

## Folkbiology

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## Folk Biology

Folk biology is the cognitive study of how people classify and reason about the organic world. Humans everywhere classify animals and plants into species-like groups as obvious to a modern scientist as to a Maya Indian. Such groups are primary loci for thinking about biological causes and relations (Mayr 1969). Historically, they provided a transtheoretical base for scientific biology in that different theories—including evolutionary theory—have sought to account for the apparent constancy of “common species” and the organic processes centering on them. In addition, these preferred groups have “from the most remote period . . . been classed in groups under groups” (Darwin 1859: 431). This taxonomic array provides a natural framework for inference, and an inductive compendium of information, about organic categories and properties. It is not as conventional or arbitrary in structure and content, nor as variable across cultures, as the assembly of entities into cosmologies, materials, or social groups. From the vantage of EVOLUTIONARY PSYCHOLOGY, such natural systems are arguably routine “habits of mind,” in part a natural selection for grasping relevant and recurrent “habits of the world.”

The relative contributions of mind and world to folk biology are current research topics in COGNITIVE ANTHROPOLOGY and COGNITIVE DEVELOPMENT (Medin and Atran 1998). *Ethnobiology* is the anthropological study of folk biology; a research focus is *folk taxonomy*, which describes the hierarchical structure, organic content, and cultural function of folk biological classifications the world over. *Naive biology* is the psychological study of folk biology in industrialized societies; a research focus is *category-based induction*, which concerns how children and adults learn about, and reason from, biological categories.

Ethnobiology roughly divides into adherents of cultural universals versus CULTURAL RELATIVISM (debated also as “intellectualism” versus “utilitarianism,” Brown 1995). Universalists highlight folk taxonomic principles that are only marginally influenced by people’s needs and uses to which taxonomies are put (Berlin 1992). Relativists emphasize those structures and contents of folk biological categories that are fashioned by cultural interest, experience, and use (Ellen 1993). Universalists grant that even within a culture there may be different special-purpose classifications (beneficial/noxious, domestic/wild, edible/inedible, etc.). However, there is only one cross-culturally universal kind of general-purpose taxonomy, which supports the widest possible range of inductions about living kinds. This distinction between special- and general-purpose folk biological classifications parallels the distinction in philosophy of science

between artificial versus natural classification (Gilmour and Walters 1964).

A culture’s general-purpose folk taxonomy is composed of a stable hierarchy of inclusive groups of organisms, or taxa, which are mutually exclusive at each level of the hierarchy. These absolutely distinct levels, or ranks, are: folk kingdom (e.g., animal, plant), life form (e.g., bug, fish, bird, mammal/animal, tree, herb/grass, bush), generic species (gnat, shark, robin, dog, oak, clover, holly), folk specific (poodle, white oak), and folk varietal (toy poodle; swamp white oak). Ranking is a cognitive mapping that projects living kind categories onto fundamentally different levels of reality. Ranks, not taxa, are universal. Taxa of the same rank tend to display similar linguistic, psychological, and biological characteristics. For example, most generic species are labeled by short, simple words (i.e., unanalyzable lexical stems: “oak,” “dog”). In contrast, subordinate specifics are usually labelled binomially (i.e., attributive + lexical stem: “white oak”) unless culturally very salient (in which case they may also merit simple words: “poodle,” “collie”). Relativists agree there is a preferred taxonomic level roughly corresponding to that of the scientific species (e.g., dog) or genus (e.g., oak). Phenomenally salient species for humans, including most species of large vertebrates and trees, belong to monospecific genera in any given locale, hence the term “generic species” for this preferred taxonomic level (also called “folk generic” or “specieme”). Nevertheless, relativists note that even in seemingly general-purpose taxonomies, categories superordinate or subordinate to generic species can reflect “special-purpose” distinctions of cultural practice and expertise. For example, the Kalam of New Guinea deny that cassowaries fall under the bird life form, not only because flightless cassowaries are physically unlike other birds, but also because they are ritually prized objects of the hunt (Bulmer 1967).

Universalism in folk biology may be further subdivided into tendencies that parallel philosophical and psychological distinctions between RATIONALISM VS EMPIRICISM (Malt 1995). Empiricists claim that universal structures of folk taxonomy owe primarily to perceived structures of “objective discontinuities” in nature rather than to the mind’s conceptual structure. On this view, the mind/brain merely provides domain-general mechanisms for assessing perceptual similarities, which are recursively applied to produce the embedded similarity-structures represented in folk taxonomy (Hunn 1976). Rationalists contend that higher-order cognitive principles are needed to produce regularities in folk biological structures (Atran 1990). For example, one pair of principles is that every object is either an animal or plant or neither, and that no animal or plant can fail to belong uniquely to a generic species. Thus, the rank of folk kingdom—the level of plant and animal—is a category of people’s intuitive ontology, and conceiving an object as plant or animal entails notions about generic species that are not applied to objects thought to belong to other ontological categories, such as person, substance, or artifact. Although such principles may be culturally universal, cognitively compelling, and adaptive for everyday life, they no longer neatly accord with the known scientific structure of the organic world.

In the study of naive biology, disagreement arises over whether higher-order principles evince strong or weak NATIVISM; that is, whether they reflect the innate modularity and DOMAIN-SPECIFICITY of folk biology (Inagaki and Hatano 1996), or are learned on the basis of cognitive principles inherent to other domains, such as NAIVE PHYSICS or FOLK PSYCHOLOGY (Carey 1995). One candidate for a domain-specific principle involves a particular sort of ESSENTIALISM, which carries an invariable presumption that the various members of each generic species share a unique underlying nature, or biological essence. Such an essence may be considered domain-specific insofar as it is an intrinsic (i.e., nonartificial) teleological agent, which physically (i.e., nonintentionally) causes the biologically relevant parts and properties of a generic species to function and cohere “for the sake of” the generic species itself. Thus, American preschoolers consistently judge that thorns on a rose bush exist for the sake of there being more roses, whereas physically similar depictions of barbs on barbed wire or the protuberances of a jagged rock do not elicit indications of inherent purpose and design (Keil 1994). People everywhere expect the disparate properties of a generic species to be integrated without having to know the precise causal chains linking universally recognized relationships of morpho-behavioral functioning, inheritance and reproduction, disease and death.

This essentialist concept shares features with the broader philosophical notion NATURAL KIND in regard to category-based induction. Thus, on learning that one cow is susceptible to “mad cow” disease, one might reasonably infer that all cows, but not all mammals or animals, are susceptible to the disease. This is presumably because disease is related to “deep” biological properties, and because *cow* is a generic species with a fairly uniform distribution of such properties. The taxonomic arrangement of generic species systematically extends this inductive power: it is more “natural” to infer a greater probability that all mammals share the disease than that all animals do. Taxonomic stability allows formulation of a general principle of biological induction: a property found in two organisms is most likely found in all organisms belonging to the lowest-ranked taxon containing the two. This powerful inferential principle also underlies systematics, the scientific classification of organic life (Warburton 1967). Still, relativists can point to cultural and historical influences on superordinate and subordinate taxa as suggesting that biologically relevant properties can be weighted differently for induction in different traditions.

See also CONCEPT; COLOR CLASSIFICATION; NAIVE SOCIOLOGY

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## Folk Psychology

In recent years, folk psychology has become a topic of debate not just among philosophers, but among developmental psychologists and primatologists as well. Yet there are two different things that “folk psychology” has come to mean, and they are not always distinguished: (1) commonsense psychology that explains human behavior in terms of beliefs, desires, intentions, expectations, preferences, hopes, fears, and so on; (2) an interpretation of such everyday explanations as part of a folk theory, comprising a network of generalizations employing concepts like *belief*, *desire*, and so on. The second definition—suggested by Sellars (1963) and dubbed “theory-theory” by Morton (1980)—is a philosophical account of the first.

Folk psychology (1) concerns the conceptual framework of explanations of human behavior: If the explanatory framework of folk psychology (1) is correct, then “because Nan wants the baby to sleep,” which employs the concept of wanting, may be a good (partial) explanation of Nan’s turning the TV off. Folk psychology (2) concerns how folk-psychological-(1) explanations are to be interpreted: If folk psychology (2) is correct, then “because Nan wants the baby to sleep” is an hypothesis that Nan had an internal (brain) state of wanting the baby to sleep and that state caused Nan to turn the TV off.

Although the expression *folk psychology* came to prominence as a term for theory-theory, that is, folk psychology (2), it is now used more generally to refer to commonsense psychology, that is, folk psychology (1). This largely unnoticed broadening of the term has made for confusion in the literature. Folk psychology (in one or the other sense, or sometimes equivocally) has been the focus of two debates.