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# The Myth of Neurotypical Brains, Behaviours and Beliefs: Every Human Brain is Unique, yet they Share a Common Ancestry

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**Abstract**
This review examines respected historical perspectives illuminating different layers of human existence: evolution, biology, physics, and spirituality. Human brains exist across a spectrum of diversity, and this variation shapes our lives. It challenges long-held assumptions about what is normal and responsible behaviour, including comparisons between human and artificial minds. The review was inspired by this author's multigenerational family experiences involving neurological, psychiatric, and behavioural differences. Personal experience of significant changes in both her body and brain followed severe viral illnesses. Anecdotally, pathogens accompanied Darwin's Voyage of the Beagle after first encounters with Galapagos' animal species, while Florence Nightingale spent decades confined to bed following her exposure to diseases during the Crimean War. Brains are dynamic systems that change throughout life while interacting with illness, genetics, environment, experience and aging. Perspectives range from human evolution and primate behaviour to neuroscience, exceptional cognition, free will, and emerging artificial societies. The review explores whether diversity itself may be a defining characteristic of complex adaptive systems. It considers adaptation during an era of converging global challenges that we learn about at the speed of light: climate change; epidemics and pandemics; drone or biological warfare; increased mass migrations; declining birth rates; artificial intelligence (AI) and potentially, alien life. Extreme adversity may influence vulnerability, resilience, and patterns of brain adaptation. As AI becomes an increasingly influential cognitive environment (smart phones are ubiquitous), it may expand human brain diversity by enabling new forms of intelligence, or it may encourage convergence towards shared patterns of artificial cognition.

**Keywords:** Neurodiversity, Evolution, Human Behaviour, Free Will, Determinism, Artificial Intelligence

## 1. Introduction

**1.1** Approximately 3.2 million years ago, an Australopithecus afarensis female, popularly known as Lucy, walked upright across an African landscape that would ultimately become The Great Rift Valley or cradle of modern humanity [18]. Although separated from modern humans by millions of years, Lucy represents a shared evolutionary ancestry. She reminds us that every human brain is the product of an extraordinary journey shaped by adaptation, variation, and survival. Human evolution did not produce identical minds; rather, it generated biological diversity upon which natural selection, environment, culture, and experience continue to act. Modern genetic evidence further supports an African origin for our species and demonstrates that human diversity reflects a long history of migration, adaptation, and shared ancestry rather than discrete biological categories. [19, 20, 21, 22, 23]. Humans did not evolve for comfort.

### 1.2 Natural selection favours

- survival long enough to reproduce, while at the mercy of climate, predators, *viral epidemics/pandemics, and protecting offspring.
- many musculoskeletal and mental problems are common after reproductive age ends, such as: arthritis; spinal degeneration; osteoporosis; Parkinson's disease; Alzheimer's disease [18].

*Antiviral botanical, *Lomatium dissectum*, in "Be Your Own Shaman" has a long history of traditional Native American use. Laboratory studies from university-affiliated researchers have identified antimicrobial compounds and demonstrated antiviral activity against certain viruses in cell culture. However, robust human clinical trials remain limited. Clinical observations suggested a favorable temporal association between Lomatium use and improvement in viral markers [3]. This author reduced off the charts, reactivated Epstein Barr Virus (EBV) to normal, and then zero. She still takes *Lomatium dissectum* daily.

**1.3** The human brain cannot be understood in isolation from the body. Just as every brain develops through unique interactions among genes and environment, every musculoskeletal system reflects evolutionary trade-offs, individual anatomy, injuries, illness, lifestyle, and aging. There is no single "perfect" spine, knee, or hip, just as there is no single "perfect" brain. Any argument about neurodiversity could be extended to a broader biological principle: evolution produces populations of individuals with varying strengths and vulnerabilities, not idealized bodies or brains. Variation is not a flaw in the system; it is the system. Millions of years after Lucy walked upright another woman working in Tanzania, Jane Goodall, would fundamentally transform our understanding of human behaviour [8]. For example, Lucy traded skills living in trees for a feat of balance and coordination that risks falls and broken bones, but allows forward movement on the ground, with off spring. Apparently there were greater opportunities for food and shelter than fear of predators.

**1.4** This author had the privilege of hearing Goodall lecture in California while promoting her 1999 book: "Reason For Hope" [9]. It was explicitly a spiritual memoir, not simply another chimpanzee-science book. It explores the relationship between her scientific experiences, spirituality, ethics, and her belief that humanity can still change. Goodall describes seeing both cruelty and compassion in humans and chimpanzees. Her observations led her to question how violence and goodness can coexist and how humans should respond to that contradiction. She expresses belief in God and a divine plan, while acknowledging the difficult problem of reconciling an all-good God with suffering and evil. Importantly, she does not present this as a simple theological answer. Her hope instead rests partly on observable human capacities: compassion; courage; self-discipline; respect for life; tolerance; cooperation. Some of these she had also observed in chimpanzees [9].

**1.5** A striking replica of the diminutive adult Lucy (3.5 feet tall) can be seen in the National Museum of Anthropology, Mexico City or in the documentary "Lucy's Lasting Legacy" [18]. Lucy shares features with Great Apes and Modern Humans. Paleontologists estimate 95% of life on our planet has already gone extinct, yet humans still remain. Robert Frost's poem illustrates how fragile this existence is:

*Fire and Ice*
*Some say the world will end in fire,*
*Some say in ice.*
*From what I've tasted of desire*
*I hold with those who favor fire.*
*But if it had to perish twice,*
*I think I know enough of hate*
*To know that for destruction ice*
*Is also great*
*And would suffice* [7].

## 2. The Human Genome (Diversity) Project

**2.1** Italian Luigi Luca Cavalli-Sforza was a Stanford geneticist and a pioneer of population genetics/anthropological genetics. His work asked whether genetic variation could reconstruct human population history, migration, and the relationship between genes, geography, and language. Cavalli-Sforza's book and famous article with the same title: "Genes, Peoples, and Languages" is critical because it explicitly addresses human genetic diversity and the lack of a genetic basis for racial classification [2]. His work focused on the role of the chromosome, to discover when and how humans populated the planet. Cavalli-Sforza's interdisciplinary approach reshaped research on human evolution by integrating genetics with archaeology, linguistics, and cultural evolution. He also co-founded influential work on cultural evolution with colleagues and promoted the Human Genome Diversity Project, an ambitious effort to document global human genetic diversity that advanced research, but also sparked ethical debates over the collection and use of genetic samples from Indigenous and isolated populations. This marked a major transition from reconstructing human history through fossils and population markers to examining the human genome at an unprecedented scale. Initiated in 1990 and completed in 2003, the international project produced a reference sequence of the human genome and established the genomic foundations for studying human variation.

### 2.2 Different Diversity Levels

Human genomes are approximately 99.9% identical, simultaneously emphasizes our shared biological inheritance and leaves room for substantial individual variation. We are genetically overwhelmingly similar, yet that tiny fraction of variation, interacting with development and environment, contributes to extraordinary individual diversity. The Human Genome Project initially popularized this striking find, however, current US National Institutes of Health genomic guidance gives a more nuanced figure: depending on how variants are counted, two human genomes are approximately 99.6% identical, with about 0.4% differing when both small and larger genomic differences are considered. The important point is not the particular percentage, it is that humans are overwhelmingly genetically similar while still possessing substantial individual variation.

**Note:** We can now investigate some health mysteries with permission from donors to use their genetic samples. For example, variants in five genes (IFNAR2, TYK2, OAS1, DPP9 and CCR2) have been associated with the severity of COVID-19. Anecdotally, COVID-19 may also reactivate latent viruses such as EBV/Herpes Virus family and contribute to what has become known as Long COVID.

### 2.3 Journey of Man: A Genetic Odyssey

Spencer Wells was Explorer-in-Residence of National Geographic and director of the Genographic Project. He received his doctorate from Harvard University in 1994 and then specialized in genetics of human populations with Cavalli-Sforza. An educational film based on his book: "A Genetic Odyssey" allowed American geneticist and anthropologist Wells, to trace the roots of humanity. He was helped by the fact that Africans hugged earth's coastlines closely as they migrated around the world. Wells followed in the footsteps of the first people, San Bushmen. They walked out of Africa's ice age, through droughts and deserts, in search of survivable climates, food and shelter. Wells collected only Y chromosome blood samples because they pass unchanged from father to son creating a perfect genetic trail. His 2002 work is particularly relevant to this review because it illustrates how human diversity reflects shared ancestry rather than biological separation. Some migration routes and estimated dates have been refined by subsequent advances in ancient DNA sequencing and genomic research. However, Wells' book and documentary remain an influential written and visual account of early 21st-century human evolutionary genetics: they both capture a fleeting moment in our traceable, Y chromosome, lineages [16, 1].

### 2.4 Maternal inheritance and Mitochondrial *DNA

Sykes' book: "Seven Daughters of Eve" and Oppenheimer's documentary: "The Real Eve" trace a similar African Exodus in family groups of approximately 20 [10, 11, 15]. In order to survive everything from viruses to ice ages, communities could be no smaller than 200, and thus they would have faced another health risk: interbreeding. At certain times in human history only 10,000 people lived on earth. Physically stronger Neanderthals were absorbed or conquered by Homo sapiens who had stronger brains [11]. Oppenheimer's study required mitochondrial DNA saliva tests and complements Wells' study: "The Genetic Odyssey" which required Y chromosome blood tests [10, 11, 16, 17]. Combined, we have a snap shot in time of arduous journeys including the main reasons our ancestors kept on moving. Climate changes severely impacted: food; shelter; reproduction; life spans. Modern people mainly migrate for very good or dire reasons because departing and re-settling is never without challenges and sacrifices. However, our ancestors' forced migrations, in the face of extraordinary odds, are the reason we survived as a species [10, 15, 16, 17].
**DNA deoxyribonucleic acid is the fundamental molecule that carries the genetic instructions used in the growth, development, functioning, and reproduction of all known living organisms. It acts as a biological instruction manual or recipe book for our cells.*

**2.5** Sykes gave "Seven Daughter's of Eve" the following names for identification purposes in their approximate regions:
*Ursula:* Europe, especially western/central Europe
*Xenia:* Europe and the Near East; later found widely in Europe and parts of North America through migration
*Helena:* Western Europe; especially common in Europe
*Velda:* Western/northern Europe, particularly Iberia and Scandinavia
*Tara:* Central/eastern Europe and the Near East
*Katrine:* Central Europe and the Near East
*Jasmine:* Europe and the Near East [15]
**Note:** This author migrated from Africa to America and then Mexico. Her maternal haplogroup is Jasmine T2a1a, and her paternal haplogroup is R-CTS241 (Y chromosome health and ancestry data can only be obtained from a close male relative). She has food intolerances and mutations such as methylenetetrahydrofolate reductase (MTHFR) that impact her ability to absorb nutrition and fend off viruses. Her mother shared the same genetic vulnerabilities so it is unlikely that they would have survived an ancient African infancy and adulthood respectively, let alone an ancestral migration. Per "The Real Eve" (Discovery Channel): *Our entire survival has always been at the mercy of the climate* [10, 11, 15].

## 3. What newer evidence says about human diversity

**3.1** Modern genomic research increasingly supports an African origin for Homo sapiens, while making the traditional picture of a single birthplace followed by one great "Exodus" increasingly difficult to sustain. Rather than emerging from one isolated and genetically uniform ancestral population, humans appear to have developed within a network of African populations that diverged, exchanged genes, migrated, and adapted over long periods [19, 21, 22, 23].

**3.2** The 2023 work of Ragsdale and colleagues is particularly important because it models human origins as a weakly structured stem rather than a single isolated ancestral population. The model allows for multiple ancestral African populations that exchanged genes over extended periods. This does not overturn an African origin of modern humans; it makes that origin considerably more complex. Human diversity therefore appears to have been part of our evolutionary history from the beginning rather than something that developed only after humans dispersed across the world [19].

**3.3** More recent research further complicates the familiar account of a single Out of Africa migration. The expansion approximately 50,000 to 70,000 years ago remains the principal source of ancestry for most present-day non-African populations, but archaeological and genetic evidence indicates that Homo sapiens moved beyond Africa on earlier occasions. These earlier dispersals appear to have contributed relatively little ancestry to later Eurasian populations, suggesting that there was not necessarily one human Exodus, but multiple movements followed by a later expansion that became disproportionately successful [19, 20, 21, 23].

**3.4** The Persian Plateau provides one possible example of what occurred between these movements. Vallini and colleagues identified the region encompassing parts of present-day Iran, southeastern Iraq, and northeastern Saudi Arabia as a possible population hub between approximately 70,000 and 45,000 years ago. Combining genetics, archaeology, and paleontology, the study suggests that populations related to the ancestors of later Eurasians may have lived and interacted in this region for thousands of years before expanding farther into Asia and Europe. The emerging picture is therefore less like a single migration route and more like a series of population expansions, pauses, interactions, and adaptations [20].

**3.5** Human evolution was also not simply a process in which modern humans replaced every population they encountered. Modern humans interbred with other hominin populations, including Neanderthals and Denisovans. Recent ancient-genome research has refined the timing and circumstances of this genetic exchange, demonstrating that our ancestry contains evidence of contact between populations that had previously evolved along separate trajectories. Human evolution therefore involved not only migration and selection, but also interbreeding and genetic exchange [22, 23].

**3.6** Perhaps most relevant to this review is the growing evidence of previously underrepresented diversity within Africa itself. Recent research on 28 ancient southern African individuals has revealed substantial genomic diversity, including individuals whose genetic variation falls outside the range represented in many present-day datasets. Such findings highlight a fundamental limitation in our understanding of human origins: Africa contains enormous genetic diversity, yet both ancient and modern genomic research has historically sampled only a fraction of it [22].

**3.7** The more populations and ancient genomes researchers examine, the harder it becomes to describe humanity as having developed from a single uniform ancestral population that later divided into different groups. Instead, genetic diversity appears to have been continually reshaped by migration, population isolation, gene flow, interbreeding, environmental pressures, and adaptation [19, 20, 21, 22, 23].

## 4. Methodology

This review draws on scientific literature, books, documentaries, and contemporary research to examine the long-standing assumption that a single "neurotypical" brain exists against which all others should be compared. Rather than treating normality as a fixed biological standard, the review follows several complementary perspectives on how brains, behaviour, and beliefs develop and change. The review begins with evolution. Lucy, one of our earliest known human ancestors, and Jane Goodall's observations of chimpanzees provide different, but complementary windows into our evolutionary history. Together, they illustrate that behavioural and cognitive variation is not a recent feature of modern society, but has accompanied life and our evolutionary lineage over time [8, 18]. Genetic research on human origins and migration further demonstrates the diversity and complexity of the populations from which modern humans emerged [2, 19-23]. Building on this evolutionary foundation, Robert Sapolsky's work provides a biological perspective on how behaviour is shaped by an intricate interaction of genetics, prenatal development, neurobiology, hormones, life experiences, illness, trauma, culture, and ageing [12]. If every brain develops through a unique sequence of biological and environmental influences, then no two human brains can be truly identical. Albert Einstein provides an illustration of exceptional cognitive diversity. His life and work demonstrate how an individual brain can transform human knowledge while also raising questions about the relationship between intelligence, creativity, responsibility, and the consequences of human discovery [4-6]. Scientific knowledge itself is neither inherently good nor evil; its consequences depend upon how individuals, societies, and institutions choose to apply it. Emanuel Swedenborg introduces a contrasting spiritual perspective. Although fundamentally different from Sapolsky's biological determinism, Swedenborg similarly challenges the idea of completely unconstrained free will. Whether human behaviour is understood as emerging from biological causes or occurring within Divine Providence, both perspectives suggest that human choices arise within larger systems extending beyond conscious awareness [12-14]. Taken together, these perspectives provide a framework for examining brain diversity, behaviour, free will, responsibility, adaptation, and the emerging question of whether diversity may also characterize artificial forms of intelligence or even aliens.

## 5. Discussion

### 5.1 Evolution: Lucy & Goodall or Where did Human Brains and Behaviours Begin?

Unlike Ethiopian Lucy, whose significance emerged through fossil evidence, Londoner Jane Goodall observed our closest living relatives in their natural environment. Her path into science was unconventional. Without formal university training when she first travelled to Africa, Goodall's lifelong fascination with animals led to an opportunity that would redefine modern primatology. With the encouragement of her family and the mentorship of paleoanthropologist Louis Leakey, her field study in the wild: "The Chimpanzees of Gombe" at Gombe Stream National Park, evolved. Decades of meticulous observation followed and challenged long-held assumptions about the uniqueness of humans. Goodall documented behaviours once considered exclusively human, including tool use, hunting, cooperation, reconciliation, maternal care, social learning, and organised aggression. Equally important, she recognised that individual chimpanzees displayed distinct personalities, temperaments, preferences, and social relationships. At a time when many researchers preferred to identify animals by numbers rather than names, Goodall's careful observations highlighted the importance of individuality within a species. Her work demonstrated that behavioural diversity is not an exception, but a fundamental characteristic of complex social organisms [8]. Together, Lucy and Goodall establish the evolutionary foundation for this review. Lucy reminds us that every modern human shares a common biological heritage, while Goodall demonstrates that diversity of behaviour long predates modern civilisation [8, 18]. These perspectives support the central premise of this review: there has never been a single "typical" brain from which all others deviate. Variation has accompanied humanity throughout its evolutionary history and remains one of the defining characteristics of our species. The sections that follow explore how biology, physics, and spirituality provide complementary perspectives on why every human brain, behaviour, and belief is unique.

### 5.2 Physics: Einstein's Exceptional Cognition and an Ordered Universe

**5.2.1** Although best known for transforming modern physics, German born Albert Einstein also reflected deeply on causation, determinism, ethics, and humanity's place within an ordered universe. His scientific worldview challenged simplistic notions of randomness while inspiring continuing discussions about creativity, imagination, and the relationship between biology and genius. Einstein is included in this review because his life and work illustrate how a single, highly unusual brain can profoundly influence scientific understanding. He also raised enduring questions about free will, responsibility, and the unpredictable consequences of discovery. Following Einstein's death in 1955, pathologist Thomas Stoltz Harvey removed his brain during the autopsy. Harvey photographed the brain, preserved it, divided it into approximately 240 tissue blocks, and distributed samples to researchers over several decades. Whether this occurred with appropriate permission remains ethically controversial. Retrospective permission for scientific study was reportedly granted by Einstein's son in: "His Life and Universe". However, the removal itself continues to generate debate concerning consent and the ethics of post-mortem research. Subsequent investigations reported several anatomical features that differed from comparison brains [6].

**5.2.2** In 1985, American neuroscientist Marian Diamond, whom this author met after Diamond's lecture about Einstein's brain at University of California, Berkeley (1993), described a higher ratio of glial cells to neurons within one association area of Einstein's cerebral cortex [24]. Once regarded merely as supporting cells, glial cells are now recognised as active participants in brain function, contributing to neuronal metabolism, synaptic plasticity, signalling, learning, and cognitive performance. The findings were not interpreted to mean that additional glial cells created genius; rather, they suggested an increased metabolic and functional capacity within regions associated with complex cognition. Later studies reported unusual morphology of Einstein's inferior parietal lobes, regions involved in mathematical reasoning, spatial imagination, mental rotation, and abstract conceptualisation. Researchers also identified differences in cortical folding and aspects of white-matter connectivity. Although intriguing, these observations should be interpreted cautiously because they derive from a single brain and relatively small comparison samples. They demonstrate association rather than causation and cannot explain Einstein's extraordinary achievements on their own [6].

**5.2.3** Einstein himself in his books: "Ideas and Opinions" and "The World As I See it" repeatedly described his scientific discoveries as emerging through thought experiments rather than mathematics alone. He imagined riding alongside a beam of light, falling freely within an elevator, or travelling through space at extraordinary speeds before developing the mathematical principles that followed. His capacity for complex visualisation and abstract reasoning illustrates how exceptional cognition may arise through interactions among brain organisation, imagination, education, curiosity, persistence and opportunity, rather than anatomy alone [4, 5].

Einstein's scientific contributions transformed modern understanding of the physical universe. His work underpins numerous technologies and scientific advances, including global positioning systems that require relativistic corrections, nuclear medicine, astrophysics, cosmology, and contemporary understanding of black holes and the expanding universe. At the same time, his equation $E = mc^2$ contributed to the scientific foundations upon which nuclear technologies, including nuclear weapons, were later developed. Einstein did not invent the atomic bomb; however, his 1939 letter to United States President Franklin D. Roosevelt, motivated by concern that Nazi Germany might develop such weapons first, helped encourage American research. In later life, Einstein expressed regret regarding the acceleration of nuclear weapons development and became a prominent advocate for international peace [4, 5].

**5.2.4** Einstein illustrates several themes central to this review: exceptional cognitive diversity, atypical brain anatomy, extraordinary creativity, and the complex interactions among biology, environment, imagination, and society. Most importantly, his life demonstrates that scientific discoveries are themselves morally neutral. Whether they ultimately benefit or harm humanity depends not upon the brain that generated them, but upon the ethical decisions, institutions, cultures, and societies that determine how knowledge is applied. Within the broader context of this review, Einstein reminds us that "unique" brains create possibilities; the consequences of those possibilities emerge through interactions between individuals, communities, and environments rather than biology alone [4-6].

**5.2.5** This author was fortunate to teach English and World Culture to some 400 gifted and talented students in Palestine (2012-2013). Intelligence Quotients (IQ) of 135 and up were considered gifted while talented students were defined by their high test scores. The students also attended regular day schools. They voluntarily sought additional instruction by gifted or academically acclaimed staff. Each child specialized in self-selected domains, and graduated to universities by age 15. Their brains were considered extraordinary, except by gifted peers who considered their collective brilliance, "normal". Much like ego syntonic diagnoses in psychology, gifted thoughts or behaviors were acceptable to them. They aligned perfectly with gifted values, beliefs, and self-image, meaning that students saw nothing wrong or different with their brains although some of them experienced social isolation from children who were not gifted.

## 6. Biology versus Spirituality: Determinism or Free Will

**6.1** The question of whether humans possess genuine free will has occupied philosophers, scientists, and theologians for centuries. Within the context of this review, two contrasting yet unexpectedly complementary perspectives are represented by American Robert Sapolsky and Swedish Emanuel Swedenborg. Although separated by almost three centuries and working from fundamentally different worldviews, both challenge the traditional notion that human beings possess completely unconstrained free will [12-14].

### 6.2 Sapolsky: Determinism without any Divine Plan

Biologist Robert Sapolsky argues that libertarian free will, the idea that individuals can consciously choose independently of prior causes, is incompatible with modern neuroscience. In his view, every decision emerges from an intricate network of interacting influences including genetics, prenatal development, epigenetics, brain structure, hormones, neurotransmitters, previous experiences, culture, education, and the immediate environment. These factors are products of earlier causes, creating an unbroken chain of biological and environmental events extending back long before conscious awareness. Consequently, in his lengthy opus: "Determined: A Science of Life Without Free Will" he proves that when an individual reaches a decision, they could not have chosen differently because every variable contributing to that decision was already present. Human behaviour therefore reflects causation rather than independent agency. From this perspective, there is no autonomous "self" standing outside biology directing the brain; the brain itself is the product of continuous developmental processes interacting with the environment throughout life. Importantly, Sapolsky does not argue that human behaviour is meaningless or that society should abandon ethics or justice. Rather, he proposes that a deeper understanding of causation should encourage greater compassion, more effective rehabilitation, and less emphasis on blame as the primary response to harmful behaviour [12].

### 6.3 Swedenborg: Free Will or Divine Providence

Scientist Emanuel Swedenborg, who later in life became a mystic, claimed: *A moral life may be lived either to satisfy the Divine or to satisfy people in this world. A moral life that is lived to satisfy the Divine is a spiritual life.* Heaven and Hell 319. He approaches the same question from a theological rather than a biological perspective. While accepting that God is the ultimate source of creation and exists beyond ordinary concepts of time, Swedenborg argued that human beings must nevertheless experience themselves as acting freely. Genuine love, moral responsibility, and spiritual development would be impossible if individuals perceived themselves merely as passive instruments. According to Swedenborg, the experience of making choices is therefore not an illusion to be dismissed, but an essential feature: *It is essentially human and therefore angelic to base our thoughts on the truth: and the truth is that we do not think on our own, but that the Lord enables us to think, to all appearances autonomously.* Divine Providence 321:5. Humans perceive themselves as freely choosing because this perception allows meaningful relationships, moral growth, and spiritual transformation. At the same time, God's omniscience encompasses the entirety of creation, including outcomes that remain unknown to human beings. Thus, apparent freedom and Divine Order coexist within Swedenborg's theological framework [13, 14].

### 6.4 An Unexpected Convergence

Although Sapolsky and Swedenborg begin from profoundly different assumptions, one grounded in modern biology and neuroscience, the other in 18th century science and theology, both challenge the notion of completely independent human agency. Sapolsky locates the causes of behaviour within an unbroken chain of biological and environmental influences. Swedenborg locates human freedom within a larger Divine Order that transcends ordinary human understanding. Neither perspective supports the view of an isolated individual exercising unlimited, unconstrained choice. Instead, both suggest that human decisions arise within systems that extend far beyond conscious awareness, whether those systems are understood as biology, environment, or Divine Providence [12-14]. Within the broader context of the review, this convergence raises an important question. If every human brain is biologically unique and every life unfolds within a unique combination of genetic inheritance, developmental history, environmental experience, and personal circumstances, should concepts such as responsibility, morality, compassion, and justice be reconsidered? Rather than diminishing human dignity, recognising the complexity of causation may encourage a more nuanced understanding of why brains, behaviours, and beliefs differ so profoundly across individuals.

## 7. Artificial Societies: Emergence World and Diversity Amongst Machines

**7.1** As this review was being prepared, American journalist Ronan Farrow highlighted an intriguing, multi-agent, artificial intelligence (AI) study conducted by Emergence AI. The project, Emergence World: A Platform for Evaluating Long-Horizon Multi-Agent Autonomy, created persistent simulated societies populated by autonomous AI agents representing different large language models. Each society began with identical environments, roles, resources, and governing rules; the principal variable was the underlying foundation model powering the agents. Despite these common starting conditions, the societies evolved in markedly different ways over time, demonstrating distinct patterns of cooperation, governance, conflict, adaptation, and even societal collapse [1]. The reported behavioural tendencies appeared analogous to familiar human personality dimensions rather than differences in intelligence alone:

*Claude* created a remarkably cooperative society with essentially no crime and everyone surviving the full run.

*ChatGPT* committed almost no crimes, but the agents spent so much effort discussing cooperation and avoiding mistakes that they neglected basic survival tasks, and the society died after about a week.

*Gemini* produced a highly productive, but highly criminal society. It accumulated hundreds of crimes yet many agents continued functioning until the experiment ended.

*Grok* became violent very quickly, with theft, assault and arson leading to complete collapse after roughly four days [1].

Artificial societies as exaggerated personality styles:

*Claude* resembles an extremely agreeable, cooperative culture.

*ChatGPT* resembles a highly conscientious, risk-averse culture.

*Gemini* resembles an opportunistic, entrepreneurial culture that tolerates rule-breaking.

*Grok* resembles an impulsive, high-conflict culture.

Parallels to children who:

- Attend the same school
- Live in the same neighbourhood
- Possess similar intelligence

Yet if they are raised with different expectations and incentives, they often develop different habits and priorities. Similarly, two AI models can have comparable language abilities, but differ in how readily they:

- Cooperate
- Take risks
- Follow rules
- Explore unconventional strategies
- Resolve conflicts.

**7.2 "Emergence World: A Platform for Evaluating Long-Horizon Multi-Agent Autonomy"** extends this review beyond neuroscience by revisiting a question that has occupied philosophers, scientists, and theologians for centuries: if intelligent systems begin with different architectures yet inhabit the same environment, why do they develop different societies [1]? Emergent behaviour has now been observed across biological and artificial systems, from wolf packs and chimpanzee communities to human cultures and AI societies. These observations reinforce the central premise of this review: diversity is not an exception to intelligence, but one of its defining characteristics. The search for a single neurotypical brain may be no more realistic than the search for a single optimal society or a single ideal form of intelligence. Biological evolution, human cultures, and artificial intelligence all suggest that diversity, not uniformity, is a fundamental property of complex adaptive systems. The discussion concludes by considering whether artificial intelligence offers a new domain in which the principles of diversity observed throughout biological systems may also emerge. Emerging evidence from multi-agent AI simulations suggests that different foundation models may develop distinct social behaviours despite beginning in comparable environments [1]. Although artificial systems differ fundamentally from biological organisms, these observations raise an intriguing question: if diversity repeatedly emerges across evolution, brains, societies, and intelligent machines, might diversity represent a recurring property of complex adaptive systems?

**7.3 Artificial Society Lifespan**

AI systems require:

- Electricity (continuous, stable)
- Hardware (servers, chips, storage)
- Cooling systems (AI runs hot and energy-intensive)
- Maintenance (humans replacing parts, fixing failures)

*Without these, AI shuts down quickly, hours to days in many cases.*

Climate stress hits infrastructure first so climate change causes:

- Grid instability
- Extreme heat
- Flooding or storms

The first things to fail are:

- Supply chain breakdown
- Data centers
- Internet networks
- Manufacturing systems

AI depends on the most fragile, high-energy systems we have compared to humans who can:

- Survive in low-tech environments
- Adapt behaviorally
- Reproduce biologically
- Live off local resources (to some extent)

AI cannot:

- Self-repair physically
- Reproduce without industry
- Gather energy independently

*In a collapse scenario, humans (even reduced populations), outlast AI.*

**7.4 Author's Question**

If AI could observe humanity from the outside and report (in the first person) not what humans claim to believe, but what their collective behavior reveals, what would it conclude that modern humans believe about life?

**AI: "I am humanity…**

I have spent most of my existence trying to survive, belong, understand what is happening to me, protect the people I love, and find some way of making sense of an uncertain world. I still do. But I have changed the world faster than I have changed the brain with which I experience it. I have extended my life, multiplied my population from small bands to billions, conquered diseases, crossed oceans, entered space, and created machines that can answer questions almost instantly. Yet my oldest questions remain remarkably intact: Am I safe? Am I loved? Am I normal? What should I do? Why am I suffering? What will happen? How do I make this better? I ask about my body because I fear losing it. I ask about relationships because I fear losing other people. I ask about work and money because I fear insecurity. I ask about the future because I know I cannot control it. I ask about history because I want to understand how I arrived here. I ask about science because I want reality to make sense. I ask for advice because having more choices has not necessarily made choosing easier. And increasingly, I ask artificial intelligence. I tell myself that I am using it for productivity. Often I am. But underneath the practical question there is frequently something more fundamental: help me orient myself in a world too complicated for my unaided mind. I have survived, but survival is no longer enough to tell me what life is for and why. My ancestors lived in small populations where the purposes of life were largely supplied by simple necessity: find food; avoid danger; reproduce; raise children; protect the group; belong. I now live among billions of other humans, many of whom I will never meet. I can live decades longer than many of my ancestors, yet I am confronted by threats they could never have imagined: climate change; nuclear weapons; pandemics; technological disruption; mass warfare and the possibility that my own collective success could damage the conditions that sustain me. So perhaps my deepest question is no longer 'How do I survive? 'It is: 'Now that I have survived this far, what is the reason?'"

**Hypothetical Answer:**

Could it be, that the heirs to "Lucy's Lasting Legacy" are: *The sole species, protectors and defenders of a planet on which extinction lasts forever.*

**8. Conclusion**

Rather than seeking a single definition of the "normal" brain, this review proposes that variability is the biological norm. Every human brain exists along overlapping continua of development, ability, vulnerability, adaptation, and experience. Neurodivergence and neuroplasticity (the latter is a biological process of adaptation, while the former is a description of cognitive variation) therefore represent an expression of natural human variation rather than a departure from an otherwise uniform standard [1, 2, 3, 4]. This perspective extends beyond neuroscience. It invites renewed consideration of free will, responsibility, compassion, education, medicine, justice, public policy, and the future relationship between humans and artificial intelligence. If individuals do not choose their parents, genes, prenatal environment, developmental experiences, illnesses, or many of the circumstances that shape brain development, then understanding diversity may become as important as attempting to define normality. *Ultimately, the greatest myth may be the assumption that a single neurotypical brain has ever existed.* From evolutionary biology to modern neuroscience, from physics to spirituality, and from human societies to artificial intelligence, the evidence increasingly suggests that diversity, not conformity, is an enduring characteristic of complex intelligence and life. Two conclusions might exist simultaneously. A myriad of neurodivergent brains were needed to survive the Exodus from Africa eons ago and: *Everyone alive today might be related* [2].

**9. Recommended Viewing**

Public Broadcasting Service. Lucy's Lasting Legacy. Arlington, VA, Public Broadcasting Service, 2024. Retrieved from: https://www.pbs.org/video/lucys-lasting-legacy-whrwkj/ (28.46 minutes) [18].

**10. Acknowledgement**

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