Psychiatric Disorders Are Not Natural Kinds

Peter Zachar

Abstract: I critique the *essentialistic* notion that psychiatric disorders should be conceptualized as natural kinds, that is, exhaustively defined with reference to inherent properties. Biomedical model thinkers believe that psychiatric natural kinds can best be isolated by studying underlying biopathological processes, while research-oriented clinical psychologists think they can be identified statistically. Both groups assume that if a category can't be conceptualized as a natural kind, it is an arbitrary category. I argue that conceptualizing psychiatric disorders as bounded entities in nature is inconsistent both with medicine's understanding of *disease* and evolutionary biology's understanding of *species*. In contrast to natural kinds, I introduce the concept of practical kinds, which are stable patterns that can be identified with varying levels of reliability and validity. I claim that thinking *anti-essentialistically* and conceptualizing psychiatric disorders as practical kinds is more consistent with a scientific view of the world.

Keywords: categorization, diagnosis, *DSM,* essentialism, evolution, internalism-externalism, natural kinds, nosology, prototypes, psychiatry

A natural kind is an entity that is regular (nonrandom) and internally consistent from one instance to the next. Elements such as carbon, gold, or a species of animal such as tigers are common examples. Bechtel (1988, 57) defines natural kinds as "sets of objects which figure in scientific laws and have defining conditions". Defining conditions refer to necessary and sufficient properties that are inherent to the thing in question. For example, any element that has an atomic number of 79 is gold. Having seventy-nine protons is the essence of what it means to be gold, in all possible worlds. Any object that looks like gold but is not made out of atoms having seventy-nine protons is not gold. Thinkers who believe in the widespread existence of natural kinds are called essentialists.

Although mental health professionals do not use the term *natural kind*, they have used related concepts to evaluate classification systems. As framed in psychiatry and psychology, the goal of any nosological system is to carve *nature at her joints*. According to Kendell (1975), "[i]n terms of the familiar aphorism that classification is the art of carving nature at the joints, it should indeed imply that there is a joint there, that one is not sawing through bone" (65).

Related to the concept of natural kinds, Blashfield (1986) applies the traditional philosophical distinction between intensional and extensional definitions to the analysis of psychiatric categories. An intensional definition of depression would be a list of necessary and sufficient conditions that define the inherent meaning of depression. The extensional definition of depression would

be the set of all people who are depressed. This model is essentialistic. There is a specific kind of thing with an inherent meaning (intension), and all members of that set of things can be listed (extension).

In this article, I argue that it is a mistake to think of psychiatric syndromes as natural kinds, meaning bounded categories that have necessary and sufficient internal conditions for their diagnosis. This is important because thinking about something as a natural kind suggests that there is a God's-eye view of that thing, a single accurate description of what it really is—independent of any particular way that we may conceptualize it.

Because phenomena such as diseases and species (as currently understood) are not natural kinds, mental health professionals should not think of psychiatric disorders as natural kinds either. This holds whether they are using the medical model favored by physicians or the psychometric model favored by scientific psychologists. Like species and diseases, psychiatric syndromes are best considered as belonging on the continuum of *practical kinds*. Thinkers who prefer to think in terms of practical kinds are called pragmatists. Pragmatists are committed anti- essentialists.

Thinking of psychiatric disorders as practical kinds makes it possible to ask whether someone has a generalized anxiety disorder or an anxious personality disorder without believing that this is a fixed either/or question. There may be sound reasons for preferring one category over the other in terms of the consequences that the labels have, but choosing between these two categories is not a question of diagnosing the "real" disorder.

Kinds of Kinds

Psychometrically defined, since natural kinds have fixed internal properties that make them be what they are, they can potentially be identified with perfect reliability. Natural kinds can be identified as the same kind of thing every time. To illustrate, once you know what the essence of gold is, you can decide whether a particular element is or is not gold with perfect accuracy. A natural kind is a pure kind, and once you have defined its essence, errors of identification are eliminated.

From an essentialistic perspective, any category that cannot be defined with respect to fixed internal properties is an artificial (or arbitrary) category. In psychiatry, Thomas Szasz (1961) is famous for arguing that schizophrenia is an artificial kind. Artificial kinds are supposedly pseudo-kinds; that is, they don't really exist. What limited reliability they have capitalizes on chance. Some psychologists, especially those who favor dimensional models such as Robert McCrae (1994), also claim that the personality disorder categories in the American diagnostic system are arbitrary. Because both schizophrenia and the personality disorders are not natural kinds in the way that Alzheimer's disease is supposedly a natural kind, an assumption is made that they must be artificial kinds. Both Szasz and McCrae fail to consider the continuum of practical kinds.

Gorenstein's (1992) description of the kind drug is a good example of a practical kind. According to Gorenstein, drug is a superordinate category that describes the role of a diverse set of chemical compounds used in medical practice. Drugs include "throat lozenges, cholesterol reducers, nasal sprays, muscle relaxants, antibiotics and diaper rash relievers" (15). Many different kinds of compounds can be drugs. Being a drug is not an inherent property of any chemical; it is a relational property. Gorenstein thinks that mental illness is a practical kind of this type.

Practical kinds are fuzzier than natural kinds, but they are not arbitrary. Psychometrically defined, classification of practical kinds requires balancing criteria that change their values in different contexts. As a result, practical kinds do not have perfect reliability. They can be thought of as existing on a continuum, with some of them having higher reliability than others. To illustrate, deciding whether or not a particular instance of behavior is altruistic requires considering several factors, and there are no fixed rules telling us which factors are most important. A decision about whether a mother lion's self-sacrifice for the sake of her cubs is altruistic cannot be made with perfect reliability.

Understanding more about the role of practical kinds is important, primarily, because of a tendency among some scientifically minded psychiatrists and psychologists to think about psychiatric disorders as natural kinds. For example, thinking that schizophrenia or bipolar disorder can be fully understood as broken brains or thinking that diagnostic overlap between categories such as anxiety, depression, borderline personality, and histrionic personality disorder indicates that these categories are arbitrarily defined. Those who believe in natural kinds claim that the goal of the scientist is to isolate the "real" categories. In contrast, I argue, similar to Paul Meehl, that this kind of essentialistic thinking is scientifically malignant.

The *DSM* Does Not Assume Natural Kinds

The advantage of rejecting the notion of psychiatric natural kinds is reflected in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) conceptualization of categories, which is based on the prototype model of categories rather than the classical model of categories. The prototype model is an attempt to define how human beings actually categorize objects and concepts. It is based on the work of psychologist Eleanor Rosch and her colleagues, and it is robustly anti-essentialistic (Rosch 1981; Rosch and Mervis 1975).

Classical categories are the kinds of categories an essentialist would believe in; they are natural-kind categories. According to Lakoff (1987), classical categories have distinct boundaries, so someone either is or is not a member of the category. For example, Mars either is or is not a *planet*, or a figure can be a *triangle* or a *square*, but not both. Classical categories also have a set of necessary and sufficient properties that define them. Aristotle's definition of human beings as "rational animals" is an example of classical categorization. Thus, the term *rational animal* expresses the essence of what it means to be human. In this view, anyone who could read the book of nature, God's cookbook, could know what something really is.

As opposed to classical categories, categories in the prototype model have "fuzzy boundaries," so it is not always clear who is and who is not a member of the category. Some members are better examples of the category than others; for example, a robin is more prototypical of the category *bird* than is an ostrich, and the King's throne is more prototypical of the category *chair* than is a bean bag. There are prototypical (a robin is a bird), atypical (a whale is a mammal), and borderline (a bookend is a piece of furniture) examples of any particular category.

In addition, prototype categories do not have necessary and sufficient conditions that define membership. A picture of a horse without legs would still be correctly identified as a horse by most people. Members of a category do not need to share all properties in common; instead, they share a *family resemblance*. This means there can be alternative criteria for being placed in a category.

For example, although an Aristotelian would take "rational animal" to be a necessary and sufficient criterion for being human, one could also uniquely define humans as "featherless bipeds." Furthermore, those who are brain dead may not be rational, but we would still think of them as human beings. Nor do we consider a chimpanzee who can both use tools and rationally generate sentences in sign language to be human. There are not always clear and distinct sets of properties that define category membership. As the *DSM-IV* states, classification is not a cookbook affair; it sometimes requires clinical judgment that takes context into account.

In the *DSM*, patients are diagnosed according to how well they match the criteria set, but no one criterion or group of criteria is necessary and sufficient. Diagnosticians call this the "polythetic" criterion strategy, and it is a version of the *prototype* model. Polythetic criteria sets are organized so that the most prototypical criteria are listed first. As Widiger and Francis (1994) note, there are 93 different ways to meet criteria for being diagnosed with borderline personality disorder in the *DSM-III-R* and 848 different ways to meet criteria for antisocial personality disorder. A syndrome such as antisocial personality

disorder is a family of personality types rather than a single discrete type.

The manual also provides differential diagnostic suggestions to help with the issue of fuzzy boundaries between categories. For example, someone can be depressed or schizophrenic, or depressed *and* schizophrenic, or schizoaffective. For the diagnostician to distinguish schizoaffective disorder from depression with psychotic features, the affected person must have experienced sustained hallucinations and delusions in the absence of a mood disturbance. To distinguish schizoaffective disorder from schizophrenia *and* depression, a mood disturbance must be present for a substantial portion of the active psychotic phase. The biggest fuzzy boundary categories are called V-codes, where the category *psychiatric disorder* itself has borderline cases. V-codes refer to conditions such as marital discord and spiritual crises, problems that may deserve clinical attention but are not labeled as mental illnesses.

Scientific realists influenced by Meehl, such as Grove and Tellegen (1991), claim that prototype models confuse clinicians' cognitive processes with the nature of reality. In their view, we may naturally think in terms of prototypes, but that does not mean the world is really organized into prototype categories. Unfortunately, Paul Meehl overemphasizes the project of discovering reality, jumping from the legitimate goal of trying to find out how the world is to the questionable suggestion that we can find out how the world really is. As a good falsificationist, he knows that claims about finding out about *The Truth* are wrong. He is so good at pointing out what is false that he sometimes talks as if robust statements that survive logical critique can be thought of as having been confirmed—a possibility that Popper rejects. His University of Minnesota colleagues are even looser with talk about "carving nature at the joints."

To calm the fears of my "tough-minded" readers who may be less familiar with the details of pragmatism, the absence of absolute criteria does not leave professionals with "anything goes." There are criteria and those criteria are a function of more than personal whims. For example, even if the categories of *schizophrenia* and *borderline personality* are best considered prototypical in structure where there are clear cases and borderline cases for each, there is still a difference between schizophrenia and borderline personality. Even though diagnosticians cannot provide a single set of conditions that are both necessary and sufficient for the diagnosis of schizophrenia, schizophrenia can still be distinguished from other disorders. Furthermore, we can give plenty of reasons for saying that "racist personality disorder" is not a legitimate psychiatric disorder without having to think that we are carving nature at the joints. "Whatever goes" is not an option.

From the standpoint of pragmatism, theories and models are instruments that help us navigate through the world. Their validity is in their usefulness.[1] Similar to natural scientists, pragmatists are open to the possibility that a better model can always be developed. This cautions them from too easily believing that their categories directly correspond to how things really are. Models are best considered prescriptions—possible tools for understanding the world, rather than descriptions—meaning authoritative statements about what the world is really like. This kind of pragmatic anti-essentialism is also consistent with the following three propositions from Lakoff (1987):

(a) There is a world external to human beings.
(b) The world is somehow the cause of our knowledge.
(c) Some belief systems are better than other belief systems.

Two Classification Approaches, Both Arguably Anti-Essentialistic

In the next two sections, I argue that the medical model approach to identifying psychiatric categories and the psychometric approach to identifying psychiatric categories are both consistent with anti-essentialism.

Approach 1: The Medical Model

Classification has been and continues to be one of the most important problems in psychia-

try. It involves deciding what syndromes psychiatrists should diagnose and treat. Proponents of the biomedical model would define syndromes just as other syndromes are defined in medicine. The first step involves a clinical analysis where various signs and symptoms are seen to co-occur in a way that suggests that more than chance is operating. So the co-occurrence of a sore throat, runny nose, and head and chest congestion would suggest an integrated syndrome, classified as the "common cold." This is called the clinical presentation of the illness. The next step is to describe the course of the syndrome, so we find out the sore throat may come first and disappear, then sinus congestion, manifested in a yellow discharge, followed by a clear discharge as the person becomes noninfectious. At some point in the process, chest congestion develops, and it can linger on for weeks. Recovery is spontaneous. In this model, syndromes have a common etiology and therefore a common cure. Describing the physical mechanisms that produce the syndrome is the heart of the biomedical model. Once it is clear that there are such mechanisms, syndromes are called diseases and traditionally conceptualized as natural kinds.

If psychiatric syndromes are biological natural kinds, biological variables such as genetic codes and drug response may help us isolate their underlying reality. Some psychiatrists and psychologists assume that, because physical diseases are the bedrock reality of medical science, in order to be scientifically valid, depression and schizophrenia have to be understood as physical diseases. As diseases, they must have underlying pathological processes. For example, in the one-time epidemic psychiatric disorder *general paresis*, the symptoms or the presentation can vary from a paranoid syndrome to a depressive syndrome to a grandiose syndrome, but the underlying pathological process is the same (Blashfield 1984). The underlying pathological process is untreated syphilis. The presence of the spirochete is necessary and sufficient for a diagnosis of syphilis.

According to Staats (1991), one characteristic of a mature and unified science is being able to see how superficially diverse phenomena are really manifestations of the same phenomena, such as an underlying pathological process. Explaining schizophrenia and depression just as general paresis was explained is an important goal for the biomedical model.

Although the notion that syndromes conceptualized as diseases will help mental health professionals discover psychiatric natural kinds, diseases cannot be conceptualized only as discrete physical entities. Following an examination of this issue, I will examine the concept of the species, showing that evolutionary biologists reject the idea of absolute boundaries between species. If diseases and species are not considered to be natural kinds, psychiatric disorders should not be considered to be natural kinds either.

Diseases Are Not Natural Kinds

According to Blashfield (1984), disease literally once meant dis-ease, but advancing medical knowledge led to the discovery of conditions where people could have a disease without any subjective discomfort, for example, high blood pressure. The meaning of the term *disease* evolved and continues to do so. Some diseases are fatal, others are inconveniences. Some diseases represent high or low ends on a normal continuum of biological processes, while others represent qualitative deviations in biological processes (Guze 1992).

Our inability to point to one thing and say this is the disease is summarized by Roth and Kroll (1986):

> Thus for example, not everyone exposed to tuberculosis develops the disease in its complete form. The state of the immune system depends on the host's genetic constitution, nutritional status, viral infections that may produce an immunodeficiency syndrome, previous exposure to similar microbial pathogens, state of fatigue, state of anxiety, level or morale, presence of depression, recent major life changes and other 'psychological' factors. (63)

The bacillus is necessary but not sufficient for tuberculosis. Infections exist in hosts, and disease processes result from the interaction between infection and host. They are relational rather than inherent properties. Wallace (1994) shows that anti-essentialism pertains to treat-

ment as well. He notes that although infectious diseases are the most physiologically based diseases in medical science: (a) the same infection in two different patients may not respond to the same antibiotic or antiviral medication, and (b) different microorganismic infections may respond to the same medication. Wallace's observations should lead us to be skeptical of some biological psychiatrists' claims that every disorder that responds to anti-depressant medication must be a variation of the same disorder.

Infectious diseases are prototype diseases. If someone has the TB bacillus, he or she will be diagnosed as having tuberculosis and treated. The same is true for syphilis. If the spirochete is present, the person will be treated for syphilis before any symptoms appear. Such problems can be reliably diagnosed, and accurate diagnosis helps physicians make predictions about what is going to happen to the person if they are not treated. Once a category is defined, understanding its causal mechanisms becomes an important clue to deciding whether or not it is present. The high reliability and predictive validity of infectious diseases makes them the most practical of practical kinds.

Because practical kinds cannot be fully defined with respect to inherent properties, external criteria play a role in their definition. Gorenstein (1992) notes that we mistakenly confuse the issue of the biological basis of syndromes such as schizophrenia and borderline personality with the question of whether they are diseases. Showing that they have a biological basis does not demonstrate that they are diseases any more than showing that extroversion has a biological basis demonstrates that it is a disease. Like Fulford (1991), Gorenstein thinks the disease concept also involves a social evaluation of maladaptiveness, which is a different problem from the problem of deciding if schizophrenia exists. As Kendell (1975) notes, in practice, claiming that a person has a disease really means that there is something wrong that needs to be treated. Like all practical kinds, diseases cannot be fully defined with respect to inherent properties.

An example of the role of external criteria in identifying practical kinds is the American Psychiatric Association's reclassification of homosexuality from a pathological sexual perversion to a normal variation in sexual orientation. We still think of homosexuality as a type of behavior with a biological basis, but we do not think of it as a maladaptive disease. The gay-lesbian community has even used theories about a biological basis for homosexuality to support the idea that it is a normal variation. Thirty years ago, an identified biological basis would have been considered confirmation of the real existence of a disease. If the community is unwilling to label homosexuality as an illness that needs to be treated, its biological basis will not be called a disease.

If we separate the question "What is schizophrenia?" from the question "Is schizophrenia a disease?" it might be possible to define schizophrenia essentialistically. If natural kinds are defined only with respect to their causal mechanisms, the essence of schizophrenia would be its causal mechanisms. However, schizophrenia would still not be a classical category. Defining a disease with respect to its causal mechanisms without considering that disease to be a classical category might be called a "soft" natural kind. This raises the thorny question of what level is going to be considered the essential causal level and the problem of overdetermination (or multiple causality). Also, it may not be so easy to separate the question "What is paranoid personality disorder?" from the question "Is paranoid personality disorder a disorder?"

One promising strategy for rescuing the classical category model has been to substitute the concept of disease for the concept of a disorder. Wakefield (1992a, 1992b, 1993) specifically defines mental disorder as "harmful dysfunction." The term *harm* refers to the fact that the condition has negative consequences for the person. It involves a reduction in well being, defined by social values and meanings. The term *dysfunction* refers to the fact that something has gone wrong with an internal mechanism; it is not operating the way it was designed to operate. The concept of dysfunction helps distinguish a mental disorder from normal responses that also have negative consequences, such as grief and trauma. So *disorder* refers to harm to the person

because of the failure of some internal mechanism to operate in the way it was designed to operate.

Wakefield's definition conforms to the classical category model in that *design failure* and *harm* are in combination necessary and sufficient for labeling a particular state a disorder—with design failure being the underlying pathological process. Wakefield defines *dysfunction* like Thomistic philosophers defined *evil*, it is a privation—an absence of something that ought to be there. It is not an entity. The biggest challenge in using this model is in deciding what ought to be there.

I'm not convinced that Wakefield's concept of harmful dysfunction is being proposed as a natural kind because the harm criterion does not refer to internal or inherent properties. For Wakefield, *harm* means maladaptive. As long as *maladaptive* is part of the meaning of psychiatric disorders, defining psychiatric disorders as *identical* with some fixed internal state will be insufficient. This is because rather than there being inherent, fixed traits that define adaptativeness, adaptiveness is defined as whatever confers a competitive advantage. As the local ecology changes, what counts as adaptive changes, so that traits adaptive in some situations can be maladaptive in other situations. For example, Wakefield (1993) notes that being in a psychological state of hyperalertness because you believe the Mafia is trying to kill you is adaptive if you are a government informant and the Mafia actually is trying to kill you. That same psychological state is maladaptive if you are delusional, and the Mafia is not trying to kill you. These kinds of states have what philosophers call *narrow content*. Their adaptiveness can't be evaluated independent of external conditions—especially social norms and practices.

Even design failure cannot be understood only with reference to internal properties. According to Dennett (1987), we can't understand an organism's internal design without making reference to external conditions. Imagine, asks Dennett, finding a heretofore unknown life form that has been put into a kind of suspended animation. Our job is to study this organism's design and figure out how it would behave. We could not proceed without developing some theory about what kind of environments the organism is adapted for. Learning more about the internal design of the life form will always include more specific theories about what kind of environments it is adapted for. Natural selection acts on interactions between an organism and the environment. Realizing this, Wakefield (1999) indicates that identical internal mechanisms may constitute a design failure for one subspecies and adequate design for another subspecies—depending on their evolutionary history. Design failure is therefore not a natural kind, one defined solely with respect to fixed inherent properties.

Contra Wakefield and similarly to Lilienfeld and Marino (1999) and Richters and Hinshaw (1999), I would prefer to leave open the possibility that syndromes such as *psychopathy* and *dysthymia* are currently maladaptive variants rather than dysfunctions imposed on the brain. Evolutionary theory readily admits the existence of individual variations that are maladaptive but consistent with an organism's "design."

For example, after watching enough *Nature* programs on PBS, it seems reasonable to hypothesize that a condition such as narcissistic personality disorder could be labeled *alpha male syndrome*—a normal variation within the range of male behavior. If we follow leading evolutionary theorists such as Hamilton (1964), Williams (1966), Trivers (1971), Dawkins (1976), and Cosmides and Tooby (1999) in holding that the gene is the unit of selection, narcissistic personality disorder could be an effective strategy for maximizing gene replication and therefore consistent with an organism's design. All of Wakefield's examples of design use an individual-centered concept of evolution. It is possible that from a "gene's-eye" point of view, Wakefield would have to bite the bullet and say that narcissistic personality disorder is not really a disorder. If these kinds of counterintuitive cases (false negatives) begin to pile up, we will begin to think that the harmful dysfunction model needs to at least be augmented with some auxiliary propositions.[2]

Species Are Not Natural Kinds

If the anti-essentialistic model of disease sounds too tender-minded, it may help to know that the

existence of natural kinds is also doubtful in zoology and paleontology. For example, Hull (1989) notes that species are statistical abstractions rather than essences.

> At any one time, one can rarely discover a set of traits which is possessed by all members of a species and by no members of some other species. In addition, the members of successive generations of the same species are usually characterized by a sightly different set of traits. (147)

Gould (1983) points out that alternative taxonomic systems provide scientists with different classifications of species. A major debate in zoology in the past thirty years has occurred between proponents of phentic versus cladisitic classification. According to the *numerical phenetic model*, which is based on a mathematical analysis of outward appearances, mountain zebras, Burchell's zebras, and Grevery's zebras are all part of the species *zebra*. According to the *cladistic* or phylogenetic model, where organisms are grouped according to their common ancestors, mountain zebras are classified as a kind of horse. Gould (1983) also notes that orangutans are cladistically more distant from chimps and gorillas than humans are. Another example is given by Ridley (1989), who points out that lungfish are more similar to cows than to salmon according to cladistic criteria. Neither phenetic nor cladistic classifications are whimsical; for example, neither model would classify orangutans as a type of reptile. The phenetic and cladistic taxonomies also have significant overlap, but what counts as a group is partly model-dependent. Zoologists have not achieved what could be called a fixed "God's-eye" view of species.

A compromise between the phenetic model and cladistic model is offered by one of the century's most prominent biologists, Ernst Mayr (1988, 1989, 1991), who believes in the reality of species more than Darwin did but rejects the natural-kind view of species favored by pre-Darwinian thinkers such as Linnaeus. Ruse (1988) and Mayr (1988) both claim that post-Darwinian biology has given up on Aristotle's idea of species as natural kinds for an understanding of species defined by polythetic criteria. Mayr notes that the very possibility of the evolution of species contradicts the idea of a fixed inherent structure that defines all members of a species. The facts of evolution suggest that any criteria set will eventually become outdated. This is why Mayr (1969) claimed that the traditional approach of classifying what species exist, that is, classical taxonomy, must be augmented with an understanding how life in all its diversity fits together, that is, systematics.

Biologists do not think of the individual-species relation as analogous to the member-class relation where members belong to a class because they share common properties; rather, they think of it as more analogous to the cell-organism relation, where individual cells make up a larger organism. Instead of *organism,* they follow Darwin in using the word *population*. In contrast to Linnaeus, Darwin defined a species in terms of populations of unique individuals rather than individuals sharing a common essence. A population is a genetic, behavioral, and ecological system whose members compete with each other and as a whole with the members of other species. Rather than what an essentialist would call "imperfections," "errors," or "accidents," individual variation is central for understanding the long-term fluid nature of species.

Mayr's own compromise between the phentic and the cladistic models is called the *biological species* model. A species is defined as:

(a) A reproductive community, usually mating only within the group.
(b) An ecological unit; individuals in the group share an environmental niche and relate as a group to other species.
(c) A genetic unit; any individual only holds a part of the species' gene pool.

Especially for the behavioral criteria (a) and (b), species are defined in terms of relationship patterns rather than an internal essence. In contrast to the phenetic model, Mayr shows that groups with very different external appearances can interbreed, and groups with similar external appearances cannot interbreed. In contrast to the cladisitic model, even though birds and crocodiles are closer together with respect to shared ancestors than crocodiles are to other reptiles, ecological and behavioral variables make croco-

diles more like reptiles than like birds. Both models provide evidence that we can use in a comprehensive conceptualization.

As a confirmed anti-essentialist who explicitly rejects nominalism, Mayr believes that species are not just inventions. The distinctions accepted by taxonimists are far from arbitrary. For example, there are nonarbitrary gaps between many species. There is a clear gap between primates and reptiles, whose inability to interbreed is stable. Whether genetic manipulation could transform this "law" into an empirical generalization is an open question (and probably one that should never be answered).

In terms of populations that are less distinct, however, it can be difficult to clearly see what counts as a genetic or reproductive community, especially when you have incipient species—groups that have acquired some but not all characteristic of a species. With these borderline cases, a species as an absolutely fixed type evaporates away. With a change of habitat, single groups can divide into two or more groups (speciation), or two groups that were separate under certain conditions (for example, wolves and dogs) can relate to each other as a species. As Dawkins (1986) notes, the primary reason that we can maintain a belief in discrete boundaries between species is that intermediaries tend to be extinct.[3] A few intermediaries do, however, still exist. For example, Kendell (1975) notes the platypus is neither cold-blooded like a reptile nor warm-blooded like a mammal, but a mixture of the two.

The process of categorizing species can illuminate the process of categorizing psychiatric disorders. As the phenetic-cladistic debate shows, although external appearances do not define the essence of categories, they still have an important role to play in categorization. Appearances are always part of the evidential basis in any comprehensive system for defining categories. For example, it is impractical to exclusively classify lungfish with cows and not with salmon because lungfish behavior is so much more congruent with salmon behavior. Habitat matters.

In the same way, it would be impractical to classify borderline personality exclusively as an anxiety disorder or to reduce anxiety and depression to negative emotionality as some people in psychiatry have suggested. Internal biological properties, whatever they may be, are important, but they tend to be insufficient for understanding syndromes. Phenomenology still has an important role to play in categorization.

Psychologists such as Widiger and Trull (1991) use terms such as *arbitrary* to refer to psychiatric classification systems which are based on similarity of presentation. Arbitrary is a strong word, suggesting whims or preferences as opposed to the kind of sustained regularity one would expect in natural kinds. Unfortunately, a pejorative word such as *arbitrary* is merely a rhetorical device used to demean an opposing model.

Let me illustrate this by analyzing Corning's (1986) example of classification by similarity of presentation. It involves his six-year old son's rearrangement of his office. Corning drew babysitting duty with his six-year old son on an afternoon that he had to chair a thesis defense. He arranged it so the boy would be occupied in his office while he was at the meeting. Upon returning to his office after the meeting, he found that his son had reorganized his filing system. All his brown folders were neatly stacked in a pile on the floor. All his manila folders were stacked in their own pile. The documents in each file had been removed and placed in their appropriate piles. Legal size yellow notepaper was in one pile, legal size white notepaper was in another pile, notebook-size yellow notepaper was in a third and so on. All white paper with typing on it was in its own pile. When his father returned, the boy proudly proclaimed that he had "straightened the office out." Corning suggests that his son's classification was analogous to psychiatric classification, where a superficial analysis based on outward appearances takes the place of an analysis of categories in terms of the information they contain.

This amusing story, however, fails to make the point that proponents of natural kind categorization think it does, that is, that it is an example of arbitrary classification. The boy's reclassification of Corning's files into folder type and paper type was not arbitrary. It was concretely system-

atic in its organization. The important issue is not what rules we use to develop categories. The important issue is deciding how useful the proposed categories are. Organizing offices in terms of files, so that information on attention deficit disorder is in one file, information on lateralization is in another file, and information on cluster analysis is in another file is more useful to an academic than putting all the yellow paper in one pile. Categories are practical kinds. The categories developed by Corning's son were impractical, not arbitrary. Traditional psychiatric categories are not arbitrary either. Rejecting essentialism in favor of anti-essentialism does not require one to adopt nominalism. Practical kinds are more than names, but less than inherent essences.

Addendum: Maximize Taxonomic Advantages, Compensate for Disadvantages

If philosophers of biology are correct, medical model theorists should be able to propose alternative taxonomic systems for defining syndromes, and each system may have different sets of syndromes. Classification schemes developed at different level of analysis, for example, (including but not limited to) the genetic level, the neurochemical level, the anatomical level, the phenomenological level, or the sociocultural level may not be perfectly isomorphic with each other. Each taxonomy would have validity for certain purposes, but no one could be called the real taxonomy.

All but the most partisan thinkers agree that this is true with respect to the categorical versus the dimensional classification of psychiatric disorders. Under certain conditions, disorders considered unique can be seen to be a variants of the same disorder:

Alcoholism, attention deficit hyperactivity disorder, and psychopathy equal the same disorder (Wender and Klein 1981).

Comorbidity between personality disorders is a function of shared pathogenic factors (McCrae 1994).

Or a single disorder can be more usefully studied by being fragmented into several different types:

Schizophrenia equals a positive symptom presentation a negative symptom presentation (Andreasen and Olson 1982).

"Borderline schizophrenia" includes borderline personality disorder and schizotypal personality disorder; Schizoid personality in *DSM-II* equals schizoid and avoidant personality in *DSM-III* (Gabbard 1994).

Each taxonomy would have a different set of advantages and disadvantages, but syndromes would not just be inventions.

Another version of the same point is made by Widiger and Francis (1994). They note that one of the most important decisions in developing *DSM* diagnoses was to decide where to place cut-off points. For example, to be diagnosed as having antisocial personality disorder, one has to meet at least five of the nine criteria for that disorder. Widiger and Francis note that any diagnostic system will be used for many purposes, including "hospitalization, medication, psychotherapy, insurance coverage, scientific research, criminal responsibility, disability, and so forth" (23). The optimal cut-off point would be slightly different for each of these purposes. No diagnostic system can be considered "The System."

Approach 2: Psychological Measurement

One problem with clinical observation is that human judgment may not always be sensitive enough to detect subtle patterns. For example, AIDS as a syndrome existed in patient populations long before physicians noticed it. In psychiatry, ever since Kraepelin proposed the label dementia-praecox, students of what came to be called schizophrenia have believed that is not a unitary syndrome but a group of related disorders. Unfortunately clinicians have not been able to intuit the different syndromes that make up what we call "schizophrenia."

The traditional medical model is not the only approach to classification. Clinical psychologists, who are trained in scientific methodology rather than applied medicine, claim that co-occurrence is a synonym for correlation. Correlation has an exact mathematical definition—it is an index of the proportion of total variance that is due to scores that co-vary in a predictable manner. The

best way to decide what variables are correlated is by statistical analysis. Therefore multivariate methods such as factor analysis and cluster analysis, which can objectively determine the presence or absence of patterns in the data, may be more scientifically sound than clinical observation. Because the observer-independent patterns found by statistical analysis are also by definition nonrandom, they could even be called natural kinds.

Statistics Require Assumptions

Unfortunately for psychological science, statistical methods are not so artless. Skinner (1981) and Blashfield (1980) have both criticized the naive empiricism adopted by some proponents of statistically guided classification. For example, in *Monte Carlo* studies, where artificial data sets are generated to test statistical assumptions, even with a random pattern of data, factor analytic procedures will extract factors. They capitalize on chance variance in the data to find a pattern. The same can be true for cluster analysis. Even if no patterns exist, statistical analysis may find them. This means that there is a potential false-positive problem with multivariate statistical methods. Such methods may find patterns that are not really there. Furthermore, if the appropriate variables are not entered into the analysis, multivariate methods can also fail to detect patterns, that is, yield false negatives.

Another problem with multivariate statistical methods is that their calculations are not as objective as some of their proponents claim. As Skinner (1981), Blashfield (1981), and Tinsley and Tinsley (1987) note, various theoretical and mathematical decisions have to be made before analyses can be run, and these decisions can affect the results. These decisions include deciding whether variables or persons should be correlated; deciding whether factors should be correlated or uncorrelated (orthogonal); deciding whether all the variance to be partitioned is considered common variance; deciding whether items should load highly onto one and only one factor (simple structure); deciding how distances between variables are to be computed; and deciding what strategy the investigator uses to form clusters. All these decisions can influence the results. Therefore, the derived patterns are partly method-dependent.

Mathematically Structured Folk Constructs Are Not Natural Kinds

Widiger and Corbitt (1994), Widiger and Trull (1991), and McCrae (1994), who favor psychometrically discovered dimensional models, critique clinically discovered categorical models because they are "hypothetical constructs," "arbitrary," and "not naturally occurring categories." They contend that the *DSM*'s comorbidity problem is unacceptable for a system that is supposed to be composed of discrete entities. This essentialistic critique of categorical models, which conforms to the nineteenth-century view of disease, suggests that their own dimensions based on the five-factor model of personality will somehow carve nature at her joints. Their preferred measure of the five-factor model is called the NEO-PI.

As noted, there are good reasons for claiming that psychometric methods for discovering psychological dimensions do not carve nature at the joints. It is true that once certain parameters are defined, relatively stable solutions emerge, but change the parameters and different solutions may appear. In carving, we should not find different joints if we switch knives. When the issue is considered under the rubric of *scientific realism* versus instrumentalism, dimensional models do not themselves meet the standards that their proponents use to reject categorical models.

Furthermore, considerable subjective judgment is required to name factors. For example, the Conscientious factor on the NEO-PI could also be called dependable, responsible, scrupulous, conformist, or, as a rebellious young client of mine once stated, "ass-kisser." These are not mere synonyms. It is like describing someone as flexible versus describing them as flaccid or as rigid versus rigorous. Different terms have different connotations. These are not natural kinds.

The biggest misinterpretation of latent mathematical categories is to confuse a *factor* with a

factor-derived scale. As Cattell (1978) notes, a factor is a latent entity that accounts for a proportion of variance in a correlation matrix. Each item in the correlation matrix usually loads onto the factor. Psychometricians often take the items on a factor with the highest loadings and put them on a single scale, but the scale is not the same thing as the factor. The factor usually contains some of the variance from all the items, not just the items with the highest loadings. Furthermore, the items with high loadings still contain variance that is not associated with the factor. Scales are not factors. They are constructs of convenience.

During the development of the *DSM-IV* in the early 1990s, the NEO-PI dimensions were proposed as alternatives to the personality disorder categories. The NEO-PI measures five traits, Neuroticism, Extroversion, Openness, Conscientiousness, and Agreeableness. These are called the "Big Five" because they have emerged in several major factor-analytic research programs over the years. In their review of its conceptual beginnings, McCrae and Costa (1990) claim that the NEO-PI is based on the descriptions of personality found in natural languages, which they refer to as "folk wisdom" (30). They also claim that, over the centuries, all important traits have been encoded in natural languages. In their view, because factor analysis can find latent dimensions underlying these person-in-the-street labels for traits, we can, in principle, isolate real categories for the psychology of personality. McCrae and Costa (1997) use evidence for the cross-cultural consistency of the NEO-PI to claim that they have discovered the universal structure of personality.

Not all philosophers and psychologists would agree with McCrae and Costa's assessment. For example, in what he calls the "fallacy of the perfect dictionary," Alfred North Whitehead (1938) criticized the pernicious idea that humans have "consciously entertained all the fundamental ideas that are applicable to [their] experience" and encoded them in language (173). With respect to the NEO-PI, Tellegen (1993) convincingly argues that McCrae and Costa's exclusion criteria led to an item pool that failed to sample the personality descriptions used in natural languages adequately. For example, their exclusion criteria eliminated both evaluative terms such as *pretentious* or *charismatic*, and mood states such as *happy* and *fearful*. Almagor, Tellegen, and Waller (1995) claim that the initial narrowness of the McCrae and Costa item pool explains why John (1989) could not classify traits such as *independent*, *peculiar*, and *conservative* on the Big Five dimensions.

Tellegen also argues that the a priori elimination of evaluative and mood terms from what is supposed to be a comprehensive index of folk personality descriptions weakens the NEO's application to be the framework for the *DSM*'s assessment of maladaptive personality styles. For example, removing evaluative terms eliminates any consideration of self-esteem as a source of individual differences. Ben-Porath and Waller (1992) astutely claim that NEO-PI still needs to demonstrate incremental validity above and beyond standard clinical measures such as the Minnesota Multiphasic Personality Inventory even to be *included* in the assessment of psychopathology, let alone to define it.

Supporting Tellegen's claim is the fact that the Big Five used to be the Big Three! Costa and McCrae's (1985) first attempt to measure the structure of personality was called the NEO inventory. It had three factors, Neuroticism, Extroversion, and Openness. Later, McCrae and Costa decided that the structure of personality changed. They added two more factors, Conscientiousness and Agreeableness. It is not unreasonable to expect that, if someone improves it, the model will change again. Many clinical and counseling psychologists have ignored these issues. They have ignored them because McCrae and Costa have succeeded in making traits scientifically respectable again, and because the NEO-PI has had great heuristic value with respect to topics for theses, dissertations, and tenure-track publications. The popularity of McCrae and Costa's model has, unfortunately, circumvented needed criticism.

Ironically, dimensional classification is very similar to the anti-diagnostic model of Karl Menninger, who held that the discrete categories described in textbooks cannot help us truly under-

stand people's problems. Instead, he thought we should think in terms of scales or yardsticks. On one end of the scale would be "maladjusted" and on the other end "adjusted." Once people get into a maladjusted range, the mental health professional is supposed to help them figure out how to achieve a greater sense of "normality" (Menninger, Mayman, and Pruyser 1963). This recommendation compares favorably with Widiger's (1994) proposal that mental health professionals first assess degree of maladjustment and then determine the person's position on the basic dimensions of personality to understand the nature of the maladjustment.

Rather than using fixed states called *disease entities,* Menninger claimed that we should think in terms of shifting positions on various yardsticks of personality functioning. In an interesting parallel with neo-Kraepelinianism, Menninger calls this view neo-Jacksonianism, after J. Hughlings Jackson. By this he means a focus on quantitative (dimensional) rather than qualitative (categorical) distinctions between different kinds of mental illness. What modern-day dimensional proponents propose to add to neo-Jacksoninan psychiatry is a scientifically based model of personality functioning.

Personality Traits Having a Genetic Basis Are Not Natural Kinds

Like some physicians, psychometric thinkers may also be vulnerable to confusing the presence of a biological basis with something's being a natural kind. For example, according to Lykken and Tellegen (1996), folk constructs such as *negativism* and *happiness* and *altruism* have a biological/genetic basis. Sandra Scarr (1987) also suggests that 24 to 40 percent of the variance in personality stems from heredity. Based on these findings, psychologists might conclude that some psychological traits really exist—as natural kinds.

First, the notion that traits that have a biological basis are traits that really exist has to be rejected by anyone claiming to be a materialist. For materialists, no cognitive or emotional states would exist without brains. According to the materialist's brain-as-substrate thesis, every psychological state has some kind of biological basis. For example, the reason a rock cannot get depressed or do calculus is that it doesn't have a biological basis for either depression or calculus. Any trait, such as extroversion, or a cognitive-emotional state, such as depression, exists because of a biological predisposition. Every aspect of human psychology has a biological basis.

Second, to say that something has a genetic basis does not mean that it is a discrete entity at the level of DNA. For example, other traits, such as traditionalism, religiosity, well-being, delinquency, emotional stability, ego-strength, and time watching television, have been shown to have a genetic basis as well (Bouchard, Lykken, McGue, Segal, and Tellegan 1990; Bouchard and McGue 1990; Cattell, Rao, and Schuerger 1985; Prescott, Johnson, and McArdle 1991). No one (I hope) suggests that our ancestors evolved a time-watching-television gene! Dispositions to react to possibilities presented by one's culture may not have evolved with those possibilities in mind.

With respect to watching television, there is probably a biological basis, a protein-synthesizing program creating a nervous system with a cognitive-affective predisposition, which initiates a process that ends up in a person watching more television if they are given the opportunity to do so, but the final point in the process is not the biological basis. The same is true for personality traits. They are end products and cannot be reduced to inherent necessary and sufficient criteria. Genetics may be necessary as process initiators, but they are not sufficient causes of most traits.

When we look at a trait such as extroversion or a syndrome such as bipolar disorder, psychological, behavioral, and biological covariation reflects some kind of coherent organization so consistently that we can say there is something there, we just cannot reduce it only to biological covariation. There are no inherent properties that make traits and syndromes be what they are. They are practical kinds.

CONCLUSION

There are no necessary and sufficient internal conditions of objects that makes them be some-

thing like a chair. Chairs are not natural kinds. There are many reasons for refusing to believe that syndromes, diseases, species, and personality traits are natural kinds as well. This is a property of any categorical system that can also be considered as continuous or dimensional. Neither the traditional medical model and its methods for isolating disease nor the psychologist's mathematical approach to classification have succeeded in isolating what could be called *natural kinds*. Both have discovered stable patterns that are more than mere inventions, but the idea of an isolated inherent reality, definable by using only biological experimentation and sophisticated statistical analysis, is mistaken. We need too many other variables and kinds of evidence to individuate patterns, and adopting different methods or evidential priorities can alter the patterns we find.

Meehl (1986) discussed the advantages of thinking of diagnostic taxa as open concepts and considered any other strategy to be "scientifically malignant" (220). Reality is always going to be more complex than what is captured by our categories. No matter how specifically we define disorders such as schizophrenia, we will always have to admit exceptions—cases that do not fit the model. The more specific the criteria, the more exceptions we can expect. We can avoid the problem of exceptions by using broader definitions but that would lower reliability. Using the terms discussed in this article, thinking of our categories as natural kinds, as closed absolute concepts, is unwarranted. Scientific openness to evidence is better supported by considering psychiatric categories to be *practical* and not natural kinds.

Notes

1. From a pragmatic standpoint, what an essentialist calls an *artificial kind* is just a practical kind that is not very useful.

2. As long as Wakefield is defining *disorder* by stipulation, I think his proposal has some merit. By stipulation I mean that he is only proposing a model that should be useful in helping diagnosticians distinguish between disorders and non-disorders, rather than making an authoritative statement about what a disorder really is. Furthermore, it is not unreasonable that *harmful dysfunction* in practice would become a radial category with prototype cases and borderline cases.

3. Dawkins (1986) shows that genes don't have inherent effects either. The effect of a gene is not a simple property of the gene itself. It "is a property of the gene in interaction with the recent history of its local surroundings in the embryo. . . . A gene turned on in the cells at the base of the spinal cord in the third week of development will have a totally different effect from the same gene turned on in the cells of the shoulder in the sixteenth week of development" (296).

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