How We Think about Human Nature: The Naturalizing Error

Douglas Allchin and Alexander J. Werth*†

History is littered with scientifically ill-founded claims about human nature. They frequently appear in normative contexts, projecting ideology or values onto nature (what we call the naturalizing error). In considering a remedy, we adopt a naturalized epistemology approach to how we think about human nature. The "nature" in "human nature" fosters unproductive essentialist thinking, epitomized in the adage "a tiger cannot change its stripes." Universalist, fixist, and teleological perspectives each erode epistemic reasoning and blur the distinction between normative and descriptive justification. We articulate strategies to guide more responsible claims about human nature in science and science communication.

1. Introduction. We are concerned here not with any particular claim about human nature, or the very possibility of objectively characterizing a human nature, but with how we think about human nature. What is the structure and epistemic status of such claims? How are they justified? What justification should be considered adequate? Appeals to human nature often appear in normative arguments as inescapable descriptive claims, ostensibly validated by science. "That's just how people are. You can't expect a tiger to change its stripes," so the familiar adage goes.[1] The role of such purportedly scientific claims in normative or policy contexts should be reassessed, we contend.

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*To contact the authors, please write to: Douglas Allchin, Minnesota Center for the Philosophy of Science, University of Minnesota, Minneapolis, MN 55455; e-mail: allch001@umn.edu. Alexander J. Werth, Biology Department, Hampden-Sydney College, Hampden Sydney, VA 23901; e-mail: awerth@hsc.edu.

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1. This common phrase is a variant of "a leopard cannot change its spots," which, as an indication of its deep cultural roots, can be traced back at least to Jeremiah 13.23. Equivalent expressions are found in many cultures.

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In particular, we explore the implications of inscribing normative views or values into scientific views of human nature, what we have elsewhere called the *naturalizing error* (Allchin and Werth 2017). Adopting a naturalized epistemology posture, we consider how people actually think about human nature, the scientific flaws in such thinking, and what strategies may help remedy such tendencies. We describe, in particular, how essentialist-style and teleological thinking, as well as the ambiguity in the very term "nature," contribute to the problem. One rarely encounters appeals in quite the same way to human *dispositions*, human *potentials*, human *limitations*, probabilistic human *tendencies*, frequently found human *traits*, or the spectrum of observed human *behavior*, even when such expressions might suffice. Why not? The very term "nature," we claim, functions (with its implicit teleology) to help inappropriately disguise an illicit slide between descriptive and normative modes of justification.

In what follows, we first briefly review the argumentative contexts in which appeals to human nature appear and foster motivated reasoning and several cognitive errors. We note how unjustified appeals to science often go unchallenged in these contexts. We articulate, too, the problematic ambiguity in the term "nature" and the role of essentialist conceptions in straddling descriptive and normative contexts (sec. 2). We then comment in more detail on the various dimensions of essentialism—universality (sec. 3), fixity (sec. 4) and, most importantly, teleology (sec. 5)—and on efforts by various philosophers to conceptualize human nature in nonessentialist ways. We summarize how each dimension of essentialism contributes to the naturalizing error (sec. 6) and what remedies might be available (sec. 7). Our ultimate aim is to highlight the frequency and significance of the naturalizing error in human nature claims (in both academic and nonacademic settings), toward informing scientists, educators, and others who communicate science and its sociocultural implications to the general public (Griffiths 2017), as well as the researchers, philosophers, and others whose work they draw on and quote.

2. From "Nature" to Naturalizing. Elsewhere we survey in some detail the discursive contexts of appeals to human nature, from everyday discourse to academic tracts. They vary from explaining (and apparently thereby justifying) government shutdowns, carnivorous tastes, pornography and infidelity, sexual orientation and family structure, gender identities, and the ethics of stem cell and genetic technologies, to name a few (Werth and Allchin, forthcoming). Namely, they are primarily ideological and partial. This sets an important context for assessing what may be presented as neutral descriptive claims.

Such contexts may shape scientific reasoning. That is, scientists are susceptible to projecting their particular perspectives onto "objective" nature.

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In such cases, a value-laden normative view thence passes for a neutral descriptive view. Elsewhere, we have characterized the subtle shift from "ought" to "is"—an ironic reversal of G. E. Moore's familiar naturalistic fallacy—as a discrete error type, which we have called the *naturalizing error* (Allchin 2001, 2008b; Allchin and Werth 2017). This becomes problematic, of course, from an epistemic perspective, if such views are then presented as "justifying" the very ideologies from which they were derived. Ironically, however, the ultimate source of the error is scientific.

Rather than address some vague notion of the "social construction" of science (or some generalized relation between the "social" and the "rational"), we focus on the particular epistemic flaws in such reasoning. We trace the source of the error to many types of now well-documented cognitive patterns. Context can foster selective framing, confirmation bias, premature satisficing, and misleading simplifications, such as unwarranted universal generalizations, strict either-or dichotomies, unqualified all-or-none effects, and absolutes (Gilovich 1991; Sutherland 1992; Nickerson 1998; Hallinan 2009; Lehrer 2009). Further, the aim to justify ideology sets the scene for *motivated reasoning* (Kunda 1990; Kahan 2013; Mercier and Sperber 2017). All have led to incomplete consideration of the evidence and to scientific errors about human nature (Werth and Allchin, forthcoming). The science of human nature (with its pervasive ideological contexts) seems especially susceptible to the naturalizing error, as exemplified in a history littered with faulty claims about tool use, language, sexual dichotomy, developmental "monsters," biophilia, rape, diet, self-awareness, gendered attributes, deception, and other features (Allchin 2008b, 2012). Not a praiseworthy track record. We are concerned, therefore, with how scientists can prejudice a presumptively descriptive characterization of nature with normative views and how potentially honest efforts at critical reasoning can be (repeatedly) transformed into exercises in rationalization.

Epistemically, a major problem with human nature pronouncements, we contend, is the word "nature" itself, a basic term with multiple meanings that is used in varied contexts (Kronfeldner 2018). To what does "nature" refer, and does it do so consistently? Commentators sometimes refer to nature as relating to the physical, material world. In this sense, human nature is a fundamentally scientific notion about who we are and how we came to be that way. Claims can be empirically investigated and verified independently by all. At the same time, the "nature" of something defines its essence, an abstract characterization that distills and delineates its unique makeup (Medin and Ortony 1989; Gelman 2003). It is a metaphysical notion and, like a Platonic essence, a transcendental ideal. It need not correspond directly and in all details to every real case. Or it may be conceived normatively. Thus, a reference to human nature embodies an inherent ambiguity between the idealized and the real. As we detail more fully below, the teleology

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(intent or purpose) commonly attributed to nature adds further potential confusion to the basic meaning of the term.

We take seriously the claim that words and their metaphors strongly shape thinking (Lakoff and Johnson 1980; Haraway 1989). In our view, the metaphor of nature contributes significantly to *naturalizing* cultural norms or values. The double meaning of "nature" fosters ambiguity and can lead to linguistic sleight of hand. Most significantly, normative and descriptive claims may be confused or conflated. A flat-out *normative* claim about human "nature" (embodying an ideological, ethical, political, or other value-based perspective) may easily be presented in the guise of a secure *descriptive* fact about human "nature," presumably fully justified by science. In some cases, the ambiguity allows a conscious bait and switch. For example, an argument about sexual orientation may contend that homosexual behavior is commonly observed in numerous species (in a descriptive sense) and thus is natural (in an idealized, normative sense of ethically warranted). Alternatively, it may be characterized as a "disease," or abnormality that contradicts the species' manifest necessity for reproduction, and hence is an unnatural, morally reprehensible perversion. In both instances, descriptive and normative senses are inappropriately conflated by switching between different meanings of "nature."

For example, as we have noted elsewhere (Allchin and Werth 2017), Herbert Spencer and other historical Social Darwinists, as well as laissez-faire capitalists today, did not succumb to the naturalistic fallacy so much as the naturalizing error. They primed their arguments with descriptions of "natural" selection as placeholders for "natural" norms in the economy. Wealth, competitive ambition, and conspicuous consumption in today's global economy are treated as descriptive substitutes for "natural" processes found among other species, from which well-informed policy supposedly directly follows (Ridley 2010; Saad 2011). The ability to toggle unannounced (and often undetected) between descriptive and normative modes based on two meanings of the same term, "human nature," is a pervasive challenge when assessing the many arguments that draw on human nature claims.

Our concerns about the connotative meaning and implications of appeals to "nature" run far deeper, however. The very term "nature," we claim, carries much more than mere summative description. It is simultaneously an appeal to *essentialism*. That is, the unregulated intuitive view is that human nature is not arbitrary, fleeting, subject to qualification, or contingent on any particular precondition. It seems inevitable and inviolable. A tiger is a tiger, after all, and thus apparently cannot change its stripes. Recent psychological studies have identified three significant features of essentialism, as embodied in vernacular conceptions of animal nature or innateness (Atran 1995; Griffiths 2002; Griffiths, Machery, and Linquist 2009; Linquist et al. 2011; Heine 2017): (1) *universality*, or frequency or "normality"; (2) *fixity*, or

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various forms of genetic determinism; and (3) *teleology*, or inherent purpose or intentional design. Namely, in an unmediated view, (*a*) all tigers have stripes, (*b*) the stripes are genetically determined, and (*c*) they exist for a reason (and this explains why they cannot change). Each of the three features of essentialism is a factor in how ostensive descriptions acquire implicit normative weight and how the flaws in scientifically weak claims about human nature escape notice. All are important. Thus, even while many philosophers have proposed concepts of human nature that avoid some of these features, they may still embody another. We also give special attention to teleology, which we regard as central and underappreciated in most earlier analyses. Again, our aim is not to advocate for or against essentialist claims of human nature, so much as to show how they contribute to epistemic problems in the relation between descriptive (ostensibly scientific) and normative claims.

3. Universality. Perhaps the most intuitive feature of essentialism in how we think about human nature is universality, the idea that "all humans (and, sometimes, only humans) are X." There have been numerous academic debates about whether there are any genuine human universals (Brown 1991, 2000; Antweiler 2016) and whether they would even be meaningful in interpreting human nature (Hull 1986; Brown 2004; Machery 2008, 2018; Lewens 2012, 2018; Ramsey 2013; Laland and Brown 2018). However, our focus here is different. We want to highlight universality as part of a common rhetorical strategy and to analyze its functional role in those arguments.

At the most basic level, universality is a tool to facilitate sorting and discrete logical reasoning. That is, human nature claims are rarely framed as statements about the specific habits of Juan or Juanita. Rather, they are constructed as general claims, involving features presumably shared by all. Thinking in terms of clearly delineated and uniform categories is simpler, easier, smoother, and faster. In this sense, essentialism helps streamline or economize reasoning. As a powerful heuristic, it shapes how we tend to think about human nature.

More importantly, in rhetorical contexts essentialism helps cement the argument. With stable categories exhibiting consistent properties, there is no need for qualifications, conditionals, or probabilities. It discourages or forestalls wondering about special cases or unusual contexts. The traits are universal, after all. No exceptions. The conclusion seems less ambiguous, more certain, and more secure. That way of thinking about human nature is an advantage in a social, persuasive context (Mercier and Sperber 2017).

In our view, an essentialist view of universalism fosters substituting an abstract nature for the material, physical nature. That will seem fine if you want to promote or defend the ideal (Morton et al. 2006, 2009). But it depends on being able to defend the universalist claim, which is often assumed rather than rigorously examined. A notable consequence of universalist

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claims about human nature is that they should be extremely vulnerable to falsification. One exception should be enough to puncture the bold claims that "all humans are X." Yet this seldom happens. When exceptions were found to the contention that human tool use was unique, excuses were found, one after another (Allchin 2012). When E. O. Wilson introduced his concept of biophilia, counterexamples were easily at hand—fear of spiders, sharks, and snakes; anxiety with bared exposure to wilderness; technophilia; "urbanophilia"; towering hardware aisles of household pesticides and herbicides; and disdain for "tree-huggers"—yet Wilson brushed them all aside. One need only switch from the material universal to the conceptual universal to escape exceptions. One appeals, as Wilson did, to deeper intuitions about "essential" properties to discount the exceptions as no more than mere anomalies that can be acknowledged without threatening the original claim (Allchin 2018). Ultimately, when universal claims are shuttled surreptitiously into an essentialist mode of "nature," they become immune to falsification. That is both their rhetorical strength and their epistemic Achilles' heel. Essentialism helps illegitimate claims seem like "good science."

One of the greatest ironies here is that universal assertions are often projections of an individual's limited experience and perspective, confirmed only partially via selective use of evidence. A commitment to an idealized "nature" in an essentialist perspective further blinds the thinker to the limitations of the claim when measured against physical reality. Rather than revealing insights of vast scope, human nature claims about universals just as often reveal the blind spots of an essentialist reasoner (Haslam et al. 2005; Bastian and Haslam 2007).

Philosophers now, following Hull (1986), generally concur that speaking in terms of species universals runs afoul of biological and evolutionary thinking (Buller 2005; Cashdan 2008; Ramsey 2013; Kronfeldner, Roughley, and Toepfer 2014; Barrett 2015; Downes 2016). By this they seem to mean, more specifically (and narrowly), that variation within the population of a species (both synchronically and diachronically) precludes a universalist human nature. However, this does not guarantee that their approaches remain purely descriptive or that they escape implicit normative overtones. Namely, many still exhibit other key features of essentialism (fixity, teleology).

In particular, universalism links strongly to teleology. Namely, if all members of a species exhibit a certain property, we tend to assume that it must have a purpose. (Why else would it be there?) This form of reasoning about essences applies equally to frequency-based claims, where "most," "nearly all," or even "a major proportion of" members of a species share a certain property. Appeals to "species-typical," "normal," or "robust" properties (or even a developmental "norm of reaction," or "core," "central," or "average" features) may appear to be descriptive only, but they plainly incorporate normative judgments about "type" and "norm," as a justified selective "model"

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of the species. They exhibit the "tyranny of normality" (a statistical analog of the political "tyranny of the majority" in democracies; Allchin 2008a).[2] They generalize from a subset and hence are still susceptible to the naturalizing error and the normative dangers of attributed essentialism. A frequency-based or cluster-based view of human nature (such as Ramsey 2013) is just as teleological and essentialist as a universal one.

4. Fixity. A second major feature of how we think about human nature through an essentialist lens is fixity—or immutability, permanence, or unchangeability. This is typically attributed to heredity with phrases such as "in the blood," "in the genes," or "in the DNA." The reference to inheritance draws on intuitive notions of stability and continuity through generations and genetic determinism, or rigidly "programmed" developmental pathways (Lewontin, Rose, and Kamin 1984; Lewontin 1993; Rose 1997; Heine 2017). Studies indicate that, among the three features of essentialism, fixity is the most heavily weighted psychologically in shaping beliefs (Griffiths et al. 2009). Fixity, like universalism, certainly evokes a persuasive aura of inevitability (Dar-Nimrod and Heine 2011).

The importance and role of fixity in how we think about human nature is evident historically in the concerted efforts to depict human nature in genetic terms. For example, when Wilson speculated on biophilia, he presented it as "psychological phenomena that rose from deep human history" and (thus) "resident in the genes themselves" (Wilson 1993, 40). The rhetorical implication was that biophilia was an inescapable part of who we are. "Innate" seems to mean intrinsic, or unavoidable. A similar strategy was used to try to justify the (now thoroughly debunked) Paleolithic diet. Our evolutionary history purportedly generated particular digestive enzymes and immunities, which supposedly determined our dietary fate today (Allchin and Werth 2017). In neither case did the scientific claim emerge unexpectedly from an independent exploratory inquiry into human evolution. Rather, the evolutionary history and the genetic basis were pursued to justify current desires (here, conservation of nature and tastes in food). In this, both projects borrowed on the widespread belief that genes, through a deterministic causal structure, guarantee a fixed essence. It should not be surprising that the effort to embed human nature in inflexible genetics has a long history, from Francis Galton's hereditary genius and Charles Davenport's pedigrees of "degeneracy," to chromosomal conditions that lead to criminality, and to modern sociobiological and evolutionary psychology speculations about human aggression, altruism, and political skills (Wilson 1978; Fowler and

2. For example, using frequency alone we might conclude that the nature of honeybees is to be a sterile female worker. Queen bees and drones, as exceptions, would not be included. Honeybee nature would, paradoxically, not include any reproduction.

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Schreiber 2008). And there is an equally long history of science debunking such fixist claims (Lewontin et al. 1984; Paul 1995; Gould 1996; Gotz, Johnstone, and Ratcliffe 1999; Gaspar 2004; Buller 2005; Richardson 2007; Allen 2011). The allure of an essentialist argument is so strong that (here again) appeals to scientific claims about human nature persistently seem to run ahead of the science itself. While the scientific deficits of genetic determinism are familiar to philosophers and others, our emphasis on "how we think" leads us to underscore the deep cognitive tendencies that foster the recurring errors.

The psychological theme that biology-is-fixed-destiny has a long heritage, too, from the playful plot twists of Gilbert and Sullivan's operetta *H.M.S. Pinafore*, to the notorious US Supreme Court decision on sterilizing mentally handicapped individuals, or even to the more stately traditions of royal lineages and their inherited privileges or the now-nightmarish visions of the early twentieth-century eugenics movement. The significance of essentialist arguments concerning a fixed human nature is, from our perspective, how normative principles seem to be justified by plain reference to descriptive science. Assuming that a state of affairs is fixed in nature, it cannot be changed or even budged. "Is" begins to looks like "ought." Nature, in being governed by immutable natural laws at least, appears inevitable. One can declare that the status quo cannot be otherwise. So, for example, someone may explain away a perceived negative trait as beyond the reach of free will. Consider the provocative cover of *Time* magazine, picturing a wedding ring cleft in two, with the headline, "Infidelity—It May Be in Our Genes" (Wright 1994). Pronouncements about a "gay gene" (whether to ostensibly legitimize homosexual behavior or to disparage it) follow a similar pattern, also appearing on the front cover of a popular news magazine (Gelman 1992). There is no naturalistic fallacy here. Values or norms are not explicitly taken or derived from nature. Rather, nature is taken at face value. No justification seems needed. Nature just *is*. "You can't fight nature. A tiger cannot change its stripes." (So don't even try.) As a result of essentialist reasoning about fixed (innate) properties, faulty science can be immensely powerful, whether inadvertently or deliberately.

Of course, contemporary biologists (and philosophers of biology) widely reject associating genes with causal fixity. They acknowledge significant roles for complex interactions between genes and environment and for cultural factors in shaping human behavior, yielding diverse outcomes from similar genomes (e.g., Dupré 2003, 2018; Heine 2017; Laland and Brown 2018; Nettle 2018). Deflationary views of genetic determinism still allow scientists to examine human genetic heritage, commonalities across human populations, and discernible differences between humans and other species. Yet one can easily profile such patterns without reference to human nature (see also Laland and Brown 2018). The use of the additional term "nature," we

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contend, is deeply and indelibly associated with essentialism, which unproductively situates genes in a fixist and deterministic framework (see also the next section on teleology).

Attuned to the biological problems of genetic determinism, many philosophers have proposed how to reconceptualize human nature to accommodate an interactionist, developmental systems or multilevel approach that allows for plasticity or other dynamics (e.g., Dupré 2003, 2018; Cashdan 2013; Stotz and Griffiths 2018). But these analyses and new alternatives only seem to underscore the tension between vernacular views of human nature (as fixed and generally normative), the findings of the human sciences, and the naturalizing error. As Downes (2016) notes in his cogent critique, while the new perspectives are valuable contributions, they may not contribute to the philosophy or science of human nature. Ironically, a nonfixist version of human nature strips science of most of its persuasive leverage or relevance in a normative context, the very reason most people appeal to human nature. Fixist (descriptive) thinking continues to be strongly linked to normative appeals.

5. Teleology. The third dimension of essentialism in how we tend to think about human nature, which we think has been least addressed in recent discourse by philosophers, is a notion of intent, purpose, or teleology. The cornerstone of teleological thinking is a belief that humans (collectively and individually) express an intended purpose—a conviction that we exist for a reason and that everything, including our lives, is part of an ultimate plan. This belief seems to emerge early in life (Kelemen 1999, 2004) and persist into adulthood (Guggenmos 2012), even among professional physical scientists (Kelemen, Rottman, and Seston 2013), and appears in divergent cultures (Rottman et al. 2017). It may result from projecting our own intentional status onto the world around us (Epley, Waytz, and Cacioppo 2007). Perhaps through mirror neurons (the causes are still unknown), we easily interpret intent and motive in all aspects of nature—in other humans we relate to socially, in other life forms, as well as in natural phenomena (storms, fires, clouds) and even in inanimate objects (rocks, dolls, teddy bears; Kelemen and Rosset 2009; Mead and Scott 2010a, 2010b). The effect of envisioning purpose is to transform the notion of inevitability one step further into one of inviolability. The way things are is the way they were meant to be. Human nature acquires an aura of inherent justification and sanctity. Thus, people widely believe that an organism that fully expresses its "inner nature" is somehow better than one that does not and that interfering with an organism expressing its "true nature" can only yield ill effects (Griffiths 2002). In argumentative contexts, human nature claims implicitly invoke dire consequences for those who would dare to disagree. Teleology is another layer of insulation against criticism in promoting a naturalized ideology.

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Further, humans tend to believe that because they are meant to be a certain way (whether as products of nature or divine creation), members of a given species are all the same, fulfilling a preordained order. Instead of expecting humans to display variation, we expect they will act in canalized ways, as they were meant to. Thus, a teleological predisposition toward unified order tends to rationalize and reinforce universalist-style thinking. It is a powerful psychological bias (Fyfe et al. 2008; Kelemen and Rosset 2009). Here, we are interested in the implication of these cognitive tendencies in how humans reason about their own nature for a naturalized philosophy of human nature.

The attribution of purpose is integral to how ostensive scientific descriptions of nature acquire normative import in cultural contexts. Consider the details of the now well-known case of the naming of mammals in the mid-eighteenth century and its relation to gender politics (Schiebinger 1993). To justify excluding women from political discourse, leaders appealed to breast-feeding as part of maternal human nature. Edward Long explicitly described maternal breast-feeding as "consonant to the laws of nature." Most social debate revolved around wet nursing, which Jean-Jacques Rousseau framed normatively as endangering the moral order of society. Carl von Linne (Linnaeus) also criticized wet nursing and inscribed that cultural view into nature by naming animals with hair, internal development, and live birth "Mammalia." Namely, mammary glands were an essential feature of the group, embodying a natural purpose incumbent on all female mammals. It was not just a descriptive explanation. Through inherent teleology, the purpose also justified a normative view. Nature became the descriptive substitute for the cultural norm. Such scientific errors cannot be dismissed as past history and irrelevant now. Similar arguments are echoed today (as noted above) in debates about whether sexual orientation is to be sanctioned culturally depending on its "natural" status. A similar pattern of appeal to nature occurs in arguments for human monogamy, based partly on serial pair bonding in birds, although both birds and humans appear to have more diverse patterns of mating relationships (Benshoof and Thornhill 1979; Fisher 1989; Cézilly et al. 2000; Barash and Lipton 2001; Tucker 2014; Barash 2016). Teleology still actively haunts claims about human nature.

The language of teleology can be slippery and is often hidden in apparently innocuous metaphors. Consider common appeals to "playing God" as a moral argument against certain human-crafted technologies. Although the phrase would seem to invoke divine law or purpose, it is common in secular contexts. That is, the phrase typically ascribes "natural" boundaries to human behavior and to proper human purpose. It is a normative claim framed through teleology as something essential about objective human nature. Here, humans creating and using certain tools is, ironically, viewed as illegitimate. According to such claims, humans were not "meant" to engineer

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genes, to alter reproductive physiology in test tubes, to support life "artificially" with machines, to harvest embryonic stem cells, to build atomic bombs, and so on. Such appeals are now also found in the discourse on the ethics of human "enhancements," such as steroids in athletics, "uppers" in academics, gene therapy, robotic prosthetics, artificial intelligence, and beyond (Buchanan 2009; Lewens 2018). Namely, critics cast the behaviors as "unnatural" and therefore as impermissible, or without sanctioned purpose. The normative arguments are naturalized, cloaked in the teleological language of essentialist, objective human "nature."

Purportedly scientific conceptions of purpose even appear in conventional evolutionary biology (exemplified in Ayala 1970, 1999; Mayr 1988; critiques by Gonzalez, Galli, and Meinardi 2010; Werth 2012; Richerson 2018)—what may be called *cryptoteleology*. As profiled vividly by Gould and Lewontin (1979), biologists and others tend to adopt a functionalist interpretation of organic structures. The default assumption is generally adaptation by natural selection—a "natural" purpose of another sort. That is, tigers have stripes because they are adaptive. They are there to serve a prescribed purpose. They have an intended function—namely, disruptive patterning and camouflage to enhance predation. It is in such a conceptual climate that evolutionary biologists have endeavored to portray rape as adaptive, with the implication that "nature" not only explains the behavior but also implicitly exonerates the perpetrator as no more than an unfortunate victim of natural selection. (Ironically, females too are supposedly subject to their own evolutionary function: a mandate for "mate choice"; Thornhill and Palmer 2001; see thorough debunking by de Waal [2000]). The argument is structured such that any organismal feature construed as adaptive is "meant" to be there, even if only because of environmental exigencies. Through teleological perspectives, a conclusion of evolutionary science colored by cultural values can circle back to cultural discourse, supposedly as a norm validated directly by facts. Ardrey (1966) promoted the evolutionary roots of a "territorial imperative," which then implicitly justified capitalist views of property and the notions of geopolitical spheres of influence, prominent just then in the Cold War. In a similar way, perhaps, evolutionary explanations of altruism based on kin selection emerged historically through an ideological prism that privileged familial relationships over other forms of reciprocity that are now more plainly visible. The "purpose" of sacrifice was presumably the promotion of the value of family (Allchin 2011). Similarly, many evolutionary psychologists present improvised "just so" stories as fully justified (Buller 2005; Richardson 2007). Adaptive stories in evolutionary science are vulnerable to the naturalizing error. However, as illustrated in these cases, the deeper epistemic danger emerges when the error is coupled with widespread teleological perspectives that imbue human nature with normative overtones.

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The role of "natural" purpose, or cryptoteleology, in evolutionary explanations appears even in recent conceptions of human nature that endeavor to escape metaphysical essentialism. For example, Machery (2008) promotes a nomological view in lieu of essentialism, but by characterizing human "nature" as those traits that result from the evolution of the species, he thereby supports an alternate form of essentialism: through a teleological stance whereby frequency of traits indicates implicitly justified endpoints or "norms" (combined with a touch of genetic determinism). Cashdan (2008) criticizes essentialism but still adopts the adaptive function of human behavior as an explicit default assumption (and absent any further consideration of alternatives). Teleology, here, seems to favor ecological "optimality" as a default target or unquestioned norm.[3] Ramsey (2013) provides an alternative to universalist essentialism but remains preoccupied with describing "naturalness" (986, 989–91), by which he seems to mean standards for how humans are "supposed to" behave because of evolution (but that are ultimately a teleological overlay).[4] In these cases, the cryptoteleology reintroduces a dimension of essentialism and naturalizing that has been formally disavowed. These views still sit on the problematic cusp between descriptive and normative accounts.

6. Essentialism and the Justification of Norms. In the past three sections, we have documented how the essentialist dimensions in the commonly accepted notions of human nature—universality, fixity, and teleology—contribute cognitively to naturalizing normative ideologies and (time and time again) fostering scientific errors. Ironically, the things that make an appeal to human nature rhetorically attractive in normative arguments are also the very things that tend to erode their epistemic justification from a scientific standpoint.

We can now clarify further the ways in which the illegitimate claims move unperceived from science to normative arguments. The various features of essentialism foster this shift by establishing dichotomies, with metaphors and code words that implicitly convey "natural" behaviors as in accord with, and thus justified by, the empirical facts and "unnatural" ones as unjustified (table 1).[5] Again, the descriptive, scientific "nature" (along with its errors) is transformed unnoticed into a normative, idealized "nature" (with a supposed equivalence of meaning).

3. Namely, discounting "the unfit and the maladaptive" as an integral part of a species' "nature" is a normative judgment.

4. Offering "naturalness" as a prime desiderata of a concept of "human nature" (Ramsey 2013, 986) seems highly uninformative, if not circular.

5. It may be worth noting that a key element in the normative reasoning about human nature, here, is not any explicit conception of "good" (as per Ramsey 2013) but a sense of *justification* based on "objectively" following nature's own categories, which seem to allow one to conveniently sidestep the need to articulate or justify the value(s) involved.

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TABLE 1. Various Ways Features of Essentialism Contribute Cognitively to Bridging Descriptive and Normative Forms of Justification

	Normative Dichotomy	
Feature of Essentialism	Natural (As a Surrogate for Justified)	Unnatural (As a Surrogate for Unjustified)
Universalism	Universal	Accidental, heterogeneous
	Species typical	Exceptional, anomalous
	Normal	Abnormal
Fixity	Genetic (nature)	Environmental, social (nurture)
	Biological, evolutionary	Cultural
	Physiological	Psychological
Teleology	Adaptive	Accidental, random
	"Given"	Man-made, artifactual
	Organic	Synthetic, artificial, technological
	Normal, healthy	Pathological

By framing a human feature as a part of "nature," an essentialist claim renders it as inevitable and unchanging. Along the way, the subtle difference between "cannot be otherwise" and "should" is often lost. It seems all too easy to slide across modes of justification from "the way things always are," along with "there is no other way," to "the way things are supposed to be." Thus, the practice of packaging human tendencies or contingent dispositions into an essentialist human nature is a key element in naturalized errors going undetected in normative arguments. They cognitively eclipse awareness of a need for rigorous epistemic analysis. As a result, one can easily imagine that claims about nature (as unconditional, inevitable, or indicative of purpose) are adequately justified when they are not. That is the epistemic predicament of the naturalizing error in human nature.

7. Remedies. In summary, as documented above, how we think about human nature seems to be plagued with problems, both in repeatedly biased science and at the interface of descriptive science and normative philosophy. We are not persuaded that the faulty reasoning can be solved by reconfiguring a new conception of human nature at a high level. In our naturalized epistemological perspective, the tendencies toward essentialism in how we think about humans have deep cognitive roots and will merely emerge in other ways. This is the reason for probing and characterizing in detail the patterns of universalist, fixist, and teleological thinking. This is where prospective solutions lie. We need to address directly how our thinking falters, not jerry-rig concepts around the problems.

Following our analysis, we do see possible remedies. In our view, discussions of human nature and the human sciences need to adopt new standards:

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1. *Ideally, avoid the language of human "nature*."—Meaningful descriptive, empirical generalizations about humans (their behavior, heritable traits, evolutionary history, genetic relationships, etc.) are possible without saddling them with the unfruitful normative overtones of "nature" or "natural." Likewise, meaningful normative claims about human flourishing or ideal human behavior are also possible without trying to disguise them as descriptive claims or scientific observations or even appealing to "nature" as a benchmark. Any potential ambiguities in use of the term "nature" should be explicitly resolved.
   Kronfeldner et al. (2014; echoing Samuels 2012) have proposed that essentialist "human nature" is a catchall pastiche of diverse and divergent concepts, and they advocate a pluralistic posture. We suggest, by contrast, that the various conceptual approaches be fully differentiated, appropriately (re)named, and not conflated under a single problematic label. Abandoning the term human "nature" need not disturb any of the ultimate aims or endeavors currently embraced by that concept, while contributing to stronger epistemics.
2. *Articulate universalist claims*.—Where appropriate, universalist claims should yield to descriptions of tendencies, contingent dispositions, potentialities, limits, and so forth. Context dependence and qualifications should be explicit, and quantitative statistics and probabilities should be provided when appropriate. Frequency-based generalizations should be labeled as not implying either universalism or notions of "typicality," "normality," or "core essence." The role of exceptions should be addressed, not dismissed as insignificant or peripheral. Because they can easily evoke implicit essentialism and teleological interpretations, descriptive universalist claims should be explicitly labeled as not implying normative interpretations. Further, the logical and argumentative roles of universalist claims should themselves be reexamined in light of teleological perspectives.
3. *Articulate determinist and fixed-feature claims*.—Mitigate illegitimate essentialist causal thinking by framing claims in qualified, contingent, or probabilistic terms. Avoid the ambiguous and vague term "innate." Historically, a posture of biological (especially genetic) determinism has fostered many errors. Hence, deterministic claims about human behavior should meet higher standards of rigor (see also 5 below). Many efforts to naturalize behavior in genetic and evolutionary terms can be easily debunked by applying some now common themes (an error repertoire, or list of common domain-specific error types), such as clarifying levels of causation, challenging untested analogies, not mistaking correlation for causation, denying mere plausibility or hypothesis as concrete proof, disallowing promissory notes on purported "genes for," exposing adaptationist biases, and demanding

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adequate sample size and experimental robustness (e.g., Rose 1997; de Waal 2000). Passing such error probes in prepublication review should become standard in the human sciences.

4. *Probe for and avoid teleology and cryptoteleology*.—Actively monitor for the tendency to transform descriptive statements about human nature into normative ones without proper additional justification. Look for purpose implied (even if not stated) in universalist and determinist claims. Be alert for uncritical adaptationist bias. Recall that, cognitively, cryptoteleology is still teleology and carries normative overtones and connotations.
5. *Apply higher standards of epistemic rigor for claims about human behavior that may be used in normative contexts*.—Recall, first, that the standards of evidence required for claims about human nature are not met by plausibility, nonsystematic evidence (anecdotes or handpicked cases), correlation, or theoretical coherence alone. The strength of empirical evidence required should parallel the cultural significance of the normative claim. Search for any telltale conflict of interest as a form of bias. Following a now familiar social epistemological principle, assess completeness of evidence in part by engaging complementary interpretive perspectives, especially those that might be adversely affected by the normative views (Harding 1991; Solomon 2001). Namely, expose and neutralize partiality with counterpartiality. History reminds us that epistemic checks and balances are especially needed when motivated reasoning about human "nature" may arise from considerations of gender, race, class, and other social dimensions with political overtones.
6. *Clarify normative contexts*.—Keep descriptive and normative claims distinct and clearly identified. The justification for normative claims should be explicit and detailed. Descriptive claims should inform, not indicate any mandated action. Motivational contexts should be candidly announced. When assessing arguments presented by others, one should examine the context of human nature claims for potential "conflicts of interest" or other forms of ideological, political, economic, or religious bias as potential signals of the naturalizing error.

The epistemic concerns thus apply quite broadly. However, different actors have different roles to play. We see major opportunities for corrective regulation at four points. First, and perhaps most important, science communicators, journalists, teachers, and other media "gatekeepers" should use awareness of the naturalizing error to interpret scientific claims about human nature, identify their shortcomings, and report on them in public discourse. Second, scientists and other scholars who are aware of the possible (mis)use of their claims can be more careful, guarded, and circumscribed in their claims. Scientists cannot fully abdicate their professional role as stewards

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of public knowledge. They need to monitor how their claims are portrayed in public media. Third, more deeply, in generating and originally publishing their claims, researchers can be more mindful of the potential errors, the standards of evidence, and the import of their word choice and arguments in broader nonscientific domains. They can seek complementary perspectives in planning empirical investigations and, later, in interpreting the results, toward incorporating epistemic checks throughout the process. Fourth, potential critics can use the principles to be more thorough and articulate in their criticisms—for example, by identifying particular claims as exhibiting the naturalizing error or faulty essentialism, genetic determinism, or teleological assumptions.

We have not aimed to make any original claim about human nature ourselves. However, we have relied on scientific knowledge about human behavior—specifically what we take as reliable understanding about how humans tend to think about teleology, universals, and causation. We trust that this knowledge was developed independently from building normative claims about human nature and outside the shadow of any relevant ideological and political bias. At the very least, we hope that such scientific findings can contribute to a process of noticing and remedying the naturalizing error and improving how we think, individually and collectively, about the human sciences, on the one hand, and our ideals of human flourishing, on the other.

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