic of ritualised self-injury in Buddhist, Shia, South Asian and European traditions, where shared pain forged group identity. In unconstrained digital environments, self-harm images, narratives and methods diffuse quickly, strengthening group cohesion while substantially increasing risk.

Dr Rana Kurtaran, another Charles Darwin Prize winner, gave a reframing of social anxiety disorder, drawing on social rank theory, sociometer theory and conditional adaptation models. She explained how vigilance to belonging and potential rejection once provided crucial survival advantages in small, interdependent groups. However, in highly digital

November 2025—Online Conference Report (cont.)

environments where social cues are constant and ambiguous, they become prone to over-activation. Understanding this reduces shame and supports more compassionate, targeted care.

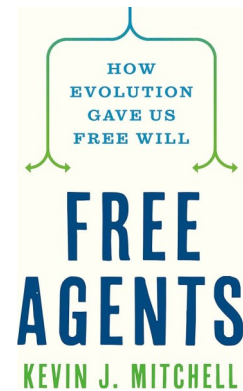
Dr Gul Deniz Salali presented over a decade of research with Bayaka hunter-gatherers, showing how childhood in forager societies is shaped by intensive cooperative caregiving, which includes a wide network of siblings and unrelated adults, with up to 14 caregivers nearby and allomothers providing 40–50% of care. As children grow, older siblings and mixed-age peer groups take on increasing roles, teaching skills through play, exploration and imitation. Bayaka children learn largely through observation and embodied practice and are far more autonomous and physically active than children in industrialised societies.

Both Professor Alfonso Troisi and Professor Jerome Wakefield emphasised the need to shift psychiatric focus from symptom checklists to real-world functioning, defined evolutionarily as the ability to pursue adaptive goals such as maintaining relationships, securing resources and contributing to group life. This distinction helps clinicians differentiate adaptive responses - such as grief, fear or anger - from genuine breakdowns in regulatory systems. To this end, Troisi introduced the **GOAL** model, urging clinicians to **G**ive less weight to symptoms (which often act as evolved signals), **O**bserve the daily functioning of patients, **A**ssess functional capacity and **L**eave the office” to understand their social environments.

Across presentations, the conference demonstrated that evolutionary psychiatry offers a powerful integrative lens - clarifying mechanisms, reducing stigma, enriching diagnosis and guiding more effective, function-focused care.

Book Review

Free Agents: How Evolution Gave us Free Will by Kevin J Mitchell, Princeton University Press, 2023



NOTE: An abridged version of this review appeared in the BJPsych, December 2025 issue.

Resolving the question of the existence of free will is considered by many as a hopeless task and one not worth embarking on, given that the greatest minds have tried and failed to settle the matter over the last two and half millennia.

Thus far, philosophers have been the main protagonists but more recently a few biologists/neuroscientists have weighed in. What is different about Mitchell's thesis is that he has courageously stuck his neck out in favour of the existence of free will. For a materialist, a neuroscientist and an evolutionist, this is a rare position and to our mind, one worthy of special attention as it has become received wisdom in polite scientific discourse to state that free will either doesn't exist in a fully deterministic universe (example: Robert Sapolsky) or that an attenuated form of free will exists (?illusion of free will) which is compatible with a fully deterministic universe (example: Daniel Dennett).

It is intriguing that two eminent neuroscientists (Sapolsky and Mitchell), considering roughly the same literature and data have published books around the same time and reached diametrically opposite conclusions.

How can this be?

Mitchell's declared aim is to 'naturalise the concept of agency' and herein lies the difference in approach between these two scholars. Mitchell argues that the evolution of life involved more than just the novel arrangement of matter, the state of disequilibrium between living matter and its surroundings and life's distinctive anti-entropic properties.

Together with life there emerged the novel phenomena of agency, together with meaning, goals, motives, reasons and informational relevance. Before life there were events which had consequences but no consequences that mattered to anyone. Even the simplest forms of life have an interest in the outcome of events i.e. events acquire a valency absent in non-living matter. Also, even single-celled organisms are imbued with agency; they act within their environment in pursuit of their own goals: survival and propagation. More complex organisms with brains have reasons for their actions and in the case of humans can reflect upon these reasons.

Mitchell usefully provides a classification of determinism together with definitions. He renames the hard and soft versions of determinism as 'physical pre-determinism' (the idea that only one possible timeline exists) and 'causal determinism' (the idea that every

Book Review (cont.)

event is necessarily caused by preceding events) respectively. He adds a third category which is 'biological determinism' (the idea that an organism's actions are internally necessitated by its own physical configuration: its biochemical state and nervous system wiring) (page 146).

Mitchell persuasively dismisses physical pre-determinism and biological determinism which leave no room for randomness/stochasticity by dictating that there can only be one possible future (and in the case of biological determinism by ignoring the existence of agency). The role played by randomness in the early universe as well as the real existence of stochasticity in complex systems (such as in weather systems) but specifically and most saliently in biological systems, provides decisive evidence against pre-determinism. Mitchell draws attention to the random errors of DNA copying that produces mutations which can occasionally be beneficial and contribute to the variation that is acted upon by natural selection without which the whole evolutionary process could not exist. Chance events have been claimed to have such a pivotal role in the trajectory of the evolutionary process that Stephen Jay Gould famously suggested that if we replayed the tape of life we would get a different result every time. While there is strong evidence of convergence in evolution whereby similar solutions have been reached repeatedly e.g. vision, flight, the precise details of the design of the organs serving these functions can be vastly different and influenced by stochasticity and chance (e.g. the vertebrate camera eye versus the compound eye of arthropods). Hence, Laplace's

demon, however intelligent and omniscient of the state of the universe could not possibly predict the exact trajectory of the evolution of life on earth let alone the exact words used by Tolstoy in *War and Peace*.

In addition, stochasticity is part and parcel of the functioning of a range of bodily systems including the immune system and nervous system (where there is a stochastic element to the firing of individual neurons, discussed in some detail). Nevertheless, Mitchell concedes that randomness does not of itself serve to demonstrate the existence of free will but that 'It's that a pervasive degree of indefiniteness loosens the bonds of fate and creates some room for agents to decide which way things go' (page, 280).

However, his reliance on quantum field theory with its built-in randomness and uncertainty principle at the sub-atomic level in his rejection of causal determinism at the macro level seems much less secure. Specifically, the claim that the extension of quantum randomness extends above the subatomic level is widely accepted among physicists seems rather suspect. But, in our view, this particular weakness does not detract from Mitchell's central thesis which is that agents make real choices in the world, make them in the service of their own goals and in complex organisms, for their own reasons.

Mitchell makes a strong case against the reductionist position that states that events at the lowest level of organisation are causally comprehensive. In our view this is one of the most important messages in the book. The assumption of an exclusive and comprehensive bottom-up causation that is fully

Book Review (cont.)

explanatory of all higher-level phenomena is pervasive among scientists including those in fields of psychiatry and medicine. The concepts of causation at higher levels of organisation, emergent properties and top-down causation (also known as downward causation) are unfamiliar to many and are eloquently discussed in this book. To many in psychiatry, these concepts will be an eye-opener, introducing many to a way of thinking that can potentially free the mind from the intellectual straight jacket that locates all causation at the molecular level and denudes higher levels (the psychological and social) of any real causal powers. In this regard, the important work of philosopher and mathematician George Ellis is briefly introduced.

Mitchell usefully provides a classification of determinism together with definitions. He re-names the hard and soft versions of determinism as 'physical pre-determinism' (the idea that only one possible timeline exists) and 'causal determinism' (the idea that every

Mitchell's conception of free will does not assume being free of all constraints or being divorced from our history, culture, moral principles or current circumstances. That is an impossibility. It is more about the ability to make real choices for our own reasons that are consistent with our selves and goals and to be responsible for our actions. In this regard, there are degrees of free will that differ from person to person, and this can change over time. Mental disorder and brain disease can impair the freedom of will and action and hence diminish the individual's responsibility. Hence, unlike, Sapolsky's thesis where no one

deserves blame or praise, Mitchell suggests that our current intuitions regarding personal responsibility are on the right track.

This book should be of interest to reflective psychiatrists whether or not they have a prior interest in philosophical questions. Whether readers agree or disagree with the author's thesis, they will come out better informed about their own position regarding a range of important questions. Overall, we agree with Steven Pinker that "Kevin Mithchell brings clear thinking and scientific rigour to a vital topic that leaves many people confused., caught between the preposterous alternatives that either humans are robots or that every time we make a decision, a miracle occurs."

Riadh Abed & Paul St John-Smith

EPSIG Essay Competition 2025—Prize Winner

How an Evolutionary Perspective Can Improve Our Understanding of Dissocial Personality Disorder: A Forensic Psychiatry View

Loraine Marniki

INTRODUCTION

According to ICD-11, Dissocial Personality Disorder (DPD) is marked by a long-standing and inflexible disregard for the rights and emotions of others. Individuals typically show callousness, poor empathy, indifference to social obligations, and irresponsible behaviours that cuts across several areas of daily life (World Health Organization, 2019). Personality disorders are lifelong conditions, usually apparent from adolescence or early adulthood, with significant impact on interpersonal, occupational, and social functioning. The stability of these patterns reflects the definition of personality disorder as a pervasive and enduring disturbance of personality organisation rather than a transient episode of illness. Epidemiological studies suggest that DPD, and its DSM-5 equivalent Antisocial Personality Disorder (ASPD), affects approximately 1–3% of the general population, with prevalence far higher in prisons (up to 50–80%) (Fazel and Danesh, 2002). A smaller subgroup demonstrate **prominent psychopathic features**, estimated at 1% in community samples and 15–25% of incarcerated offenders (Hare, 2003).

Within forensic psychiatry, psychopathy has long been recognised as a construct of particular concern. Those with **prominent psychopathic features and risks, as assessed by the PCL-R, are characterised by a unique pattern of clinical features and risks**, including heightened risk of vio-

lent recidivism, diminished treatment engagement and effectiveness, and a **destabilising influence on institutional environments** (Salekin, 2002; Leistico et al., 2008). Their presentation, marked by manipulateness, superficial charm, and lack of **remorse, has a disproportionate impact within secure settings, where such individuals are shown to increasingly manipulate staff, subvert security, and push against therapeutic boundaries. Traditional psychiatric explanations often struggle to account for the persistence** of these traits despite their costs. The discussion that follows considers how evolutionary theory helps explain the persistence of DPD and psychopathy, and how this perspective enriches forensic psychiatric practice.

AN EVOLUTIONARY FRAMEWORK

Evolutionary psychiatry views mental disorders not simply as malfunctions but as traits shaped, at least in part, by pressures of adaption and natural selection (Nesse, 2019). Traits which in present-day society are often regarded as maladaptive may once have conferred benefits for survival or reproduction. In the case of DPD and psychopathy, characteristics such as fearlessness, inclination towards high-stakes behaviours, manipulateness, and reduced empathy may historically have increased success in competition for resources, social status, or reproductive opportunities (Mealey, 1995).

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From this perspective, psychopathic tendencies can be understood as strategies that may once have served adaptive purposes, even if they generate significant personal and societal costs in contemporary settings. However, critics argue that not all features of psychopathy appear adaptive, and some may instead represent maladaptive by-products of cognitive or emotional deficits (Skeem et al., 2011).

LIFE HISTORY THEORY

Life History Theory (LHT) provides a valuable framework for explaining variation in psychopathic traits. It suggests that organisms allocate energy and time between growth, reproduction, and survival according to environmental pressures (Ellis et al., 2009). When environments are unstable, dangerous, or resource-poor, evolutionary pressures may favour a fast life history style, one that prioritises early reproduction, immediate rewards, and short-term survival over delayed resources or benefits.

Psychopathy can be understood as a **heightened manifestation of the fast life history approach**, marked by impulsivity, opportunism, and shallow interpersonal attachments that may increase short-term reproductive or material gains (Jonason et al., 2010). Experiences such as childhood neglect or violence may push individuals towards this strategy, consistent with evidence that early adversity is overrepresented among forensic populations with DPD (Widom, 1989). This formulation is testable, and one could predict higher psychopathy scores among those exposed to unstable childhood environments, a hypothesis supported

by longitudinal studies. Yet, critics note that LHT is sometimes criticised for being broad and difficult to falsify, as almost any behaviour can be retrospectively framed as “fast” or “slow” (Copping et al., 2014).

CHEATER STRATEGIES AND SOCIAL EXPLOITATION

From an evolutionary standpoint, psychopathic tendencies can be understood as a type of “cheating strategy” within cooperative groups, where individuals exploit others while avoiding reciprocal obligations (Mealey, 1995). In ancestral settings, traits such as superficial charm, callousness, and deceitfulness may have helped individuals secure resources or social dominance without the costs of cooperation. Such strategies depend on rarity, if too many individuals adopt them, group cooperation collapses (Tooby and Cosmides, 1992). This dynamic may help explain why psychopathy has remained stable but relatively uncommon across populations. This idea is also testable: if psychopathy is a stable frequency-dependent strategy, its prevalence should remain relatively constant across cultures and over time, which appears broadly consistent with current prevalence estimates (Hare, 2003). Nonetheless, alternative views suggest that psychopathy may be less a “designed” cheating strategy and more a maladaptive failure of socialisation and moral development (Lykken, 1995).

SEXUAL SELECTION AND REPRODUCTIVE STRATEGIES

Sexual selection offers further insight into the persistence of psychopathy. Traits such as boldness,

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superficial charm, and opportunism can provide advantages in securing short-term mating opportunities. Studies suggest that individuals with elevated psychopathic traits often report greater numbers of sexual partners and use exploitative or coercive strategies in achieving this (Jonason et al., 2009). While such approaches may once have enhanced reproductive success despite social risks, today they are associated with relationship instability, sexual exploitation, and sexual offending, patterns of clear relevance in forensic psychiatry (Harris et al., 2007). This perspective generates testable hypotheses: it could be expected that psychopathic traits correlate with short-term mating strategies and higher partner turnover, findings which have been supported in both community and forensic samples. Yet such findings remain controversial, as they risk overstating the “adaptive” value of behaviours that in contemporary contexts are profoundly harmful and criminal.

NEUROBIOLOGICAL AND COGNITIVE MECHANISMS

Neurobiological findings complement evolutionary explanations of psychopathy. Neuro-imaging studies consistently show reduced amygdala activation in individuals with prominent psychopathic features, linked to impaired fear conditioning, **blunted sensitivity to others’ distress, and difficulties in reinforcement-based learning** (Blair, 2007). These mechanisms may account for the emotional callousness and chronic rule-breaking observed in DPD and psychopathy.

From an evolutionary perspective, reduced sensi-

tivity to fear and punishment may have supported dominance and exploitative strategies by dampening normal inhibitory responses. In today’s context, however, these same mechanisms underpin persistent offending, **reduced responsiveness to deterrence, and substantial challenges for treatment and risk management in forensic settings** (Blair, 2007; Brazil et al., 2018). This account is also empirically testable: one could predict that psychopathic individuals show attenuated psychological responses to threat cues, a finding confirmed across fear-conditioning studies.

VARIABILITY AND PROTECTIVE FACTORS

Not all individuals with dissocial or psychopathic features engage in persistent offending and evolutionary perspectives help explain this diversity. Traits such as boldness, reduced anxiety, and social dominance may, in certain circumstances, support resilience, leadership, or effective risk-taking (Lilienfeld et al., 2012). Protective influences, including secure attachments, higher intelligence, and prosocial role models, can moderate risk by directing potentially antisocial tendencies into adaptive domains. In organisational or political settings for example, psychopathic traits combined with self-control and strategic intelligence may lead to achievement as opposed to criminal behaviours (Babiak and Hare, 2006). This highlights a broader point, that evolutionarily explanations should be applied with caution, as traits manifest very differently dependent upon environmental context and protective scaffolding.

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IMPLICATIONS FOR FORENSIC PSYCHIATRY

An evolutionary perspective offers important insights for forensic psychiatry. It reframes traits linked to DPD and psychopathy not simply as deficits, but as context-dependent strategies, encouraging a more nuanced approach to clinical formulation and risk assessment. It is vital to consider how environmental factors interact with underlying traits, an especially relevant consideration when applying structured risk assessment tools such as the HCR-20 or RSVP (Douglas et al., 2013).

This has clear treatment implications, as conventional therapeutic methods often prove less effective due to the diminished empathy and reduced sensitivity to punishment that typify psychopathy (Salekin, 2002). Interventions may be more effective when they appeal to self-interest, use clear contingencies to reinforce prosocial behaviour, and focus on structured, skill-based management of interpersonal interactions. Approaches such as schema therapy, mentalisation-based therapy, and targeted behavioural programmes show some promise when carefully adapted (Bernstein et al., 2007).

At the systemic level, understanding the evolutionary roots of manipulateness, boundary-testing, and exploitation can inform staff training, team-based management, and formulation-driven strategies. Far from being a clinical curiosity, psychopathy is a striking reminder that evolutionary success and societal harm can be two sides of the same coin.

FINAL THOUGHTS

Viewing DPD and psychopathy through an evolutionary lens suggests they are not merely pathological deviations but context-dependent strategies that once conferred advantages in ancestral settings. Traits such as fearlessness, manipulativeness, and reduced empathy may historically have supported survival or reproductive success, but in contemporary contexts they manifest as violence, treatment resistance, and institutional disruption. Forensic psychiatry benefits from this perspective by enabling more nuanced risk formulations, guiding the design of tailored interventions, and strengthening systemic responses to manipulation and boundary-testing.

Going forwards, integrating evolutionary insights with neuroscientific, developmental, and psychosocial models may support more comprehensive interventions. By recognising psychopathy as both an enduring and adaptive phenomenon, we can better understand why it persists, why it resists treatment, and why it remains as one of the most formidable challenges in forensic psychiatry.

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EPSIG Essay Competition 2025—Prize Winner

From Ancestral Alarm to Contemporary Anxiety: Understanding Social Anxiety Through Evolution

Rana Cagla Akduman Kurtaran

*“Man is a social animal—everyone will admit that man is a social being. We see this in his dislike of solitude and in his wish for society beyond that of his own family. Solitary confinement is one of the severest punishments which can be inflicted” (Darwin, *The Descent of Man, and Selection in Relation to Sex*, 1871)*

Social anxiety, marked by an intense and persistent fear of negative evaluation or rejection, affects approximately 12% of the global population and often leads individuals to avoid social situations, impacting daily functioning and well-being (1). While traditional clinical models focus on cognitive and behavioural processes that maintain these symptoms, evolutionary psychiatry poses a fundamental question. Why did humans evolve such heightened sensitivity to social scrutiny in the first place? What if social anxiety is not simply a flaw, but rather a hyper-sensitive survival mechanism that was once adaptive in ancestral settings, but less suited to modern environments?

The foundation of this evolutionary understanding lies in the Environment of Evolutionary Adaptedness (EEA), a concept introduced by John Bowlby in 1969, in his work on attachment (2). EEA refers to the ancestral conditions in which a species is adapted, the environment in which human traits and behaviours evolved (3). For most of history, humans lived in small, tightly knit nomadic kin groups. As Coon observed, group living has been a universal feature of our species, though size and structure varied with resources and environment (4). In resource-limited environments, groups often adopted hierarchical structures (agonic mode), dominated by an alpha figure. By contrast,

when resources were dispersed, cooperation and egalitarian arrangements were favoured, also known as the hedonic mode (5). Both modes probably emerged at different times and likely overlapped across human history (6). Whether in hierarchical groups focused on social rank or in egalitarian groups emphasising cohesion, being attuned to social cues and monitoring one’s standing was vital for survival and reproduction. Belonging to a group was not merely a matter of social comfort; it was a matter of survival. Access to resources, protection from predators, and opportunities for reproduction were directly tied to social standing and acceptance within the group. Social exclusion increased vulnerability to environmental threats, including predation and starvation, and the potential termination of their reproductive lineage, making social ostracism a profound existential risk.

Within this environment, natural selection favoured mechanisms that helped individuals to navigate complex social hierarchies. These pressures shaped a highly sensitive social monitoring system, attuned to cues of acceptance, rejection, and opportunities for cooperation. Sexual and social selection reinforced these tendencies, since being perceived as a desirable partner—socially or sexually—provided access to resources, alliances, and mates (7). Conversely, those who struggled to manage relationships risked exclusion and lost opportunities. In such context, behaviours that maintained attractiveness, reliability, and cooperative alliances were strongly motivated. In this environment, Social anxiety may have served a protective role, encouraging self-monitoring, careful partner choice, and adherence to social norms (7).

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Given these evolutionary pressures, it is plausible that social anxiety did not arise randomly but rather as a conditional adaptation, responsive to social and environmental cues. This was further explored by Karasewich and Kuhlmeier, who identified three core systems underlying this trait: threat detection, social competition, and social exclusion (6).

The threat-detection model considers social anxiety as part of a broader defence system, evolved to recognise and respond to potential dangers. Nesse describes anxiety disorders as “smoke detectors” that favour false alarms over missed threats (8). In ancestral environments, this bias was adaptive as it was better to overreact than to overlook a threat. Experiencing these false alarms, anxiety in the absence of actual danger, was considered a low-cost strategy compared to the risks it helped avoid, making heightened sensitivity advantageous in ancestral environments. Consequently, individuals who could quickly detect both physical and social threats were more likely to survive and navigate complex social interactions successfully (7). However, when these systems become overactivated, they can produce chronic distress, hypervigilance and avoidance.

Although detecting threats was crucial, our ancestors also needed to be aware of the social hierarchy and understand their rank and position within the group. The social competition model builds on this idea, emphasising the central role of status and rivalry in ancestral life, highlighting how sensitivity to social evaluation and fear of devaluation could have served adaptive functions (7). This model is supported by Gilbert, who proposed that social anxiety is not only about belonging but also about navigating status hierarchies. He argued that humans inherited vigilance systems from primate ancestors, designed to monitor dominance and subordination, which he described as the social-rank theory. In small groups, being overly assertive or failing to recognise one’s lower status could provoke ag-

gression and intragroup conflicts. As a result, sensitivity to shame, rejection, and the risk of devaluation were seen as adaptive mechanisms (9). Öhman’s *evolutionary analysis of fear* complements this view by highlighting the dominance–submissiveness system. He conceptualises social fear as one pole of this system, with social dominance forming the opposite pole, highlighting how fear of subordination or negative evaluation can drive hypervigilance in social hierarchies (10). However, this same ‘rank-focused’ system can become overactive in the modern world, where competition is constant and comparisons are amplified by schools, workplaces, and social media, leading to a heightened preoccupation with the fear of negative evaluation and judgment, which are key features of social anxiety.

Social exclusion focuses on the risk of rejection or exclusion regardless of social rank or hierarchy, highlighting the importance of relational value. Sociometer theory complements this perspective by providing a framework to understand how individuals monitor and respond to such social threats. The sociometer acts as an “internal gauge” of social acceptance. It is an internal system that calibrates a person’s self-esteem and social standing based on relational values, or how much one is accepted and valued by others

(11). Self-esteem reflects the readings of this gauge, rising with social acceptance and falling when rejection or exclusion is perceived. Functioning as an alarm system, it triggers anxiety and other negative emotions when social standing is threatened, motivating behaviours that help maintain social bonds.

Baumeister and Leary’s ‘need to belong’ theory complements this view by emphasising the affiliative side of human evolution. Throughout history, the need to form interpersonal relationships has been an important topic of discussion across various fields, including literature, psychology, and psychiatry, whether considered as

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a sex drive by Freud or as the 'love and belongingness' stage in Maslow's hierarchy of needs. (12) Baumeister and Leary highlight the "innately prepared and hence nearly universal" need to belong, a desire to form and maintain social bonds through frequent, positive interactions and mutual care. Forming and maintaining social bonds offered evolutionary advantages by supporting defence and resource sharing. For adults, forming stable attachments also enhanced reproductive success and improved the survival of offspring by ensuring that they were nurtured to maturity (12). In addition to the survival benefits of group cohesion, humans were especially motivated to seek others during illness, danger, or nighttime, as social bonds not only supported survival but also helped individuals endure challenging circumstances (12). This deep-seated drive to remain connected may be the source of adaptive vigilance, leading to increased attention to social cues. In today's world, this once-adaptive social sensitivity can manifest itself as heightened awareness of social evaluation and fear of rejection or isolation.

Social anxiety appears to be driven by different systems, those that monitor hierarchies and rank, and those that promote social cohesion and bonding. Despite their distinctions, these systems all share the common goal of increasing sensitivity to social threats. These innate social monitoring systems, once essential for survival in small, close-knit groups, face challenges in modern environments, resulting in what is known as an *evolutionary mismatch* (13). Psychological adaptations that were highly effective in ancestral contexts may be less suitable today, as ancestral threat-detection systems are ill-equipped to respond to the comparatively low-risk social situations of contemporary life (14). In small kin-based communities, vigilance toward rejection or disapproval helped individuals secure access to resources, mates, and social support. By contrast, modern life is characterised by

large, fluid social networks, frequent interactions with strangers, and digital communication lacking nonverbal cues, making these ancient mechanisms prone to overactivation.

While evolutionary mismatch helps explain the general prevalence of social anxiety today, it does not account for individual differences. The *developmental-mismatch hypothesis* emphasises how early-life experiences could calibrate stress-regulation and social monitoring systems, influencing susceptibility to anxiety later in life (15). Early exposure to environments that signal high social threat, such as peer rejection, harsh parenting, or limited social interaction, can increase vigilance and caution, which would have been adaptive in ancestral contexts. These patterns, described as *anxious relational schemas*, guide expectations by providing cues about the likelihood of social threat, based on early interactions with caregivers and peers (6).

Genetic factors also interact with environmental influences, contributing to individual differences in sensitivity to social contexts. From a conditional adaptation perspective, these inherited predispositions combine with early-life cues to fine-tune social vigilance. Over the past few decades, research has increasingly focused on the role of the amygdala in social anxiety. The amygdala, often referred to as the brain's "fear circuit," plays a central role in fight, flight, or freeze responses. (16) Individuals with social anxiety frequently exhibit heightened amygdala reactivity to social cues. Similar patterns of reactivity have been observed in people with behavioural inhibition or an inhibited temperament during infancy. For example, Khan et al. found that adults who had been inhibited as infants displayed stronger amygdala responses to unfamiliar faces, suggesting heightened sensitivity to social uncertainty (6, 17). These studies show us that genetic predispositions and environmental experiences interact to produce neurobiolo-

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-gical changes that might influence how individuals perceive and respond to social cues. Together, these developmental and genetic influences indicate that social anxiety functions as a conditionally adaptive trait: a sensitivity system evolved to anticipate social risks, shaped by early experience, historically advantageous, but sometimes overactive in modern contexts.

Social anxiety can be understood as an evolutionary adaptation rather than a mere dysfunction. It reflects a sensitivity system shaped to detect social threats, navigate hierarchies, and maintain cooperative relationships. In ancestral environments, such heightened sensitivity would have supported survival by helping individuals navigate complex social networks and maintain access to valuable alliances and mates (9).

However, in modern, lower-risk contexts, these once-adaptive mechanisms can become overactive, leading to excessive worry, avoidance, and anxiety.

It is important to understand anxiety disorders, particularly social anxiety, through an evolutionary lens, asking why these ancestral mechanisms exist and what functions they once served. By integrating evolutionary insights into clinical practice, we can better support individuals in transforming a once-adaptive survival mechanism into a tool for healthy and fulfilling social functioning.

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