Bridging the Gap between Human Kinds and Biological Kinds

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Many writers claim that human kinds are significantly different from biological and natural kinds. Some suggest that humans kinds are unique because social structures are essential for the etiology of human kinds. Others argue that human cultural evolution is decidedly different from other forms of evolution. In this paper I suggest that the gulf between humans and our biological relatives is not as wide as some argue. There is a taxonomic difference between human and nonhuman organisms, but such factors as social structure and cultural evolution do not distinguish us from many other organisms.

1. Introduction. Many writers believe that human kinds are significantly different from biological and natural kinds. Some environmental ethicists suggest that humans are unnatural, that humans are not part of the natural order of things (Elliot 1997, Callicott 1999). Others argue that human kinds are different than natural kinds because social structures are essential for the etiology of human kinds (Hacking 1992, Stein 1998). Still others maintain that humans are unique because human cultural evolution is decidedly different than other forms of evolution (Dennett 1995, Boyd and Silk 2000, Dupré 2001).

Despite the frequent claim that we are different from biological and natural kinds, one might wonder if there are compelling reasons to label human kinds, humans, and human actions as "unnatural." Similarly, one might wonder if the distinction between human kinds and biological kinds is as sharp as many writers claim. Undoubtedly, a distinction between human kinds and biological kinds exists—there is a taxonomic distinction.

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Human kinds contain only members of our species, for example, the kind consisting of humans with multiple personality syndrome. Biological kinds may contain only nonhuman organisms, such as an ecotype of a Cuban snail species. Or biological kinds may contain both humans and nonhuman organisms, such as the kind *sexual organism*. A salient feature of human kinds is that they contain only *Homo sapiens*. Beyond this taxonomic feature, does the divide between human kinds and biological kinds carry the weight that many authors claim?

In this paper I will suggest that the gulf between humans and our biological relatives is not as wide as some argue. The approach taken here will be to question those arguments that cite social phenomena as establishing a deep divide between human and biological kinds. As we shall see, the causally salient features that are often cited as distinguishing human kinds from biological kinds miss their target. Such features as reliance on social structure do not distinguish human kinds from all other kinds of organisms. The distinction between those kinds whose etiology depends on social structure, and those that do not, cuts across the human-kind/biological-kind distinction.

It is worth mentioning what this paper will not do. No attempt will be made to show that there is not a divide between humans and nonhuman organisms. The goal here is merely to show that assertions concerning the divide between humans and nonhuman organisms are weaker than many claim.

The debate over human kinds and biological kinds has important consequences beyond the philosophy of biology. It is common in the philosophical literature and popular press to claim that we are different from other organisms and then to argue that such a difference underwrites various normative claims—for example, that our actions are unnatural and nature should be protected from our actions. Deflating the distinction between humans and other organisms should raise a cautionary flag concerning normative claims that depend on such a distinction.

2. Hacking and the Social. Ian Hacking (1991, 1992, 1995) offers the most prominent account of human kinds in the philosophical literature. Hacking distinguishes human kinds and natural kinds along putative causal grounds. According to Hacking, human kinds, such as suicides and multiple personalities, are caused, at least in part, by human social structures. Natural kinds, such as copper and homozygote, can exist independently of any social structure. Copper, for example, can exist without there being any groups of humans or organisms.

To clarify what Hacking means by human kind, let us look at one of his examples, that of *Western Suicide* (Hacking 1992). Prior to the nineteenth century, Europeans took their lives in one of two ways: either as

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an act of insanity or as a form of noble suicide. By the end of the nineteenth century, some Europeans took their lives in a different way: they planned their deaths, wrote suicide notes, and chose popularized forms of death. According to Hacking, this kind of suicide was caused, in part, by the actions of journalists and medical doctors. They articulated and publicized this kind of suicide. Their actions made this kind of suicide possible.

Examples of Hacking's human kinds can be found elsewhere. Consider Paul Ehrlich's (2000) description of those humans that have the metabolic disorder PKU and survive. Before knowledge of PKU, humans with a certain genetic content were doomed to an early death. Now doctors can identify those humans that have PKU, and nutritionists can provide them with diets that enable them to live through adulthood and reproduce. The development of a human with PKU to adulthood depends on the social structures responsible for PKU tests and special diets.

I would like to raise some concerns with Hacking's way of distinguishing human kinds from biological kinds. Hacking's distinction turns on a distinction between cultural traits and biological traits. However, drawing the line between what is a cultural trait and what is a biological trait is not so easy if one is concerned with the etiology of those traits. On the one hand, traits we call "biological," such as gene frequencies and physiology, often depend on social structures for their existence. For example, the persistence of genes for PKU and the lives of PKU individuals depend on medical and other social structures. PKU humans would not live full lives and pass on their genes unless they were able to follow certain diets. On the other hand, those traits we call "social" depend on biological factors. Such traits as dominance hierarchies and food-gathering alliances depend on biological traits. Organisms can engage in such organizations only if they have certain physiologies, for example, mouths, wings, and glands for communicating.

These examples illustrate that the etiology of "biological" and "cultural" traits often depends on the occurrence of the other type of trait. This claim is far from new. It has been made by Richard Lewontin (1983) as well as some developmental system theorists (for example, Oyama 1985). From an etiological perspective, many traits are the combined effect of cultural and biological factors. From an etiological perspective, such resultant traits cannot be clearly classified as biological or cultural.

One might respond that, yes, human kinds are the result of a tangle of biological and cultural factors. Yet biological kinds are the result of purely biological traits—there is no introduction of social or cultural factors in such traits. This response attempts to save the cultural/biological divide by maintaining that there are purely biological traits. The hazard with this response is the possibility that many organisms are engaged in social

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activities. If it is found that many organisms besides humans engage in social activities, and those activities are essential for the etiology of their kinds, then many kinds of nonhuman organisms satisfy Hacking's requirement for human kinds. This raises the question of how pervasive social factors are in the organic world.

It is not difficult to provide examples of social structures in nonhumans where those structures affect gene frequencies, physiology, and behavior. Consider the neurostructures of dominant and subordinate male macaque monkeys (Morgan et al. 2002). Dominant males have a distinctive brain structure not found in nondominant males. A dominant male's distinctive neurostructure occurs after he attains the social role of being the dominant male. One current hypothesis is that the distinctive brain structure of dominant males is caused by their attaining a certain social role. Being dominant causes them to have certain neurostructures.

That social structures occur in nonhumans should not be surprising. Any number of species, from nonhuman primates to birds, to aquatic mammals to insects display social structures. Culture and social structure goes well beyond primates and mammals. In the extreme, even eukaryotic cells may have started as symbiotic relations among distinct organisms (Maynard Smith and Szathmáry 1999). The case for the existence of such structures beyond humans is fairly noncontroversial. What is important to add is that such structures affect the physiology, gene frequencies, and behaviors of those organisms. We have just seen the case of macaque monkeys and their social structures. Proponents of group selection cite a number of cases where social structures affect gene frequencies (Sober and Wilson 1998). Perhaps a more interesting case for those who write about human kinds is the *normative effect* that nonhuman social structures have on behavior. If a monkey is classified by his troop as dominant, then he is permitted to engage in certain activities. If he is classified as subordinate, then he is prohibited from certain activities. This is just one example, among many, of social structures affecting the behavior of nonhumans.

Returning to Hacking's theory of human kinds, we see that he distinguishes human kinds from biological kinds by citing the existence of social structures that affect the members of certain groups of humans. Yet we have seen that social structures occur in groups of nonhuman organisms, and such structures affect the members of those groups. So the etiological effect of social structure does not distinguish humans from nonhuman organisms.

Supporters of Hacking's view might respond that this view makes matters much more complicated than need be. They could point out that social structures are necessary for human kinds but not sufficient. Human kinds must also contain humans. So they could agree with my conclusion

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that social structures cause the existence of nonhuman kinds, but they would deny that I have shown anything problematic with Hacking's theory. This defense, however, does not properly bolster Hacking's theory. This defense allows for social structures to occur in groups of humans and groups of nonhumans, it just happens that human kinds are kinds with humans. According to this defense, then, the distinction between human and nonhuman social kinds merely turns on the taxonomic distinction between humans and nonhumans. But Hacking's insight into the nature of human kinds is supposed to turn on more than the mere taxonomic distinction.

3. Cultural Evolution. Let us turn to another approach to human kinds. One might accept that many organisms have social structures but contend that there is a nontaxonomic way to divide humans and nonhumans. What sets us apart, some argue, is our distinctive form of evolution. Human cultural evolution is thought to be significantly different than other forms of evolution (Dennett 1995, Boyd and Silk 2000, Dupré 2001). Let us take a closer look at this claim.

Anthropologists Richard Boyd and Joan Silk (2000, 608ff.) write that culture is common in other animals, but *cumulative cultural evolution* is rare outside of humans. According to Boyd and Silk, two mechanisms account for cultural differences in groups of primates. In *observational learning*, a younger animal learns how to perform an action by observing the behavior of older conspecifics. In *social facilitation*, a younger animal lives in a social environment that helps facilitate the learning of a skill. In social facilitation, a younger animal learns a skill on her own, with the aid of social resources, but she does not learn the skill from the older members of her species. For example, a chimpanzee lives in an environment where both nuts and stone hammers are present, and she learns how to use those hammers by herself.

Boyd and Silk maintain that only observational learning leads to cumulative cultural evolution. Suppose a talented chimp learns a new and more useful way to build a stone tool. With observational learning that skill can be passed on. With only social facilitation, that skill would not be passed on—each chimp would need to learn the skill by himself. Returning to the divide between humans and other primates, Boyd and Silk argue that observational learning rarely occurs in nonhumans. As a result, cumulative cultural evolution is common in humans but rare in other organisms. This difference, they suggest, marks a significant divide between human kinds and biological kinds.

I would like to raise a couple of concerns with Boyd and Silk's line of reasoning. The first centers on Boyd and Silk's claim that social facilitation does not result in cumulative cultural evolution. Boyd and Silk assume

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that the units of transmission in cultural evolution are memes in the head that are transmitted from primate to primate. Yet memes can also be artifacts outside the head, such as nut-cracking tools, that are transmitted from one primate generation to the next. Furthermore, these artifacts can display cumulative evolution. Consider a study by Mercader et al. (2002). They report that a set of cracking tools has been used by a band of West African chimpanzees for over a hundred years. Moreover, they suggest that this set of tools has evolved over time. Some stones have been physically altered, and some stones have been replaced. Over time, the tools have improved with respect to the task of nut cracking.

If one allows that artifacts in the social environment can be memes in cultural evolution, then the occurrence of cumulative cultural evolution in primates becomes more plausible. Primates, at least the chimps just mentioned, are *biocultural lineages* consisting of both biological and social factors. Among the social factors that constitute the biocultural lineage of the West African Chimpanzee are the use of nut-cracking tools. Taken as biocultural lineages, primates display signs of cumulative cultural evolution. The idea of biocultural lineages was introduced by the anthropologist William Durham (1991). The notion of biocultural lineages gives substance to the idea that humans and many other kinds of organisms are not merely genetic lineages or social groups, but integrated lineages of both biological and social factors.

Let me raise a second concern with Boyd and Silk's line of reasoning. Boyd and Silk claim that observational learning rarely occurs in nonhumans. But how often it occurs in nonhumans is controversial (Boyd and Silk 2000, 611). A number of reports cite instances of observational learning in nonhumans. Consider a recent review piece on the topic in *Behavioral and Brain Sciences* (Byrne and Russon 1998). In that review, Byrne and Russon offer examples of what they take to be cases of observational learning in nonhumans. For example, mountain gorillas living in volcanic areas of Africa consume plants covered with thorns and other hard, indigestible parts. The gorillas in these areas have developed methods for extracting the nutritious parts of the plants while not ingesting the thorns and hard parts. According to Byrne and Russon, this behavior is learned by infants observing their moms. This is just one of many putative examples of observational learning in nonhumans. Byrne and Russon also cite examples involving chimpanzees and orangutans. Whiten and Boesch (2001) provide further examples of observational learning in nonhumans.

Returning to Boyd and Silk, they assume that observational learning is necessary for cumulative cultural evolution, and they argue that such learning rarely occurs outside of humans. Boyd and Silk conclude that cumulative cultural evolution distinguishes us from other organisms.

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However, the report of gorilla eating habits is one among many that observational learning occurs in other primates. If these reports are correct, then the ground for cumulative cultural evolution exists outside of our species. Perhaps the take-home message is that cumulative cultural evolution is clustered in primates yet is more prominent in humans. If that is the case, then cumulative cultural evolution does not distinguish us from all other types of organisms. Cumulative cultural evolution does not mark a sharp divide between human kinds and biological kinds.

One might respond that even if humans and other primates display cumulative cultural evolution, our evolution is nevertheless more significant. Whiten and Boesch (2001) cite the "ratchet effect" of human language. Humans have language ability, and that ability allows us to develop and pass on elaborate memes. Whiten and Boesch point out that while apes are still using rocks to crack nuts, we have developed hammers and other elaborate tools. Moreover, we have developed propositional logic, literary criticism, and nuclear missiles. The evolution of such elaborate cultural phenomena depends on our language ability.

In evaluating the ratchet effect argument, one must first recognize that whether language use is unique to us is controversial. Other primates can and do use abstract symbols (Boyd and Silk 2000, 502). Consider the case of the bonobo Kanzi who constructs and understands complex lexigrams (Greenfield and Savage-Rumbaugh 1990). The line of debate here is not whether other organisms use lexigrams, but the degree of difference in that use. Greenfield and Savage-Rumbaugh (1990) argue that the linguistic abilities of some nonhuman primates are comparable to the linguistic ability of young children. For Greenfield and Savage-Rumbaugh, this shows a continuity between the linguistic abilities of apes and humans. For proponents of human uniqueness, the linguistic differences between humans and other primates are far greater (Tattersall 1998). (For a review of recent work on language and evolution see Hauser, Chomsky, and Fitch 2002.)

Putting the question of human language to one side, there are other types of social phenomena that have caused significant evolution in nonhuman species. Cooperative behavior and nonhuman communication have dramatically affected the evolution of many species. Think of the coordinated food-gathering activities of cooperative and commutative groups of mammals. Undoubtedly, human language is an amazing phenomenon. But the occurrence of human language does not depreciate the significance of cultural evolution in other species. Our lineage is just one of many that has had significant cumulative cultural evolution. To claim that our form of cultural evolution is especially noteworthy is more than a little chauvinistic.

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4. Salient Distinctions. Let us step back and take stock. A number of authors contend that the difference between human kinds and biological kinds turns on the occurrence of certain social phenomena in humans. According to Hacking, human kinds are different because they owe their existence to social structures. According to Boyd and Silk, humans are different because they display cumulative cultural evolution. As we have seen, these lines of argument are problematic. First there are conceptual problems. Hacking's distinction between human kinds and biological kinds assumes a distinction between biological and social traits. However, the etiologies of cultural and biological traits are inextricably intertwined. The conceptual problem in Boyd and Silk's argument is their limiting memes to the head. Memes reside and evolve in places outside the head as well. Both sets of authors are aware of the mix of cultural and biological factors that affect humans and other primates. Nevertheless, their approaches are still too dichotomous.

Putting aside such conceptual difficulties, there are more pedestrian problems with their approaches. Nonhuman organisms have social structures, and those structures affect nonhuman organisms and their kinds. In Hacking's terminology, both human kinds and biological kinds can be "looping kinds"—social structure can affect a kind's members, and the members of a kind can affect social structure. Turning to Boyd and Silk's arguments, the traits they cite as particularly human—observational learning and cumulative cultural evolution—occur in nonhumans as well. In sum, Hacking and others distinguish human and biological kinds along the lines of cultural and social causes. But these types of causes occur in both groups of humans and groups of intraspecific nonhumans. In the end, arguments concerning social phenomena do not establish a deep chasm between human kinds and biological kinds.

As mentioned at the start of this paper, there is an obvious difference between human kinds and biological kinds. That difference is the taxonomic one. Human kinds consist of only *Homo sapiens.* Some biological kinds consist of only nonhuman organisms, for example, the ecotype of a fruitfly species. And some biological kinds consist of humans and nonhumans, for example, the *sexual organism* kind. Beyond this taxonomic difference, there is less to the human-kind/biological-kind distinction than many advocate.

Still, there are some distinctions cited in the debate over human kinds worth highlighting. But these distinctions are different than the human kind/biological kind distinction. Consider the difference between *social kinds* and *nonsocial kinds*. Social kinds are caused, in part, by social structures. Nonsocial kinds do not depend on social structures for their

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existence. The social kind/nonsocial kind distinction is a clear, causal one.[1] Yet, the distinction between social and nonsocial kinds does not line up with the taxonomic distinction between human kinds and biological kinds. Some social kinds consist of humans. And some social kinds consist of nonhumans. The distinction between social and nonsocial kinds does highlight a causal difference in the world. But that difference does not draw a line between human and biological kinds.

One might nevertheless feel that there is something important about the etiology of human kinds that has not yet been captured. Let me suggest that the missing component concerns the kinds that humans make. I will call such kinds *human-made kinds*. IQ groups are a good example of human-made kinds. Arguably, a significant feature of such kinds is that we are responsible for the effect such kinds have on their members. We make IQ kinds, thus we should be responsible for how people are affected when placed in an IQ group. We have now captured the salient distinction behind Hacking's discussion of human kinds. That distinction is the one between human-made kinds and kinds not made by humans.

Notice that human-made kinds need not consist of humans. They can consist of other organisms. Through genetic modification we create new kinds of organisms. And one might argue that we are responsible for the effects of such kinds. The distinction between human-made kinds and kinds not made by humans turns on the etiology of a kind, not on which species a kind's members belong to. The salient etiological divide highlighted by Hacking does not fall along taxonomic lines.

In the end, then, there are three different distinctions worth highlighting. There is the distinction between social kinds and nonsocial kinds, where social kinds are caused by social structures. There is the distinction between human-made kinds and kinds not made by humans, where human-made kinds are made by us. Finally, there is the distinction between human and biological kinds. This last distinction is the taxonomic one. And this last distinction is a pale shadow of the difference many writers draw between humans and other organisms.

On the surface, humans seem very different from other kinds of organisms. But when we take a closer look at the biological literature, the distinction between humans and other organisms becomes much less clear. Perhaps a salient distinction between human kinds and biological kinds,

1. Earlier, I suggested that many organismic traits are the result of both biological and social factors, hence the distinction between biological and social traits is problematic. This suggestion does not undermine the claim that the social/nonsocial kind distinction is a clear, causal one. Most kinds containing organisms may be social ones. Nevertheless, such social kinds are clearly distinguished from such nonsocial kinds as mountain peaks and planets.

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besides the taxonomic one, will be found. Whether or not such a distinction exists is, in part, an empirical question. As matters stand now, however, we should be wary of the claim that humans are significantly different than other kinds of organisms. Alarm bells should go off when we are told that human actions and certain types of human behavior are "unnatural." Finally, we should be skeptical of normative arguments that rely on the distinction between human kinds and biological kinds.

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