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Revisiting Evolutionary Naturalism: Challenging Misconceptions and Embracing Interactionism

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Abstract

The study aims to illuminate the fallacious misconceptions regarding evolutionary naturalism, which often reduce it to strict fatalist naturalism, while also defending an interactionist perspective between nature and nurture in explaining social and individual traits. To achieve this goal, the study is divided into two sections. The first section offers a brief overview of evolutionary naturalism and nurturism, illustrating their biased interpretations as well as the erroneous philosophical, ethical, and political implications they allegedly entail. By clarifying the fundamental tenets of evolutionary naturalism and distinguishing it from sociobiology, the second section argues that evolutionary naturalism, as an interactionist approach, offers incomplete yet superior explanations for highly complex traits such as cultural, legislative, and ethical ones. To support this argument, the second section exposes several fallacies and misconceptions surrounding evolutionary naturalism, which often lead to overlooking its interactionist dimension. These fallacies include the fallacy of genetic causation, the fallacy of genetic sufficiency, and the fallacy of genetic necessity. It is concluded that, rather than adhering to creationist naturalism, sociobiology, strict naturalism, or nurturism, embracing evolutionary and interactionist naturalism provides better insights into investigating the origins of such complex traits.

Keywords: Evolutionary Naturalism, Nurturism, Interactionism, Creationist Naturalism, Traits.

Evrimsel Doğalcılığın Yeniden Değerlendirilmesi: Yanlış Anlamalarla Mücadele ve Etkileşimcilik Yaklaşımı

Öz

Bu çalışma, evrimsel doğalcılığa ilişkin yanlış anlamaları aydınlatmayı ve bu yanlış anlamaların sık sık evrimsel doğalcılığı sıkı bir kaderci doğalcılığa indirgeyerek yanlış yorumladığına işaret etmeyi amaçlamaktadır. Ayrıca, toplumsal ve bireysel özellikleri açıklarken doğa ile yetiştirme arasında etkileşimci bir perspektifi savunmayı hedeflemektedir. Bu bağlamda, çalışma iki ana bölümden oluşmaktadır. İlk bölüm, evrimsel doğalcılığın ve indirgemeci çevreciliğin kısa bir özetini sunar. Bu bölüm, evrimsel doğalcılığın yanlı yorumlarını ve genellikle iddia edilen yanlış felsefi, etik ve siyasi sonuçlarını örneklemektedir. Evrimsel doğalcılığın temel prensiplerini netleştirerek ve sosyobiyolojiden farkını belirterek, ikinci bölüm evrimsel doğalcılığı, etkileşimci bir yaklaşım olarak tanımlamaktadır. Bu yaklaşımın, kültürel, yasal ve etik gibi son derece karmaşık özelliklerin açıklanmasında eksik ancak daha kapsamlı bir bakış açısı sunduğunu savunmaktadır. İkinci bölümde, bu iddiayı desteklemek için evrimsel doğalcılığı çevreleyen ve evrimsel doğalcılığın etkileşimci boyutunun göz ardı edilmesine neden olan birkaç yanılgı ve yanılsamayı analiz edilmektedir. Bu yanılgılar arasında genetik nedensellik, genetik yeterlilik ve genetik zorunluluk gibi yanılgılar yer almaktadır. Varılan sonuç, yaratılışçı doğalcılık, sosyobiyoloji, katı doğalcılık veya indirgemeci çevrecilik gibi alternatif yaklaşımların yerine evrimsel ve etkileşimci doğalcılığın, karmaşık özelliklerin kökenlerini anlamada daha derin bir anlayış sağladığıdır.

Anahtar Kelimeler: Evrimsel Doğalcılık, İndirgemeci Çevrecilik, Etkileşimcilik, Yaratılışçı Doğalcılık, Özellikler.

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Introduction

Creationist naturalism was the leading position regarding the debates on the relation between the organism and its environment, until the publication of Darwin's *The Origin of Species*.[2] Although the contemporary jargon of the philosophy of biology interprets naturalism within an evolutionist frame, the naturalism before *The Origin of Species* was quite creationist. Thus, the Abrahamic narrative about the creation of Adam and Eve had many implications about the fixedness of the human nature along with the natures of other creatures of God, which had further implications in morality, politics and law. It seems to have worked well indeed, as it offered a metaphysical explanation about the universe and positioned humans and animals to a hierarchy in a bigger frame. It also let the juries and judges hold people legally responsible for their deeds and convict them if guilty, since human beings were considered as agents responsible of their deeds. The Abrahamic or non-Abrahamic creationist frames were the roots of many metaphysical problems themselves, such as the epistemic status of revelation, problem of soul, consciousness in non-human animals etc. The creationist frame was inadequate in explaining away some detailed problems such as finding a compatible way in which the diversity of human behavior and fixedness of the nature of human biology could be expounded in harmony. How the things could go wrong can be illustrated by many cases throughout history. To illustrate, convicting people of such crimes as witchcraft and burning them alive in public are examples that illustrate how bad metaphysics may result in a bad jurisdiction system.

Creationist naturalism held sway in debates concerning the relationship between organisms and their environment until the publication of Darwin's *The Origin of Species*.[3] While contemporary philosophy of biology now largely interprets naturalism through an evolutionary lens, pre-Darwinian naturalism was distinctly creationist. As such, the Abrahamic narrative of Adam and Eve's creation carried significant implications regarding the immutability of human nature and the natures of other creations. These implications extended into morality, politics, and law, offering a metaphysical explanation for the universe and establishing a hierarchical framework for humans and animals within it. This worldview facilitated the attribution of legal responsibility to individuals for their actions, allowing juries and judges to hold people accountable and convict them for wrongdoing, given humans were deemed agents responsible for their deeds. However, both Abrahamic and non-Abrahamic creationist perspectives gave rise to numerous metaphysical quandaries, including the epistemic status of revelation, the nature of the soul, and the question of consciousness in non-human animals. Yet, the creationist framework proved inadequate in reconciling certain intricate issues, such as elucidating a coherent explanation for the diversity of human behavior alongside the presumed fixedness of human biology. Historical instances, such as the wrongful conviction and public execution of individuals accused of witchcraft, serve as stark reminders of how flawed metaphysical assumptions can lead to unjust legal systems. In essence, the limitations of creationist naturalism became evident when attempting to address complex phenomena, highlighting the necessity for more nuanced philosophical frameworks to inform jurisprudence and societal norms.

However, it was not until the publication of Darwin's *The Origin of Species* and the subsequent advancements in science and philosophy that alternative, non-creationist perspectives began to emerge, offering fresh insights into the integration of human nature and the influence of nurture. The philosophical positions central

[2] Charles Darwin, *The Origin of Species* (London: William Collins, 2011).

[3] Darwin, *The Origin of Species*.

to this study are naturalism and nurturism, serving as umbrella terms encompassing various viewpoints classified as either naturalist or nurturist, depending on their emphasis. Specifically, this study delves into evolutionist naturalism and nurturism. While the former seeks to uncover traits rooted in human biology, the latter appears to overlook the impact of nature on traits, whether they be political, religious, or mundane habits. It is worth noting that these descriptions are not absolute truths but rather perceptions influenced by fallacious or mistaken interpretations. Both evolutionist naturalism and nurturism have been unjustly targeted, not only during eras dominated by creationist ideologies but also within contemporary philosophy of biology.

The study aims to document some of these fallacious views, and to accomplish this objective, it is structured into two sections. The first section conducts analyses of two philosophical positions, deferring the unveiling of fallacious interpretations and assumptions to the second section. In the second section, attention is turned to three fallacies and three misconceptions contributing to the prejudice against these two views. Additionally, it is in this second section where an interactionist perspective is advocated and defended concerning the influence of nature and nurture in tracing the origins of traits.

1. Evolutionary Naturalism and Nurturism

As previously mentioned, naturalism serves as an umbrella term encompassing various sub-varieties with differing foundational claims. The form of naturalism under consideration in this study is primarily non-creationist and, significantly, evolutionary in nature. This evolutionary perspective only emerged as a distinct viewpoint following the contributions of Darwin and his followers.[4] Like all philosophical positions within the realm of the philosophy of biology, this version of naturalism carries significant implications for fields such as law, ethics, politics, and related areas.

According to Buss, "Darwin clearly envisioned his theory of natural selection as being just as applicable to behavior, including social behavior, as to physical structures".[5] This implies an explanation of behavioral diversity grounded in the evolutionary, physical, and naturalistic aspects of human beings. Clearly, the body and its nature warrant examination in connection with the concept of behavior, as the body serves as the physical basis for all behavior. For example, "Bipedal locomotion is a behavior, for example, and requires the physical structures of two legs and a multitude of muscles to support those legs while the body is in an upright position".[6] When considering the contingency of evolution alongside the assumption that the evolutionary development of the body influences behavioral motives, the indirect role of the principle of selection becomes more apparent. This principle not only determines the evolutionary trajectory of the body directly but also indirectly influences behavior. Drawing on the example of dog-breeding and the (artificial) selection for aggressiveness or passivity, Buss concludes that "behavior is not exempt from the sculpting hand of evolution",[7] suggesting that changes in genetic traits of the body lead to corresponding changes in behavioral traits.

The evolutionist-naturalist approach, characterized by its reductionist stance in grounding behavior in biology, appears susceptible to various criticisms, particularly in cases where it aligns with radical genetic

[4] See Marsha Driscoll, Elizabeth E. Dunn, Dann Siems and B. Kamran Swanson, *Charles Darwin, the Copley Medal, and the Rise of Naturalism, 1861-1864* (United States: University of North Carolina Press, 2022).

[5] David M. Buss, *Evolutionary Psychology: The New Science of The Mind* (3rd ed.) (Boston and New York: Pearson, 2008), 11.

[6] Buss, *Evolutionary Psychology: The New Science of The Mind*, 11.

[7] Buss, *Evolutionary Psychology: The New Science of The Mind*, 11.

determinism. This reductionist perspective raises concerns, as it seems to undermine common sense and cultural diversity by reducing morality to genetic diversity among human beings. Essentially, it suggests that certain behaviors are inevitable based on genetic structures, potentially absolving individuals of responsibility for their actions by attributing them solely to nature. Critics argue that genetic determinism could serve as the biological underpinning for gene-based racism and may even justify acts of genocide. Such interpretations, reducing naturalism to evolutionary-behaviorism, have been contested by proponents of the evolutionist-naturalist view.[8] This debate underscores the significance of interpreting biological data, shifting the focus from raw biological facts to the role of interpretation. It raises questions about the extent to which biological data can be considered independent of interpretation. While this issue is not the primary concern of the current section, it becomes a central question in the subsequent discussion.

At first glance, nurturism presents itself as an appealing alternative view. Nurturism encompasses various perspectives that advocate the notion that all behavior is learned and is not determined by the genetic traits of the individual but rather by environmental influences. As is well-known, John Locke's articulation of the *Tabula Rasa*, or *Blank Slate thesis*, is widely regarded as the foundation of nurturism. Locke posits that

> Let us then suppose the mind to be, as we say, white paper void of all characters, without any ideas. How comes it to be furnished? Whence comes it by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this I answer, in one word, from EXPERIENCE.[9]

The nurturist perspective firmly rejects the idea of any predispositions inherent in the genetic traits of individuals, positioning itself as a direct counter to many versions of radical naturalism. According to nurturists, every human being begins as a blank slate, and their experiences shape them—an outlook that emphasizes the inseparability of individuals from their environment. In this framework, the traditional blank-slate view articulated by Locke attempts to reconcile the perceived constancy of human nature with its behavioral diversity. However, this reconciliation comes at a significant cost: the rejection of the innateness of any predispositions. This rejection carries profound moral, legal, and political implications. Morally, nurturism asserts that all morality is acquired rather than innate, thereby reducing concepts such as right and wrong to mere cultural or environmental constructs. Legally, individuals with conditions like kleptomania would not be excused on medical or naturalistic grounds, as nurturist psychopathology attributes all such syndromes and conditions to learned behavior. Politically, the notion of the blank slate has been exploited by totalitarian regimes and "was eagerly filled by totalitarian regimes, and it did nothing to prevent their genocides".[10] By propagating the idea that evil and good are solely taught concepts disconnected from human nature, these regimes absolved themselves of responsibility for their actions, leading their societies down fundamentalist or racist paths without accountability for the consequences. In essence, the nurturist perspective challenges fundamental assumptions about human nature and behavior, prompting critical examination of the societal, legal, and ethical frameworks built upon these assumptions.

In contemporary philosophy of biology, it is rare to find thoroughgoing naturalists or nurturists who completely exclude either biological or environmental influences from their frameworks. Instead, most pers-

[8] See Bernard D. Davis, "Social Determinism and Behavioral Genetics," *Science* 189, no. 4208 (1975): 1049-1049.; and Elizabeth A. Segal and Keith M. Kilty, "The Resurgence of Biological Determinism," *Race, Gender & Class* 5, no. 3 (1998): 61-75.

[9] J. Locke, *An Essay Concerning Human Understanding* (New York: E. P. Dutton, 1947), 26.

[10] Steven Pinker, *The Blank Slate: The Modern Denial of Human Nature* (New York: Penguin Books, 2003), 421.

pectives adopt some degree of interactionism, acknowledging the interplay between nature and nurture. Consequently, debates often center on the extent to which individuals emphasize either nature or nurture in their interactionist stance. To illustrate, let us consider De Waal's interactionism as an example:

> When the Harvard sociobiologist E. O. Wilson twenty years ago proclaimed that "the time has come for ethics to be removed temporarily from the hands of philosophers and biologicized," he formulated the same idea a bit more provocatively. My own feeling is that instead of complete reliance on biology, the best way to generate fresh air is simultaneously to open both front and back doors.[11]

De Waal seeks to distance himself from the sociobiology espoused by Wilson, which overly biologizes ethics and places excessive emphasis on nature while disregarding the role of nurture. Particularly in complex matters such as decision-making and moral judgment, sociobiology tends to oversimplify by attributing everything to biology, neglecting the nuanced influence of cultural and social factors. [12] In the social sciences, issues related to culture, ethics, relationships, and social hierarchies—including considerations of rank and socio-economic status—are viewed as integral components of nurture. These aspects cannot be adequately explained solely through a biological lens, as Wilson proposes. It is evident that biology alone cannot account for all facets of human behavior and societal dynamics. A similar inclination towards naturalism can be observed in Pinker's views. Pinker, while commenting on his own work, maintains a more naturalistic stance. He argues that human beings possess a nature that interacts with and influences the nurturing environment. Nature, with its adaptable traits, sets the stage for the interplay between nature and nurture.

> This book is based on the estimation that whatever the exact picture turns out to be, a universal complex human nature will be part of it. I think we have reasonto believe that the mind is equipped with a battery of emotions, drives, and faculties for reasoning and communicating, and that they have a common logic across cultures, are difficult to erase or redesign from scratch, were shaped by natural selection acting over the course of human evolution,[13] and owe some of their basic design (and some of their variation) to information in the genome.[14]

Pinker argues that human evolution alone cannot account for every aspect of human traits. Nature is just one component of a larger framework that encompasses both nature and nurture. Relying solely on biological or sociobiological explanations, especially when addressing highly complex issues like culture, society, and politics, would be misleading and would undervalue the role of nurture. It is crucial to recognize that while nature may set the stage for nurture, we cannot fully explain nurture through nature alone. They do not explain each other; rather, they coexist and interact within a broader framework.

Prinz appears to advocate for a plausible interactionist stance, extending his commentary beyond human organisms to include non-human organisms, such as microscopic life forms and even more complex organisms like nematode worms:

> Even microscopic organisms, like the lowly nematode worm, are influenced by both nature and nurture. These tiny creatures are capable of associative learning. In the lab, they will show a preference for chemical environments like those in which they have found food. Worms that have found food in sodium solutions will

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[11] Frans De Waal, *Good Natured: The Origins of Right and Wrong in Humans and Other Animals* (7th printing) (Massachusetts: Harvard University Press, 2003), 10-11.

[12] See Edward O. Wilson, *Sociobiology: A New Synthesis* (Cambridge: Harvard University Press, 2000).

[13] Regarding the question of how one acquires these reasons, there are some interesting debates, e.g., Dennett contends that a comprehending mind can be one of the results of a mindless process of natural selection. For more on this, see Daniel C. Dennett, *From Bacteria to Bach and Back: The Evolution of Mind* (New York: W. W. Norton & Company, 2017).

[14] Pinker, *The Blank Slate,* 73.

> gravitate towards sodium, and those who have found food in chloride will gravitate towards chloride. Their taste in food is determined by nature, but their knowledge of where to find it is driven by nurture.[15]

Indeed, Prinz's position challenges the separability of biological organisms from their environments. This perspective acknowledges the crucial role of environmental conditions in shaping and revealing the traits exhibited by biological organisms. For instance, the potentialities inherent in an organism, such as a nematode worm, are actualized within a specific environment. Without the presence of suitable food sources, we would not be able to observe the worm's behavior, as it is prompted by its surroundings. It is important to note that while chemistry may play a role in the organism's environment, it does not solely explain the organism's behavior. Rather, it functions as a component of the environment, or nurture, rather than dictating the organism's nature. One might argue that the inner chemical processes of the worm explain its behavior. However, these internal reactions are triggered by external chemical stimuli, without which the worm would not exhibit the observed behavior. Consider a hyena using olfaction to locate food in its environment. While olfaction is a natural trait of the hyena, the scent of food is not innate to the hyena itself. Without the presence of the food scent in the environment, the hyena would be unable to utilize its olfactory abilities to find food. Thus, while olfaction is a part of the hyena's nature, its activation relies on external environmental factors.

2. Unveiling the Fallacies, and Defending Evolutionary and Interactionist Naturalism

As outlined in the introduction, the first part deliberately presented fallacious conceptions of evolutionary naturalism and nurturism. This section aims to uncover the underlying fallacious assumptions that led to these misconceptions. Firstly, it is essential to recognize that nature should not be viewed as a deterministic biological foundation. Genetic determinism, often associated with biological naturalism, portrays biology as governed by chemical reactions, which in turn are governed by the laws of physics. This perspective inevitably leads to strict determinism, suggesting that all aspects of nurture can be explained solely through deterministic principles. This reductionist approach, especially when applied to fields like ethics, sociology, and politics, essentially implies that there are no social constructs; rather, human behavior is solely determined by the immutable laws of physics. This line of reasoning closely resembles a Platonic perspective, reminiscent of Frege's hierarchy of sciences, wherein biology can ultimately be reduced to the laws of chemistry, which can ultimately be reduced to the laws of physics. From this Platonic viewpoint, one could argue for determinism, effectively undermining legal systems and providing criminals with justification for their actions. Criminals could claim that their actions were not the result of free will but rather predetermined by the laws of physics that shaped their genetic predispositions toward criminal behavior.

This notion can be unsettling for individuals striving to lead decent lives, abiding by the law and avoiding violence. In situations where they become victims, they rightfully expect the perpetrators to face justice through the legal system. However, contemplating that even the concept of justice is merely a product of evolutionary processes guided by the laws of physics can be disconcerting. Nevertheless, it is important to recognize that a genuine evolutionary approach is not inherently deterministic, as it does not reduce complex human behaviors and societal constructs to mere physical laws. This perspective, free from deterministic implications,

[15] Jesse J. Prinz, *Beyond Human Nature: How Culture and Experience Shape Human Mind* (New York: W. W. Norton & Company, 2012), 5.

offers reassurance to many, especially social scientists, who may be troubled by the prospect of their work being reduced to deterministic explanations.

Let us explore how evolutionary naturalism both advocates for the importance of nature while avoiding strict determinism. According to Buss, "Contrary to this misunderstanding, evolutionary theory in fact represents a truly interactionist framework. Human behavior cannot occur without two ingredients: (1) evolved adaptations and (2) environmental input that triggers the development and activation of these adaptations".[16] This perspective aligns with the middle-way approach we discussed earlier. However, the nature of this interaction is crucial. In a genuine interactionist viewpoint, it should be impossible to determine which component—nature or nurture—is dominant. Any alternative perspective would fail to uphold true interactionism. Prinz identifies three fallacies concerning the interaction between an organism's environment and its genetic structure: *the fallacy of genetic causation*, *the fallacy of genetic necessity* and *the fallacy of genetic sufficiency*. These fallacies, according to Prinz, perpetuate the idea of determinism. He contends, "We often read in the headlines that scientists have discovered the gene for a particular psychological trait. This way of talking is usually based on three fundamental fallacies".[17]

Let us examine the first fallacy, the fallacy of genetic causation, which is "the mistake of thinking that a gene somehow codes for, and is thus directly responsible for, a particular psychological trait". [18] This assumption is grounded in the *gene-for-x hypothesis*, which posits that certain genes determine traits, leading individuals with those genes to inevitably exhibit those traits. For instance, consider the trait of alcoholism. Someone subscribing to this fallacy might argue that there exists a gene that directly causes alcoholism, suggesting that all individuals with this gene will inevitably develop alcoholism and exhibit withdrawal symptoms in its absence. However, Prinz identifies this as a fallacy, emphasizing the lack of decisive scientific evidence to support such a claim:

> We are told that alcoholism is a genetic disease, and that there is a gene for it. When we read headlines like this, it's hard to resist thinking that there is a little stretch of DNA that causes a person to be born with an alcohol addiction. This is far from the truth. Genes that have been implicated in alcoholism are not genes for alcoholism; they are genes that make a small contribution to the probability that someone will become addicted to alcohol under certain environmental conditions.[19]

Obviously, Prinz's argument is sound. Genes alone do not determine complex traits like alcoholism. Instead, a multitude of factors, including environmental influences and interactions between various genes, contribute to the development of such traits. It is crucial to understand that no single gene can be solely responsible for the entirety of a complex trait like alcoholism.

Regarding the second fallacy, namely the fallacy of genetic necessity, Prinz highlights the critical flaw leading to the fallacy. This fallacy assumes that to possess a certain trait, one must have a specific gene associated with that trait. However, Prinz refutes this assumption using the example of alcoholism, stating that "you can't become an alcoholic unless you have a particular gene. This is a mistake. First of all, different genes can

[16] Buss, *Evolutionary Psychology*, 18.
[17] Prinz, *Beyond Human Nature*, 24.
[18] Prinz, *Beyond Human Nature*, 24-25.
[19] Prinz, *Beyond Human Nature*, 24-25.

have the same effects. ... Consequently, no single gene can serve as the red flag for alcoholism".[20] This assertion emphasizes the fact that different genes can produce the same effects, and therefore, no single gene can serve as a definitive indicator of alcoholism. The key takeaway is that complex traits like alcoholism are not solely determined by individual genes in isolation. Rather, it is the interplay between various genes within the genetic structure, along with environmental influences, that ultimately shapes the expression of such traits. Therefore, no single gene can dictate the development of a trait entirely on its own; rather, it is the collective genetic makeup and interactions between genes that determine the final outcome.

The third fallacy, the fallacy of genetic sufficiency, closely parallels the fallacy of genetic necessity. Prinz contends that "an individual gene is never sufficient for a trait. Every gene depends on other genes and on contributions from the environment. By ignoring these other factors, we exaggerate the role of nature, and we underestimate the role of nurture".[21] In essence, this fallacy assumes that a single gene alone can determine the presence of a trait, disregarding the complex interactions between multiple genes and environmental factors. By overlooking these additional factors, we overemphasize the role of genetics and underestimate the influence of the environment. In fact, traits are influenced by a combination of genetic and environmental factors, and the interactions between these factors can vary significantly from person to person. As a result, attempting to explain a trait within a framework that encompasses all cases of that trait is akin to addressing *the one and the many* problem. Each individual case presents its own unique set of genetic and environmental influences, making it challenging to generalize explanations across all instances of a trait.

Buss and Prinz share similar concerns regarding genetic determinism or what Prinz terms the fallacy of genetic necessity. Buss provides an illustrative example involving calluses to highlight this concept. Imagine two individuals engaging in manual labor under similar conditions. According to genetic determinism, if one person develops calluses due to their genetic predisposition, the other person, lacking the same genetic makeup, would not develop calluses under identical circumstances. This simplistic view fails to consider the complex interplay between genetics and environmental factors. Buss's example below underscores the limitations of genetic determinism and the importance of recognizing the multifaceted nature of traits, which are influenced by both genetic predispositions and environmental conditions. Buss contends that

> Consider calluses as an illustration. Calluses cannot occur without an evolved callus-producing adaptation, combined with the environmental influence of repeated friction to the skin. ... calluses are the result of a specific form of interaction between an environmental input (repeated friction to the skin) and an adaptation that is sensitive to repeated friction and contains instructions to grow extra new skin cells when it experiences repeated friction. ... So notions of genetic determinism-behaviors caused by genes without input or influence from the environment-are simply false. They are in no way implied by evolutionary theory.[22]

The example of calluses illustrates the intricate interplay between nature and nurture in shaping physical traits. While genetics may predispose individuals to develop calluses in response to friction, the environmental conditions—such as engaging in manual labor—play a crucial role in activating this genetic adaptability. Without the environmental stimulus, the genetic trait for callus formation would remain dormant. This demonstrates that nature and nurture are not mutually exclusive but rather complementary forces that work together. It is not a matter of nature determining nurture or vice versa, but rather a dynamic interaction betwe-

[20] Prinz, *Beyond Human Nature*, 25.

[21] Prinz, *Beyond Human Nature*, 25.

[22] Buss, *Evolutionary Psychology*, 18.

en the two. This concept aligns with the principles of evolutionary interactionism, where both genetic factors and environmental influences contribute to the development and expression of traits.

Buss highlights the second common misunderstanding regarding evolutionary traits: the belief that if a trait is evolutionary, it cannot be changed. While this may hold true for certain physical traits like height, it does not necessarily apply to all physical traits. For instance, even eye color can be altered through medical interventions. However, this misconception becomes particularly problematic when applied to social traits. The assumption that evolutionary traits are immutable represents an overgeneralization or a case of universal generalization fallacy. Take kleptomania, for example. Upon learning of their condition, individuals with kleptomania may become more aware of their urges and actively work to control them. Similarly, introverted individuals may feel destined to a life of loneliness, believing their introversion to be genetically predetermined. Yet, through training and experience, they can develop social skills and become more extroverted. Buss elucidates this misunderstanding by emphasizing the changeability and contingency of traits, which are influenced not by a single genetic cause but by a complex interplay of genetic factors inherited from parents:

> Knowledge about our evolved psychological adaptations along with the social inputs that they were designed to be responsive to, far from dooming us to an unchangeable fate, can have the liberating effect of changing behavior in areas in which change is desired. This does *not* mean that changing behavior is simple or easy. More knowledge about our evolved psychology gives us more power to change.[23]

The third misunderstanding highlighted by Buss does not directly correspond to the fallacies mentioned by Prinz. This misconception revolves around the belief that our biological state is optimally evolved for our current environment. In essence, it assumes that our genes have perfectly adapted our bodies to respond effectively to environmental changes, leading to an optimal biological structure. However, this assumption overlooks a crucial reality: the pace of our biological evolution lags behind the rapid evolution of our lifestyle and technological advancements. Buss illustrates this with the example of our strong desire for fatty foods: "leads to clogged arteries and heart attacks. The lag in time between the environment that fashioned our mechanisms ... and today's environment means that our existing evolved mechanisms may not be optimally designed for the current environment".[24] In today's environment, however, this desire contributes to health issues like clogged arteries and heart attacks. The gap between the environment that shaped our evolutionary mechanisms and our current environment means that our existing biological adaptations may not be optimally suited to meet the challenges of modern life. This highlights the mismatch between our evolved traits and the demands of contemporary society.

Pinker exposes the flaws of genetic determinism by illustrating its potential consequences in various aspects of society, including politics, ethics, and education. His satirical depiction highlights the absurdity of attributing human behavior solely to genetic factors, such as asking "Is this the bright future promised by the sciences of human nature—it wasn't me, it was my amygdala? Darwin made me do it? The genes ate my homework?".[25] Pinker's point is akin to a criminal attempting to justify their actions based on genetic determinism—it simply cannot provide a comprehensive framework for understanding human behavior. Unlike strict sociobiological views, evolutionary naturalism does not fall prey to such inadequacies. However, this does not

[23] Buss, *Evolutionary Psychology*, 19.

[24] Buss, *Evolutionary Psychology*, 19.

[25] Pinker, *The Blank Slate,* 175-176.

mean that evolutionary naturalism is immune to criticism. As discussed earlier, it must guard against fallacies and biases to provide a more accurate and nuanced understanding of the complex interplay between nature and nurture in shaping human behavior.

Conclusion

It is evident that both creationist naturalism and extreme nurturism have proven inadequate in addressing the practical needs of society, spanning from ancient times to modernity. Creationist naturalism, rooted in religious conceptions of the divine, has failed to adequately address ethical, political, legal, and moral dilemmas, often leading to superstitions and unjust practices. On the other hand, a staunchly nurturist approach, which discounts the role of genetics entirely, overlooks the significant influence of nature on human traits and behavior. While nurturism may have some valid points, it has largely been disregarded by scientists due to its oversimplification of complex phenomena. In light of these shortcomings, an interactionist position emerges as the most promising framework for understanding complex social phenomena. Scholars like Prinz and Buss advocate for an approach that acknowledges the interplay between nature and nurture in shaping human behavior. This interactionist perspective offers a more nuanced understanding of social issues, bridging the gap between biological determinism and environmental influences. By embracing this approach, we can better address the multifaceted challenges facing society and strive for more effective solutions.

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