# Mind-Independence, Real Natural Kinds, and Unification Principles

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The notion of actual divisions and classifications of reality has its roots in the Greeks. A kind is a grouping of particulars into a set or class: such as *cups*, *chairs*, or *tables*. Kinds such as these are useful for day-to-day life or communication. However, natural kinds are thought to be actual divisions of nature; to use the old Platonic saying, that which "carve[s] nature by the joints." Natural kinds are considered valuable in scientific fields as classifications of reality and for their ability to ground inductive inferences (for example, some fact about a particular hydrogen atom is thought to apply to the kind *hydrogen*).

A typical account of kindhood in the natural kind debate is the homeostatic property cluster theory (HPC).

Homeostatic Property Cluster View: to be a member of a kind X, there is some homeostatic mechanism that causes certain properties to cluster with a higher probability together. (Boyd 142)

Typically, the mechanism is understood as a causal, lower-level mechanism that explains how properties cluster in such a way as to constitute members

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of a kind (Tahko 5). A causal mechanism could be a biological mechanism or a natural process.

But what does it take for a natural kind to be *real*? Real kinds are considered actual classifications of reality, not arbitrary human classifications. The HPC account itself is overly pluralistic in what counts as a kind—it provides kindhood for both *cup* (a non-real division of reality) and *hydrogen* (a prime candidate for a real kind). So, it is important to establish a principled reason to distinguish those *conventional or constructed* kinds from the real natural kinds. Part of the difficulty of determining a kind's reality lies in the different intuitions about what are and what are not obvious cases of real kinds. It is fairly intuitive that *hydrogen* is a real kind, but perhaps synthetic chemicals, like *Ritalin*, are less obvious examples of real kinds. Intuitions about certain kinds will almost certainly differ. But in this essay, I will define and evaluate many criteria to distinguish real kinds from unreal ones, much in part by drawing on our intuitions about reality and specific candidates for real kinds.

It is important to mention here that social kinds are often considered unreal kinds. Nevertheless, philosophers who believe that the naturalness of natural kinds only means a kind's use in a classificatory matrix or scientific research program—its projectability—argue that social kinds can and should be considered natural.<sup>1</sup> However, I set out to answer what makes a kind a *real* division of nature. This is a metaphysical question, not an epistemic one. Hence, I will not be giving an epistemic account of kinds. As such, I posit that social kinds are not proper candidates for real kinds in the sense that natural kinds are.

Furthermore, as many accounts of real natural kinds appeal to some criterion of mind-independence to delineate real from conventional kinds, there is often an intuition to disavow psychological kinds, such as *depression* and *ADHD*, from being real. Yet I see this as a mistake. Let us leave the possibility that certain psychological kinds are real. For instance, it is plausible that depression could be explained by some lower-level biological or neurological means; it should not be considered unreal without good reason. However, I am not committed to all psychological kinds being real. For example, the test for *ADHD* asks the taker to mark nine symptoms of *ADHD*, although only five are required for a diagnosis. Two individuals who share only one symptom might be diagnosed with the same disorder. I am not disputing the claim that *ADHD* 

<sup>&</sup>lt;sup>1</sup>For more on this view, see Boyd's "Homeostasis, Species, and Higher Taxa", Ereshefsky's "Natural Kinds, Mind Independence, and Defeasibility", Franklin-Hall's "Natural Kinds as Categorical Bottlenecks", and Mason's "The Metaphysics of Social Kinds."

is a useful category in psychiatry—only that one might reasonably be more suspicious of *ADHD* as a real kind. Perhaps it is even better explained by multiple underlying real biological processes.

There are three main sections in this essay. First, I will analyze some popular notions of mind-independence. Next, I will propose an essentialist account to delineate real kinds from unreal kinds. Finally, I will examine Tuomas Tahko's mind-independence of unification principles as a fresh take on a distinguishing criterion. In the course of each section, however, I will find each account to be insufficient.

#### Mind-Independence Criteria

Often thought necessary to establish the reality of natural kinds is a mind-independence criterion.<sup>2</sup> If a kind classification is mind-dependent, it is ultimately not a privileged division of nature but a product of human classification or imagination. It may take a form like this:

Naïve Mind-Independence Criterion: a kind is real if and only if its creation and continued instantiation does not depend on minds.

However, certain problematic kinds (and kinds of kinds) require some added nuance. For example, mind-independence is thought to prima facie discount kinds, such as psychological kinds. Candidates include *depression, anxiety, PTSD,* and *ADHD.* Yet, in some important way, all psychological kinds are mind-dependent. Consider an especially problematic psychological kind: *social anxiety.* Some robust biological mechanism may be the immediate cause of depression; however, *social anxiety* is not given that same privilege. Indeed, it is caused and perpetuated by human social interaction. Similar issues arise for a real account of *PTSD*, which the symptoms of are irrevocably informed and caused by external and potentially non-natural events.

But perhaps psychological kinds should not be considered real kinds. There are, however, more intuitive cases for kinds that would be unreal on this naïve account. Consider the synthetic kind, *Einsteinium* (Khalidi 240; Tahko 7). *Einsteinium* is the element with atomic number 99. However, it is not known or likely to exist, save for in a particle accelerator. It is constructed and thereby mind-dependent. An element failing a mind-independence criterion is especially concerning, given that elements are

usually considered paradigm examples of real natural kinds due to rigid, non-fuzzy borders and their epistemic interest to scientists.

Perhaps, then, we ought to modify our mind-independence to account at least for synthetic kinds—not just *Einsteinium*, but also synthetic polymers or compounds such as *Ritalin*:

Constitutive Mind-Independence: a kind is real if and only if the kind itself is not constituted by minds.

On this account, humans causally create some kinds, but these kinds need not be considered mind-dependent. *Einsteinium* and its instantiations are created by humans, but it is not constitutively mind-independent as human minds do not constitute it.

However, this account also has its issues. Muhammad Ali Khalidi argues that what "constitutive" means should be questioned (Khalidi 230). Initially, it is unclear exactly how this criterion might apply to psychological kinds, as it is difficult to imagine how things make up abstract entities such as minds, although, it discounts psychological kinds as real. Furthermore, if it is understood as dependence, this criterion faces the same pitfalls as the naïve conception of mind-independence. Khalidi also argues that kinds like *Ritalin* exist the way they do due to their influence on human mental states, which could be understood as constituted by minds (Khalidi 231).

I take issue with the idea that *Ritalin* is mind-dependent. While *Ritalin* is as common as it is because it influences the human mind, this does not mean its very constitution is mind-dependent. If mind-dependent, it only exists because of scientific and medical practice. Nevertheless, I agree that the notion of "constitutive" is vague and needs spelling out.

Another mind-independence criterion could be formulated which captures the modal dependence by which a kind came to be:

Necessary vs. contingent mind-independence: a kind is unreal if and only if it is necessarily mind-dependent, where it could not have existed without the existence of minds.

This account agrees with those in favor of including *Einsteinium* as a real kind. It is possible, however improbable, that it could come into existence naturally—however, the account over-extends reality to artificial kinds, such as *cups* and *chairs*. Perhaps on Mars, some natural process produces cups sprouting from the ground. It is possible that cups could be a kind independent of human influence, but then it is not necessarily mind-independent.

A controversial example on this account is something like *Ritalin*. Tuomas Tahko argues that complex molecules and compounds such as *Ritalin* or *fentanyl* could not have come into existence without human intervention, despite the desire to identify them as real (Tahko 9). I find this unlikely, as it is conceivable that *Ritalin* or *fentanyl* could be found on a planet's surface somewhere in the galaxy. So, necessary vs. contingent mind-independence accurately identifies these compounds as real. Despite this, it still fails to exclude all artificial kinds from being real.

Khalidi's final suggestion for a mind-independence criterion is that of mental sustenance vs. initial manifestation:

Mental sustenance vs. initial manifestation: a kind is unreal if and only if for the upkeep of that kind, it requires continual mental sustenance.

This is partly motivated by the fact that a social kind like women would cease to exist if minds stopped sustaining it. However, kinds like *Einsteinium* persist after their initial manifestation and can be considered real. But again, this account fails to explain artificial and synthetic kinds. It gets around the issue of cups naturally popping up from the red Mars ground, but earth-cups would be considered a real kind by this view.

Mental sustenance vs. initial manifestation could be amended by adding a temporality condition. The kind *cups* would cease being maintained and eventually stop being a kind, so they require mental sustenance. However, this is an incoherent addition. Wouldn't it be true that at some time X that *cups* were a kind, say even after humans stopped having beliefs or opinions about them? More telling is a kind like *dog*. *Dog* exists as they do because of their coevolution with humans, so they can be classified as a synthetic kind. But even if humans stopped having beliefs or opinions about dogs, they would indefinitely persist as any other species does. So, this criterion fails.

Khalidi outlines other mind-independence criteria. I have presented what I deem to be the most plausible. He ultimately ends his essay by proclaiming that the mind-independence criteria are irrelevant for realism. This is because of what he sees as the ultimate failure of mind-independence criteria: they cannot properly account for bogus or fictional kinds (Khalidi 244). Mind-independence criteria often lump together social kinds as being unreal in the same way that fictional and bogus kinds are. Furthermore, criteria like the mental sustenance account would place fictional kinds like *fairies* in the same category as real kinds. As *fairies* are kinds which are never instantiated at all, there is never any mental upkeep required for the kind (Khalidi 244). So, for a criterion of realism, it includes obvious cases of unreal kinds.

Khalidi's arguments about *fairies* being real under some criteria may be met with some skepticism. In particular, kinds that are never instantiated might not be the sorts of things we would consider real. MATTHEW TRAGER

However, the idea that we need a criterion that does not lump together social and fictional kinds is good. It is important to keep it in mind for other potential distinguishing principles.

As outlined, each criterion faces difficulties and objections from various angles. General pessimism (perhaps warranted) about the mind-independence criterion convinced Khalidi that mind-independence criteria are flawed. But rather than give in to pessimism, let us move on to another possible way of distinguishing real and unreal kinds.

#### Essences to the Rescue?

Another way to determine the reality of a kind is by way of essences. In this section, I will motivate a criterion to distinguish the reality of a kind by appealing to real essential properties. First, I will articulate a standard view about the essences of kinds in the realism debate and how they fail to demarcate real and unreal kinds. Then I will motivate neo-Aristotelian essentialism to distinguish real from unreal kinds: a kind is real insofar that its essential properties are objective. Finally, I will conclude this section by showing that it fails to distinguish real from non-real kinds.

The essentialist account of a kind argues that there is some property essential to being a member of a certain kind.

*Essentialist account:* to be a member of the kind X, some essential property Y (or properties Y1, Y2, etc.) is necessary and sufficient to be a member of that kind X.

Drawing from Locke, it is often thought that real kinds are the kinds of kinds that have *real, intrinsic* essences or essential properties (Locke 417). So, there is a promise that a real intrinsic essence can demarcate between the real and unreal. We can argue that nothing without a real essence is not a real kind but a conventional one.<sup>3</sup> We can articulate it like this:

1. X is a real kind iff it has a real essence.

2. Conventional kinds lack real essences.

C. Conventional kinds are not real kinds.

However, there is an immediate objection to premise 1. Some kinds we would like to include as real lack any real essence. For instance, while *hydrogen* could have an essential property of "having a one proton

structure," it is far more difficult to determine an essence of something like "tiger-ness." *Tiger* as a kind changes over time, as outlined by the robust laws of natural selection and evolution. Moreover, our classificatory schemes for species might also be arbitrary. For example, although a species distinct from *chimpanzees*, *bonobos* can interbreed with *chimpanzees*. However, the cost of denying species as a real classification is not too steep. Many philosophers reject that species are real natural kinds and endorse an essentialist cladistic view, rather than understanding something like *tiger* in terms of Boyd's HPC account (Boyd 142).

Still, the traditional argument that only real kinds have real essences will fail for the reasons outlined by Khalidi. If we desire to distinguish social kinds from bogus or fictional kinds, this proposed account lump both kinds, like *Wookie* and *women*, into the same non-real category (Khalidi 244). This shows that this argument from real essences fails to distinguish real kinds from unreal kinds. However, hope is not lost for an essentialist account of what it is to be a real kind. By adopting Finean/neo-Aristotelian understanding of essences, we can put forward a new principle to distinguish real from unreal kinds.

Recent literature, inspired by Kit Fine and a neo-Aristotelian tradition, suggests a new understanding of essence. A Finean view of understanding the essence or nature of kinds would use the notion of the "real definition" of a kind and not define the properties of the kind in terms of modality. Fine's analysis of modal-existential accounts of essences, the view that essences are collections of necessary and sufficient conditions to be a thing (whether it be *tigers* or *hydrogen*), suggests that the modal-existential account fails to capture what we mean by essence. Take the famous example that it is not essential to Aristotle to be a member of the singleton set {Aristotle}, even though it is necessary truths, such as '2 = 2,' would also be considered essential to Aristotle under the modal existential view of essences, though it is obvious that '2 = 2' is not essential to Aristotle (Fine 10).

However, there is a potential downside to adopting this framework. It allows for kinds such as social kinds to have "real" essences instead of merely nominal essences. This could be problematic for an essentialist criterion to distinguish real and unreal kinds. Responding to claims that social kinds only have nominal essences and lack metaphysically real essences, Mason argues against a social kind's nominal essences in favor of real properties that constitute a kind. Every kind has some property or properties, say X, which compose the nature of, or what it is to be that kind. That X comprises the identity of K means that X is essential to K. So, every kind K has essential properties (Mason 3988). For a kind like money, there is something for a thing to be included as a member of that kind, say being a medium of exchange or a store of value. If there are no properties by which we can identify a thing to be a kind, *money*, then there is no way we can identify a thing to belong to a kind. However, it is obvious that a dollar bill does belong to the kind *money*. So, there is something that constitutes the kind *money*, namely its essential properties. Notably, these properties are not the real, intrinsic properties like those ranging back to Locke. Rather the attempt is to reframe the debate in terms of grounding facts about social kinds like race and gender by real definitions.<sup>4</sup> However, is adopting this framework counter-productive to determine reality? It contradicts the initial assumption that social kinds are not real while natural ones are. Moreover, Khalidi may argue that these essences permit fictional kinds to have real essences.

I suggest there is no apparent problem. While social and fictional kinds are considered real in this view, it is a different question if they are of the same ontological category as natural kinds. And ultimately, they are intuitively in a different category. Nevertheless, we can still distinguish the kind of real we mean while talking about divisions of nature—objective features of the world. Similarly, this account will avoid lumping together social and fictional kinds into the same category, as we can consider social and fictional kinds to be different sorts of real.

I have only briefly summarized Fine and some aspects of a neo-Aristotelian movement. I cannot do justice to this new notion of essence in this essay. However, there are two important takeaways here relevant to distinguish what kinds are real: 1) that we can now formulate a non-modal account of the reality of kinds in terms of essence, and 2) we avoid issues of lumping together social and fictional kinds. This creates a unique criterion from the examples provided originally provided by Khalidi. The essential properties of being a kind can be reformulated as below:

*Essentialist Account:* a kind is a real kind if and only if the *essential* properties of that kind are objective.

Notably, objective here is meant to stand in opposition to social or fictional essences. This proposed account is not a mind-independence criterion. Instead, it takes the essence of a kind and evaluates those essences as objective and real. The first benefit is that it may allow psychological kinds like *depression* to be real. There is no notion of mind-independence baked in. Additionally, it seems no part of the essence of *Einsteinium* is unreal—the essence of having 99 protons is certainly an objective property. However, I still argue that this account fails.

First, let me respond to a potential objection that those critical of the essentialist account may make. It could be objected that this account replaces the metaphysical burden to determine a criterion of reality with an epistemic one. To determine what is essentially objective, we must just have knowledge about if it is a real kind. In short, my suggestion is a cop-out. However, I would like to resist this objection. I am not determining if a kind is essentially real, but if it has properties that are essentially real. This is a much less extreme requirement.

Nevertheless, this account still fails for multiple reasons. Consider a new kind of kind that I will dub *a mixed case kind*. As conceived, a mixed case kind has both objective and nonobjective properties. To provide an example, imagine the kind *hysteria*. *Hysteria* is a now-debunked psychiatric kind. It was a disorder diagnosed exclusively in women. Today, *hysteria* is understood as a tool once used to oppress females, not as a real kind. However, the unique case of *hysteria* as a mixed case presents a pertinent issue for determining the reality of a kind using the essentialist argument.

*Hysteria* was historically diagnosed on some biological ground. There was a wide range of symptoms, from yawning and clean urine to shortness and chest pain (Cohut *Medical News Today*). However, along with biological properties, the kind *hysteria* was also marked by psychological properties such as amnesia and anxiety. Finally, it was specific to the social kind *women*. So, *hysteria* was a mixed case with both essential objective and unobjective properties. *Hysteria* is now considered unreal, but the notion of mixed kinds exists as a conceptual possibility.

I argue that distinguishing the reality of a mixed case—one with both essential objective and unobjective properties—cannot be determined by an essentialist definition alone. When faced with a mixed case, there must be some additional weighing of that kind's essences to determine whether or not a kind is real. We must ask questions such as "does the fact that essence X override this kind's reality?" Another candidate for a mixed kind is *social anxiety*. It has psychological and social essences, but it seems the knowledge of its essences alone is not enough to determine the reality of the kind. Even if we could uncover the metaphysical essences of mixed case kinds, we still require another principle to determine whether or not it is a real kind. For this reason, the essentialist criterion fails. Furthermore, the essentialist argument cannot account for arbitrary classifications. Assume for the sake of argument that being the color blue is a real natural property. Say I make a collection of all blue things in my room. This is an arbitrary classification, but the essential property of all members of the group is itself real. Another principle must be introduced to determine its reality.

An essentialist criterion to delineate real from unreal kinds might be possible, but I am skeptical any is feasible due to mixed case kinds.

### Tahko's Mind-Independence of Unification Principles

The final view I would like to consider is Tuomas Tahko's mind-independence of unification principles. I will articulate his view and outline its ability to identify typical problem cases for distinguishing criteria. However, I point out that his criterion also fails to distinguish some kinds of kinds as being adequately unreal, despite his attempts to avoid these pitfalls.

Unlike Khalidi, Tahko is in support of a mind-independence criterion. He identifies the failures of previous attempts by their focus on entities rather than unification principles. The general motto of his view goes something like this:

"Rather than focusing on the mind-independence of instances of [a kind] or the constitution of those instances, we should ask whether the clustering of properties in instances of [a kind] is objectively determined" (Tahko 15). He defines unification principles as such:

*Unification Principle (UP):* the narrowest common cause for the clustering of properties in members of natural kinds (Tahko 2).

The narrowest common cause, in this view, is someone unique to the kind that unification principle clusters. What exactly is a candidate for a UP is left purposely agnostic—it could be the case that it is the laws of nature, an essence, or some causal mechanism. This leaves room for a pluralist interpretation of natural kinds and ensures it is an applicable criterion for any account of realness (Tahko 6). For example, causal accounts of fundamental kinds like *hydrogen* quickly break down and are more easily explained by objective UPs like essences or laws of nature. Ultimately what matters on any account of realism is that the UP clustering the properties of the kind is objective. So, the proposed mind-independence criterion takes this form:

Mind-independence criterion (MIC): a kind is natural or real if and only if there is a mind-independent unification principle that is responsible for the clustering of properties being tracked by the relevant kind term (Tahko 15). Take the famous case of *Einsteinium*. While each individual entity was created in a lab, this is not a concern of Tahko's criterion. Instead, we should look at the objective unification principle that determines the kind *Einsteinium*: something like the strong force which holds its atomic structure together (Tahko 15). This establishes *Einsteinium* as a real kind, not something about how it came to be in a lab.

But how does this new conception of mind-independence fare against previous attempts? It is important to point out first that it is very forgiving of psychological kinds. As long as a kind like depression has an objective, lower-level UP-perhaps based on neurochemistry—it would be a candidate for a real kind. In addition, it allows us to ignore external factors from kinds such as *PTSD* and *social anxiety* and instead focus on the possible UPs which might underlie the reality of these kinds. That being said, scientists might be unable to uncover UPs of certain kinds, perhaps like in the case of *ADHD*. Furthermore, Tahko's account places where certain kinds go wrong. For example, *hysteria* might be a mixed case of biological and social properties. However, the unification principle of *hysteria* was not objective, as the properties were clustered due to human influences and classifications.

However, two issues remain for Tahko: that of Khalidi's fictional examples and artificial kinds. At first glance, Tahko is lumping together social and fictional kinds. However, artificial kinds like cups are also determined by objective UPs, despite our intuitions that they are not real kinds. Tahko seeks to avoid this issue by appealing to a notion of counterfactual robustness. Not only must the unification principles be objective, but they must display robustness. Robustness is understood as a sort of stability and inevitability-generally understood to put up a wall against arbitrariness (Tahko 16, 18). Artificial kinds like cups are partially held together by objective unification principles but lack the counterfactual robustness typical of kinds typically considered natural and real. The same line of reasoning applies to fictional kinds like fairies, where all properties are seemingly arbitrary. If a kind does not display a robust enough UP, then we should be doubtful of its stability; this would identify it as an arbitrary classification, not a real one. However, Tahko does not commit to any definitive kind of robustness nor an exact principle to determine what is too contingent. Instead, robustness acts as a heuristic to guide our identification of kinds as overly arbitrary. If we cannot determine an underlying UP for a kind, robustness can act as a general epistemic rule to gauge the reality of a kind (Tahko 17).

Tahko's appeal to robustness as a guide to arbitrary classifications is novel, especially due to its relevance to the UPs he determines as the absolute guide to kind realism. However, in the case of artificial kinds, this epistemic criterion is the only guide to determine a kind's reality. Take the example of fentanyl, which occupies a tenuous state between robust determination by objective UPs and some form of mind-dependent arbitrariness. There is no way to distinguish fentanyl's reality in his account; instead, the burden is on the heuristic. While a heuristic highlights the arbitrariness of *cups* and chairs, whichever way fentanyl is placed might itself be arbitrary. A similar concern arises for kinds like dogs. However, the burden that Tahko leaves on an epistemic criterion is considerably minimal. He only evokes one in cases of empirical investigation to determine a UP and for a few edge cases and problematic kinds. For example, I could suggest something like a 'causal story' to determine the reality of a kind. While a causal story such as this must be qualified, it might be understood as: a kind is not real if and only if humans or other beings with a mind played a role in its causal history to make or maintain that kind. This determines what role humans have in a particular kind, but it places far too much emphasis on our ability to discover these underlying causal stories than is appropriate for a metaphysical principle to determine the reality of kinds.<sup>5</sup> So, while Tahko's mind-independence of unification principles does leave some to be desired, it is a promising criterion for determining real kinds.

#### Conclusion

I have outlined potential criteria for kind realism and determined that no completely satisfactory metaphysical criterion can be found. I first considered some common conceptions of mind-independence and found them to be unsatisfactory. Next I proposed an essentialist criterion to determine reality, but I am skeptical one will be effective due to what I dubbed *mixed case kinds*. Finally, I determined the best candidate for a criterion is likely Tuomas Tahko's mind-independence of unification principles.

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