ISSN: 2634-9221
European Journal of Applied Sciences; Vol. 14 No. 01 (2026) (611-633)
https://doi.org/10.14738/aivp.1401.19975

Evolution: Survival of the Wildest

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Abstract: Animals raised in captivity before release into the wild consistently show lower survival rates than those reared in natural environments. Captive-reared animals exhibit a wide range of skill deficiencies, such as in predator avoidance, food selection, migration, conspecific integration, and parenting. These differences suggest a strong selective advantage towards those able to integrate into the wild, in a way that goes beyond genetic instruction. Successfully integrating into the wild requires specific adaptations that foster a psychological state of wildness, a state that improves fluency and awareness through mechanisms targeting nature attunement, behavioural parsimony, and instinct learning. In our species, wildness is rejected because of the imagined chaos it might bring, and nature shunned as a way of coping with a fear of death, as explained by Terror Management Theory. However, better knowledge of the mechanisms involved may raise our standard of understanding and responsibility towards nature and each other. Examples comparing interpretations based upon 'survival of the wildest' (SOW) with 'survival of the fittest' (SOF) are provided.

Keywords: captive-release, wildness, attunement, instinct, fitness, nature connection

INTRODUCTION

There are thought to be over seven million animal species on Earth (Mora et al. 2011), and those not under human control are considered wild. Is 'wild' merely a metaphor for the disorganised and ruleless, a chaotic jumble? Or is there a deeper system in nature, where those seven million species are wild for a reason? How might evolution look if wildness plays a crucial role? While genes are needed to get an individual started, wildness might be the polish that completes them. This article explores the role of wildness in connecting with nature.

CAPTIVE- VERSUS WILD-REARED

Captive-rearing and release studies have long highlighted the importance for animals of connecting to the wild to survive in nature. This concept was successfully exemplified by Elsa the Lion (Adamson 1960). In contrast, the reintroduction of Keiko the killer whale failed (Simon et al. 2009). Sadly, most reintroductions gain the latter result. Beamish et al. (2012) found that smolts of captive-reared chinook salmon were approximately 15 times less likely to survive in nature compared to their wild counterparts, despite both groups being sourced from wild spawning populations. Roche et al. (2008) found that plovers raised in captivity from abandoned wild eggs fledged 56% fewer young upon release than wild-born plovers. Rehabilitated orangutans typically have an average survival rate of only 40% when released (Russon 2008; Bridgeland-Stephens et al. 2023). For elephants that have spent a substantial portion of their adult lives in close contact with humans, the International Union for

Conservation of Nature (IUCN) advises against even attempting to rehabilitate them into nature (Thitaram et al., 2024).

Similar examples where wild animals outperform captive-reared or rehabilitated animals abound, and include cod (Steingrund and Fernö 1997), trout (Wiley et al. 1993; Ward et al. 2018), salmon and trout (Hyvärinen and Rodewald 2013; Johnsson et al. 2014; Säterberg et al. 2023), sockeye salmon (Ricker and Foerster 1948), chinook salmon (Davis et al. 2018), red drum (Stunz et al. 2001), Mexican fish (Kelley et al. 2005), winter flounder (Fairchild and Howell 2004), largemouth bass (Wintzer and Motta 2005), kangaroo rats (Yoerg and Shier 1997), Siberian polecats (Biggins et al. 2011), black-tailed prairie dogs (Shier and Owings 2006), weasels (Hellstedt and Kallio 2005), elephants (Thitaram et al. 2024), bears (Beecham et al. 2016), golden lion tamarins (Stoinski et al. 2003), chimpanzees (Morimura and Mori 2010) and orangutans (Sunderland-Groves et al. 2021; Bridgeland-Stephens et al. 2023). Beck et al. (1994) reviewed 145 programs where captive-born animals were released back into the wild and found, on average, a success rate of only 11%.

The importance of instilling or harnessing wild-like traits in animals before release is well recognised (Rosengren et al. 2017; Baker and Winkler 2020; Näslund 2021). Key factors influencing rehabilitation and connection with nature include the origin of the animals being prepared for release, their experience of natural or semi-natural conditions, and their familiarity with humans.

Species captive-bred for one or more generations struggle most in nature, because as well as receiving closeted training, there is the potential for adverse genetic alterations that are unsuitable for life in nature. Research has shown that breeding animals in captivity over generations can lead to genetic alterations that hinder their ability to acclimate to wild conditions (Ford 2002; Frankham, 2008). For example, breeding rats in captivity for 25 generations led to a doubling of reproductive life and increased docility (King 1939). Similarly, changes can be found after seven generations of salmon breeding (Howe et al. 2024), or just one generation (Araki et al. 2007; Christie et al. 2012; Larsen et al. 2019; Blouin et al. 2021). Generally, the more generations an animal is bred in captivity, the lower its wild fitness tends to be (Frankham 2008).

To minimize the issues associated with genetic manipulation, some species that produce spawn or eggs have these stages collected from the wild population for rearing in captivity, to increase the survival of emerging juveniles. This approach is especially common with fish such as salmon, where wild pregnant females are collected. Although the survival rate of captive-reared smolts in natural environments tends to be low, there are opportunities to improve smolt survival by exposing them to more natural or mildly stressful conditions while in captivity. Effective strategies include providing shelters to encourage concealment behaviour, offering live or natural food, implementing periods of food limitation, varying water flow and temperature, associating visual, chemical and acoustic cues with predators to create repellent associations, and reducing population densities to align with natural levels (Thompson 1966; Wiley et al. 1993; Maynard et al. 2004; Braithwaite and Salvanes 2005; Brown and Laland 2005; Johnsson et al. 2014; Zhang et al. 2024).

Birds provide additional examples involving eggs (Kuehler et al. 2000; Colbourne et al. 2005). When bald eagle eggs are removed early from their nests, it typically prompts the parents to lay replacement eggs. This allows the initial set of eggs to supplement wild populations (Simons et al. 1988). These eggs can be incubated, fledglings fed via latex eagle head puppets to hide human involvement, and further steps taken before placement into hacking towers from which the juvenile eagles can return for food while gradually exploring their natural surroundings to sharpen their hunting and flying skills (Simons et al. 1988).

Another way to avoid genetic divergence from the wild type is to rehabilitate injured or orphaned juveniles that have been rescued from the wild. These animals usually benefit from at least some experience of their natural environment, often under the guidance of a parent (Beecham et al. 2016; Thitaram et al. 2024). However, they may also need to recover from the trauma that caused their isolation.

Best results usually arise when wild-caught adult animals are translocated from one natural habitat to another (Griffith et al. 1989; Wolf et al. 1996; Fischer and Lindenmayer 2000; Rummel et al. 2016). This approach is effective because these animals spend less time in captivity and already possess some survival skills necessary for life in the wild (Kleiman 1989). For example, Jule et al. (2008) reviewed results for carnivores and found that the survival rates of translocated wild-caught animals were much higher than those of reintroduced captive-born animals.

In the wild, young animals receive a diverse range of experiences and salutary lessons from their environment, which help them develop and hone their survival skills. The lack of these experiences is particularly noticeable in animals that are released from captivity. Deficiencies in learning cause greater susceptibility to predation (Ricker and Foerster 1948; Beck et al. 1991; Miller et al. 1994; Maloney and McLean 1995; McLean et al. 1996, 1999; Jepsen et al. 2000; Griffin et al. 2001; Stunz et al. 2001; Säterberg et al. 2023), reduction in cryptic behaviours to avoid detection (Fairchild and Howell 2004; Hellstedt and Kallio 2005; Kelley et al. 2005; Hyvärinen and Rodewald 2013), starvation from not knowing how to find appropriate food, or how to hunt (Stoinski et al. 2003; Wintzer and Motta 2005; Davis et al. 2018; Ward et al. 2018; Mollinari-Jobin et al. 2024). Additionally, they may struggle with how to deal with unfamiliar or dangerous objects (Ellis et al. 2002; Morimura and Mori 2010; Bridgeland-Stephens et al. 2023) such as snakes (Mineka and Cook 1988; Sunderland-Groves et al. 2021). Other consequences include disorientation, altered migration patterns (Burnside et al. 2017; Nelson et al. 2019; Crates et al. 2023), inadequate socialisation or competition with wild conspecifics (Simon et al. 2009), inadequacies in rearing young (Roche et al. 2008; Baker and Winkler 2020), and a diminished fear of humans (Beecham et al. 2016).

The significant differences in skills between animals raised in the wild and those raised in captivity suggest that these skills have little to do with genetic instruction but represent a strong selective advantage towards those who can integrate into the wild. Achieving such a connection with the place we call ‘the wild’ requires a psychological state known as wildness (Cookson, 2004; Ridder 2007; Cookson, 2011). Wildness gives wild information easy passage into the core of a developing mind. Bridgeland-Stephens et al. (2023) noted that while orphaned orangutans are taught practical skills in rehabilitation centres, their survival rates after release into the wild remain low. A key factor that may be lacking is their psychological resilience, or the ability to recover from stress (Bridgeland-Stephens et al. 2023). The results described above suggest that a mind that allows itself to connect with nature gains new efficiencies and skills. Wildness may be a way of becoming more effective (Child, 2021). Or, as Thoreau (1862) suggested, 'The most alive is the wildest.'

WILDNESS REQUIRES ATTUNEMENT

I defined wildness as a quality of interactive processing between organism and environment where the realities of base natures are met, allowing the construction of durable systems (Cookson 2011). The first part of this definition emphasizes the value of direct and honest interactions, while the latter serves as a benchmark for assessing the truthfulness of integration according to the objectivity reflected by the broader environment. Wildness involves engaging with and absorbing information from the natural world. In this state, the interactions between an animal and its niche become clearer and more informative. It fosters an honest partnership that enables the animal to swiftly interpret environmental cues, develop and refine essential instincts, and respond effectively – qualities that are often lacking in captive-bred animals. I propose that evolution may be best understood as survival of the wildest.

For a feature to become adaptive, there must be a phenotypic gradation that allows for the selection of some individuals over others (Dobzhansky 1959; Stearns 1989). Variability in wildness exists in nature (Cookson 2011), starting with a functional level of wildness in animals born without human influence. As these animals interact with their environment, they may survive and mature, thereby enhancing their quality of interactions with the various elements they encounter. The more a creature learns from nature, the more adept it becomes, as demonstrated by its improved interactive abilities. For instance, a herd of elephants typically follows a mature matriarch because she knows the locations of waterholes and food sources (McComb et al. 2001; Douglas-Hamilton et al. 2006; Morel et al. 2025). Similarly, in the case of male gorillas, the silverback's colouration signifies maturity. He leads the troop to foraging areas and nesting sites, improves social cohesion within the troop, and offers greater protection from predators (Schaller 1963; Margulis et al. 2002; Less et al. 2010; Tamura et al. 2024).

The ability to accurately process information at the level required for wildness has led to the genetic evolution of two proposed mechanisms for developing phenotypic wildness in animals. The first mechanism is parsimony (Cookson 2013, 2016), which might also be known as compression (Hudson 2011). Parsimony minimizes assumptions, helping us understand the reality of natural events more clearly. An example of its utility is in the construction of evolutionary trees (Sober 1983; Goloboff et al. 2022). The second mechanism needed for wildness is attunement, which facilitates the learning of instincts (Cookson 1999, 2011). This occurs through the selective stabilisation of cortical neurones into structured pathways (Changeux and Danchin 1976; Tierney 1986; Petanjek et al. 2011; Changeux 2022), which I refer to as 'mindrules' (Cookson 1999). These learned behaviours can become automatic or instinctive; an example being speech accents. Many behaviours once believed to be hard-wired or innate are being revealed as learned responses moulded by both obvious and subtle cues (Hailman 1969; Gottlieb 1997; Johnston and Edwards 2002; Blumberg 2017; Grossi 2017).

The adaptive advantage of parsimony is clear - it offers efficiency and proficiency, allowing tasks to be completed more easily and speedily. A potential mechanism driving the desire for parsimony was outlined (Cookson 2013). Society also seeks parsimony or truth through a wide variety of mechanisms, such as science, democracy, the judicial system, and scepticism. However, to achieve the wildness found in nature, parsimony must be boosted by adding attunement. This combination enhances the ‘do more with less’ approach demanded by parsimony/Ockham’s razor. The two mechanisms work together. While attunement governs the acceptability and quality of information that an individual receives, parsimony sorts that information within a personal context, finding pleasure when basic desires are fulfilled or tasks are more easily understood and achieved. Attunement involves absorbing information from the environment through methods such as receptivity (Cookson 1999), the ecological self (Devall 1995; Richey 2022), mindfulness (Shapiro et al. 2006; Siegel et al. 2009) and biophilia (Wilson 1984). These information-absorbing methods enhance one’s connection with nature, leading to an improved sense of well-being (Siegel 2007; Mayer et al. 2009; Howell et al. 2011; Schutte and Malouff 2018; Van Gordon et al. 2018; Djernis et al. 2019, Lengieza and Swim 2021; Jardine and Lange 2024).

Connecting with nature can have a profoundly positive psychological impact on those who engage in it (Andrews 2018; Hatty et al. 2022; Richey 2022). This relationship often leads to strong feelings of connection with a spirit animal (Politis and Saunders 2002), the dreaming (Hume 2004), a totem animal (Bruchac 1992; Ward et al. 2023), Mother Earth (McGregor 2020), the common or world soul (Hillman 1982; Tracey 2012; Fideler 2014) and deepens ties to country (Thorpe et al. 2023). It is easier to understand the nature of this close relationship when informed by those more culturally exposed to nature than those from a computer-based society. Generally, indigenous peoples have felt a strong connection to and identity with the land (Ford et al. 2020; Brondízio et al. 2021; Lima and Soares-Pinto 2024). In a quote from 1976, Silas Roberts, the first Chairman of the Northern Land Council, stated during the Ranger Uranium Environmental Inquiry in Australia (Pratt 2001):

> *Aboriginals have a special connection with everything that is natural. Aborigines see themselves as part of nature. We see all things natural as part of us. All the things on earth we see as part human. This is told through the idea of dreaming. By dreaming, we mean the belief that long ago, these creatures started human society, they made all natural things and put them down in special places. These dreaming creatures were connected to special places and special roads or tracks or paths. In many cases, the great creatures changed themselves into sites where their spirits stay. My people believe this and I believe this. Nothing anyone ever says to me will change my belief in this. This is my story as it is the story of every true Aborigine. All the land is full of signs, and what these great creatures did and what they left we see as very important. We see this just as much as before. These creatures … are just as much alive today as they were in the beginning. They are everlasting and will never die. They are always part of the land and nature as we are. We cannot change and nor can they. Our connection to all things natural is spiritual…*

What is relevant here is not to argue about the existence of spirit creatures, but to examine, from a psychological perspective, how the relationship feels and is experienced. It is about the information that is transmitted to the recipient through this connection. Envisioning the directness and sensations that come with attunement to nature, we can appreciate the mastery, versatility, and comfort found in wild interactions. Following this trend, modern society has also recognized some of the mental and physical benefits of connecting with nature (Ulrich 1984; Mayer et al. 2009; Berman et al. 2012; Beute and de Kort 2014; Bratman et al. 2019). Nevertheless, the sensation of wildness can be difficult to translate. Perhaps it is a connection that must be 'taught' directly by nature itself. It might be difficult to understand the mechanisms of nature without having a nature-connection (my affinity is with clan-water dragon).

Connecting with nature generally has a positive impact on humanity. However, a conceptual challenge or fear about wildness is that it allows animals to do, or try to do, whatever they want. For humans, this freedom is often associated with chaos, savagery, looting, and other repugnant behaviours, making it irresponsible to explore (Taussig 1987; Jahoda 1999; Brand and Smith, 2000; Groes-Green 2010; Grotti and Brightman 2010). However, the expression of wildness is shaped by the quality of the mind developed through the attunement process. If, early in our history, we inched away from nature, and have now reached a point where we largely disregard it, then the messages we receive from nature will be distorted (Cookson 2011).

The difference in how humans and wild animals relate to their environments has led to contrasting views on wildness. For humans, wildness is something that needs to be discouraged, while for animals in nature it should be encouraged. In the natural world, the importance of wildness for ecosystem health is evident in management guidelines that advise the public against feeding or disturbing its inhabitants (Orams 2002; Mallick and Driessen 2003; Senigaglia et al. 2020). The result in nature is that its ecosystems support a much higher diversity of species, larger population sizes, and greater sustainability compared to the systems we create (Barnosky et al. 2011; Cowie et al. 2022; Ceballos and Ehrlich 2023).

A further barrier to perceiving wildness positively is the realisation that nature is intertwined with mortality. This understanding, perhaps not fully grasped by other species, penetrates humanity. The prospect of death has a psychological impact, which is explored through Terror Management Theory (Becker 1971, 1973; Greenburg et al. 1986; Goldenberg et al. 2001, Vess and Arndt 2008). Evolution requires death (Haldane 1957; Dimijian 2012). It is through this process that certain forms are selected, allowing some organisms to live longer or have reproductive success. Without death, we would not be here. In nature there are numerous animals, so there needs to be a lot of death.

To avoid reminders of death, humanity develops defensive psychological world views. Rejecting nature may allow people to construct a supernatural view that transcends death (Fritsche and Hoppe 2019). This terror management-induced strategy often leads to the devaluation of nature, which can reduce concern for the natural environment (Fritsche and Häfner 2012). Excessive fear of death appears to underpin our distancing from nature (Goldenberg et al. 2001; Browning and Viet 2023), producing a jaundiced view that readily gains traction. Darwin (1859) noted the face of nature bright with gladness, but dismissed this impression as a facade for struggle within the war of nature. Nature has been characterized as ruled by selfish genes (Dawkins 1976; Pinker 1997) and a deeply unhappy place (Ng 1995; Horta 2010). However, our critical judgment and condemnation of how other species live may reflect more about our misunderstanding of wildness of nature, so that we miss the point.

A disconnection from nature can lead to a significant loss of attunement, resulting in profoundly negative psychological effects. This impact is often most visible in the cultural clash between indigenous and modern societies. Such disconnection can cause isolation through individualism (Miller 2018) and alienation (Hailwood 2015; Parsloe 2025), destructive choices (Reo and Parker 2013; McGregor et al. 2020), reduced emotional regulation (Gu et al. 2023; Ríos-Rodríguez 2024), increased narcissism (Metz 2014; Logan and Prescott 2022), a form of madness (Shepard 1982), and escapism through drugs or alcohol (Gray et al. 2018). In severe cases, it can bring about suicidal thoughts or actions (Hunter 1991; Silburn et al. 2014).

Animals can only feel from their perspective, which limits their ability to empathize as humans do. Therefore, they can commit atrocities, and can have the same foisted upon them. However, the fear we project onto the deaths of other species is often unfounded. The fear of death could be moderated by viewing it as a part of life, and a return to 'Mother Earth.' In nature, deaths caused by predators usually occur quickly, as prey is easily overpowered (Browning and Viet 2023). If prolonged, the captured animal often enters a state of shock, which can numb its pain and allow it to remain aware and potentially escape (Browning and Viet 2023). Predators learn how to hunt, practicing and honing their skills, which results in more efficient kills in the future (Kitowski 2009; Reid et al. 2010). Venomous predators, including some snakes, cone shells and the blue ring octopus, can induce minimal pain or a dazed sensation in their prey, rather than causing agony (Peterson 2006; Ou et al. 2015; Ward-Smith et al. 2020). This reaction lowers the risk of injury to the predator from thrashing prey. Of course, many animals produce venoms that cause intense pain, when their own predator deterrence strategy plays a greater role. Diseases and parasites typically evolve to minimise harm to their hosts (Telford 1971), sometimes leading to symbiosis (Sagan 1967; Wong 2013). Deadly diseases tend to emerge when there is insufficient time for such co-evolution, which can happen due to unusual circumstances, such as new stresses, disease transmission from another region, or host jumps as experienced by humans while domesticating animals (Diamond 1998; Tan et al. 2024). Ultimately, nature does not care about us, but it does follow good (parsimonious) reasoning, which is something we could work with.

When mature animals are captured and placed in cages, even when provided with plenty of food and resources, they often exhibit anxiety and a strong desire to return to the wild. This phenomenon is illustrated by symptoms of zoochosis (Sharma et al. 2022; Yasmeen et al. 2023). For instance, mature Gippsland water dragons will rub their noses raw against wire mesh or glass to get back to the wild. In contrast, juveniles that have yet to attune to the wild and are properly housed show no escape behaviour (pers. obs.). I do not see that animals possess murderous or evil intentions. Engaging in intentional cruelty would be non-parsimonious and a waste of effort (Carlill 1886). Instead, I perceive joy in wildlife. This joy is evident in their songs (Stevenson et al. 2020), displays, the daring with which they explore, their sensory alertness, attention to detail, acceptance of their environment, and their motivation. They appear to be fully engaged with their surroundings. My reading of nature is that the joy of living wild counters the inevitability of death.

SURVIVAL OF THE FITTEST VERSUS WILDEST

The driving force behind evolution is often summarized by the phrase 'survival of the fittest' (SOF), first introduced by Spencer (1873). For biologists, this concept primarily refers to reproductive success (Bell 1980; Benton and Grant 2000; Millstein 2016), a theme difficult to glean from the phrase itself (Gregory 2009). One major issue with the phrase is that ‘fit’ has several meanings, including being physically strong, and being well-suited to the selecting environment. While physical fitness and strength can be advantageous in some situations, other traits may lead to greater success, such as increased fecundity, skill level, camouflage, stealth, a spiny body, singing ability, sticky webs, or the ability to drop a tail that wiggles enticingly. The second interpretation of fitting in with the environment aligns more closely with what is necessary for evolution and can also be understood as integration or attunement with that environment.

Another problem with SOF is that it offers no moral guidance on how we should live if we want to be natural, apart from the basic drives to survive and breed. This lack of guidance is uninspiring and inane (Campbell and Robert 2005). Karl Popper (1972) was one of the first to articulate this issue. While he supported the theory of natural selection, he criticized the narrow interpretation of ‘survival of the fittest’ as potentially tautological and as meaningless as ‘survivors survive.’ In this moral vacuum, humans create their own narratives on such a vital topic, leading to unfortunate slogans like ‘only the strong survive,’ ‘dog eat dog,’ and ‘red in tooth and claw.’ Humans seek to understand the moral of the story; in the absence of a clear message, they will make up their own. Without a straightforward theme that accurately conveys the complexities of evolution, the concept will remain challenging to understand.

The phrase ‘survival of the wildest’ (SOW) has the advantage of incorporating the fundamental steps meant for SOF, where those that survive long enough to reproduce are more likely to contribute to evolutionary change. However, SOW also elaborates on the theme of integration, which is often underrepresented in many interpretations of SOF. It suggests that individuals who can best attune with their environment are more likely survive long enough to produce offspring. Furthermore, SOW places greater emphasis on attunement and parsimony, the components needed to produce wildness. Its underlying message is that to thrive, one must fit within their environment. By focusing on attunement, SOW allows for more consideration of the diverse influences that an environment can exert. Moreover, SOW is not tautological; it goes beyond merely stating that those capable of replication will continue to survive in evolutionary terms. Instead, it gives a guiding principle that accepts more avenues into nature.

The need for wildness offers a new perspective on how to live. Through SOF, nature is often seen as a relentless competition or an evolutionary arms race. In our quest to win the imagined priority for survival, we envision genes as weapons, developing traits such as ruthlessness, selfishness, fear, and emotion to equip individuals for their struggle (Dawkins 1976; Pinker 1997). However, mere survival and producing offspring are not enough. Many people choose not to have children, and the fact that many societies experience a distressingly high rate of suicide indicates that survival is also not the primary goal. To make life fulfilling, something beyond mere survival is required. Perhaps the true aim of life is to experience it wild.

Without direct experience of the sensation of wildness, some may observe its effects on other species. There are many repugnant behaviours to list. Some species kill infants (Hausfater and Hrdy 2017). Chimpanzees have shown examples of ‘war’ (Wilson 2013). Are these hard-wired instincts that will resurface if we explore wildness too deeply? Or does integration into nature cause species-specific outcomes? While the wildness in nature might sort our adaptations more efficiently, what exactly are these adaptations? We are told that selfish instincts drive us, so we should resist and rise above nature. However, attributing ourselves with behaviours seen in other animals overlooks the intellectual gains possible through attunement. Our adaptions have steered us towards the prospect of greater understanding, and produced our species' capacity for empathy. Wildness helps develop different traits in different species. Perhaps our progression toward a more responsible humanity can only be achieved when we embrace wildness. After all, you cannot be selfish when attuned to the core.

SOF VERSUS SOW EXAMPLES

The difference between the two approaches to evolution (SOF and SOW) can be stark. Survival of the Fittest leads to 'do more with more' (arm up with genetic defenses). Survival of the Wildest is 'do more with less' (accept gains through parsimony and attunement). Some examples can demonstrate:

The genetic arsenal imagined under SOF continues to grow in the literature. Researchers have proposed that genes are responsible for a wide range of instincts, fears, personalities, and emotions. It was surprising in the early 2000s to discover that humans share 60% of their genes with flies and almost 99% with apes, especially when many distinctly human traits were being attributed to genes (Marcus 2005). Erhlich (2001) pointed out the problem of gene shortage for these 'little evolutionary stories.' Instead of inheriting a variety of instincts, the SOW approach suggests that these traits can be learned. This attunement often begins subtly and even subconsciously, resulting in deeply ingrained skills that may seem inherited. Learning can even start in the womb/uterus (Kolata 1984; Gottlieb 1997; Blumberg 2017 Weiss et al. 2024), prior to the onset of conscious awareness. Attunement provides a more efficient and adaptable method for acquiring various skills compared to the constraints of genetic construction. Through this process, instincts can be learned rather than inherited, explaining why so few genes are necessary.

An example of differing interpretations can be found in the classic 'visual cliff' test, which suggests that babies old enough to crawl have an innate fear of heights (Gibson and Walk 1960). In this test, babies refuse to cross the boundary of a cliff where a chequered floor pattern suddenly drops away, even though a thick sheet of glass maintains the existing height and would support their weight. Consistent with SOF, a fear of heights can be claimed as inherited. However, attunement processes suggest that this 'instinct' could be easily learned. Babies notice things and learn, and the brain's cortex then subconsciously assembles those learnings into patterns and perceptions. These become the foundation for their future experiences, indicating that such instincts can be learned rather than inherited. Chimpanzees and monkeys lack a fear of heights, and it would be detrimental for them to inherit one. Therefore, the idea of an inherited fear in humans must be carefully examined. Finding its DNA code should be relatively straightforward, given that humans differ from chimps by just 1%, yet no such evidence has emerged. SOW suggests alternative explanations. By the time we diverged from our common ancestor with chimpanzees, we were becoming increasingly social. It is likely that parents or kin would have gestured to infants to avoid climbing high places if such dangers were present in their environment. Additionally, as humans transitioned from forests to wooded and open savannas, the availability of risky heights diminished. Would evolution really develop an inherited instinct against minor risks? Crawling babies gradually learn about their capabilities and discover what is considered 'normal.' They like routine. While exploring, babies learn they cannot rely on their feet for extra grip, like chimpanzees, or on a tail for added balance or grip, as monkeys do. Kittens, when subjected to the visual cliff test, exhibit our natural fear. However, kittens that are raised in complete darkness for the first 27 days show no fear, as they lack a learned perception model to compare with. This changes if they are then exposed to light for an additional week, demonstrating the rapidity of learning (Gibson and Walk 1960). Ultimately, the visual cliff experiment merely shows that contrary information can cause a baby to hesitate (Campos et al. 1992).

An additional example of varying interpretations is when a male lion kills the cubs in a pride that he has conquered. The SOF reason is that by eliminating the cubs, he can more easily spread his genes (Bertram 1975; Krukonis and Barr 2011). This occurs despite the likelihood that lions, I assume, are not aware that sex leads to offspring, a knowledge gap that persisted long into our own history as well (Fehlinger 1921; Ashley-Montagu 1937; Merlan 1986; McLaren 1992). A SOW alternative explanation is that the lion kills cubs simply to make the female stop nursing and in turn, become receptive to his advances. In this view, the male lion is motivated solely by the desire for the pleasure of sex, which arises from the evolution of sensitive genitalia. A hard-wired instinct in the cortex to promote the spread of genes is not needed to explain this natural, albeit repugnant, behaviour.

In another context, inclusive fitness is often considered the ultimate proof of SOF, and was first used to explain altruism in worker bees that prioritize the welfare of the colony over their own reproduction. Hamilton (1964) illustrated how haplodiploidy in Hymenoptera (where males are haploid and females are diploid) could account for this behaviour, suggesting that it was not truly altruistic. In haplodiploidy, sisters share 75% of their DNA, while daughters and mothers share only the usual 50%. Consequently, the female worker should invest more energy in ensuring the survival of their fellow workers (sisters), rather than breeding to produce daughters. This analysis further prioritized the role of 'selfish' genes.

However, research led by Nowak et al. (2010) suggests that inclusive fitness is not the primary force driving eusociality for Hymenoptera; rather, it is only an occasional outcome. Evolution, instead, appears to favour the advantages of creating a defensible nest, particularly one expensive to build and located near food sources. While all Hymenoptera are haplodiploid, which results in high genetic relatedness among sisters, not all species within this taxon became eusocial. Conversely, all termites are eusocial, but the inclusive fitness theory, which relies on high genetic relatedness, does not apply to them because they are diplodiploid. For Hymenoptera, the transition to eusociality only requires that a female and her adult offspring remain together to defend their existing nest rather than dispersing. Further cooperation can then develop through incremental improvements in various other attributes. For example, even solitary species that are forced together experimentally avoid performing the same task as another, leading to a division of labour that supports eusociality. In ants, simply turning off a gene that normally encourages wing production can help establish the worker caste. These changes can be explained by standard natural selection theory, with no need to invoke inclusive fitness (Nowak et al. 2010).

My final example concerns research showing that people prefer symmetrical faces over asymmetrical ones. Under SOF, this preference is often attributed to inheritance, because facial symmetry may be an indicator of 'good genes' and overall health (Gangestad et al. 1994, Jones et al. 2001, Rhodes 2006, Little 2014). An alternative view is that our appreciation for symmetry arises from the broader perspective of how the brain processes information (Enquist Arak 1994, Enquist Johnstone 1997). Our drive to identify general patterns, or prototype models, from the flood of incoming information steers us towards an appreciation of symmetry. This tendency applies not only to faces but in numerous other experiences such as art, flowers, other animals, watches, and music (Smith and Melara 1990, Halberstadt and Rhodes 2000, Bertamini et al. 2019, Maurer and Maurer 2024). Symmetry becomes attractive because the vision is processed more fluently than asymmetrical stimuli. A symmetrical face, for example, is easier to recall if it aligns with a prototype; there is no need to remember subtle deviations, such as when one ear protrudes more than the other. This fluency contributes to positive affect: research shows that people not only process prototypes more easily but are also motivated by the ease of processing itself, which elicits favorable emotional responses (Reber et al., 2004; Winkielman et al., 2003, 2006). This same mechanism might explain the rewarding feeling gained from improved understanding and insight (Cookson 2013).

In this article, I suggest that achieving a state of wildness is crucial for participating in nature and, therein, survival. Achieving parsimony in information processing is essential for finding wildness, which in turn gives the animal fluency and speed in interaction. Finding symmetry is one aspect of sorting information to achieve parsimony and develop effective prototypes within the environment. A mechanism linking parsimony in the learning neural network to pleasurable outcomes has been proposed (Cookson 2013). The pleasure-reward centres of the brain have been likened to scattered islands that collectively form a single archipelago (Berridge and Kringelbach 2008). Why are the pleasure centres divided into multiple nodes rather than a single larger node? Possibly, that arrangement facilitates the measurement of parsimony. The more nodes stimulated at once, the wider was the breadth of impact and value of information gleaned. Enhancing 'liking' above normal by opioid stimulation may require unanimous 'votes' in favour from more than one participating hotspot in the forebrain (Berridge and Kringelbach 2008). Improvements in parsimony could stimulate more hotspots simultaneously (Cookson 2013).

CONCLUSIONS

Animals have a higher level of engagement with nature than we know and understand. They use wildness to participate, which requires daring and personal commitment. The reward is to enter a system where there is a higher level of attunement, answers, honesty and elegance than we experience in human society today. That is the nature into which we evolved, along with all the other species, and we are still geared – thanks to our highly receptive brains - to expect partnership with something grand. While we might try to satisfy that longing with religion, the existence of deities is difficult to prove. The state of wildness might be a way to make partnership with something greater than ourselves, and be a way of raising our behaviours and understanding to the level intuitively imagined possible.

Recognizing the significant role that wildness plays in evolution can change our perspective on nature. Under SOF, nature is viewed as a place to avoid. Under SOW, 'in wildness is the preservation of the world' (Thoreau 1862).

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