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The Naturalizing Error

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"That's the way nature is."

"You can't argue with nature."

"It's only natural."

Such appeals are common in everyday discourse, from gossip and social commentary to political posturing and academic arguments. They are presented, for example, to justify the virtues of a **"Paleolithic" diet,** the defense of **sexual identity as assigned at birth,** the "unnaturalness" of **GMOS,** and the evolutionary appropriateness of **nuclear families** [**IMAGE**]. I wish to highlight and articulate how such arguments often exhibit a significant source of error, what I have identified (along with my colleague, Alex Werth) as a general and widespread error type that we call *the naturalizing error*. Ultimately, we hope awareness of the error type may help foster more effective appraisal of scientific claims — both in cultural contexts and in cases where scientists hope to inform discussion of social issues. (This presentation builds on and extends my presentation to AFHiB in 2008.)

The central theme intersects with, but goes beyond, discussion of issues widely familiar to ISHPSSB and AFHiB members. FIRST, I hope to clarify a distinction between the well known naturalistic fallacy and the naturalizing error being described here. G.E. Moore's criticism was that we tend to **extract values from nature [IMAGE].** Our concern, by contrast, is that the problem exists in the very "facts" themselves, and how they can already embody values. The naturalizing error is an error in science, not ethics.

SECOND, the naturalizing error echoes familiar ideas about the "social construction" of science [**IMAGE: Rousseau painting**]. Namely, sociologists have described how scientists tend to inscribe their own cultural and biographical views into conceptions of nature. But unlike many sociologists, I do not endorse blind relativism. Philosophers have a role in articulating effective epistemic norms. Accordingly, I contend, we want to identify the cases where those projections onto nature are misleading and that can be properly framed as scientifically incorrect, as many ultimately do become in the course of history. This shift in emphasis from sociological insight to philosophical norms underscores the role of developing a system of **error types [IMAGE: table]**. Error types parallel and help underscore the methodologies for avoiding those very errors. To achieve this, we must delve more deeply into the cognitive dimension of those social constructions, or errors, and clarify just how they develop. Only then will we be situated to remedy them and reduce their adverse social effects.

THIRD, I hope to invite some reflection on the distinction between biological determinism and biological essentialism [**IMAGE: Genes on face**]. Exploration of the naturalizing error underscores the potent role of teleology in everyday thinking. The critique of the flaws of reductionism and ill informed notions of strict biological causation, may well be more approriately viewed as based on unwarranted beliefs about natural "essences" (like natural kinds or "human nature") and their link to views about inherent purposes in nature. Such hidden teleology gives rise to such appeals (as noted in my opening) as: "That's the way nature is." "You can't argue with nature." "It's only natural."

Ultimately, again, my concern is how claims about nature, apparently endorsed by science, are interpreted and assessed in non-scientific discourse. In such cases, nature may become an implicit or explicit benchmark for justifying behaviors.

This presentation will unfold in the **3 parts** I've just mentioned [**IMAGE: outline**]: (1) shifting from the naturalistic fallacy to the naturalizing error; (2) shifting from social construction to cognitive error type and (3) shifting from biological determinism to biological essentialism.

[**From the Naturalistic Fallacy to the Naturalizing Error**]

The relationship between facts and values is complex and often contested. We may begin, however, with common thinking patterns, which frequently rely on scientific facts to inform our values decisions. For example, **facts about DDT as a pesticide inform the values we attribute to its use** [**IMAGE**] in different contexts. G.E. Moore was specifically concerned , however, that we might try to extract the values themselves directly from "facts" about nature. He thus criticized Herbert **Spencer's logic as deriving values from facts** [**IMAGE: Spencer's illicit logic?**]. I claim, however, that Spencer's error was much deeper — reflecting now familiar critiques of his work. **Victorian society** exhibited a **dramatic social hierarchy** [**IMAGE: rich and poor**]. Spencer's "solution," in a sense, was to project that hierarchy onto nature. Hierarchy resulted, he claimed, from **competition and "natural selection"** [**IMAGE: bears**] — where the very term "natural" served a justificatory function in trying to render such selection as inherent in nature. That **projection onto nature of Spencer's social ideology** [**IMAGE: argument diagram**] was the fundamental error. Once that was done, it would be easy to argue, as in the case of DDT's value, that competition in society was merely an unbiased reflection of natural principles. The argument, of course, is circular, and easy to see, for us in modern times. The **core error was scientific, not ethical**. This is the core of the naturalizing error, as distinct from the naturalistic fallacy.

For a contemporary case, we might examine the reasoning for adopting a

“**Paleolithic diet**”. That is, some people promote a diet that they claim accords with human natural history. According to this argument, before the advent of agriculture, hunter-gatherers evolved to eat certain types of food. Our digestive enzymes and physiology adapted to those food sources. We have inherited those traits from our Paleolithic ancestors. Hence, we should eat the way we evolved to eat. We should not eat excessive grains (with gluten) or dairy (with lactose) because they are “unnatural” and unhealthy. The reasoning parallels Spencer’s in mandating a behavior based on our evolutionary history. One could easily criticize the so called Paleolithic diet as seeking normative guidance in the wrong place, using the wrong principles. However, the argument is plausible. Maintain health (as an ultimate value) by aligning diet with the facts of human physiology. There is nothing inherently wrong with such an argument. However, if one now approaches this case from the perspective of the naturalizing error, the appeal to “natural” conditions should alert one to probe (instead) the justification for the scientific claims. Indeed, this case exemplifies the “**mismatch hypothesis**,” which claims that modern humans live wholly unlike the way our ancestors did for tens of thousands of years [**IMAGE: Neandertal diner**]. The Paleolithic diet, ironically, seems to reflect particular preferences — tastes for meat and fat. The purported history seems enlisted only for convenience — to *rationalize* those dietary choices. A closer reading of the scientific research indicates that the diet promoters have misconstrued or misrepresented ancestral diets, intentionally or incidentally. The core premise of evolutionary stasis since the Stone Age is unsupported both in principle and in fact. The naturalizing error, rather than the naturalistic fallacy, provides a framework for effectively analyzing the normative claims of the Paleolithic diet.

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[**From Social Construction to Cognitive Error-Type**]

Next, let us turn to a related concern: the social construction of science [**IMAGE: Rousseau**]. The concept of the naturalizing error may seem merely to echo well-established — and, for some, well-worn — conclusions that scientists may project their particular views onto natural phenomena. Scientific claims about nature may be strongly shaped by personal ideology, biography, and social context. So let us plainly acknowledge this. Cultural or personal perspectives may be unwittingly *naturalized*.

For example, consider the well known example of the naming of **mammals**. When Linnaeus labeled the group, he had several options. Other proposed names at the time were based on other distinctive structures, such as hair, live birth, and two ventricles in the heart. Linnaeus might have focused on nourishment by milk. Instead, he focused on the mammae. As Londa Schienbinger has observed, the name appeared during cultural debates about the value of wet-nursing and the domestic role of women. Six years earlier, Linnaeus had advocated **breast-feeding** by birth mothers. His taxonomic name embodied a view that a mother's milk is "natural" to the organisms' very identity. Numerous contemporaries agreed about the "natural" status of maternal breast-feeding. That illustrates **naturalizing as a form of social construction** [**IMAGE: logic diagram**].

However, these claims about nature, once **derived from ideological perspectives, were then used politically to assign social roles** and simultaneously exclude women from politics [**IMAGE: logic behind error**]. The taxonomic term *Mammalia,* apparently neutral, was not. So, a social decision that *seemed* informed and justified by "nature" as an independent benchmark (like actions about DDT) was instead merely (re)expressing the cultural perspectives that shaped those very scientific claims. Again, the justification was circular. This epistemic misstep underscores the significance of going beyond social construction alone to consider epistemically the role

of error.

That is, while the awareness of social construction is foundational, it does not tell us if the resulting knowledge is *well constructed* or not. Is the "construction" sound? Is it epistemically well-justified? *Philosophically,* one may still characterize certain psychosocial processes as potential ***sources of error*** [**IMAGE: table**]*.* Careful analysis might help us guard against such errors. In this way, we can situate the naturalizing error among other general error types. We habitually note errors such as systematic bias in experimental instruments or data collection, fallacies in reasoning, or conflicts of interest in trustworthy communication — each an error type already recognized by philosophers of science. The naturalizing error emerges at the cognitive and social levels of science.

For a contemporary example, one may consider the **arguments** common recently in the U.S. that for using restrooms, all individuals should be classified as either male or female, and that such categories are also permanent. In this view, transgender individuals are "unnatural" and thus have no social standing. Of course, good biologists know that male and female identities can be fluid. My favorite example is that many reef fish, such as **clown fish**, can change sexes, sometimes in a matter of hours. In the popular animated film, Nemo's dad should have become a female after the mom died — a detail discreetly eclipsed by Disney Studios. This, along with other cases of the ambiguity of sex, helps one see how the "natural" categories — which for some persons are apparently validated by science — are **ultimately rooted in ideological categories** of male and female [**IMAGE: transgender "logic" diagram**]. An understanding of the naturalizing error fosters a deeper analysis of claims about nature used to justify *cultural and political* positions — not to unilaterally discount them, but to focus more strongly on the justifications *behind the science*, again as in the case of the Paleo diet. Conventional norms for the burden of proof may shift substantially.

At this point, it is worth considering in more detail how the naturalizing error arises. At one level, it reflects the well-known cognitive pattern typically called **confirmation bias** [**IMAGE: blinders**], also known variously as the availability error, the primacy effect, belief persistence, positivity bias, and the congruence heuristic. That is, prior experience can filter subsequent perception and judgment. Metaphor, analogy and association are powerful filters. The mind tends to classify perceptions into existing mental categories. It highlights confirming examples and discounts counterexamples by "cherry-picking" of evidence. The very relevance or significance of evidence is evaluated relative to concepts already adopted. This all occurs unintentionally and more importantly without conscious awareness. Indeed, one rarely notices that the evidence stockpiled to bolster one's position may be selective, insufficient, or incomplete. As a result of this widespread confirmation bias, much perceived justification is simply selective rationalization. Naturalizing errors develop in our blind spots. Hopefully, an understanding of the naturalizing error can help make us more aware of them.

[**From Biological Determinism to Biological Essentialism**]

Why does the **naturalizing error** occur? [**IMAGE: Rousseau**] What motivates it? Anyone can, of course, reason about values—whether about gender roles, social hierarchy and competition, diets, or sexual identity—without reference to nature. Yet humans seem prone to respect appeals to nature. They more readily accept normative arguments that seem independent of human interests. "Nature" seems an impartial arbiter. Thus, we tend to frame our personal beliefs as "natural" and universal. We project them onto nature and then interpret natural processes as embodying those beliefs independently of our own circumstances.

Alex and I suspect that prevalent teleological thinking patterns contribute significantly to naturalizing cultural norms. Humans seem to have a deep-seated

tendency to seek purpose in nature. It appears in the explanatory structure of ancient myths as much as in modern beliefs about “Intelligent Design.” Across many cultures, humans tend to believe that things happen in ways that are inevitable and that justify the final outcome. That is, humans generally interpret and explain natural phenomena in terms of an ultimate result rather than a proximal process. Thus, referring to something as “natural” often embodies an implicit belief about inherent purpose. The ostensibly **descriptive** term “natural” (about causation in nature) is ultimately normative (about the **intentional** structure of the world).

This awareness may enrich our understanding of beliefs that have been characterized in terms of biological determinism — issues about **genes and identity**, **innate behaviors**, brain size and intelligence, sex and gender, evolution and family structure, and more. In our view, the key issue is not the nature of the causation, but that the features are viewed as natural, hence apparently inevitable. For example, debates about the **gay gene** were rarely about what *described* the behavior, but usually about what *justified* it or not. What did “nature” say about the “essence” of homosexuality? The normative dimension of the claims, even in ostensibly scientific arguments, indicates that the issues were about more than mere causation or reductionism. They were about profiling purpose and meaning in nature.

The flawed beliefs — about pop Ev-Pysch or “genetic” diseases — typically focus on **what can and cannot be changed in nature** [**IMAGE: magazine covers**] — namely, what is fixed or “essential”. Those essences embody vague normative purposes, modern echoes of Aristotelean ideals. Thus, Alex and I prefer to think of these issues in terms of *biological essentialism*. For example, to say that something is genetic, or innate, is also to endow it with some latent and unstated “natural” purpose. Reframing these familiar issues in terms of the naturalizing error shifts our attention from causal understanding of genes, for example, to questioning why anyone sees

genes as central to identity, with implied norms. We might analyze such claims the same we we do claims about “human nature.” What is the meaning of the appeal to something “natural”?

[**Conclusion**]

To conclude, we should recognize the combined outcome of pervasive human cognitive habits toward teleological thinking and confirmation bias. They lead to claims about nature that are often projections of personal or cultural values. Namely, ideology may be subtly inscribed in scientific concepts. Appeals to nature specifically to justify normative claims in such cases are problematic, and potentially rife with error — not because of an ethical misstep, but because the science itself is easliy misleading or flawed. This is the naturalizing error, and one hopes that by profiling it clearly, we can develop and adopt strategies to reduce such errors, both in science and in social contexts informed by scientific claims. For further reflection on some of those strategies and the problem itself, I invite others to peruse the fuller papers that accompany this presentation. Thanks from afar for taking an interest in the topic, and I hope it may generate some active discussion.

Extension on GMOs

The naturalizing error provides a framework, for example, to address contemporary claims of whether genetically modified crops (**GMOs**) are safe to eat. Critics contend they are “unnatural” and hence less nutritious and more likely to contain harmful chemicals. A social constructivist perspective fosters examination of the interests behind claims of safety defended by producers of GMO seeds and farmers of GMO crops. Initial skepticism may surely be warranted pragmatically by potential conflicts of interest. Yet a staunch social constructivist would typically dismiss claims of safety as unreliable or unresolvable on that basis alone. Our approach supports instead a close scientific consideration of what critics mean by “unnatural.” Ultimately, these claims seem embedded in widespread but ill-informed views of genes as constitutive of “natural” identity as well as vague connotations of the word “modification.” The image, sometimes stated explicitly, is that the GMO crop is “essentially not the same.” Critics disregard scientific details and fail to acknowledge that the nutrient composition of GMO crops is unaffected. In the case of *Bt* corn, this GMO’s “new” chemical is one that was already applied externally to deter insect pests. While allergens are a potential concern, as with all foods, these (rather modest) genetic modifications entail no new or hidden type of risk. Criticism of these aspects of GMO safety, notwithstanding potential environmental concerns, are scientifically unwarranted, as reported by the non-political National Research Council. The framework of the naturalizing error as an error type thus differs from social constructivist critiques and, in the case of GMO food safety, ultimately fosters a deeper, more informed analysis.