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What Is Human Nature (If It Is Anything at All)?

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INTRODUCTION

Talk about human nature, particularly in an evolutionary framework, can get you into trouble with two sets of people: philosophers of biology and anthropologists. In both cases, there is an objection to the essentialism that seems inherent in such a concept. As David Hull (1986) and Michael Ghiselin (1997) famously pointed out, biological species are not natural kinds in the way of chemical elements; that is to say, they are not the sort of things that can possess an intrinsic essence. Hydrogen is hydrogen, for example, because it has the atomic number 1, an intrinsic feature shared by all hydrogen atoms that is always and forever the case (i.e., it possesses a particular micro-structural property that accounts for all of its macro-structural properties, no matter when or where you find it). Species are not like this: they come into being at a particular time and place, they come to an end when they go extinct, and they are made up of populations that can vary in their attributes—attributes that can themselves vary over time. As Hull (1986) puts it, species are individuals, not kinds (see also Sober 1980). It makes no sense to propose some intrinsic, hidden essence or "nature" that can explain why species are the way they are.[1] Although species are real entities, they are also simply analytical conveniences that reflect the ecological spatiotemporal scale at which humans view and understand the world around them.

This kind of objection to talk of "human nature" is often directed at efforts to demarcate the boundary between humans and other species, and identify those features that are supposedly unique to humans. The anti-essentialist argument is used to make the case that any attempt to find the defining "spark of humanity" is futile—there is no such spark, because species cannot be defined or distinguished in that way. Although these arguments obviously have relevance to any evolutionarily oriented approach, I am not concerned with the comparative argument specifically here. Instead, I want to focus on another objection from within evolutionary biology, one that hinges on the way in which

the concept of "human nature" is pressed into service as the opposite of culture, creating a distorted view of both development and evolutionary processes; a view that remains incredibly resilient in the face of all attempts to eradicate it (see, e.g., the interviews with Kevin Laland and Patrick Bateson in Fuentes & Visala 2016). Specifically, I am interested in the extent to which recent attempts to define and describe human nature promote a dichotomous separation of nature from culture (an interesting question given that, as Lévi-Strauss pointed out, the separation of nature from culture is itself a cultural decision), and the tension between viewing humans as members of a single evolutionary species while simultaneously recognizing them as the product of highly particular historical processes.

This brings us to the objections from the social sciences. These rest in part on the way anthropologists of the 19th century used biological differences between human populations to argue for essential differences between peoples, and rank them according to an evolutionary scheme in which they became progressively more "civilized"; an interesting twist on the philosophical objection to essentialism (see, e.g., Marks 2009, 2013 for discussion). Although these ideas are now thoroughly discredited, there is continuing objection to the notion that it is possible to generalize across human populations, because this fails to recognize that they are highly specific products of time and space. There is no "human nature" that escapes the influence of culture, thus any attempt to naturalize humans is seen as incoherent and, what is more, continues to smack of the same kind of biologically rooted essentialism that led to the racist theories of earlier times (Bloch 2005, 2012; Ingold 2006, 2008; see Kronfeldner, Chapter 15 this volume). Even if these concerns can be put aside, there is still a worry that attempts at generalization will not only be inaccurate but also completely illusory, given that the attempt to construct a general view of human life will have been filtered through the culturally specific lens of the anthropologist undertaking the effort. Thus, over the course of the 20th century, there has been a turn away from theorizing about people in general, and anthropology has almost entirely focused on ethnography: its mandate is to carefully and sensitively document diversity and interpret how other people understand their societies and make meaning for themselves within them—to particularize, not generalize (see Bloch 2005 and Ingold 2008 for a discussion of this issue).

The same argument against generalization has been applied to our understanding of the past. In *The Great Cat Massacre*, Robert Darnton's cultural history of 18th-century France, he emphasizes the importance of receiving a good dose of culture shock, one that shakes us out of our false sense of familiarity with the past (Darnton 2009). We need this, he argues, because "nothing is easier than to slip into the comfortable assumption that Europeans thought and felt two centuries ago just as we do today—allowing for the wigs and wooden shoes" (2009: 4). We therefore need to capture the "otherness" of our recent ancestors' ways of thinking, just as ethnographers do in their studies of contemporary humans. As Darnton suggests, the minute you come across a proverb or joke that was once common wisdom, but which now seems utterly bizarre, you have the means to tug at the threads of another way of thinking, and potentially unspool a strange and intriguing world view.

So far, so good. As anyone who had to read Shakespeare at school knows, the jokes are not funny and, as Laura Bohannan details in her classic article "Shakespeare in the bush," the "universal themes" embodied by his plays proved not to be so when she tried

to explain the plot of Hamlet to some Nigerian Tiv elders (Bohannan 1966). Instead, the elders questioned every cultural assumption contained within the plot, leaving Hamlet's motives much more difficult to explain. (Right off the bat, the elders considered Gertrude's marriage to Claudius as the only sensible response to the death of Hamlet's father.) Although Bohannan's piece is intended to demonstrate the dangers of assuming that others will think as we do, it also provides a beautiful illustration of Darnton's point: the Tiv elders were all too willing to "slip into the comfortable assumption" that the antics of Hamlet, Gertrude, and Claudius were explicable in terms of their own cultural traditions. It seems, then, that we continually run the risk of misrepresenting how other people think and feel, and there is no way to come up with a general understanding of what humans are like. If true, this creates a real problem for any evolutionary analysis of human behavior and psychology. If we cannot understand how our contemporaries think, or our ancestors from only 400 years ago, how can we possibly hope to understand how people thought 40,000 years ago, or 400,000?

But is it true? After all, people across the world continue to read and watch Shakespeare: they understand Hamlet's indecision, along with Othello's jealousy and Lady Macbeth's corrosive ambition. Although they questioned Hamlet's way of going about it, the Tiv elders nevertheless understood his desire to avenge his father's death. By the same token, although history can sometimes be opaque, we can and do make sense of past events on their own terms—they are not completely inexplicable to us, and historians are continually on their guard against Whiggish interpretations in which the "triumphs" of the present are pre-figured in the past. Anthropologists and their informants also manage to understand each other and communicate in their everyday interactions, even if their interpretations of precisely what goes on might differ. Surely, then, it is not too far-fetched to suppose that all humans have at least something in common, and that this can transcend both history and place?

HUMANS AS "INTERESTINGLY SIMILAR"

The notion that humans are, in fact, "interestingly similar" (as Edouard Machery puts it (2016: 63)) has driven most of the recent evolutionary theorizing on the nature of human nature. Machery (2008), for example, has developed what he calls a non-essentialist, "nomological," or descriptive concept of human nature. According to this account, human nature just is the set of species-typical attributes that humans tend to possess as a result of evolutionary processes. Thus, being bipedal is part of human nature, as is the capacity to speak, our tendency to startle when we hear an unexpected noise, along with our dependence on culture. Notably, this definition includes traits that we share with other species (i.e., it is not attempting to pick out human uniqueness), and it says nothing about the precise nature of these evolutionary processes; the traits that comprise human nature can be the products of natural selection, genetic drift, byproducts of adaptations, or the outcome of developmental constraints. The nomological account also recognizes that the traits that make up human nature can change over time. Machery therefore likens his concept to a "field guide" for humanity much like those used in ornithology (2008: 323), designed so that "we don't lose track of the shared aspect of human existence" (Machery 2016: 58). In this sense, the nomological concept maps onto views of some prominent

social anthropologists, who have argued similarly that anthropology should be more than just ethnographic description and that some form of "acceptable generalization" is not only possible but necessary (Bloch 2005, 2012; Ingold 2008). In contrast, Tim Lewens has argued against Machery's view on several grounds, most notably because it explicitly excludes traits that are culturally produced or socially learned, thus reinforcing an unhelpful nature–nurture dichotomy, and seemingly denying that learning is itself the product of an evolutionary process (Lewens 2012). As we shall see below, this division between nature and culture is, however, often the precise reason why certain authors defend the human nature concept.

In contrast to this wholly descriptive approach, Richard Samuels (2012) takes Machery's "field guide" position one step further, defending what he calls a "causal essentialist" concept: in this view, human nature is the suite of mechanisms that underpin the species-typical suite of traits identified by the nomological concept. These mechanisms are themselves a species-typical suite of traits (e.g., language production systems) that can explain why similarities and differences are manifest at the surface level (e.g., differences in the languages that are actually spoken). As with Machery, the main aim here is to enable the similarities that exist across all humans to be considered within an evolutionary framework, by showing that these do not automatically fall foul of the "bad" biological essentialism identified by Hull (1986).

By far the most vehement and vociferous defenders of the concept of human nature, however, are members of the Santa Barbara School of Evolutionary Psychology (e.g., Tooby & Cosmides 1990a, 1990b, 2005; Buss 2005; Pinker 2003). (Indeed, the nomological and causal essentialist views within philosophy can be regarded as the "dialing down" of the Santa Barbara human nature concept; see also Samuels 1998, 2000.) The original impetus for an evolutionary concept of human nature was an immense frustration with the anthropological taboo on generalization, and a particular disdain for Clifford Geertz's (1973, 2000) approach to interpreting cultures as texts. John Tooby and Leda Cosmides (1992) therefore set about developing a manifesto for the study of our evolved human nature, as a way to tie the social sciences back to biology. More specifically, their aim was to integrate anthropology and sociology into psychology under the banner of evolutionary theory. To do so, and somewhat ironically perhaps, they imported wholesale Adolf Bastian's notion of the "psychic unity of mankind," one of the few organizing principles of anthropology (i.e., the idea that genetic differences cannot explain the manifest differences in behavior seen across different populations, and that all such differences are cultural in origin). From there, however, they went on to demolish what they referred to as the "Standard Social Science Model" (SSSM) in favor of their own evolutionary "Integrated Causal Model."

THE CUPCAKE MODEL OF MIND

The SSSM was presented as a naïve "Blank Slate" view. Tooby and Cosmides argued that the social sciences (mostly characterized by sociology and anthropology) regarded humans as infinitely malleable, and shaped entirely by culture through a small number of general-purpose learning mechanisms. As this move revealed human nature to have no content, it removed human nature as a legitimate and worthwhile area of study because

there was simply nothing there *to* study: human nature was "an empty vessel, waiting to be filled by social processes" (Tooby & Cosmides 1992: 8). Anthropologists turned to the study of culture alone because of an adamant refusal to accept any biological influences on human behavior. Why study the blank page, as Tooby and Cosmides would have it, when you could study what was written on it? (See also Pinker 2003.)

Whether anyone, anywhere, ever subscribed to this grossly simplistic blank slate view is open to debate,[2] but it served its rhetorical purpose. Tooby and Cosmides (1992) were able to offer a radically different model of a universal human nature, constituted by a large number of highly specialized evolved (psychological) information-processing mechanisms, each of which represented a solution to the set of recurring problems faced by our ancestors. In many of their writings Tooby and Cosmides also mention the innate contents of our psychological mechanisms (Tooby & Cosmides 1990a; Tooby et al. 2005); that is, dedicated stores of knowledge built in by natural selection to help solve problems that would be impossible to achieve through individual learning—for example, the fitness costs of inbreeding with close relatives (see L. Barrett et al. 2014 for an argument against this position). Tooby and Cosmides's (1992) model was, then, an unapologetic argument for an evolved biological core of human traits, with cultural differences seen as the variable output generated in response to variable environmental inputs (which presumably themselves are often cultural, as well as simply climatic or environmental). This was brought out even more prominently in their notion of "evoked culture," with its use of a jukebox metaphor, where environmental inputs select the variant of our evolved psychology that will manifest in a particular setting, much as a single jukebox can play a variety of records.

In this and subsequent work, Tooby and Cosmides took great pains to explain why their view was not deterministic, as well as showing why it neither denied nor constrained the production of behavioral variability (Tooby et al. 2003; Tooby & Cosmides 2005). As they note, all traits result from the interaction of genetic and environmental inputs, and there is nothing in their formulation that denies this. In addition, they have argued that selection has acted on the entire developmental system, and not genes alone, and that each generation thus represents a process of "design reincarnation" whereby the phenotype is constructed through the interaction of genetic and environmental resources (see also H.C. Barrett 2006). While the incorporation of these elements ensures their argument is robust against simplistic accusations of genetic determinism, there remains a clear-cut divide between nature and culture: in their view, culture is not something that penetrates or alters our "human nature" in any fundamental way. Tooby and Cosmides are not alone in this, however, as Peter Richerson (forthcoming) identifies a similar tendency in all modern evolutionary theorizing about human nature; a stance he attributes to a desire to avoid acknowledging the inadequacies of standard evolutionary theory (i.e., the Modern Synthesis) in accounting for human behavior, and a resistance to the idea of an Extended Evolutionary Synthesis.

Another notable aspect of Tooby and Cosmides's formulation is that they seem to leave no room for human agency—cultural artifacts, rituals and beliefs are not the product of human ingenuity or foresight, but simply the manifestation of our evolved nature. Although Tooby and Cosmides concede that some knowledge is transmitted by social processes, they refer to this as "epidemiological culture," where certain ideas are more likely than others to "infect" us and get passed on because they accord with our evolved

psychology, hence psychology shapes culture, but not vice versa (see Sperber 1996 for a more nuanced view relating to ideas of "cultural attraction," along with Morin 2016). More recently, however, Cosmides and Tooby have suggested that humans are also in possession of "improvisational intelligence" (i.e., the ability to come up with solutions to entirely unprecedented evolutionary novel problems), which evolved via the bundling together of a number of evolved functional specializations, and embedding them in a cognitive architecture that has a scope syntax, that is, "an elaborate set of computational adaptations for regulating the interaction of transient and contingent information sets within a multi-modular mind" (2002: 147). As much as culture is deemed "natural" by Tooby and Cosmides, then, both their original model and the more "improvisational" model of the mind resemble a cupcake, with our evolved biological nature as the sponge base onto which the variable icing of culture is plopped. This is why, for example, Steven Pinker, advocating for a universal human nature, is able to argue that "our brains are not wired to cope with anonymous crowds, schooling, written language, governments, police, courts, armies, modern medicine, formal social institutions, high technology and other newcomers to human experience" (2003: 42).

More recent work by H. Clark Barrett builds on Tooby and Cosmides's notion of an evolved human nature by incorporating aspects of developmental systems theory (Griffiths & Gray 1994). In this way, he attempts to deal with the cupcake objection head-on: "there is no evolved part of the mind and then the cultural part added on like icing on a cake; culture and experience percolate throughout. And conversely, evolved mechanisms have to be part of the explanation for mental functioning all the way up" (H.C. Barrett 2014: 261). Barrett then presents an argument in which environmental inputs (culture and experience) lead to functional specializations that are attuned to present circumstances, via the developmental process.[3] The opposition between nature and culture remains, however, because culture is still viewed simply as an input to which our evolved architecture responds during development, and an output generated by an evolved developmental process. Although Barrett argues convincingly that any evolved developmental system is shaped by and incorporates the influence of external environmental resources available to the organism, along with internal genetic and other cellular resources, there is nothing in his argument that incorporates cultural factors in a more thoroughgoing way, that is, as something that can shift or alter the structuring or the components of the developmental system itself. In his terms, "phenotype space" is the visible manifestation of the area of multidimensional "design space" that environmental and genetic resources tap into, but the design space itself remains unchanged.

Thus, as Barrett notes elsewhere (Frankenhuis et al. 2013), the incorporation of developmental systems theory into his theoretical framework is self-confessedly "soft," in that the developmental system remains internal to the organism. As such, it continues to promote a dichotomous account of development, where two classes of resources—genes and "all the rest"—interact to produce the adult phenotype. This is quite unlike the "hard" developmental systems theory (DST) formulation where genes are seen as one resource among many available to the developmental process, and not always as its central drivers (Griffiths & Gray 1994; Griffiths & Stotz 2000); that is, DST moves away from drawing a rigid contrast between genes and environment, instead emphasizing that genetic and environmental resources can often play virtually equivalent roles (a classic example being

phenocopying, whereby similar changes in phenotype can be brought about by changes in the environment or due to mutation—for example, bithorax mutants in *Drosophila* can be induced by ether shocks, in a way that does not involve generating mutations in the genes). Thus, in "hard" DST, the developmental system is no longer internal, but comprises the sum total of resources that go into constructing the phenotype in each generation, which means it includes any and all cultural artifacts and practices, along with the social institutions that shape human life on earth. As a result, the organism plays a more active role, shaping its own environment in ways that can help guide its future evolution. This opens the way for human agency (i.e., the capacity to make choices, and engage in goal-directed activity) to enter into the process, rather than the environment simply evoking a particular kind of response.

Thus, according to this view, cultural artifacts and practices are constitutive of human nature—they literally make us what we are (see below)—and do not act simply as inputs or outputs. Another way to put this is that they serve to actively enlarge the design space, generating more than variations on a single theme, but entirely new modes of thought and behavior. Although Barrett (2014) argues explicitly against an essentialist view of human nature on the grounds proposed by Hull (1986), there remains an essentialist tinge to the idea that cultural (phenotypic) variation is the product of a universal, evolved "design space" in which there is no causal influence that can feedback from cultural practices and so alter the nature of the design space itself. As with Tooby and Cosmides, the view on offer seems to actively promote a particular kind of nature–culture dichotomy, even as it works to undermine it.

Moreover, the very abstract concept of "design space" used by Barrett seems to suffer from the some of the same conceptual problems that are often laid at the door of social anthropologists (see, e.g., Bloch 2005, 2012 for a discussion of this from the latter perspective). That is, it seems to generate a form of idealism that strips humans of the historical and cultural trappings that help make them what they are, in much the same way that structuralist theories focus exclusively on signification and symbolism, removing these away from the particular human activities with which they are associated (although see Bloch 2012 for an interesting discussion of Lévi-Strauss as an evolutionary anthropologist).

This is something that can be seen very clearly in the Evolutionary Psychological-notion of human nature (EPNHN) recently proposed by John Klasios (2016). This incorporates elements of Machery's (2008) and Samuels's (2012) concepts of human nature, with Richard Boyd's (1999) more general ideas concerning homeostatic property clusters,[4] and combines these with Barrett's (2014) developmental systems approach. Although Klasios makes all the right noises about cultural variability, phenotypic plasticity, and the ability to deal with novel environments, it is telling that he goes on to argue that the EPNHN construal will enable us to capture the "truly universal aspects" of our psychological adaptations because "it would peel away the historically-, ecologically-, and culturally-contingent aspects which feed into the open-ended parameters of the adaptation that ultimately generate the tokens and instead reveal the invariant aspects which actually constitute the function of the adaptation" (2016: 110). This view is problematic because it seems to suggest that we can identify a "pure" human nature (a form of Platonic ideal) that is separate from the contingent, messy world in which human beings actually live (see also Bloch 2005; Derksen 2007). Furthermore, it suggests that it

is actually possible to disentangle culture from nature, a suggestion akin to an attempt "to uncook spaghetti" (Peter Richerson, pers. comm.); given that we have been cultural creatures since the emergence of our genus, and that cultural processes have been crucial to our evolutionary trajectory, we cannot now "uncook" the causally entangled genetic and cultural components of human spaghetti, and "somehow recover the separate straight bundles of genes and culture" (Richerson, pers. comm.).

GETTING CULTURE OUT OF THE HEAD

Other evolutionary views of human nature do not fall into the same trap because they incorporate culture more fully into their theoretical framework. Boyd and Richerson's "dual-inheritance" or gene-culture co-evolutionary theory (Boyd & Richerson 1985; Richerson & Boyd 2005), for example, along with subsequent work by Joseph Henrich (2015), states that behavior is a result of both genetic and cultural influences, and incorporates both genes and culture as distinct but intertwined inheritance systems. Dual inheritance theories also conceive of a universal set of psychological adaptations but, in this case, they comprise a small suite of specialized social learning mechanisms that make cultural evolution possible. Hence, these views do not argue for the same level of functional specialization as current thinking in evolutionary psychology.

According to Maarten Derksen (2007), however, the dual inheritance approach encounters a similar problem to classic evolutionary psychology. Derksen locates this in the way that culture is defined solely as social information (knowledge, beliefs, values) transmitted between individuals via teaching and imitation. As a result, although biology is influenced by culture and culture influences our biology, Derksen argues that it does so via a mind that acts simply as conduit between the two. Although the characteristics of this "channel" modify the mutual influence of genes and culture on each other, Derksen notes that this formulation grants humans only a very limited amount of individual agency. To this, I would add that perhaps it is not agency so much as a lack of the reflexivity that is typical of human engagement; that is, the way that our knowledge about ourselves serves to alter the manner in which we think, act, and construct our identities (Hacking 1995; Brinkmann 2004). It may also be the case that human agency is over-rated, and human choices are more constrained than we realize. In addition, formal modeling inevitably requires a number of simplifying assumptions in order to be tractable, and does not aim at capturing the full complexity of a given system. Derksen's criticism, although valid at one level, may also misunderstand the aim of gene-cultural co-evolutionary modeling, which is to appreciate how cultural processes give rise to new evolutionary dynamics. Finally, Derksen also seems to underestimate the extent to which Boyd and Richerson (1985, 2005) have modeled various bias forces (e.g., guided variation, context and content biases) in order to reflect human choice-making processes.

Having said this, there are some gene-culture co-evolutionists who sometimes seem to favor a position similar to the more hard-core evolutionary psychologists. Henrich (2015), for example, identifies a key set of evolved social learning mechanisms that generate the capacity for culture (and hence give rise to our "cultural nature"), which he links

to other "innate" psychological tendencies. For example, among other things, Henrich suggests that "marriage norms found in most societies—for better or worse—operate to reinforce our otherwise flimsy pair-bonding instincts" (2015: 150), that "stripped of our social norms and beliefs, we aren't nearly as cooperative and cultural as we might seem" (154), and that "there is reason to suspect that we humans have an innate susceptibility to picking up meat aversions" (158). Such a view, perhaps inadvertently, suggests that it remains possible to divide up human tendencies into those that are biological (genetic) and those that are cultural, despite the overarching notion of genes and culture as deeply intertwined, and exerting complex forms of feedback on each other. As we have seen, for evolutionary psychologists, this is unproblematic. For social and cultural anthropologists, however, it is precisely this demarcation of genetic from cultural resources that continues to provoke their ire. Tim Ingold (2007), for example, considers all human behaviors to be as biological as each other—whether this be learning to walk or learning to play the cello—because both emerge as a result of a developmental process that takes place in a rich, supporting environment. He therefore argues against gene-culture co-evolutionary theory because, in his view, it continues to treat culture as some form of "add-on" to an evolved biological substrate. Ingold (2013) also disputes the idea that humans possess a general "capacity for culture" that somehow exists in advance of the diverse social practices that come to fill it. As he sees it, such theorizing is simply an attempt to prop up a fatally flawed neo-Darwinian approach that cannot account for the complexities of human lifeways. Ironically, given that he is firmly in the gene-culture co-evolution camp, Richerson (forthcoming) identifies the very same problem in many modern evolutionary views of human nature: specifically, his claim is that they contain a "Modern Synthesis fundamentalism" that insists on characterizing "human nature" as those abilities that are not penetrated or changed by culture, thus allowing the standard evolutionary model to persist unchallenged. (Richerson's brand of gene-culture co-evolution escapes this criticism precisely because it recognizes and models cultural evolutionary effects.) There is, then, more common ground between some gene-culture co-evolutionary theorists and social anthropologists than first appearances would suggest. This is tempered by the fact that, Ingold, no doubt, would continue to revile the recognition of culture as a separate evolving system, while Richerson would question the idea that one can meld genes with culture as seamlessly as Ingold suggests, given the greater conservatism of genes compared to the social and cultural practices. Richerson, and other gene-culture co-evolutionists would also maintain that psychological traits related to social learning and teaching are independent of the cultural practices they enable.

Another point of difference between Ingold (along with other social anthropologists) and gene-culture co-evolutionists is that, until very recently, the latter have worked with a purely psychological definition of culture (i.e., culture as information in the head) that excludes material artifacts and behavior from consideration (i.e., aspects of our embodied experience of the world). In this view, tools and other artifacts are considered to be the products of culture, but not potential producers, shapers, or even constituents of human cultural and psychological processes. That is, although cultural processes enable and sustain the manufacture of material artifacts, the artifacts themselves have not been considered "psychologically," that is, to partly constitute human cognitive systems (e.g., Malafouris 2013). There is recent evidence to suggest, however, that this view is being

reconsidered. Henrich, for example, describes how the use of an abacus "provides a mental prosthesis that, by harnessing aspects of our visual memory, can deliver mental powers that seem almost unimaginable to those unfamiliar with this simple but elegant tool" (2015: 230). What remains unclear is the extent to which these "mental powers" are seen as the plastic, flexible manifestations of an evolved psychology attuned to pick up various kinds of cultural information and social practices, or are viewed as being transformative of human cognition itself (i.e., as generating entirely new kinds of minds). That is, to what extent might there be cumulative ratchet-like effects on human cognitive functioning, as a consequence of incorporating external tools and resources into our cognitive system (e.g., ideas relating to the "extended mind": Clark 2004, 2008; Menary 2010; see also Malafouris 2013) in the same way that we see cumulative ratchet effects on other forms of material culture?

Arguing along somewhat similar, although more classically psychological, lines, Cecilia Heyes (2012) has called into question the idea that humans have evolved highly specific social learning mechanisms as adaptations for functioning in cultural groups, suggesting instead that these are themselves the outcome of cultural learning processes. That is, she questions the idea that we possess biologically inherited "mills" (the processes that allow us to learn from others), which enable us to inherit culturally the "grist" of our lives (the knowledge and know-how needed to deal with the world). In contrast, she argues that both grist *and* mills are culturally inherited: our social learning mechanisms are cultural adaptations, not evolved functional specializations. Using the example of imitation, Heyes argues that a combination of perceptual biases and "asocial" general learning mechanisms can result in abilities equivalent to the specialized social-learning adaptations proposed by gene-culture co-evolution theorists, and argues that this provides an added advantage of greater built-in flexibility to respond to changing circumstances.

Similarly, Daniel Hutto's (2008) theory of narrative practice argues that Western folk psychology—the way we make sense of others by attributing private and invisible mental states—is a product of the stories we are read and taught as children: we talk about minds in a particular way as a result of this particular kind of social participation (an idea first expressed by Bruner 1990). In this account, the hidden, private, internal mind that we take as biologically given (and which is treated as a distinct modular adaptation by evolutionary psychologists) is a sociocultural construction generated by the social, public process of "minding" (see Heyes & Frith 2014 for a similar argument). For Hutto (2008), as for B.F. Skinner (1957, 1976) before him, "mind" is simply a way that we have learned to speak about our actions in the world as part of our cultural heritage. Heyes's and Hutto's ideas, although theoretically speculative at present, make a strong case for more serious consideration of how various sociocultural practices must be folded into, and considered as constitutive of, human cognition, and not merely causally related to it.

It is also important to note that these views do not deny a role for the evolved nature of the human brain. Instead, they emphasize mutual enhancement and integration: the nature of the human brain is instrumental in the process of creating minds (and thus we should not expect to find chimpanzees to be capable of developing fully human-like minds, even with appropriate social and cultural scaffolding), but minds cannot be reduced to brain function alone. In addition, other aspects of our embodiment may contribute crucially to our cognitive success, by affecting to our ability to construct and use

material artifacts; our hands are obvious examples here, and have been considered as "organs of the mind" (Zdravko 2013).

COGNITIVELY INTEGRATED CULTURAL PRACTICES

The idea that human cognitive systems (or, if you prefer, minds) are not limited to brains alone but incorporate various environmental resources and tools—that is, the notion of "cognitive integration" (Menary 2010) or the "extended mind" (Clark 2008)—seems crucial to the generation of a satisfactory evolutionary account of human behavior, not least because there is abundant evidence to suggest that the invention of certain artifacts and practices has transformed our understanding of ourselves and the world around us. That is, we come to think both through and with objects, and we can document how human thought has changed in profound ways, across both evolutionary and historical time, through the invention and use of technologies of various kinds. Lambros Malafouris, for example, argues that human ideals of bilateral symmetry with respect to hand-axe manufacture may have been the product of stone hand-axe production, rather than a reflection of the prior intentions of the knapper about how an axe should look—that is, the stones themselves help shape knappers' choices by presenting suitable striking surfaces. Notions of intentionality thus cut across the standard categories of the internal mind and its external products. Instead, it is the "directed action of stone knapping . . . [that] brings forth the knapper's intention" (Malafouris 2010: 17; see also Malafouris 2008; Clark 2010).

In a similar but perhaps less radical vein, Kevin Laland et al. (2000) have made a convincing case that human evolutionary history should be viewed as a process of (ongoing) niche construction: the world to which humans have adapted over evolutionary time has been largely one of our own making. We are, as Kim Sterelny argues, "creatures of feedback" (2012: 75). Indeed, for Sterelny, "human nature" lies precisely in the uniqueness of the feedback mechanisms that connect, among other things, the cultural environments we construct and inhabit, human social learning, individual expertise, and human life history processes. As he notes: "Human brains are *developmentally* plastic, so transforming hominid developmental environments transformed hominid brains themselves. As hominids made their own worlds, they indirectly made themselves" (Sterelny 2003: 17). Here, then, human behavior and material culture act as selection pressures on human brains and bodies, and do not simply represent their proximate products, or the "novel" inputs to which our evolved human natures must respond.

Karola Stotz (2010) has recently combined these ideas, and incorporated them with developmental systems theory, to generate the concept of the "ontogenetic niche" (an idea first proposed by West & King 1987). This can be viewed as the suite of resources, both genetic and extra-genetic, that is vital to the reproduction of a life style. The use of the word "niche" brings in both the way of life of the organism and the environment in which the young are raised. The key claim here is that human nature does not lie in the possession of particular kinds of traits, but is instead represented by a particular kind of developmental process: young humans are born into a niche that has been "epistemically engineered" for them in various ways (i.e., there are various "non-neural structures

[that] are used to transform the shape of the problem-solving activity required of individual brains" (Wheeler & Clark 2008: 3565)). Past generations thus structure and scaffold the developmental context of those that succeed them, providing resources that are essential to the production of species-typical behavior. In addition, past generations provide ever more sophisticated forms of cognitive scaffolding that itself augments the scaffolding that previous generations bequeathed to them, and by this means they enhance what can be achieved by future generations (Griffiths & Gray 1994; Sterelny 2012). This process therefore gives rise to adults who possess commonalities with their parents (due to a similar developmental process), but who will also differ from them (often quite dramatically at times) due to changes in the suite of resources comprising its ontogenetic niche.

My colleagues and I have argued for something similar, using Derksen's (2005, 2007) notion of human nature as a process of "cultivation" over both evolutionary and historical time (L. Barrett et al. 2014). The ongoing construction of developmental niches, and the flexible response to them, also means we come to a different picture of the ultimate source and cause of human behavior as public shared phenomena, rather than simply as private knowledge and beliefs residing inside individual heads (L. Barrett et al. 2014); that is, cultural phenomena simultaneously exist as both shared social practices and as individual knowledge, and forcing a distinction between these two (as evolutionary psychological theorizing does, with its commitment to a strongly individualistic adaptationist stance based on the Modern Synthesis) is as false as the opposition between nature and culture (see also Boyd et al. 2011, for allied criticism of this strongly individual cognitivist stance). It also suggests that we need to take seriously Ian Hacking's (1995) "dynamic nominalism" or "looping effect"—the idea that our practices of labeling and naming interact with the things so named. More specifically, the idea is that, in describing ourselves psychologically, we are able to react to these self-descriptions in ways that generate or change the kinds of people that we are (Sugarman 2009); the developmental niche concept can no doubt be extended to include this process also.

Finally, it suggests that ideas of evolutionary "mismatches" of the kind identified by Pinker (2003) are misplaced. Such arguments imply that, having achieved perfectly optimal solutions to life's problems during our ancestral past, we have now fallen from this adaptive peak as a consequence of recent cultural evolutionary processes. Instead, as Boyd and Richerson (1985; Richerson & Boyd 2005) have detailed, a certain proportion of maladaptive behavior is the price we pay for learning socially, cumulatively, and culturally, and this is something that characterizes the entire history of our species; it is not a recent manifestation generated by rapid cultural change that leaves our "stone age minds" out of kilter with the modern world.

All of this means that, as Michael Wheeler and Andy Clark put it: "A child whose early experience is shaped by the special environments provided by books and software programs, and whose own emerging cognitive profile favors certain elements within that culturally enabled nexus over other elements, will end up with a cognitive system that is not just superficially, but profoundly different from that of a differently encultured child" (2008: 3572)—and this is especially true if we recognize that the cognitive system includes the extra-neural body as well as the brain, where aspects of

nutrition and exercise can exert equally powerful effects on both. Put more broadly, this "neuroconstructivist" perspective (e.g., Sporns 2007) suggests that what characterizes human psychology is not some specific suite of traits acquired over the course of our evolution, but the ability to enter into "deep, complex and ultimately architecture-determining relationships with an open-ended variety of culturally transmitted practices, endowments and non-biological constructs, props and aids" (Wheeler & Clark 2008: 3572). Material culture can thus transform, enhance, and augment human cognitive functioning, and cultural practices are therefore both cause and consequence of our psychological and cultural variability (L. Barrett 2011; L. Barrett et al. 2014; Malafouris 2008, 2010, 2013). This results in a self-transforming, "snowballing/bootstrapping" extended cognitive architecture "whose constancy lies mainly in its continual openness to change" (Wheeler & Clark 2008: 3572). At present, some of the most prominent evolutionary theorizing about the human mind and nature leaves out the more material, embodied aspects of human cognitive life by treating culture as a mode of thought, rather than a means of active bodily engagement with the world. By contrast, a more relational, embodied view regards social and material practices to form a central element in understanding why humans think and act in the ways that we do; one that can help form a bridge between the social and natural sciences, without eradicating or denying the relevance of either one.

CONCLUSION

Human nature, if it is anything at all, is an ongoing and historically contingent process: we are constantly being transformed and adapted over the course of our individual development, as well as over historical and evolutionary time, by the inclusion of various psychological tools and material culture into our daily lives. As we take on the social practices that give rise to new psychological tools, so we take on the entire history of our culture. In this way, human lives become variable across space and time, and do not conform to any "universal" human nature. This process can explain why we are different psychological creatures to the peoples of 400, 40,000 and 400,000 years ago, while people 4000 years hence will be very different psychological creatures to us. Yet, this shared evolutionary and historical ancestry—this taking on of our cultural history—also links us together across time and space, allowing us to recognize and sustain some form of common humanity. Our lives are an entanglement of our biological bodies and brains with the cultural practices and contingent historical events to which they help give rise. The "universality" of human minds therefore inheres in the processes by which they are created and maintained: through social interaction, within a rich cultural milieu.

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NOTES

1. Although it should be noted that Hull did endorse the notion of some form of human nature, stating that "If by 'human nature' all one means is a trait which happens to be prevalent and important for the moment, then human nature surely exists" (Hull 1986: 9).
2. Tooby and Cosmides concede that even Geertz did not subscribe to the blank slate, although they do insist he was wedded to the idea of the mind as a "general purpose computer," which in their view is just as bad.
3. Notably, many aspects of Barrett's reconceptualization of classic evolutionary psychological theory bear a strong resemblance to Karmiloff-Smith's (1984) classic argument for progressive modularization across development, which seems to undercut the claim that evolutionary psychology promises a new and revolutionary approach to understanding the human mind.
4. The homeostatic property cluster view suggests that natural kinds are a consequence of shared causal mechanisms rather than shared essences. That is, a kind is composed of a cluster of properties shared by a group of entities, along with a causal mechanism that accounts for why these shared properties should co-occur. It should be apparent that Samuels's account of human nature is very close to this.

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