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Abstract: Many philosophers take mind-independence to be criterial for realism about kinds. This is problematic when it comes to psychological and social kinds, which are unavoidably mind-dependent. But reflection on the case of artificial or synthetic kinds (e.g. synthetic chemicals, genetically modified organisms) shows that the criterion of mind-independence needs to be qualified in certain ways. However, I argue that none of the usual variants on the criterion of mind-dependence is capable of distinguishing real or natural kinds from non-real kinds. Although there is a way of modifying the criterion of mind-independence in such a way as to rule in artificial kinds but rule out psychological and social kinds, this does not make the latter non-real. I conclude by proposing a different way of distinguishing real from non-real kinds, which does not involve mind-independence and does not necessarily exclude psychological and social kinds.

Keywords: Natural kinds; Social kinds; Psychological kinds; Human kinds; Social ontology.

1 Mind-Independence and Realism

Mind-independence is frequently taken as a criterion, or a necessary condition, for realism about a phenomenon. To say that something is mind-independent is commonly thought to be at least part of what it is to say that it is real, objective, truly exists, and that it is not just the product of our fertile imaginations or other cognitive faculties (like, say, *fairies*, *genies,* and *dementors*, or for that matter, *phlogiston*, *hysteria,* and *cold fusion*). To this end, many contemporary philosophers have included mind-independence (or the related

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notion of human-independence) in their criteria for realism about a set of phenomena.[1]

If we take mind-independence as criterial for realism about properties or kinds, this threatens to rule all psychological and social properties and kinds as non-real. Perhaps that is how it should be; properties like *expensive* and *boring* and kinds like *money* and *depression* (whether economic or psychological) are often regarded as ontologically suspect, and this criterion seems to allow us to distinguish them clearly from the more respectable properties and kinds that we regularly encounter in physics, chemistry, and biology. But there are many kinds,[2] even in the domain of the natural sciences that are not strictly mind-independent, towards which we might not want to adopt a non-realist stance. These kinds include what I will call "artificial kinds," such as synthetic chemicals, genetically modified organisms, and artificially selected organisms.[3] Is there a way of maintaining a realist attitude towards these kinds while upholding the centrality of mind-independence to realism? And would this enable us to preserve a realist attitude towards psychological and social kinds, or should we conclude that these kinds are not real?

Some philosophers have suggested that there are different criteria for realism for kinds in different domains, and that mind-independence is criterial for kinds in the non-mental domain, whereas it is not for the mental domain.[4]

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1 Here are just a few recent examples, drawn from a collection of many others. Devitt (2005, p. 768) states: "The general doctrine of realism about the external world is committed not only to the existence of this world but also to its 'mind-independence': it… does not depend for its existence and nature on the cognitive activities and capacities of our minds." Similarly, Chakravartty (2007, p. 212) writes: "Scientific realism is the view that our best scientific theories give approximately true descriptions of both observable and unobservable aspects of a mind-independent world." Lowe (2011, p. 99) characterizes metaphysics as "an inquiry into the ultimate nature of mind-independent reality." Meanwhle, Tahko (2015, p. 796) defines "Natural Kind Realism" as follows: "There are entities – the natural kinds – which reflect natural divisions in mind-independent reality." Finally, though Bird and Tobin (2008/2014) included the following statement in the original version of the *Stanford Encyclopedia of Philosophy* entry on "Natural Kinds," they removed it in a subsequent revision: "To say that a kind is natural is to say that it corresponds to a grouping or ordering that does not depend on humans."

2 From now on, the discussion will focus mainly on kinds rather than properties, though I think much of what I say applies to both.

3 Few philosophers seem to have discussed artificial or synthetic kinds, but see e.g. Grandy (2007), Sperber (2007). In calling these "artificial kinds," I do not mean to contrast them with natural kinds; as I will go on to argue, I think that many of these kinds are good candidates for being natural kinds.

4 This is effectively what Alston (1979, p. 779) does in excluding "human thought" and "what depends on it causally or logically" from his realist criterion.

But in addition to being unparsimonious, this strategy does not enable us to preserve a realist stance towards the artificial or synthetic biological and chemical kinds (unless we relegate them, implausibly, to the mental domain). Another proposal, which promises to deal with the difficulty of artificial or synthetic kinds, consists in making a distinction between different types of mind-dependence and -independence. The thought would be that although artificial or synthetic kinds are indeed mind-dependent in some sense, the sense of mind-dependence involved is not one that would preclude realism about them. In short, the idea is to distinguish an innocuous sense of mind-dependence that does not impugn the reality of a kind from a problematic sense that does. The artificial chemical and biological kinds would then presumably only be mind-dependent in the former sense, while the psychological and social kinds would be mind-dependent in the latter (along with fictional and other spurious kinds). But I will argue that the most plausible ways of making the distinction do not seem to do the trick. I will then try to show that mind-independence is a red herring, since whether or not something depends on the mind is irrelevant to realism about that phenomenon, and that what we should be after is something else entirely. The paper will proceed as follows. In Section 2, I will identify some paradigmatic artificial kinds, paying special attention to their similarities to and differences from standard natural kinds, as well as from artifactual kinds. In Section 3, I will outline four variants on the distinction between mind-dependence and -independence, arguing that none of them succeeds in doing the work that some metaphysicians have wanted them to do. In Section 4, I will look at another way in which kinds can be mind-dependent, arguing that although it provides a rough means of distinguishing social and artifactual kinds from artificial and other kinds, it does not supply a suitable criterion (even a partial criterion) for realism about kinds. In the same section, I will propose an alternative ontological criterion for realism about kinds. Finally, in Section 5, I will conclude by making a further plea for the irrelevance of mind-independence to realism.

2 Artificial or Synthetic Kinds

It is not hard to show that there are kinds discussed in physics, chemistry, and biology that can be said to be mind-dependent, at least in some sense. Take, for example, the non-naturally occurring transuranic elements, synthetic chemicals, genetically engineered plants, and artificially selected animals. All these depend in some way on human beings and their minds, and may not have been instantiated without them. If we take mind-independence as criterial for realism about kinds, are we forced to conclude that these kinds are not real?

Before addressing this question, it will help to introduce some paradigmatic instances of the physical, chemical, and biological kinds that are putative counter-examples to the criterion of mind-independence[5]:

> *Roentgenium*: A chemical element, atomic number 111, whose most stable isotope has mass number 281 and a half-life of 26 seconds. It was first discovered in 1994 when a single atom of roentgenium-272 was produced in the lab by bombarding a target of bismuth-209 with nuclei of nickel-64. Even though the discovery was not certified at that time, in 2002 the experiment was repeated and three more atoms were produced, and this discovery was later certified. It may be that the only atoms of this element that have ever been produced in the universe have been made in the lab, here on earth.
>
> *Methylphenidate* (trade name Ritalin): A chemical compound first synthesized in 1944 by a chemist for his wife (whose name was Rita), who used it as a stimulant before playing tennis. It acts primarily as a dopamine reuptake inhibitor and is now widely used in treating Attention Deficit Hyperactivity Disorder (ADHD).
>
> *Canola*: A variety of rapeseed (*Brassica napus*), first bred in the early 1970s to have lower levels of erucic acid and to be more palatable to humans, for the production of oil. Later, various strains were produced using genetic engineering in order to increase yield, alter nutritional value, raise resistance to herbicides, and for other features. The name 'canola' was adopted for these varieties to avoid the negative connotations of 'rape.'
>
> *Triticale*: This plant, which is a hybrid of wheat and rye, was bred to combine the grain quality of wheat with the tolerance of rye, and is mostly used as fodder. Like many hybrids, it is sterile, so it must be chemically treated to double the number of chromosomes and enable it to reproduce itself, which it could not do without intervention. This is done by applying colchicine, a chromosome doubling agent, to a growth point of the plant.
>
> *Dog* (*Canis familiaris* or *Canis lupus familiaris*): As is widely known, dogs have been artificially selected by humans over many generations and originally domesticated from wolves (*Canis lupus*). The origin of the process is still shrouded in some mystery and estimates for date of domestication vary widely, from roughly 9000 to 34,000 years ago. Moreover, current evidence suggests that the domestication of dogs may have occurred more than once in human history and that some of these lineages did not survive. There is also considerable debate over whether the process originated at human initiative or whether it was largely the fortuitous result of certain members of the wolf species lingering near human settlements. Either way, artificial selection was eventually carried out very deliberately, resulting in many distinct varieties, with distinct characteristics.[6]

In some or all of these cases, it is open to someone to deny that these are real kinds, and hence to disarm the potential objection to the criterion of mind-independence

5 Unless otherwise noted, most of the information below is taken from the Wikipedia entries on each of these kinds.

6 For a recent article explaining some of the difficulties involved in estimating the time(s) and place(s) of original domestication, see Larson and Bradley (2014).

from the outset.[7] But it seems odd in most, if not all, of these cases to deny genuine kindhood to these various types of substances and organisms but to confer it on closely related ones. There do not seem to be principled grounds (apart from mind-dependence) for saying that although *uranium* is a real kind, *roentgenium* is not. The fact that atoms of the latter kind were produced as a result of human ingenuity in the lab does not give us a reason for privileging one over the other. After all, helium atoms produced as a result of nuclear fusion in the hot core of a star are indistinguishable from those produced in a controlled fusion reaction and hydrogen peroxide produced by biological organisms is indistinguishable from that manufactured by industrial plants. In each case, there is no reason for distinguishing one from the other, much less for adopting a realist attitude towards the former but not the latter.[8]

It may also be pointed out that in the biological cases, the kinds involved are not generally considered separate species, as opposed to varieties, strains, or subspecies. But the same or similar techniques that led to the development of these varieties could also be deployed to engineer genuinely new species, according to the criteria used by many biologists, if not now, at least in the future. There seems to be nothing but technical prowess to prevent someone producing a distinct biological species, either by means of genetic engineering or artificial selection.

How then might one adjust the mind-independence criterion such that it would allow a realist attitude towards what might be called "artificial natural kinds" or "synthetic natural kinds"? In the following section, I will try to determine whether there is a way of adopting a realist attitude towards them while acknowledging that they are in some sense mind-dependent.

3 Varieties of Mind-Dependence

The challenge is to articulate a distinction between two senses of mind-dependence, one innocuous and the other threatening. As far as I can tell, the four most promising alternatives are as follows:

7 Though they do not deny the reality of artificial kinds Bird and Tobin (2008/2014) express doubts about the reality of some artificial kinds: "Instances of a natural kind may be man-made, such as artificially synthesized ascorbic acid (vitamin C); but whether chemical kinds all of whose instances are artificial are natural kinds is open to debate. The synthetic transuranium elements, for example Rutherfordium, seem good candidates for natural kinds, whereas artificial molecular kinds such as Buckminsterfullerene, C_{60}, seem less obviously natural kinds."

8 See Whewell (1840/1847, p. 527–528) for an early and prescient discussion of this issue. As he also notes, there are some chemical substances that were once thought to have been solely produced in the lab but were later found to occur naturally.

1. Mind-dependence of the kind vs. its instances
2. Causal vs. constitutive mind-dependence
3. Contingent vs. necessary mind-dependence
4. Mind-dependence vs. theory-dependence

I will discuss these distinctions in turn, trying to determine in each case whether there is a coherent distinction to be made and if so, whether it draws the line in such a way that the physical, chemical, and biological kinds (including artificial or synthetic kinds) are on one side and the psychological and social kinds are on the other. The aim is also to determine whether we should take a non-realist stance towards the latter kinds as we do towards fictional and other spurious kinds.

3.1 Mind-Dependence of Kinds vs. Instances

Whether one is a nominalist or a realist about natural kinds, one can make a distinction between the existence of a kind and that of its members. If one is a realist, then the kind exists as an immanent or transcendent universal, and the kind might be said to exist as an abstract entity whether it is instantiated or not. If one is a nominalist, then the existence of the kind may consist in the existence of an objective relation that would unify members of that kind, whether or not they actually exist and stand in that relation to one another. Either way, a chemical compound may be said to exist whether or not it has actually been synthesized and a biological species might be said to exist regardless of whether it has evolved or been selected. Thus, the existence of a kind may be considered independent of its members and would depend roughly on the way the world is, that is the laws or regularities that obtain in the world. To say that a kind exists in this sense is to say that it is nomologically possible. This opens the possibility of distinguishing the mind-dependence of the kind itself from that of its members. For example, when it comes to synthetic or artificial chemical compounds, it may be said that the members of the kind are mind-dependent, since they have been brought into existence as a result of human agency, but that the kind itself is not since it exists regardless of whether its members are manifested or instantiated in the universe.[9]

9 There is a suggestion to this effect in Franklin-Hall (2015, p. 928: n.4), though I would not attribute the argument made here to her. I am grateful to an anonymous referee for inviting me to consider this distinction more seriously and at greater length.

This would enable us to say that synthetic chemical compounds and artificially selected species are not themselves mind-dependent, since their existence does not depend on the human mind, but that their instances are mind-dependent. By contrast, psychological and social kinds are themselves mind-dependent since their existence is itself dependent on human minds. But if we allow ourselves to apply the distinction between kinds and their instantiation to the psychological and social domains, this conclusion seems too hasty. If psychological kinds can exist without being instantiated (for example, psychiatric disorders that do not happen to be manifested) then their existence is quite objective and independent of the human mind. Like other uninstantiated kinds, they would exist even if no minds did, provided their existence is compatible with the laws or regularities of nature. Similarly, the existence of many fictitious kinds may be consistent with the laws of nature (for example *fairies*, *dementors*), so the kinds themselves can be said to be mind-independent. Hence, even if we make a distinction between kinds and their instances, ruling that kinds can be said to exist when they are not instantiated, this does not enable us to distinguish the artificial chemical and biological kinds from the psychological, social, and artifactual kinds (as well as the fictitious kinds). The difference between them is not that the former kinds are not mind-dependent though their instances may be whereas the latter are such that both the kinds and their instances are mind-dependent.

It may be countered that some of the kinds we have been discussing are indeed mind-dependent, perhaps not causally but constitutively. That seems to be the case for psychological and social kinds, as well as for many artifactual kinds, whose very constitution seems to be linked to human minds. Even though the kinds themselves can exist in the absence of human minds, both the kinds and their instances are such that minds enter into their being, as they do not for artificial kinds. When it comes to the latter, the mind does not enter into the constitution of the kind itself or its instances. But I would argue that this is not a difference between the mind-dependence of the kind as opposed to its instances, but of different types of mind-dependence. The distinction here appears to be between constitutive and causal mind-dependence, so that will be the focus of the following section.

3.2 Causal vs. Constitutive Mind-Dependence

Some philosophers have distinguished between causal and constitutive versions of mind-dependence, in order to say that what threatens realism about a certain phenomenon is not that it is causally mind-dependent but that it is constitutively so (cf. Boyd 1989, p. 22; Thomasson 2007, p. 53). This would play out as

follows for some of the examples mentioned above. When humans synthesize a chemical compound in the laboratory, the process whereby this is carried out is obviously one in which human minds are causally efficacious. Chemists often deliberately plan the manufacture of certain substances by producing them from other substances, purposefully engineering them to have a certain melting point, reactivity, tensile strength, or psychopharmacological properties. They experiment repeatedly with different combinations of elements and compounds to get the result they want. In doing so, their minds are causally involved in the design and construction of the end product. This is not to deny that some instances of discovering new chemical compounds are fortuitous and not fully planned. But even in those cases, there is often a great deal of thought and mental effort that goes into the process.

Similar things can be said about breeding new varieties of animals and plants. The process of artificial selection that led to the descent of modern dogs was causally dependent on human minds and involved actively choosing certain dogs to breed with certain others in order to produce organisms with desired characteristics. It might not all have been deliberate and the whole process may have begun without any planning or forethought, but it was at least partly under human control.[10] In these cases and many others, the resulting kind or its members are causally dependent for their existence on humans and their minds, and this type of dependence may be held not to be prejudicial to the reality of the end product.

What then would be prejudicial? A different type of mind-dependence might be one in which minds are not just causally involved but are somehow constitutive of the end product. But in this context, the notion of constitution is not entirely clear and requires some unpacking. It is not a literal use of the concept of constitution, since minds are not constituents of these phenomena as bricks and mortar are constituents of houses, or cells are of biological organisms. For one thing, minds are usually construed as abstract entities, and it is not clear what it is for an abstract phenomenon to be constitutive of something else. And if minds are thought of as concrete objects, say identical with brains, then there is no sense in which brains literally constitute these kinds.

Perhaps what is meant by "constitutive" here is something like a conceptual or analytic dependence, according to which minds are part of the definition of certain phenomena but not others.[11] Minds, it may be said, do not enter into the definition of the synthetic chemical compounds or artificially selected organisms,

10 Sperber (2007, p. 135) emphasizes the fact that dogs (or their ancestors) also took advantage of humans and exploited their foibles.

11 This is how Thomasson (2007) seems to use it.

whereas they do enter into the definition of psychological and social kinds. One problem with this is that the notion of definition, conceptual dependence, and the analytic-synthetic distinction itself are all fraught with difficulty. Many of those who subscribe to some version of that distinction nowadays would say that it applies in degrees, but if so, that would tend to undermine its suitability for grounding a sharp ontological criterion.

Rather than rest the case on a denial of the analytic-synthetic distinction, let us assume, for the sake of argument, that some version of that distinction is defensible. If so, then it may seem plausible that minds enter into the definition of at least some psychological kinds, as well as of certain social phenomena. If we were to define phenomena like *belief*, *emotion*, or *concept*, the definition would surely make reference to the concept of a mind. A belief is a mental state, after all, and it is not clear how there could be such things without minds for them to inhere in (including, perhaps, minds that are very different from ours or made of very different stuff). Shifting from formal to material mode, one could also say that metaphysically speaking, minds are part of the very essence of beliefs (at least if one countenances such things as essences). Perhaps the same also applies to *war* and *poverty*, albeit at a further remove. For instance, the very phenomenon of poverty seems to require the existence of economic value, which in turn requires there being minds to value certain commodities (though those minds need not have explicitly conceptualized the phenomenon of poverty).

But then it may be said that some artificial kinds are also mind-dependent in a similar way. Consider one type of synthetic chemical compound, psychotropic drugs. The drug *methylphenidate* (*Ritalin*) was designed precisely to affect the mental states of human beings and its properties were expressly engineered to affect human mental states in certain ways. Artificial or synthetic kinds too can be said to be constituted by human minds, since their makeup and structure have been engineered to affect and influence human minds. Their very properties are dependent on human minds and would not be the way they are without the existence of human minds, with their dispositions, functions, and pathologies. For that matter, dogs might be said in some sense to be constituted by human minds, since we are discovering increasingly that their cognitive and behavioral traits have been selected in such a way as to mirror and complement our own mental dispositions. Human minds have left their mark on the distinctive cognitive capacities of dogs, having shaped them to be responsive to our communicative signals. Some researchers claim that, as a result of domestication "dogs have evolved specialized skills for reading human social and communicative behavior" (Hare and Tomasello 2005, p. 439). Indeed, "dogs have been selected for a set of social-cognitive abilities that enable them to communicate with humans in unique ways" (Hare et al. 2002, p. 1634).

These examples may be thought to be unpersuasive. The "constitution" relation and the type of mind-dependence may seem quite different in the cases of belief and poverty (on the one hand) and psychotropic drugs and dogs (on the other). Though minds shape, structure, and enter into the being or "essence" of all these phenomena, the manner in which they do so is not on a par. It seems clear that there could have been psychotropic drugs and dogs without minds, but there could not have been belief and poverty. It may be highly improbable for the former to arise without minds, but they might have been manifested or evolved in the absence of human minds or any minds at all (besides canine minds in the case of dogs), but the same could not be said of belief and poverty. If that is the case, then the distinction that is being invoked is not between constitutive as opposed to causal mind-dependence, but necessary as opposed to contingent mind-dependence. The real difference would seem to be that dogs and psychotropic drugs *could* have arisen without human minds, and are thus only contingently mind-dependent, whereas beliefs and poverty *could not* have, and are so necessarily. This is the third version of the distinction that I mentioned above, so let us move on to discuss this way of framing the distinction.

3.3 Necessary vs. Contingent Mind-Dependence

Perhaps a more promising way of making the relevant distinction between two kinds of mind-dependence has to do with distinguishing kinds that are necessarily mind-dependent from those that are so contingently. The idea here is that there are kinds that may actually have been manifested as a result of the activity of human minds, but could have come into being differently, whereas there are others that could not have been instantiated without the presence of human minds.

To examine this distinction, it will be helpful to consider a case that is in some ways intermediate between synthetic kinds and social and psychological kinds, namely artifactual kinds. Could artifactual kinds have been instantiated in the absence of human minds or not? However, improbable it may be, it seems obvious that a building, canoe, broom, or shoe, could all have materialized on a planet on which there never were any humans or other intelligent beings. But it might also be said in such cases, not that a building came into existence on that planet, but that there were stones that came to be arranged building-wise. That is, we might not consider it a genuine instance of a building, a genuine member of the artifactual kind *building*, unless it were produced in the right way (by humans or perhaps other creatures with minds). Similar considerations would appear to apply to other artifactual kinds.

It might be objected that we would not say the same about a psychotropic drug as we would about an artifact. In that case, it may be claimed that we would insist that the very same chemical substance was found on another planet, no matter what its provenance. Still, even though this may sound plausible, one would like to know the relevant difference between an artifact and a synthetic chemical. There is a sense in which a synthetic chemical that has been manufactured to perform a particular function in the context of the chemistry of the brain, is very similar to an artifact that has been designed to serve a certain purpose by humans. Both may be engineered, tested, modified, and then mass-produced to do a job that is useful to creatures like us and might be utterly useless to creatures with a slightly different physiological or psychological makeup. The fact that one is macroscopic and the other microscopic cannot be the decisive factor. Scientists design microscopic tools to perform certain roles in the human body in viral gene therapy, a procedure whereby genes are inserted into viruses to help treat certain diseases. Such viruses are akin to artifacts to many ways, since they have parts that have been constructed to carry out a certain human-oriented task, just like macroscopic tools or implements.[12]

Assuming, for the sake of argument, that there is a difference between artifactual and artificial kinds in this respect, what would account for this difference? The difference may turn in part on how the case is described. If we think of a synthetic chemical (for example *methylphenidate*) in terms purely of its chemical structure, then we may be inclined to regard it as only contingently mind-dependent, not necessarily. But if we think of it as a tool designed to perform a specific function in a particular human context (for example *Ritalin*), or indeed a product that is invented, patented, and marketed, then we might regard it as necessarily mind-dependent. Similarly, if we think of a building in terms of its structure and causal properties (for example its suitability to shelter us if we happened to land on that planet) then we might be inclined to think of it as a building no matter its provenance. But if we think of buildings as having been expressly designed to fulfill particular purposes and with certain esthetic qualities, we might not consider a collection of stones that happened to arrange themselves into a structure identical to a human-designed building to be a genuine member of the kind *building*. Yet it may be insisted that this is not just a matter of description, since artifactual kinds are properly construed functionally not structurally for good reason, whereas artificial or synthetic kinds are not. At best, it is optional

12 These considerations bring out the difficulty of drawing a clear line between artifactual kinds and artificial (or synthetic) kinds. It is similarly difficult to draw a line between artifactual and social kinds.

to think of them in functional terms and they are more legitimately conceived of in terms of their synchronic structural properties.

There is a complication that needs to be registered here, which is that one cannot say the same for artificial *biological* kinds as for synthetic chemical kinds. That is because biological organisms, unlike chemical compounds, are usually individuated (at least in part) according to their etiology or causal history.[13] Many biologists and philosophers of biology would regard an organism indistinguishable from a tiger that is found on another planet not to be a genuine tiger if it was not part of the same lineage.[14] The reason in this case is that a history of evolution and natural selection is considered to be what makes an organism a member of a certain kind. Though the claim is not universally accepted, what is important for these purposes is that there is a point of view according to which etiology is important not just for the individuation of artifactual kinds, but for biological kinds. But in the latter case, the etiology does not necessarily involve human minds. Etiology is important in the case of biological organisms because of the centrality of evolution as a prime driver of the process by which organisms separated into distinct kinds. Nevertheless, since artificial biological kinds owe their origins to human intervention, this particular etiology may also be regarded as necessary to what they are.

Few philosophers would deny that etiology is central to the identification of artifacts or to their individuation as members of specific artifactual kinds. Some claim that etiology matters in the form of the intention or design that led to the creation of the artifact. For example, Thomasson (2007) holds that the metaphysical natures of artifactual kinds are constituted by the concepts and intentions of their makers. But even many of those who privilege synchronic causal properties in the identification or individuation of artifacts do not deny the importance of etiology. Those philosophers who emphasize artifactual functions often understand functions not synchronically but in terms of a history of use. Thus, Elder (2007), who thinks that function is more important than intention in identifying and individuating artifacts, also emphasizes "histories of function" and "historically proper placement." Similarly, after noting that an artifact's function cannot fully determine its kind membership, Reydon (2014) notes that artifacts

13 Of course, there are other important differences between chemical compounds and biological species. To mention just two, instances of chemical compounds are usually identical while instances of biological species are not, and biological species evolve and change over time while remaining the same species, whereas chemical compounds do not.

14 See Magnus (2012, p. 166–168) for a discussion of the "tigers of Mars." Philosophers of biology have long emphasized the historical nature of species (e.g. Hull 1978), though this need not lead one to consider them to be individuals rather than kinds.

are more plausibly characterized "by functions plus other features," such as plans of use.

Still, the question remains as to why it is warranted to consider etiology to be necessary to the individuation of artifactual kinds but not artificial chemical kinds, given that they are similar in so many respects. If etiology matters to artifacts (as well as to artificially selected or genetically engineered biological kinds), it is reasonable to ask why we would deny the importance of etiology to the individuation of synthetic chemical kinds. There would seem to be two considerations that would count against the relevance of etiology to the individuation of synthetic chemical kinds (and hence that would count against their being necessarily mind-dependent). First, synthetic chemical kinds, unlike artifactual kinds, belong to established superordinate natural kinds, namely *chemical element* and *chemical compound*, and these kinds are not individuated in terms of causal history. This is not true of all established scientific kinds, since etiology is commonly regarded as necessary to the identity of superordinate natural kinds like *biological species*, as I have already noted. But our current scientific theories do not distinguish among chemical substances on the basis of causal history, and there seems to be no reason to do so given our present knowledge of chemistry. Second, synthetic chemical substances are often rich in features and properties that their inventors and originators had not anticipated or explicitly designed them for (witness the side-effects of drugs), which may suggest that etiology is not as important for their individuation. Of course, artifacts can have unintended uses and functions, as when computers serve as doorstops and shoes as weapons, but they tend to be more impoverished. The fact that many, if not most, of their properties are not ones their originators may have foreseen might be thought to discount the importance of etiology to their individuation. Though both considerations bring up pertinent distinctions between synthetic chemical kinds and artifactual kinds, it is not clear that either would allow us to assert unequivocally that the former are only contingently mind-dependent while the latter are necessarily mind-dependent.

Even if a qualified case can be made for the view that psychological, social, and artifactual kinds are necessarily mind-dependent, while artificial or synthetic kinds are only contingently mind-dependent, I will now argue that the distinction is irrelevant for the purposes of realism. As I have already mentioned, one problem with making the distinction in this way is that it does not put artificially selected or genetically engineered *biological* organisms in the latter category (due to the importance of etiology for the individuation of biological kinds). But more importantly, I do not think that this reveals a profound ontological difference between the former kinds and the latter kinds. What concerns us when it comes to the reality of non-mental kinds is not whether they are *necessarily* mind-dependent.

To see this more clearly, recall that mind-dependence was supposed to mark some entities or kinds of entity as non-real, such as discredited scientific kinds (for example *phlogiston*, *hysteria*) or fictional kinds (for example *fairies*, *genies*). But these unreal or fictional entities, which are of course creations of the human mind, do not appear to be *necessarily* mind-dependent. That is to say, there presumably could have been phlogiston or fairies without human beings to invent them. Many imaginary or fictional kinds could have been instantiated without human minds; they are *contingently* not necessarily mind-dependent. Necessary mind-dependence may distinguish social and psychological kinds (and perhaps artifactual kinds) from (non-biological) artificial or synthetic kinds, but it does not enable us to distinguish real kinds like *uranium*, *sodium chloride*, and *tiger*, from non-real kinds like *phlogiston*, *fairies*, and (allegedly) *belief*, *war*, and *poverty*. If the non-real kinds as well as the social and psychological kinds are both thought to be mind-dependent in a problematic way, the difference cannot be captured by distinguishing contingent and necessary mind-dependence.

3.4 Mind-Dependence vs. Theory-Dependence

This brings us to the fourth way of trying to make the distinction: mind-dependence and theory-dependence. Unlike the other versions of the distinction, the contrast here is not between mutually exclusive categories, but between a superordinate category (mind-dependence) and a subordinate one (theory-dependence), but it can easily be reconstrued in terms of theory-dependent mind-dependent kinds and non-theory-dependent mind-dependent kinds. The idea would be that what threatens the reality of a kind is not that it is dependent on our minds per se, but rather that it is dependent on our theories, where this can be construed broadly to include scientific theories, as well as descriptions, stories, narratives, conventions, positive laws, and other forms of discourse.[15] (This captures the idea that fictional kinds are dependent on our discourse – but not necessarily so, just actually so.)

In trying to determine whether a kind depends on our theories or discourse, one consideration seems to be whether, once our theories posit such kinds, their properties and features are corroborated by the world itself. Once we posit a kind

15 I am assuming for the sake of simplicity that there is a consensus regarding the theory in question. If there is no such consensus, the picture becomes more complicated with competing theories regarding the same kind. Saying that a kind itself depends on our theories is, of course, different from saying that the category corresponding to the kind does. I am also assuming that all but staunch anti-realists about kinds are willing to countenance at least some kinds that do not depend on our theories about them.

such as *cold fusion* (or for that matter *fairy*), the crucial point in determining whether the kind is real or not is to see whether reality conforms to our theoretical characterization. That is, we are concerned with whether there are instances with properties that correspond to the theoretical description.[16] And that question is not settled either way by determining whether the kind or its instances are theory-dependent. Consider a kind like *dark matter*, which is posited by current physical theory, and whose existence is currently a matter of scientific dispute. The existence of dark matter was hypothesized on the basis of certain discrepancies in our calculations or unexplained gravitational forces whose effects we can measure. In order to determine whether such a kind of thing exists, we need to figure out what is producing these effects: whether it is one kind of thing or many, whether it is a new type of matter or a familiar kind of elementary particle, or whether it is a mere illusion caused by faulty calculations. Depending on the eventual answers to these questions, we will have different stances on the existence of the kind *dark matter*. What is important for these purposes is that when we inquire into whether dark matter is real, we are not concerned with the question of whether dark matter is theory-independent. Rather, what is at issue is whether there is something in reality (or more than one thing) that corresponds to this theoretical posit. But what is it for something to correspond to this theoretical posit? That question will be taken up in Section 4.

Still, it may be objected, the difference between the problematic mind-dependent kinds and the unproblematic ones is that the former can come into existence *merely* by being posited by our theories, while the latter cannot. It may be claimed that the difference between a kind like *dark matter* and social kinds like *money*, *government*, and *race*, is that we need only theorize about the latter for them to be conjured into existence. A philosopher who comes close to thinking of social kinds along these lines is Searle (1995), who considers that at least some social kinds are created collectively by human beings in virtue of the formula, "X counts as Y in context C." As a first approximation, thinking that some physical objects (X) count as money (Y) is (at least in part) what makes them money. This makes social kinds theory-dependent in an attenuated sense, since the "theory" need not be a fully developed or systematic theory, such as a scientific theory. Still, such accounts hold that at least some social kinds are such in virtue of being conceptualized or described as such.

16 There is another question we might be interested in when it comes to the existence of a kind, namely whether the kind in question could in principle be instantiated or is nomologically possible (recall the two senses of existence distinguished in Section 3.1.). But when we are investigating the reality of a kind like *dark matter* or *hysteria*, we are typically concerned with the question of whether it is instantiated in the actual world, not whether it could be.

Now there is some truth to the idea that at least some social kinds are theory- or concept-dependent in roughly this way, but it is neither the case that *all* social kinds have this feature nor that those that do are entirely theory-dependent. First, there is a wide range of social kinds that do not depend for their existence on being theorized about or conceptualized at all. Take kinds like *inflation*, *racism*, and *gross domestic product*. These social kinds can exist whether or not someone has a theory about them or whether or not they have been conceptualized as such (cf. Thomasson 2003; Khalidi 2015). An economy may have a gross domestic product regardless of whether anyone has formulated this concept and a society may contain racism and racists even if they have not been described or theorized as such. To be sure, other concepts may have to be entertained for these kinds to exist (for example *race* in the case of *racism*, *money* in the case of *gross domestic product*), but this is just to say that the kinds are generically mind-dependent, not that they are dependent on theories about these kinds themselves, nor that they can be brought into existence by being theorized. Second, even those social kinds that appear to be dependent on theories about them (for example *parliament*, *permanent resident*) are not solely dependent on being theorized or thought of. One cannot conjure up a parliament merely by conceptualizing it, nor (alas) can one create money by theorizing about it.[17] Moreover, it is generally not a matter of individual conception but collective conception (as Searle, for one, emphasizes), accompanied by certain practices, behaviors, external circumstances, and physical conditions. The notion that social kinds come into existence merely by being conceptualized is far too simplistic. In the case of some social kinds, this certainly plays a large role, but it is by no means a sufficient condition. In addition, it also plays a role in the case of the artificial kinds that have been discussed, so this does not (again) seem to be the deciding factor.

Yet it may be maintained that the difference when it comes to social kinds is that the nature of the kinds and their members can at least be *altered* by being thought about, a feature that does not hold of non-social kinds, and this is what undermines their ontological status. As has been widely observed, social kinds are alterable by our theorizing and change in relation to our discourse. This phenomenon, extensively discussed by Hacking (1995, 1999), sometimes goes by the name of the "looping effect," whereby our theories alter the kinds, which in turn forces us to alter our theories about them, and so on. The "interactive kinds"

17 This point was apparently well appreciated by Karl Marx's mother, who was reported to have said that she wished that her son had spent some time making money rather than just writing about it. For treatments of social kinds that emphasize the non-discursive conditions for their existence, see Guala (2010), Khalidi (2015).

that Hacking examines all derive from the social sciences or the human domain, but some kinds from the biological and other realms may also be subject to a looping effect. In particular, some of the very kinds that were mentioned above, the artificial or synthetic kinds, can be altered in this way. Consider for example, artificially selected or genetically modified organisms, which can be successively altered on the basis of our theories and can also react in certain ways to these alterations, forcing us in turn to alter our theories about them. To take a simplified example, suppose we artificially select a breed of dog to be specialized for a certain task (for example hunting), and that this process of selection leads to this breed having other characteristics (for example obstinacy), which we may not have anticipated. In this case, we have modified dogs to have certain traits and these traits have indeed become manifest in dogs, who have in turn been modified in other ways, leading us to alter our attitudes and theories about these dogs and their capabilities. The fact that these organisms can be modified by our theories, and then react to these modifications by being further altered, does not seem to have any bearing on the reality of these kinds. Some kinds are more pliable than others and are more alterable by human action, but this does not make them any less real than kinds that are more impervious to modification. Moreover, the phenomenon is not confined to kinds deriving from the social or psychological domain and can in fact extend to artificial or synthetic kinds that derive from the domain of the natural sciences.[18]

4 Mental Sustenance

In this section, I will articulate a more promising way of differentiating mind-dependence from mind-independence so as to distinguish social kinds from artificial kinds. But I will also argue that the distinction in question does not sanction taking a realist attitude towards the latter but not the former.

One distinction that might be made is that between kinds that require minds for their initial manifestation as opposed to those that require minds for every subsequent instantiation. But this distinction does not appear to have much ontological import, and some of the artificial or synthetic kinds that I have been discussing fall into the former category while others fall into the latter. In particular, some of the synthetic chemical elements and compounds may depend on human intervention every time they are instantiated. It may well be that the element

18 These claims about "interactive kinds" have not been justified in detail here; for further attempt at justification, see Khalidi (2010).

roentgenium would not be manifested in the universe were it not for human intervention and it may never manifest itself again without the involvement of human minds. By contrast, other kinds, such as artificially selected biological organisms, with no more claim to being real kinds, only require human minds at their inception but then would continue to reproduce and survive without human intervention. Yet other artificial biological kinds, like *triticale*, which is sterile and requires human intervention to reproduce, cannot reproduce itself without humans. Hence, while *roentgenium* and *triticale* may require human intervention every time an instance is produced, *dogs* do not require such intervention for each instantiation of doghood. Yet this does not seem to mark an ontological divide between these artificial kinds.

There is a related but more telling distinction to be made among those kinds that require human intervention in each instance or for each manifestation. Among members of these kinds, some require minds to sustain them for them to remain in existence (as members of those kinds), while others do not require continued mental sustenance in each case. This is where a wedge might be driven between artificial kinds and psycho-social kinds. It may be said that the real difference between the former and the latter is that in the latter case, each particular instance of the kind simply ceases to be an instance of that kind if minds stop conceiving it in that way, or treating it accordingly, or responding to it appropriately. By contrast, in the former case, instances of the kind do not literally require minds to sustain them as members of those kinds. Though atoms of roentgenium may require human intervention every time they are instantiated, they would remain in existence without the involvement of human minds, albeit very briefly (since once manifested they decay very rapidly into other atoms and elementary particles). Similarly, existing triticale plants would presumably live on for a short period of time in the absence of human minds, even though they would not reproduce and hence not survive long after the extinction of human beings. Instances of social kinds, on the other hand, are such that they require human minds to sustain them at all times and could not survive as members of those kinds in the absence of human mental processes. That is not to say that human beings need to conceive of them as such or think of them under any particular description or theory, just that they need to adopt certain mental attitudes, respond appropriately, and otherwise behave in certain ways.

A social kind like *money* depends on human beings in the sense that each instance of the kind requires human mental activity for it to continue to be a member of that kind. There would be no economic value without human beings (or similar creatures) to attach value to things, and each token of the kind *money* would not have the value that it does if humans ceased to exist (or indeed ceased to assign that value to it). Ten-dollar bills only have the value that they do because

we attach a value to them. That is not to say that this is a matter of individual decision, but rather a more complex collective or communal mental attitude that gives rise to the value of paper money.

Two complications should be noted here. As some philosophers have observed, it is possible for an individual piece of paper to have economic value even though no one has explicitly conferred that value upon it or even though it has not been regarded or treated as such by anyone. For example, Searle (1995, p. 32) considers a ten-dollar bill that falls between the floorboards after being printed at the mint. The reason that such a bill might yet be considered to have value is that we have instituted an automatic procedure for generating bills of this kind, and have adopted a kind of blanket attitude towards all bills with certain specifications that have been produced in the right way, which confers value upon them. Hence, even though mental attitudes are required for sustaining the value of paper money, those attitudes need not be manifested towards each particular instance at every moment. The second complication is that the mental attitudes that are involved in sustaining some social kinds, such as *money*, may not be *sufficient* for the sustenance of these kinds. That is because there may be other characteristics that instances of the kind must have that do not depend on human minds for them to be considered to be money. In other words, there are other, non-mental conditions that must be satisfied by individual tokens for us to consider them as instances of the kind *money*. Nevertheless, it seems as though the appropriate mental attitudes are necessary (though not sufficient) for the sustenance of the kinds in question.

This seems to be a general feature of social kinds. Not only are they mind-dependent, instances of a social kind require human beings to adopt certain attitudes for them to remain instances of that kind (though they may not need to conceptualize them as such). Once a certain monetary note ceases to be legal tender in certain jurisdictions and humans no longer attach value to it, that piece of paper will stop being an instance of the kind *money*. Artifacts present an interesting intermediate case. There is a sense in which a building, once it has been designed and created by human beings, continues to be a building even if it is not actively regarded as such, treated, and used as such by human beings, as in an archeological ruin that lies undiscovered for centuries. But consider a building that survives after the entire human species becomes extinct. Does it remain a building? What if there is no intelligent life left in the universe that could treat it or use it as a building? It is not clear whether it would still be a building in this case. Perhaps this is as it should be. The artificial or synthetic kinds would pass the test of sustainability without minds, the social kinds would fail that test, and the artifactual kinds would lie somewhere in between. Though this version of mind-independence does not give rise to a sharp divide, it does seem to result in a fairly

useful distinction between kinds whose instances need human mental activity to sustain them as members of those kinds and kinds whose instances do not require sustenance in that way. In between, there may be artifacts whose instances depend in some sense on the existence of human mental activity to remain members of certain artifactual kinds, though perhaps not unequivocally so.

But notice that, here again, if our aim is to distinguish real from non-real kinds this distinction will not do the trick. For it is not that instances of the indisputably non-real kinds (for example *fairies*, *cold fusion*) cease to be members of those kinds in the absence of human mental activity. Rather, they were never members of those kinds in the first place, since there are no such kinds, in the sense that there are no actual instances of the kind in question. And once again, there are no instantiations of such kinds because there is nothing in reality that would correspond to the specifications or characteristics that members of those kinds are posited to have. What does it mean to say that there is nothing in reality that would correspond to them? One plausible answer puts it in terms of causality (rather than any kind of mind-independence). The so-called "causal criterion of reality," which has been endorsed by many philosophers, both explicitly and implicitly, states roughly that something is real if (and only if) it is capable of making a causal difference (cf. Armstrong 1978; Kistler 2005). As Kim (1998, p. 119) puts it: "a plausible criterion for distinguishing what is real from what is not real is the possession of causal power." Recall that in the previous section, in discussing the existence of dark matter, I suggested that answering the question as to the reality of the kind *dark matter* amounts to determining whether there is something in the universe that corresponds to this theoretical posit. On this proposal, that would amount to there being instances of a kind that share certain specific causal powers and have more or less uniform causal effects. To a first approximation, a kind *K* is instantiated provided there are individuals in the world that all share a set of causal powers, or at least a loose cluster of such causal powers.[19] Once a kind has been described and theorized about, the causes and effects of its instances are what ensure that the kind really exists.

The causal criterion of reality may not apply across the board. In particular, it might not apply to moral and esthetic values, numbers, and other abstract entities.[20] But if our aim is to discern real or natural kinds, I would argue that

19 This view is consistent with the account in Khalidi (2013) of natural kinds as "nodes in causal networks," though a distinction is not made there between the existence of a kind in the sense of its instantiation and the existence of a kind in the sense of its compatibility with the laws of nature.
20 Rosen (1994) argues that causal efficacy is not the mark of objectivity, roughly because this excludes the possibility of moral, mathematical facts, and facts about possible worlds being objective. Be that as it may, I think that it is the mark of real kinds, whether in the natural or social domain.

causal power is paramount. In distinguishing real from bogus kinds, what concerns us is whether a kind exists in the sense that it has instances that share causal properties. If I want to know whether there is a real kind *fairy*, I am primarily concerned with the question as to whether there is a group of individuals, all of whom share such properties as: smallness of stature (relative to humans), aerial flight, disposition to live in woodlands, ability to perform magic, and so on.[21] They may not all have the exact same set of causal properties, but there must be enough similarity among them to participate in the same or similar causal processes. Accordingly, the categories that correspond to these kinds are projectible, feature in inductive inferences, and figure in scientific explanations (whether in the natural or social sciences).

There is another objection that can be raised against this attempt to apply the causal conception of kinds to social kinds. I have argued that instances of social kinds are sustained by mental activity and that they are real as long as they have causal efficacy. But this raises a question as to whether any category whatsoever can be conjured by the mind and rendered causally efficacious, resulting in a kind of self-fulfilling prophecy. This threatens to collapse the distinction between genuine social categories and mere objects of the imagination. What would distinguish a category like *race*, assuming that it does not correspond to a biological kind but only a social kind, from the made-up category, *lobe*, which serves to differentiate people based on the size of their earlobes? Let us suppose that the latter category is the basis for a person's behavior towards others and is causally efficacious in motivating that person's actions, say, in discriminating against people with large earlobes and in treating them differently. Are we forced to conclude that *lobe* is a real social kind, on a par with kinds like *race*? The difference would seem to be based on how widespread the effects are and how robust, long-lasting, and entrenched the causal profile. If the category in question only affects the behavior of a single person, leading to minimal social influence, then there is little reason to regard it as a social kind. But if this category were to become widespread in society, giving rise to significant social consequences, with far-reaching effects, then there would be grounds for considering it to be a real social kind. Does that mean that when belief in witches was prevalent in Europe and North America and motivated social behaviors on a large scale, *witch* was a real (social) kind? Yes, in the same way that *race* is a real kind now (again, assuming that it is not a biological kind), despite the fact that most biologists do not find any basis for distinguishing among people in line with the conventional racial

21 This is what was at issue in the notorious case of the Cottingley fairies in the late 1910s and early 1920s, in which Arthur Conan Doyle was embroiled.

categories. Once it ceases to have pervasive social effects we might arrive at the vaunted "post-racial society."

5 Conclusion: The Irrelevance of Mind-Dependence to Realism

In the previous section, I argued that there is a way of formulating mind-dependence that would allow us to make a distinction between the mind-dependent artificial or synthetic kinds and the mind-dependent social kinds. The latter, unlike the former, are such that their instances require human mental activity to sustain them as members of those kinds. The need to be sustained by the mind is what marks off social kinds from artificial kinds, but this distinction does not serve to ground a clear ontological divide between ersatz and real kinds. As I have mentioned, imaginary or bogus kinds are not such that their instances require mental activity to sustain them as instances of those kinds (since there are no such instances in the first place). Moreover, there is another way to justify the claim that sustenance by the mind is not a mark of inferior ontological status. If one is a realist about the mind itself, then sustenance by the mind should not be a reason to downgrade the status of a phenomenon. The phenomena of minds, mental states, mental entities, and so on are in some respects similar to the phenomena of life, living things, life processes, and so on. Metaphysically speaking, there is no reason to think that being dependent on the mind in the sense of mental sustenance would impugn the reality of a kind any more than dependence on life would. Biological kinds like cells, organisms, and species, are life-dependent in the sense that each of their instances requires the phenomenon of life for sustenance. To say that social (and psychological) kinds are mind-dependent is no more significant than saying that biological kinds are life-dependent. It marks a difference in domain. True enough, natural kinds in physics and chemistry are usually not mind-dependent, but this is hardly different from saying that natural kinds in physics and chemistry are usually not life-dependent. Moreover, it is also the case that real kinds in the social sciences are not quantum-effect-dependent, and so on. In other words, it is rare for kinds in a given domain to be influenced by phenomena in widely disparate domains. But this principle is not unassailable (for example, some quantum effects show up in biology), and anyway, cannot serve as a criterion for the reality of natural kinds. If we say that the melting point of a chemical substance is mind-dependent, this claim is to be regarded with the same suspicion as the claim that human character traits are star-dependent. There is nothing wrong with star-dependence (after all, comet trajectories are

star-dependent) we just do not think there is a causal process by which the stars directly affect human character traits. Similarly, there is nothing suspect about mind-dependence, we just do not think there's a causal process according to which minds affect melting points. Hence, I conclude that mind-independence of the various types that I have considered is irrelevant to realism about kinds.[22]

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22 Reydon (2014) reaches a similar conclusion. With reference mainly to artifactual kinds, he finds "the traditional dichotomy between mind-independent natural kinds… and mind-dependent artificial kinds" to be misconceived (Reydon 2014, p. 129).

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