# Science and Human Nature

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There is a puzzling tension in contemporary scientific attitudes towards human nature. On the one hand, evolutionary biologists correctly maintain that the traditional essentialist conception of human nature is untenable; and moreover that this is *obviously* so in the light of quite general and exceedingly well-known evolutionary considerations.[1] On this view, talk of human nature is just an expression of pre-Darwinian superstition.[2] On the other hand, talk of human nature abounds in certain regions of the sciences, especially in linguistics, psychology and cognitive science. Further, it is very frequently most common amongst those cognitive-behavioral scientists who should be most familiar with the sorts of facts that putatively undermine the very notion of human nature: sociobiologists, evolutionary psychologists, and more generally, theorists working on the evolution of mind and culture.

Faced with such a tension, three main kinds of response come readily to mind. A first possibility would be to charge one party with ignorance or idiocy. Perhaps students of human behavior and cognition are, for example, just too stupid or ignorant to recognize the implications of well known, general facts about evolution. But this is highly implausible – not to mention uncharitable. Whatever else is going on here, the problem is surely not one of silliness. A second possible response would be to adopt a deflationary attitude towards talk of human nature. Perhaps all talk of human nature is mere rhetorical flourish – just filigree to decorate more sober views. No doubt there is something to this. Talk of human nature sounds grand and exciting, and connects one's views to historically deep and influential intellectual traditions. But it's hard to believe that this is the whole story. For it makes little sense of the fact that people *argue* for the existence of human nature,[3] or propose that a

[1] D. Hull, 'On human nature', *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* **2** (1986), 3–13.

[2] M. T. Ghiselin, *Metaphysics and the origins of species* (Albany: State University of New York Press, 1997).

[3] See, for example, E.O. Wilson, *On Human Nature* (Cambridge MA: Harvard University Press, 1979); J. Tooby & L. Cosmides, 'On the universality of human nature and the uniqueness of the individual: The role of

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central *goal* of science should be to develop a theory of human nature.[4]

This brings us to the third option. Perhaps the notion of human nature at play within the cognitive and behavioral sciences is not the traditional essentialist one targeted by evolutionary critiques, but some more sensible alternative – or *replacement* – notion. This is, I maintain, the most plausible option. Yet if this is what's going on, then it is not at all obvious what the relevant notion of human nature is supposed to be. With this in mind, the overarching issue that I address here is: What could contemporary cognitive and behavioral scientists *sensibly* have in mind when they make claims about human nature? More precisely, I focus on a three subsidiary issues:

1) What notion of human nature is implicit in the practices of cognitive science? (Roughly equivalently: What sort of phenomena do cognitive scientists purport to characterize when providing a theory of human nature?)
2) Does this notion of human nature evade the standard biological objections to traditional human nature essentialism?
3) Is the notion of human nature that figures in the cognitive and behavioral sciences sufficiently similar to the traditional one to merit the honorific 'human nature'? In particular, does it play an appropriately large number of the theoretical roles traditionally played by the notion of human nature?

If the answer to 1) yields affirmative answers to both 2) and 3), then we have a *prima facie* attractive replacement notion of human nature. And as luck would have it, there is such a notion. Or so I will argue.

It would perhaps be useful to summarize my responses to these questions. Indeed it might be useful to do so twice over: once with an eye to the content of the claims that I make, and once with an eye to the history of the notion of human nature. First, the non-historical summary: With regard to the first of the above questions, I defend a version of what might be called *causal essentialism* about human nature – roughly, human nature is a suite of mechanisms that underlie the manifestation of species-typical cognitive and

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genetics and adaptation', *Journal of Personality*, **58** (1990) 17–67; and S. Pinker, *The Blank Slate: The Modern Denial of Human Nature*. (New York: Viking, 2002).

[4] See, for example, N. Chomsky 'Human Nature: Justice vs. Power'. In N. Chomsky & M. Foucault *The Chomsky-Foucault Debate On Human Nature* (New York: New Press, 1971, 1–67).



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behavioral regularities. In response to 2), I argue that this causal essentialist conception of human nature does not succumb to the evolutionary critique; and in response to 3) I argue that it does much – though not all – of the work traditionally expected of the notion of human nature. But, I argue further that it is implausible to suppose that anything could perform all the roles traditionally expected of human nature.

Now for the more historical summary: The connection between a science of the mind and human nature is not a novel one. Rather cognitive scientific interest in human nature is an extension of the intellectual tradition that runs through David Hume. Hume was, of course, amongst the more influential, pre-Darwinian advocates of a science of the human mind; and for Hume, the science of the mind *just was* the science of human nature: an empirical discipline that sought to identify the principles and mechanisms responsible for human psychological phenomena. Though Hume was never very explicit regarding what precisely he meant by 'human nature', the notion played various theoretical roles in his research. Moreover, these roles differed in important respects from the one assumed by contemporary, evolutionary critiques of human nature. Specifically, Hume never assumed that the notion of human nature played the taxonomic function in defining what it is to be human. The working hypothesis of the present paper is that contemporary cognitive scientists are, at least in this regard, the intellectual descendants of Hume. Though most disagree – often vehemently – with the details of Hume's own theory of the mind, they readily accept his characterization of the goals of the science of the mind; and so construed, the Humean notion of human nature comes along for the theoretical ride.

Here's the game plan. In section 1, I sketch some of the central theoretical roles that the notion of human nature has traditionally been intended to play. In section 2, I briefly rehearse the standard biological objections to the traditional essentialist conception of human nature. In section 3, I discuss one proposed reconfiguration of the notion of human nature: Edouard Machery's nomological conception of human nature. Though this conception fairs quite well in capturing many of the traditional theoretical roles of human nature, there are some central roles that it will not readily play. Specifically, it will not play the traditional taxonomic and causal-explanatory roles of human nature. In view of this, in section 4, I defend an alternative *casual essentialist* conception of human nature. If we are looking for a conception of human nature that accommodates the maximal number of traditional theoretical



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functions and yet remains compatible with the evolutionary facts, then this view is preferable. Or so I maintain. In section 5, I conclude by addressing an objection to the proposal, and by spelling out the Humean character of contemporary notions of human nature.

## 1. The Theoretical Roles of Human Nature

In order to address the above issues, we need first to get clearer on the various theoretical roles that human nature – and theories thereof – have traditionally been intended to play within scientific enterprises.[5]

### *1.1 Organizing Role*

A first major theoretical function for human nature is organizational in character. It is to delimit an area of scientific enquiry, and moreover, to do so by specifying a distinctive *object* of empirical enquiry. In short: some regions of science are to be demarcated, at least in part, by the fact that they are concerned with human nature.

Hume's philosophy nicely illustrates this function. In setting out the project of his *Treatise*, Hume makes quite clear that human nature is to comprise a distinctive object of enquiry for his new science of Man; and though Hume maintained that *all* the sciences were to some degree related to aspects of human nature, what made the science of Man distinctive was that it, and it alone, had human nature *per se* as its object.[6] The *goal* of this fledgling enquiry was to provide an account of human nature. Moreover, the methods for attaining this end were for Hume resolutely empirical in character. Thus on Hume's view, human nature was an empirically discoverable phenomenon – a part of nature in much the same way as animals, plants and planets are.

It seems that this Humean attitude towards human nature is very much in evidence today. If one surveys the writings of theoretically oriented cognitive scientists, one finds much the same sentiment. Thus, for example, Chomsky asks whether

[5] Though human nature has often been expected to play a central role in moral theory, I will discuss this here. The main reason for this is that I am concerned with the status of human nature in the sciences; and in such contexts, little or no moral work is expected of human nature.

[6] D. Hume, *A Treatise of Human Nature* edited by L. A. Selby-Bigge, 2nd ed. revised by P.H. Nidditch (Oxford: Clarendon Press, 1975).



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> [T]he concept of human nature …might not provide for biology the next peak to try to scale, after having…already answered to the satisfaction of some the question of what is life.[7]

For Chomsky, then, as for Hume, the concept of human nature is to play an organizing role in the sciences: to pick out – albeit in rough-and-ready fashion – a set of phenomena that will form a focus of empirical enquiry for some region of science.

### *1.2 Descriptive functions*

A second role that theories of human nature have traditionally been taken to play is a descriptive one. They are supposed to characterize *what human beings are like*. Historically, this has often been taken to involve describing properties that are presumed to be unique to human beings, and moreover, universally possessed by us. On such a view, a fondness for cooking Beef Wellington, though unique to humans, would not be an aspect of human nature since it is not a universal characteristic. Conversely, possessing lungs, though universal, would not count as an aspect of human nature since many non-human organisms also possess lungs. On the traditional view, then, the task of saying what human beings are like becomes the task of specifying a set of properties possessed by all and only humans. As we will see in section 2, this characterization of human nature's descriptive function will require modification. But for now, let it stand.

### *1.3 Causal explanatory functions*

A third central function of human nature is causal-explanatory. Human nature – and theories thereof – are supposed to contribute to the *causal explanation* of reliably occurring features of humanity. So, for example, if the capacity for language-use is a reliably occurring feature of human beings, then aspects of human nature will be expected to figure in the causal explanation of the fact that we exhibit this capacity.

As we will see later on, there are different ways in which human nature might contribute to the causal explanation of species-typical regularities. But on the standard conception of natures – one variously associated with Aristotle, Locke and others – it is assumed that human nature is, in some sense, an underlying – 'hidden' or

[7] Op. cit. note 4.



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unobservable – entity that explains more readily observable, reliably occurring features of human beings.[8] That is, the fact that humans have the same nature is supposed to contribute to the causal explanation of generalizations that hold amongst human beings.

### *1.4 Taxonomic function*

A fourth function that is commonly attributed to human nature is a taxonomic one. A theory of human nature should specify *what it is* for something to be a human being. That is, it should provide necessary and sufficient conditions for kind membership. On this view, widely regarded as deriving from Aristotelian philosophy,[9] human nature is in some sense *definitional* of kind membership, and as such, has a certain modal status. It is not merely that, as a matter of fact, all and only humans possess a human nature. Rather, for something to be a human being, it *must* as a matter of metaphysical necessity possess a human nature.

### *1.5 Invariances*

The fifth and final assumption about the role of human nature that I discuss here is that it is supposed to set limits on human flexibility. That is, human nature is presumed to be, in some sense, *hard to change*. This idea is not readily articulated with precision; and clearly takes a variety of forms. On the strongest reading of this idea, aspects of human nature are supposed to be *impossible* to change.[10] But something weaker is often intended. Perhaps human

[8] Louise M. Antony, '"Human Nature" and Its Role in Feminist Theory' In Janet A. Kourany (ed.) *Philosophy in a Feminist Voice: Critiques and Reconstructions*, (Princeton: Princeton University Press, 1998, 63–91).

[9] Op. cit. note 8.

[10] Two points are in order. First, the precise modal status of such impossibility claims is unclear – e.g. whether they are supposed to be expressions of nomological, metaphysical or logical impossibility. Second, however else the claim is intended, it is clearly distinct from the idea that human nature is definitional of being human. The mere fact that one's membership of a kind is defined by one's nature does not imply that one's nature is hard to change. It just means that if one's nature changes, then so too does one's kind membership (and vice versa).



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nature can be changed; but it is hard to do so, and when done tends incur costs – e.g. slow, laborious efforts, curtailment of freedom, or social disruption.

## 2. Traditional Human Nature Essentialism

As already noted, the notion of human nature is closely intertwined with the idea that human beings share a common essence. Indeed, if human nature were a shared essence, then it would play the previously enumerated roles. But the idea that we share a common essence – at least in the traditional sense – is untenable, and for very familiar reasons. In what follows I briefly rehearse the view and its central problems. The lessons to be learned from this will help guide us in identifying a replacement notion.

### *2.1 The View*

Essentialism about human nature is not an isolated thesis, but an instance of other more general forms of essentialism that are familiar from metaphysics and from the philosophy of science. Perhaps the most general thesis that is relevant here is what is sometimes called *kind essentialism*. This is primarily a thesis about what it is for something to be a genuine or *natural* kind as opposed to, say, a merely arbitrary class of entities. On one very typical rendition, kind essentialists maintain the following.

K is a natural kind if and only if:

*E1*. All and only the members of a kind share a common essence.
*E2*. The essence is a property, or a set of properties, that all (and only) the members of a kind *must* have.
*E3*. The properties that comprise a kind's essence are intrinsic properties.
*E4*. A kind's essence causes the other properties associated with that kind.[11]

Some philosophers of science argue that this conception of natural kinds applies to certain regions of science. For instance, Brian Ellis has argued that chemical kinds plausibly satisfy the above

[11] M. Ereshefsky 'Natural kinds in biology' In E. Craig (ed.) *Routledge Encyclopedia of Philosophy* (New York: Routledge, 2009).



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conditions.[12] For example, perhaps having the atomic number 30 is the essence of zinc in precisely the above sense. But the particular variant of kind essentialism most relevant to the present discussion is not essentialism about chemical kinds, but about *species*. To be an essentialist about species is to maintain that for each species, there is an essence or nature that satisfies conditions E1–E4. Essentialism about human nature is just an instance of this thesis. Thus, to endorse a traditional essentialist view of human nature is to maintain that humans have an essence or a nature: that all and only human beings possess a set of intrinsic properties that define membership of the kind and cause other properties reliably associated with the kind.

Notice that *if* essentialism about human beings were true, then human nature could play its traditional theoretical roles. According to traditional essentialism, essences are definitive of kind membership and figure in causal explanation of properties associated with the kind. Further, a theory of such a nature would obviously need to describe unique, universal characteristics of human beings; and if there were such natures, then plausibly they could be objects for scientific enquiry, in much the same way as the 'essence' of zinc and other chemical elements are. The problem is that we are excellent reasons to suppose that traditional essentialism about species – and about human nature, in particular – is false.

### *2.2 Two Objections from Biology*

The main difficulties with traditional species essentialism are exceedingly well known; so I won't make heavy weather of them here. (For more detailed elaborations, see Hull, 1986; Ghiselin, 1997.) They can be divided into two, related objections.

#### *2.2.1 The Descriptive Objection*

The first targets the traditional descriptive function of human nature. As a matter of empirical fact, it seems highly unlikely that we will succeed in identifying many, unique universal properties of humanity (still less ones that are intrinsic and causally central). First, it seems that to the extent that there are properties possessed by *all*

[12] B. Ellis, 'Essentialism and Natural Kinds'. In S. Psillos & M. Curd (Eds.) *The Routledge Companion to Philosophy of Science* (New York: Routledge, 2008, 139–148).



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human beings, they are shared by non-human organisms as well. Second, though there are a great many properties that are unique to humans, they almost invariably fail to be universal. This is plausibly true for many of the characteristics that have historically been proposed as aspects of human nature – e.g. the capacity for language, for moral judgment and for rational foresight. Such characteristics are in some sense species-typical; but they clearly admit of exceptions.[13] In which case, it would seem that if a theory of human nature is supposed to describe unique, universal properties, then there is little or nothing for it to describe.

### *2.2.2 A Moral*

In addition to providing a reason to reject the traditional human nature essentialism, the above consideration also yields a moral for how best to construe the descriptive function of a theory of human nature. By broad acknowledgment, a theory of human nature is supposed to describe *what humans are like*. For traditional essentialists, this seems to consist in specifying unique, universal characteristics. But if the above objection is correct, then we ought not to expect a theory of human nature to do this. In which case, the task of describing what we are like needs to be glossed in some alternative way.

How? One alternative that I find attractive is this: We should think of a theory of human nature as, amongst other things, providing a kind of *field guide* to humanity.[14] To a first approximation, field guides function to describe what some species of organism *is like*. Moreover, they do so in such a way as to render kinds members readily identifiable; and this amongst other things involves describing typical (and readily observable) morphological and behavioral features. But they don't achieve this end by describing unique, universal characteristics. On the contrary, they seldom contain such descriptions. Instead they make reference to characteristics not possessed by other species, but that are hardly ever strictly universal. Moreover, they contain descriptions of lots of typical features that are not unique to that species. No doubt a theory of human nature should not be oriented so much towards the goal of identification; and nor (for this reason) need it focus on describing features that

[13] Of course, there are a *huge* number of characteristics that are unique to humans that no-one thinks are aspects of human nature because they are socio-historically local. Playing for the Dallas Cowboys, scoring an 800 on one's GRE's, or having a fondness for cooking Chateau Briand are characteristics of this sort.

[14] This idea was suggested in discussion with Paul Griffiths.



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are readily observable. So, a theory of human nature should differ from typical field guides in being theoretically deeper: less concerned with superficial, readily observable regularities. Nevertheless, in describing what we are like, a theory of human nature should capture aspects of human beings that are in some sense species-typical as opposed to unique and universal.[15]

*2.2.3 The Taxonomic Objection*

The second, and perhaps more serious problem for traditional species essentialism focuses on the presumed taxonomic function of essences or natures. It can be framed as a tension between the assumption that kinds are individuated by their causally relevant, intrinsic properties, and the assumption that species are individuated at least in part by genealogical relations: roughly, by their locations on phylogenetic trees. This second assumption is deeply entrenched in contemporary biological theory. Yet species essentialism of the sort outline above violates this assumption in at least two ways. First, if species essentialism were true, it would be possible for organisms to be members of the same species and yet genealogically unrelated.[16] Yet this is incompatible with the genealogical assumption about species individuation, and so flies in the face of how evolutionary biologists individuate species. Second, if species are individuated genealogically, it is possible for two organisms to vary enormously in both genetic and phenotypic properties, and yet be members of the same species because they bear the appropriate genealogical relations to each other. Suppose for example, that humans evolve dramatically – undergo massive phenotypic and genetic modification. By genealogical criteria, human beings now and them could be members of the same species. Not so, on the essentialist picture.

[15] Recently Griffiths has stressed the importance of regularities that do not concern *similarities* between conspecifics but reliably occurring *differences* – e.g. sexual dimorphisms, and systematic behavioral or morphological variation that is a function of, say, climate. Though I see no serious problem with accommodating such regularities into an account of human nature, for the sake of simplicity, I will not to focus on them here.

[16] Imagine an atom-for-atom duplicate of President Obama that inhabits a planet far, far away. If species essentialism were true, then this Twin Obama must be a human being since it is intrinsically indistinguishable from Obama. Moreover, this would be so even if Twin Obama were entirely genealogically unrelated to Obama and other humans.



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### *2.3 The Austerity Objection*

There is another, rather different problem with traditional essentialism about human nature. Though human nature essentialism is an instance of species essentialism, it is also an instance of a more generic essentialism about natural kinds. Yet this conception of natural kinds is highly problematic; and once one sees that this is so, it is utterly unclear why one should suppose that traditional essences should be at all important to the task of understanding human beings – or any other natural kind, for that matter.

#### *2.3.1 The Objection*

The notion of a natural kind has had a notoriously checkered intellectual history; and for much of the twentieth century was considered little more than an artifact of an ancient and outmoded metaphysics. But in recent decades, the notion has regained some philosophical respectability, in large measure because it has proven useful in understanding some central aspects of contemporary scientific practice.[17] Most importantly, all sciences mark a distinction between a) those kinds that are objects of systematic enquiry, and over which inductive generalizations and causal explanations range; and b) kinds that are not apt to play these roles.[18] The notion of a natural kind appears to capture just such a distinction; and it is largely for this reason that it has regained an air of respectability. In view of this, if one's theory of natural kinds fails to capture this distinction, then it fails to satisfy a central desideratum for such a theory.

Now a major problem with traditional kind essentialism – i.e. a theory that endorses E1–E4 – is that it is manifestly too *restrictive* to permit the notion of a natural kind to capture the above distinction between scientifically 'respectable' kinds and the rest. Perhaps, as noted earlier, traditional essentialism holds of some scientific categories – such as the elements of the periodic table. But it clearly does not apply more broadly to the kinds that figure in scientific practice:

- Many scientific kinds are not characterizable in terms of their intrinsic properties at all. This is true of many biological

[17] R. Boyd, 'Realism, Anti-Foundationalism and the Enthusiasm for Natural Kinds', *Philosophical Studies* **61** (1991) 127–148.

[18] E. Machery, 'Concepts are not a Natural Kind', *Philosophy of Science*, **72** (2005), 444–467.



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kinds; but it is also true of many of the kinds in psychology, materials science and arguably physics.

- Even if we allow essences to contain relational properties – i.e. we reject E3 – the modified view is still overly restrictive since it implies both that for each natural kind there is a set of necessary and sufficient conditions on kind membership (i.e. E2) *and* that these conditions are also the causally central properties of kind members (i.e. E4). Yet it is doubtful that natural kind membership is always defined by its causally most central characteristics. This is plausibly true of kinds, such as cell and neuron.
- Finally, as Richard Boyd noted long ago, there is not the slightest reason to suppose that all the (presumed) natural kinds that figure in science can be defined by sets of individually necessary and jointly sufficient conditions (i.e. E2). Boyd's parade case is biological species; but the point is almost certainly true of many other natural kinds as well, including the kinds of psychology, anatomy and ecology.

In short: Not only is traditional essentialism bad biology, it is also bad general philosophy of science.

*2.3.2 Another Moral*

Again, there is a lesson to be learned from the failure of traditional essentialism. If one seeks a theory that captures the broad distinction between the explanatory kinds of science and other kinds, then traditional essentialism won't fit the bill. But if this is so, then it is obscure why a theory of human nature – or of anything else for that matter – should place much stock in the traditional conception of essences. For it is only within the theoretical framework provided by traditional kind essentialism that traditional essences make theoretical sense. In view of this, we would do well to locate an account of human nature within some alternative, more plausible account of natural kinds. I return to this issue in section 4, when I present a positive proposal regarding how to construe the notion of human nature.

## 3. The Nomological Conception of Human Nature

We have already seen that an important moral of the demise of traditional human nature essentialism is that a theory of human nature ought not to be expected to describe unique, universal features of humanity. More plausible is the idea that its descriptive role is discharged when it specifies species-typical regularities. In recent



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work, Eduoard Machery has gone a step further and argued that the commitment to human nature *just is* the commitment to the existence of such regularities. Thus, for example, Machery and Barrett (2006) assert that a commitment to the existence of human nature is a commitment merely to the fact that:

> [T]here are generalizable statements that we can make about humans: that there are some properties that, characteristically and for the most part, humans posses.[19]

Still more recently, Machery has endorsed what he calls 'the nomological conception' of human nature.[20] On this view, human nature is what we might call a *nomological nature*: a set of species-typical, lawful regularities; or equivalently, a set of properties that humans reliably, though need not invariably, instantiate. Further, he maintains that the relevant properties are ones that result from the evolution of our species.

Notice that the nomological conception of human nature is, in a number of respects, less demanding than traditional human nature essentialism. First, regularities need only be species-typical as opposed to strictly universal. This is an acknowledgement of the fact that few, if any, scientifically interesting regularities apply literally to all humans. Second, the nomological conception of human nature does not restrict the class of regularities to those ones that are unique to humans. Thus lots of regularities might hold of other organisms as well as humans and yet still be aspects of human nature. Third, the nomological conception is consistent with the idea that human nature can change over time. In particular, it is consistent with the idea that human beings might evolve in such a way that many – even all – extant regularities cease to be regularities that apply to humans.

What are we to make of the relatively undemanding character of the nomological conception? An obvious virtue is that it insulates the notion of human nature from standard biological objections. If a commitment to human nature does not imply the existence of unique and universal intrinsic properties, then the fact that there are no such properties – and, hence, that species membership cannot be defined by the possession of such properties – is no objection. But in order to assess the adequacy of the nomological

[19] E. Machery & C. Barrett, 'Debunking Adapting Minds', *Philosophy of Science* **73** (2005), 232–246.

[20] E. Machery, 'A Plea for Human Nature', *Philosophical Psychology*, **21** (2008), 321–330.



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conception, there are two further issues to consider: a) Do human beings possess a nomological nature? b) To what extent can nomological natures play the theoretical roles that human nature has traditionally been expected to play?

### *3.1 Do Human Beings have a Nomological Nature?*

Scientists have intensively studied many different kinds of organisms, including such 'model' organisms as the bacterium *Escherichia coli*, the sea slug *Aplysia*, the *Drosophila* fruit fly, the freshwater zebrafish, and the common house mice, *Mus musculus*. As a matter of fact, whenever scientists have engaged in such intensive research, they have almost invariably uncovered a wide array of regularities that hold largely – though seldom invariably – across the species. In the nomological sense, then, such species have a nature; and though it is (of course) an empirical issue, there is excellent reason to suppose that human beings are exactly similar in this regard. This is because there are many disciplines that have generated substantial numbers of species-typical generalizations about human beings. Research on human anatomy and physiology is, for example, replete with such generalizations. But so are those sciences more intimately concerned with mind and behavior – such as, neuroscience, behavioral ecology and psychology. According to the nomological conception, all such regularities comprise aspects of our nature.

Since we are concerned primarily with the notion of human nature as it figures in contemporary cognitive-behavioral science, it would be useful briefly to highlight the above general point with some plausible candidates from the domain of psychology. Start with some readily observable – 'superficial' – examples chosen more-or-less at random. Human beings speak languages. We engage in pair bonding. We make moral judgments; and we engage in means-ends reasoning. We experience emotions, such as anger and fear; and we have thoughts about the world. Little or no systematic research is required to recognize these as robust features of our psychology – no doubt subject to plenty of exceptions, but robust all the same.

Now for some examples, again chosen more-or-less at random, whose discovery required more systematic empirical research:

- In the study of perceptual categorization, human beings exhibit typicality effects. Roughly, the extent to which something is a *typical* instance of some category (e.g. *birds*) correlates with a



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host of independent psychological measures, such as speed of response, accuracy of categorization judgments, order of recall, and so on.[21]

- In the study of memory, power laws of learning and forgetting are widespread.[22] Roughly, much data concerning remembering and forgetting – how quick, how reliable etc. – can be fit by power functions. Similarly, it is a robust finding that statistical and semantic associations influence reaction times in recall tasks.
- In the study of concept acquisition, there is good reason to suppose that concept acquisition in childhood exhibits certain regularities. For example, the concept ONE is acquired prior to the concept FOUR (if indeed the latter is ever acquired); and the concept BELIEF is typically possessed prior to the age of 5.[23]
- As a final example, the study of human perception has uncovered an enormous range of trans-cultural regularities. So, for example, in the domain of vision, there are many psychophysical findings that are extraordinarily robust.[24]

This is, of course, a vanishingly small sample of the sorts of regularities to have been identified by psychologists and cognitive scientists. Moreover, they are ones that remain open to empirical enquiry; and it may turn out that not all of them really are species-typical.[25] Nonetheless, it is plausible that they are; and to that extent, it is plausible that our psychology exhibits the sorts of regularities that according to the nomological conception constitute human nature. In any case, from hereon I will suppose that this is so.

[21] G. Murphy, *The Big Book of Concepts* (Cambridge, MA: MIT Press, 2004).

[22] J. R. Anderson & L. J. Schooler, 'The adaptive nature of memory'. In E. Tulving and F. I. M. Craik (Eds.) *Handbook of Memory*, 557–570. (New York: Oxford University Press, 2000).

[23] See, for example, Susan Carey *The Origin of Concepts* (New York: Oxford University Press, 2009).

[24] See, for example, G. A. Gescheider, *Psychophysics: The Fundamentals* (Mahwah: Laurence Erlbaum Associates Inc., 1997).

[25] The Muller-Lyer illusion illustrates this point. Though widely assumed to result from species-typical perceptual biases, it is in fact quite sensitive to developmental- environmental conditions. For discussion see R. McCauley and J. Henrich, 'Susceptibility to the Muller-Lyer Illusion, Theory-Neutral Observation, and the Diachronic Penetrability of the Visual Input System' *Philosophical Psychology* **19** (1) (2006) 1–23.



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### *3.2. Can nomological natures play the traditional roles of Human Nature?*

So, there are good reasons to suppose that humans have a nomological nature. But is this something that deserves the honorific 'human nature'? Specifically, to what extent will it play the theoretical roles traditionally assigned to human nature?

Let's start with the good news. First, nomological natures can readily play the organizational role of delimiting areas of enquiry. On the present view, human anatomy, human psychology, and so on can be viewed as largely concerned with the study – discovery, confirmation and explanation – of species-typical regularities.

Second, if Machery is right, a theory of human nature can play the role of describing what humans are like. On the present proposal, this descriptive function is not performed by specifying unique, universal features of human beings. On the contrary, the nomological conception of human nature is largely motivated by the assumption that there are few, if any, interesting generalizations of this sort. Rather, saying what we are like will involve articulating a range of species-typical generalizations. No doubt many of these will also hold for other organisms. But it is presumably the case that some of them will be unique to us. To that extent, a theory of human nature will on the present view describe features that are both species-typical and unique.

Third, the nomological conception provides, pretty much for free, a sense in which human nature is fixed. More-or-less by definition, laws of nature exhibit fixity in the sense that they are in some sense *counterfactually robust*. This is because, in contrast to accidental generalizations, lawful generalizations project to counterfactual scenarios. But if this is so, and if as the nomological conception maintains, human nature *just is* a set of lawful regularities, then human nature must exhibit fixity, at least in the sense that it is counterfactually robust. Of course, this might not – and presumably doesn't – capture all that theorists have meant when saying that human nature is fixed. So, for example, it won't capture that idea that human nature is strictly impossible to alter; and nor will it capture the idea that efforts to change our nature – 'to meddle with nature' – will come to no good. But it is *far* from clear that a replacement notion of human nature – one that seeks scientific respectability – should seek to capture such ideas.

Now for the less good news. There are two traditional aspects of human nature that nomological natures do not readily play. Moreover, they are perhaps the two most central theoretical functions



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of human nature. First, nomological natures will not play the taxonomic function that human nature has been expected to play. There are two reasons for this:

- On the nomological conception, it is doubtful that possessing a human nature is even extensionally equivalent with being human. In other words, it is doubtful that all and only *actual* humans satisfy the relevant range of regularities. Given the *ceterus paribus* character of generalizations about human beings, it is almost certain that many humans will fail to satisfy many of the regularities that (putatively) comprise human nature. Thus, for example, some humans (e.g. aphasics) fail to satisfy some of the regularities regarding language comprehension and production; some fail to satisfy various regularities regarding perceptual capacities (e.g. visual agnosics); and some humans fail to satisfy robust regularities regarding memory (e.g. amnesiacs). Thus on the nomological conception possessing a human nature will not even be extensionally equivalent with being human.
- On the nomological conception, human nature will lack the modal properties required for defining kind membership. Even if, contrary to fact, all and only humans satisfied the relevant regularities, it would still be the case that something *could* be human and yet fail to possess the relevant nomological nature. So, for example, humans might evolve in such a way that many of the extant generalizations no longer hold.

Of course, the present points come as no surprise to Machery. Indeed, the nomological conception is deliberately engineered to have these properties since it is in part by rejecting the assumption that human nature plays a taxonomic role that the proposal seeks to evade the standard biological objections to human nature. For all that, this does mark an important divergence from the traditional conception of human nature.

The second central role of human nature that the nomological account does not readily accommodate is its causal-explanatory function. As noted in section 1, natures have traditionally been expected to play of the role of underlying – 'hidden' or unobservable – entities that figure in the causal explanation of regularities involving the kind. To use a well-worn example, the essence of water – e.g. its molecular structure – is according to traditional essentialists expected to contribute to the explanation of various water-involving regularities – e.g. that water boils at 100 degrees at sea level. Similarly, human nature is supposed to be an underlying causal factor that figures in



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the explanation of regularities involving human beings. But, if human nature *just is* the set of human-typical regularities, then it clearly cannot be the *cause* of these regularities, underlying or otherwise. In which case, on the nomological conception, human nature cannot play its traditional causal-explanatory function.

Again, Machery is fully aware of the implications of his view. As he puts it:

> [I]t is important to see that the nomological notion of human nature inverts the Aristotelian relation between nature and generalization. For Aristotle, the fact that humans have the same nature explains why many generalizations can be made about them … For me, on the contrary, the fact that many generalizations can be made about humans explain in which sense there is a human nature.[26]

This is not, of course, to claim that, on the nomological conception, human nature can do *no* explanatory work. One obvious possibility, for example, is that the regularities that comprise a nomological nature can figure in DN (or statistical nomological) explanations. Another possibility, recently suggested by Machery,[27] is that human nature, construed nomologically, might figure in explanatory sketches of a certain kind. Roughly put, by asserting that something is part of human nature, one implicates that it is a product of a particular kind of cause – viz. that it can be explained evolutionarily and that a purely non-evolutionary (cultural/social) explanation would be wrong.

So, on the nomological conception human nature can do *some* explanatory work. Moreover, I would not wish to deny that it is work that is *worth* doing. For all that, it is important to be clear that from the vantage of traditional conceptions of human nature such explanatory work is *ersatz*. Natures are supposed to be underlying structures that play a central role in the explanation of an entity's more superficial properties; and *this* is not something that the nomological conception can give us. If we seek a replacement for the traditional essentialist conception of human nature, we would do well to look further afield – to seek a conception on which human nature can play its customary causal-explanatory function.

[26] Op. cit. note 20, 323.

[27] 'Virtues of the Nomological Notion of Human Nature' presented at *The International Society for the History, Philosophy and Social Studies of Biology*, Utah 2011.



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## 4. What Next? Causal Essentialism About Human Nature

The traditional essentialists conception of human nature is incompatible with the biological facts; and the nomological conception won't perform two of the most central theoretical roles traditionally assigned to human nature. We can do better. In this section I argue for a version of what we might call *causal essentialism* about human nature. As with the nomological conception, it is compatible with the evolutionary facts and enables human nature to play its traditional organizing, descriptive, and fixity-specifying functions. But in contrast to the nomological conception, it also allows us to endorse a traditional conception of human nature's causal-explanatory function. What it will *not* plausibly do is play both the traditional causal explanatory role *and* the taxonomic function of human nature. But as I hope to make clear, nothing can do this consonant with the biological facts. To the extent that we seek a replacement conception of human nature, then, it is no criticism of the present causal essentialist proposal that it cannot do this.

### *4.1 Casual Essentialism (1st Pass)*

According to *traditional* kind essentialism, a kind's essence is a set of intrinsic properties that must be possessed by all and only members of the kind, and which causes the instantiation of other properties associated with the kind. One common relaxation of these commitments is to give up the assumption that essences must be intrinsic. This yields a version of kind essentialism that allows essences to consist of relational properties; and in the context of debate over species this is associated with a view that is sometimes called *relational* essentialism.[28] Still, both traditional and relational essentialism demand that essences both a) individuate their kinds and b) cause the instantiation of properties associated with the kind. That is, they both posit what are sometimes called *taxonomic* essences.[29]

[28] Paul Griffiths, 'Squaring the circle: Natural kinds with historical essences'. In R. A. Wilson (Ed.), *Species: New interdisciplinary essays* (Cambridge, MA: MIT Press, 1999, 209–228).

[29] S. A. Gelman, 'Psychological essentialism in children', *Trends in Cognitive Sciences* **8** (2004) 404–409. D. Walsh, 'Evolutionary essentialism' *The British Journal for the Philosophy of Science* **57** (2006) 425–448.



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But there is another *causal* conception of essences that relaxes the traditional notion even further by giving up the demand that essences are kind individuating. According to this *causal essentialist view*, essences are entities – mechanisms, processes, and structures – that cause many of the more superficial properties and regularities reliably associated with the kind.[30] In which case, the causal essentialist about human nature maintains that human nature should be identified with a suite of mechanisms, processes, and structures that causally explain many of the more superficial properties and regularities reliably associated with humanity.[31]

Notice that the distinction between taxonomic and causal essences suggests a way of avoiding the standard biological objections to human nature essentialism. Recall: what the objections purport to show is that essences cannot play the traditional descriptive and taxonomic functions of human nature since there are no properties that are necessarily possessed by all and only members of the kind. But this is no objection at all, if, as the causal essentialist maintains, (causal) essences need not be shared by all kind members. Specifically, on a causal essentialist conception of human nature, when cognitive and behavioral scientists profess an interest in human nature they are in no way committed to the assumption that there is some common nature that all and only humans share. Rather, they are concerned with is the existence of empirically discoverable causal mechanisms (processes, structures and constraints etc.) that explain the characteristic properties and regularities associated with human beings – especially those concerning behavior and cognition. Thus the biological objections have no force against causal essentialism about human nature.

[30] Some maintain that this causal conception of essences and not the taxonomic one is the more traditional. For example, Walsh (2006) argues that Aristotle has a causal conception of essences was a causal as opposed to taxonomic one. I do not propose to dispute the issue here.

[31] As I use the terms, all taxonomic essences are causal essences but not *vice versa*. For in addition to figuring in causal explanations, a taxonomic essence is, as a matter of metaphysical necessity, possessed by all and only the member of the kind. In contrast, causal essences need not even be possessed by all members of the kind, let alone be individuative of the kind. They may, for example, be lacking in deviant, abnormal or borderline members of the kind. In terms of the essentialist commitments outlined in section 2.1, the point may be put as follows: Taxonomic essences must satisfy conditions E2 and E4, whilst causal essences need only satisfy E4.



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*4.2 Developing the View: Homeostatic Property Clusters*

Clearly the above formulation of causal essentialism requires elaboration; and though there are, no doubt, many ways to do this, a possibility that I find attractive recruits Richard Boyd's well-known *homeostatic property cluster* account of natural kinds. In what follows I first say what the HPC account is, and then apply it to the case of human nature.

*4.2.1 HCP Kinds*

The HPC account is arguably the most popular extant account of natural kinds to have emerged from recent philosophy of science.[32] Boyd and others have developed the account over a number of decades; and I do not propose to go into the fine-grained details here. For our purposes, the following sketch will do. Let us say that a kind K is a natural kind if:

> *H1*. It is associated with a contingently co-varying property cluster – a range of properties that tend to be co-instantiated by instances of the kind, but need not be genuine necessary conditions for membership.
> *H2*. There is some set of empirically discoverable causal mechanisms, processes, structures and constraints – a *causal essence*, if you will – that causally explains the co-variation of these various symptoms.
> *H3*. To the extent that there is any real definition of what it is for something to be a member of the kind, it is not the symptoms, as such, but the causal essence that defines membership. More precisely, to the extent that natural kinds have definitions, it is the presence of a causal essence producing aspects of the property cluster that defines kind membership.

Consider an illness such as influenza. Influenza is, on the homeostatic cluster view, a plausible candidate for natural kind status. First, it is associated with a range of characteristic symptoms – coughing, elevated body temperature, and so on – even though these symptoms do

[32] For more extensive characterizations of the homeostatic cluster view see: R. Boyd 'What Realism Implies and What It Does Not', *Dialectica* **43** (1990) 5–29; R. Boyd, 'Realism, Anti-Foundationalism and the Enthusiasm for Natural Kinds', *Philosophical Studies* **61** (1991) 127–148; and R. Boyd 'Homeostasis, Species, and Higher Taxa'. In R. Wilson (ed.) *Species: New Interdisciplinary Essays* (Cambridge, Massachusetts: MIT Press, 1999, 141–186).



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not *define* what it is to have flu. Second, there is a causal mechanism – roughly, the presence of the flu virus – whose operation explains the occurrence of the symptoms. Finally, to the extent that influenza has a definition, it is the presence of the virus – or better, the presence of the virus producing some of the symptoms – but not the symptoms as such, that make it the case that one has flu.

*4.2.2 HCP Kinds applied to Human Nature*

How might the idea of HPC kinds be applied to the notion of human nature? Traditional essentialists recruit a general theory of natural kinds in order to provide an account of human nature as an intrinsic taxonomic essence. But as we have seen the general theory of natural kinds is problematic; and there is good reason to suppose that it doesn't apply to species – and to human beings in particular – since we do not possess an intrinsic taxonomic essence. In response, I propose that if we wish to preserve the connection between talk of natures, and the theory of natural kinds, we would do well to opt for a better general account of natural kinds – the HPC view – and that we should identify human nature with whatever it is that plays a role most similar to the one played by taxonomic essences within the traditional essentialist framework. Within the HPC approach, it is obvious what this should be. Human nature should be identified with a set of empirically discoverable causal mechanisms, processes, structures and constraints that causally explain the co-variation of the various properties – especially psychological properties – associated with being human. In other words, we should identify human nature with this causal essence.

Two further issues require our immediate attention. First, an HPC view of human nature presupposes the existence of an appropriate property cluster: a set of psychological properties that reliably co-vary with each other. But does such a cluster exist? Presumably the answer is 'Yes'. Indeed, this follows with minimal addition from our earlier discussion of the nomological conception of human nature. On the nomological conception, human nature is a set of species-typical psychological regularities; and as noted, there are excellent reasons to suppose that human beings have a nature in this sense. But the regularities assumed by the nomological conception *just are* the reliable instantiation and co-variation of various psychological properties. In which case, if we have reason to suppose that human beings conform to robust psychological regularities, then we also have reason to suppose that human beings exhibit a property cluster of precisely the sort required by the HPC conception of natural kinds. Indeed, the presumed cluster *just is* a nomological



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nature of the sort that Machery has in mind. The idea that we have a nomological nature and that there is a human nature in the causal essentialist sense are, therefore, not incompatible. Rather the latter idea presupposes the former.

The second sort of issue concerns how, on the present proposal, to think about the causal essence that is to be identified with human nature. In contrast to traditional essentialism, which assumes that essences must be intrinsic, the HPC view of natural kinds makes no such assumption about causal essences. Rather, the entities responsible for property co-variation might be relational and may operate at quite different time-scales. Consider the following crude, but useful three-way division:

- Evolutionary mechanisms: Phylogenetic processes and mechanisms that operate over evolutionary time and cause human species-typical properties. This might include, selection, drift, mutation, and many other things besides.
- Developmental mechanisms: Ontogenetic mechanisms that are responsible for the acquisition of human psychological capacities. This will include developmental biological processes and mechanisms – e.g. those involved in the development of the neural tube – but it will also involve more straightforwardly psychological mechanisms, such as conditioning, induction and other sorts of learning.
- Synchronic mechanisms: Mechanisms that are causally responsible for particular manifestations of psychological capacities. For example, seeing involves various visual processing mechanisms, speaking involves language production systems, recollecting involves memory systems, and so on.

Which of these time-scales are most relevant to the present project? If we aim to provide comprehensive explanations of species-typical regularities, then *all* of them are presumably relevant. But our current task is rather more restrictive. It is to characterize a replacement notion of human nature that fits the use of contemporary cognitive-behavioral science. And as a matter of fact cognitive-behavioral scientists are not primarily in the business of characterizing evolutionary mechanisms. Rather they are most centrally concerned with the characterization of *more proximal* cognitive and neural mechanisms: those involved in online processing and in the development of psychological states and structures. Indeed the task of characterizing such mechanisms is arguably *the* central goal of cognitive science. Further, it should be noted that this focus on proximal causes is very much in line with the traditional view of human nature's causal



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explanatory function. For if essences are intrinsic properties of kind members, then they must be proximal causes, if they are to be causes at all. Thus a replacement notion of human nature that fits the usage of cognitive and behavioral scientists by construing casual essences in a *proximal fashion* – i.e. as synchronic and/or ontogenetic mechanisms – fits quite well with tradition.

To summarize the discussion so far: The general conception of human nature that I have developed here is one on which human nature is a suite of empirically discoverable proximal mechanisms – a *causal essence* – that causally explains the various psychological regularities that comprise our *nomological nature*. It is now time to see how well this proposal accommodates the scientific roles traditionally assigned to human nature.

### *4.3 The Traditional Roles that Causal Essences Can Play*

In section 1, I characterized five traditional scientific roles for human nature. The causal essentialist conception of human nature readily accommodates four of these.

First, it can function to delimit an area of enquiry. In particular, human psychology on this view would be the study of human causal mechanisms and the psychological regularities for which they are responsible. On the face of it, this fits well with what cognitive-behavioral scientists are up to.

Second, the causal essentialist conception readily accommodates the descriptive function of human nature by describing species-typical features of human beings. Indeed, it does so twice over. It must describe the species-typical regularities of the sort incorporated in a nomological nature since this is required in order to specify the phenomena that the underlying mechanisms purport to explain. Moreover, it must describe the species-typical mechanisms in virtue of which such regularities hold. Further, on the overwhelmingly plausible assumption that human beings are unique in some psychological respects, it must also describe those unique regularities and the mechanisms in virtue of which such regularities obtain.

Third, the causal essentialist picture accommodates the fixity-specifying function of human nature. As with the nomological conception, it will yield counterfactual robustness, and for exactly the same reason: nomological natures are comprised of nomological regularities. In addition to this, however, there are good empirical reasons to suppose that many of the mechanisms that are responsible for the manifestation of such species-typical regularities are environmentally



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canalized. For so far as we know, mechanisms for perceptual processing, learning, memory and so on are highly conserved across environmental variation.

Finally, the causal essentialist view accommodates the traditional causal explanatory function of human nature. This is, in my view, what makes it preferable to the nomological conception of human nature. Proponents of the latter view must seek ersatz causal-explanatory work for human nature. In contrast, the advocate of casual essentialism can attribute the exact same causal explanatory function that human nature has traditionally been intended to play: viz. an underlying entity that explains more readily observable, reliably occurring generalizations that hold of human beings. Thus where the nomological conception accommodates only three central roles for human nature, the causal essentialist picture accommodates at least four; and to that extent it provides a better replacement notion than the nomological conception.

### *4.4 What Causal Essences Will Not Do*

What of human nature's presumed taxonomic function? I maintain that given the biological facts *nothing* could play the traditional proximal causal role of human nature *and* perform this taxonomic function. There are two natural arguments for this claim. The first is probably not a good one; but the second probably is.

#### *The (Probably) Bad Argument*

Those psychological and neural mechanisms that causally explain the regularities that hold of modern humans are extant structures – they exist in the here and now. In contrast, if evolutionary biologists are to be believed, then species are genealogically individuated. In which case, it seems possible that an organism could possess the mechanisms that comprise human nature, and yet fail to be human because it lacks the relevant relationship to the past. (Think of Davidson's Swampman or Putnam's Twin.) In which case, proximal mechanisms of the sort that cognitive scientists care about cannot be kind individuating.

As it stands, this is a bad argument; and it's bad because it ignores the well-known possibility that extant states and mechanisms can be individuated *historically*. Suppose, for example, that the mechanisms for human visual perception are partially individuated by historical facts about human evolution. Then it would not be possible to



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possess a *human* visual system without being human. Of course, there might be – and indeed are – perceptual systems that are very much like our own. Still, no matter how similar in structure or function, on the present view, such mechanisms would not be *our* visual mechanisms unless they shared the same evolutionary history. But if this is so, then the present objection to the claim that causal essences individuate kinds requires that the relevant mechanisms not be (even partially) individuated by human evolutionary history. The problem (for me at least) is that this seems highly implausible. Perhaps psychological states and mechanisms *per se* are not individuated historically.[33] But the claim that being a *human* psychological state or mechanism is determined in part by genealogical relations seems no less plausible than the claim that the species, *Homo sapiens*, is historically individuated. In which case, if we are to cleave to a genealogical conception of species individuation, then we should also probably reject the present argument.

*The (Probably) Good Argument*

Let's leave aside questions about the individuation of mechanisms. The real problem with treating proximal causal essences as kind individuating is that it is possible to be a member of the kind and yet *lack* the relevant causal essence. By way of illustration, consider once more the case of visual perception. Psychophysics and vision scientists have identified a huge array of species-typical regularities regarding human vision; and on the present proposal the mechanisms that explain these regularities are aspects of human nature. But we know that these mechanisms – cognitive, neural, and developmental systems of various sorts – are *not* possessed by all humans. In particular, there is a host of disorders – both genetic and environmentally produced – that result in the absence of such mechanisms. For all that, the people who lack these mechanisms are still human beings; and this, I take it, suffices to show that human nature, construed as a proximal causal essence, cannot play its traditional kind individuating role.

## 5. Conclusion: Returning to Hume

In this paper I have articulated a conception of human nature on which it should be identified with a suite of mechanisms and

[33] This is, of course, a longstanding issue in the philosophy of psychology. See Gabriel Segal, *A Slim Book about Narrow Content* (Cambridge, MA: MIT Press, 2000).



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structures – a causal essence – that is implicated in the explanation of species-typical psychological regularities. The account is presented as a replacement for the more traditional (taxonomic) essentialist conception of human nature. More specifically, it has been fashioned to a) captures how cognitive and behavioral scientists tend to deploy the notion of human nature whilst, b) evading standard evolutionary objections, and c) allowing human nature – and theories thereof – to fulfill many of their traditional theoretical roles. In developing this account I have argued that the proposal is preferable to one competitor – the nomological conception of human nature – because it more fully accommodates these traditional theoretical roles. Further, I have argued that its failure to fulfill all the traditional roles of human nature is a consequence of the fact that – given very general considerations – *nothing* can jointly satisfy all these conditions. Finally, I have sought to integrate the proposal within a more general account of natural kinds – the HPC view – in a manner that reflects the way in which traditional human nature essentialism is an instance of a more general essentialist conception of natural kinds.

Though there are no doubt many issues and objections that a comprehensive treatment of the notion of human nature ought to address, I propose to conclude with a discussion of just one, which should help clarify how I think about causal essentialism's relation to historical usage of the notion of human nature.

The objection I envisage runs as follows: Though you purport to have articulated a replacement notion of human nature, what you have really done is show that there is no such thing as human nature. The notion of human nature has *always* been expected to fulfill both a proximal causal function *and* a taxonomic function. This is (so the objection continues) as close to a conceptual truth about human nature as anything is. But if what you say is true, then nothing could play both these roles. In which case, there is no such thing as human nature.

Of course, I accept that nothing conforms to the traditional (taxonomic) essentialist conception of human nature. That's my starting point. But I deny that there is a single univocal notion of human nature. Indeed, I deny that traditional taxonomic essentialism is even the only historically *prominent* conception of human nature. Another prominent conception – one that clearly manifests itself in Hume's work – appears exceedingly close in spirit to the causal essentialist picture developed here. For Hume, the term 'human nature' functions in the first instance to pick out – in rough and ready fashion – a suite of psychological phenomena; and a theory of



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human nature is an empirical, causal explanatory psychological theory: a 'mental geography' or 'anatomy of the mind' that provides a 'delineation of the distinct parts and powers of the mind'.[34] As such, for Hume, a theory of human nature is a specification of the underlying proximal psychological processes, structures and mechanisms responsible for human behavior and mental activity. Yet there is not the slightest suggestion that Hume *also* expected his theory to perform the taxonomic function of specifying what it is to be human, still less that he thought of human nature in traditional essentialist terms. For Hume this just does not seem to be part of human nature's remit.

In Hume, then, we have a prominent historical figure that viewed human nature as something of immense importance, and yet did not see it as involving any commitment to kind individuating essences. If what I have said in the forgoing sections is correct, then much the same is true of contemporary cognitive and behavioral scientists. Much of their research is oriented towards characterizing the mechanisms and structures responsible for species-typical psychological phenomena –whether it be a specification of components of the visual system, a theory of working memory, a model of causal inference, and so on. Indeed, specifying such mechanisms – such causal essences – is arguably *the* central goal of contemporary cognitive science. In this regard at least, we are the intellectual descendants of Hume.[35]

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[34] David Hume *Enquiry concerning Human Understanding, in Enquiries concerning Human Understanding and concerning the Principles of Morals*, edited by L. A. Selby-Bigge, 3rd edition revised by P. H. Nidditch. (Oxford: Clarendon Press, 1975)

[35] Earlier versions of this paper were presented at the Royal Institute of Philosophy Annual Conference at Oxford Brookes, Washington University, the University of Pittsburgh and the ISHPSSB conference held at the University of Utah. I am grateful for the many helpful suggestions that were offered on these occasions. Special thanks are due to Mark Cain, John Doris, John Dupre, Steve Downes, Frederick Eberhardt, Hans-Johann Glock, Paul Griffiths, Maria Kronfeldner, Sandy Mitchell, P.D. Magnus, Gillian Russell, Constantine Sandis, Roy Sorensen, Kim Sterelny and Karola Stotz. I would also like to thank Tim Schroeder, Eduoard Machery, P.D. Magnus, and Carl Craver for stimulating discussions of the issues covered in this paper.



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