

UTILITARIAN/ADAPTATIONIST EXPLANATIONS OF FOLK BIOLOGICAL CLASSIFICATION: SOME CAUTIONARY NOTES

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ABSTRACT.— Attempts to explain the complexity of folk biological classification systems may benefit from utilitarian or adaptationist arguments, focusing on the utilitarian or adaptive value of the behavioral consequences of folk distinctions among organisms. To adequately assess such perspectives it is necessary to resolve a number of theoretical, methodological, and empirical problems, which are identified and outlined in this paper as a first step toward the construction of such theories of ethnobiological classification.

INTRODUCTION

Thorough descriptions of ethnobiological classification systems are now available for a wide range, if not a large number, of societies. Sufficient similarities appear to exist among these impressively detailed taxonomic systems that universal or general principles of folk classification have been proposed (Berlin et al. 1973; Brown 1977, 1979). While the need is great for more field studies and continuing refinement of our developing theory of the *structure* of folk taxonomies, it is clear that our understanding of such logical and linguistic systems as human phenomena requires systematic investigation of the uses to which they are put by those who have created them. Some attempts have been made to relate taxonomic and lexical elaboration to the "cultural significance" of the organisms in question (Berlin et al. 1974), but this latter concept is only beginning to be operationalized and is fraught with difficulties (Hays n.d., and discussion below).

One approach to the question of the function of folk taxonomies represents a merging of traditional ethnobiological concerns with more recent "cognitive" orientations, and may be designated the "utilitarian/adaptationist perspective." In this view, the environment is regarded as a setting in which people must satisfy their physical needs, i.e., a setting to which they must *adapt*. Folk biological classification would then be regarded as a way by which people systematically organize, store, and retrieve environmental information which will enable them to accomplish this adaptation. Thus, a utilitarian/adaptationist perspective would seek to identify the practical consequences of folk conceptual and terminological distinctions, and ultimately explain folk taxonomies as structures which are motivated by a concern with these consequences.

If such an explanation of folk classification could be established, not only might we understand better how these systems function in people's lives, but there is also the hope that folk taxonomic studies could aid in the reconstruction of lifeways which are no longer directly observable, as Diamond (1966) implies by interpreting the detailed taxonomy of birds among the New Guinea Fore people as "an economic relict of disappearing food habits."

A utilitarian/adaptationist perspective clearly holds promise for a wide range of ethnobiological and anthropological concerns. However, if my own experience in attempting to operationalize some of the necessary key concepts (Hays n.d.) is a valid indicator, we must resolve a number of serious theoretical, methodological, and empirical

problems before we can determine how much of a role pragmatic considerations play in the structuring of folk models of the biological world. In this paper I identify some of these problems in the hope of advancing their discussion and solution.

DISCUSSION

First, it is important to be clear about just what is at issue. Anyone who has lived in a small-scale society with a subsistence-based economy, as I did in Ndumba in the Papua New Guinea highlands, is aware of the intimate knowledge of biology and ecology (as well as geology, pedology, and meteorology) which people employ as they extract their livelihood from local resources. What is *not* at issue in the present discussion is whether "knowledge" can and does have practical consequences for people. Rather, the question at hand is whether *folk classification systems*—viewed as particular kinds of organization of knowledge—play a part in "adaptation," and the degree to which we can explain their structure and contents in such terms.

To restate what I would propose as a central thesis of a utilitarian/adaptationist perspective: (a) People draw conceptual contrasts among classes of biological organisms, and (b) usually label these concepts with standardized linguistic expressions, in order to (c) facilitate the organization, storage, retrieval, communication, and deployment of knowledge or information about the natural world, which (d) results in differential behavioral or attitudinal responses to these organisms, with (e) consequences that are, in some specifiable sense, useful, beneficial, or "adaptive." While this statement may not fully represent the views of those who are beginning to articulate formal "adaptationist" proposals (Hunn 1980), it has the advantage of explicitly pointing out some possible directions for such inquiries and, at the same time, making it easier to identify likely sources of problems.

A second point of needed clarity pertains to the *kind of* folk taxonomy we are trying to explain. An important contrast must be drawn between "general purpose" and "special purpose" classifications (Berlin et al. 1966; Hunn 1977). The latter are employed by people in restricted domains of activity or interest, as in classifications of organisms as "edible" or "inedible"; "flowers" or "weeds"; "wild animals," "zoo animals," or "pets," and so on. Special purpose folk taxonomies are unquestionably motivated by functional or "practical" concerns. The productive question is whether general purpose taxonomies (which, in all known societies, are based primarily on morphological attributes of organisms), are *also* informed by utilitarian considerations.

We must also ask *whose* classification system we are trying to explain. If we mean to focus on conceptual and terminological systems that are "cultural" in the sense that they are widely-shared within a particular population, then we must attend to the facts of individual variation in biological knowledge, and determine just which concepts, contrasts, and names really are shared (Hays 1974, 1976). When, for example, Reichel-Dolmatoff (1976) claims that a Tukano shaman in the Amazon "has to know, name and categorise" all of the contents of his local ecosystem in order to serve as an "ecological broker," we have not necessarily learned anything about either the extent or significance of an *average* Tukano's knowledge of this same environment. Similarly, an argument that a particular contrast between two plants, say, is important to a folk medical practitioner in choosing therapeutic medicines, by itself says nothing about why that same contrast might be drawn, if it is, by a "typical" person who has no such specialized needs. To explain why particular contrasts exist within the putatively-shared folk classification system, we must determine whether there are underlying utilitarian concerns which are also shared. On the other hand, we may wish to include specialized knowledge which is irregularly distributed within a population if by "culture" we mean a composite "pool" of knowledge in a community. In either event, we must be explicit about the concept of culture we are going to use before we can identify properly the variables we are seeking to examine.

If a utilitarian/adaptationist (or any other) explanation of folk classification is to be adequate, it must account for the system as a whole, or at least for a significant proportion of it, rather than for selected segments. I could report, for example, that Ndumba distinguish between two kinds of 'una, within a larger category *hohondi*, which includes various beans. One kind, "genuine" 'una (*Lablab purpureus* (L.) Sweet) is eaten, while the other, *nerira* (a wild form of *Phaseolus lunatus* L.), is shunned since to eat it is said to cause vomiting. Here we surely have a case in which knowledge of the distinction between these two plant classes could be seen to have practical consequences. However, this is a carefully selected example from Ndumba plant classification, and it is *not* generally true of the polytypic folk plant taxa that their members contrast so neatly in terms of their uses. Rather than casual illustrations of useful, or even "adaptive," contrasts, we must ask for generality from proposed explanations of folk classification.

Those of us who seek to find "adaptive" value in any instance or system of knowledge or behavior must join the ranks of biologists and others for whom the definition of "adaptation" has become a complex and often confusing issue (Alland 1975). A utilitarian/adaptationist perspective would, it seems, contend that cultural knowledge enables people to meet their needs—whether these be thought of in terms of sheer survival, reproductive success, "adjustment" to environmental perturbations, or some other end—better than they could if they did not have this knowledge. With respect to folk classification systems, this would mean that conceptual contrasts among classes of plants and animals result in behavior which is more "adaptive" than if such distinctions were not made. It will be the responsibility of those of us who speak of adaptive outcomes to state explicitly and clearly just how these are to be judged.

A related question is whether, when we are seeking the practical consequences of folk distinctions among organisms, we are concerned only with *real* consequences or also with those which are only imagined to exist? For example, in Ndumba morphological features are used to subdivide yams (*Dioscorea* spp.) into 19 named types in the shared folk taxonomy; one of the traits so employed is the overall shape of the tuber. One kind of yam is forbidden to males during a certain stage of their youth on the grounds that to eat it would cause them to grow "crookedly," just as the tuber itself is "crooked." One might say that this is a taxonomic contrast which reflects "utilitarian" Ndumba concerns, but it is highly questionable whether a boy's physical growth pattern really would be affected if he confused the forbidden yam with another. Those who would argue for the adaptive or utilitarian value of folk distinctions must deal with this issue, not only with regard to food sources and related prohibitions, but also with respect to such areas of ethnobotany as ethnomedicine, where we find many careful distinctions drawn among plants on the basis of reputed phytochemical properties for which there is either no, or negative, scientific evidence.

If the issues raised so far in this discussion can be resolved satisfactorily, we must next ask how we would generate hypotheses and systematically test them; i.e., what would we count as evidence relevant to a utilitarian/adaptationist argument, and how would we go about obtaining and evaluating it?

Viewing folk taxonomies as systematic organizations of concepts which function in directing behavior with regard to the conceptualized environment, reasonable hypotheses might take a form such as: "Folk taxonomic contrasts correspond to contrasts in behavioral responses to the respective organism classes." (An apparently positive case would be the already-cited contrast in Ndumba between "genuine" 'una and *nerira*, which corresponds to eating the former and avoiding the latter.) In slightly less cumbersome language, we might hypothesize: "Folk taxonomic contrasts correspond to contrasts in uses of the respective organism classes." Indeed, the "economic" orientation of most representations of utilitarian/adaptationist perspectives would suggest the replacement of "behavioral response" with "use." However, operationalizing the notion of "use" entails serious difficulties (Hays 1974, 1980, n.d.). There are at least two methodological issues contained in the apparently straightforward matter of identifying

contrasts in "uses" of particular plants or animals. The first concerns just *what* will be counted as a "use," and the second involves the degree of specificity required in classifying two or more "uses" as *contrasting*.

In identifying "uses" of resources, one encounters examples such as the previously-cited *nerira* in Ndumba, which is not "used" in any ordinary sense of the word; rather, it is *avoided*. Similarly, the felling of a particular tree called *nraamma' saasira* is avoided because it is believed that such an act would cause the woodsman's wife's or mother's breasts to "dry up and die." There are also examples of organisms which are "used" only indirectly, as when a hunter seeks out a particular kind of tree because a preferred type of game animal is believed to favor its fruit, or build a nest in its branches. Many other examples could be adduced of plants and animals which have these kinds of significance or *salience* for people even though they may not be "used" in the sense that one "uses" resources for food, medicine, implements, and the like.

If we are concerned with identifying and assessing the behavioral consequences of distinctions among plants or animals, i.e., the "usefulness" of knowledge, we need to employ a notion of utility which incorporates organisms' variable salience—thus my preference for phrasing hypotheses in terms of "contrasts in behavioral responses." With such an approach, we can then talk reasonably about contrasts among given plant or animal classes in terms of their contrasting salience.

A key question remains: Do plant or animal classes in particular contrast sets correspondingly contrast in terms of salience (i.e., differential behavioral responses)? That is, do we find that the various kinds of sweet potatoes, beans, snakes, or grasshoppers are differentially responded to in the real world in other than classificatory and nomenclatural ways? This appears to be the main hypothesis that utilitarian/adaptationist approaches must test.

On the surface it is certainly the case that some classes of organisms appear to be functionally equivalent, i.e., there are no contrasting behavioral responses readily discoverable. In Ndumba, for example, *all* snakes are responded to in the same ways: all are killed on sight, none is eaten, and none is "used" in any way that I was able to discover in 16 months of residence there. Other contrast sets could be identified where the same appears to be the case, as in sets of food plants, all of which are cooked and eaten in the same manner.

If, in fact, there are folk contrast sets the members of which are truly functionally equivalent, this would constitute a challenge to the notion that conceptual distinctions correspond to, and thus reflect, differential utility or salience. Before this can be determined, the second methodological issue referred to earlier must be addressed—how finely might we need to distinguish "uses" or differential responses for ethnographic adequacy? For example, if two different flowers are said to be equally suitable for use in personal decoration, are they equivalent, or might there not be subtle contrasts which are manifested only when the would-be wearer chooses, say, on the basis of mood? If the latter is true, is this the kind of difference which we will want to consider *enough* of a difference to say that the flowers have contrasting uses? If so, then it is unlikely that any two classes would be considered truly equivalent, but we are risking here the possibility of reducing our analysis to an identification of trivial distinctions which are not obviously the kinds of contrasts utilitarian/adaptationists usually have in mind when they speak of the "adaptive" value of folk contrasts. Moreover, as we pursue contrasts in behavioral responses we must be wary of the danger of indefinite "splitting" or "lumping" of resource "uses" which not only renders it unlikely that a satisfactory description of a particular folk system will emerge, but also that comparative studies will be all the more difficult.

This last point raises the final methodological issue I will consider here: Is it possible to obtain closure in utilitarian/adaptationist investigations? In the immediate context of this discussion, is it possible to determine when one has an adequately thorough knowledge of local plant or animal "uses" (including subtle contextual factors) to employ a

final list of "uses" so that classes of organisms can be compared in these terms? I would say that some classes of plants and animals in Ndumba have *no* "uses" (and no salience, either, so far as I can discover, as in the various types of butterflies which "just are" so far as Ndumba are concerned). Yet, it might be said that there *are*, in fact, "uses" which I would observe or otherwise discover with further fieldwork. Obviously that is a possibility but just as obviously this is an argument that is capable of infinite extension and one which is likely to render our hypotheses *unfalsifiable*, and thereby useless. Certainly one could never prove a negative, such as "there is no conceivable context in which plant or animal *x* is used (or used slightly differently)."

As we attempt to develop and test utilitarian/adaptationist hypotheses after careful consideration of the points I have raised in this paper, we must beware of dooming our efforts to inconsequentiality by resorting to such "escape clauses" as contending that the hypotheses will, in fact, be confirmed once we have more data. This is one of several all-too-common counterproductive escape clauses resorted to by proponents of what Gould and Lewontin (1979) have called the "adaptationist programme." They assail biologists who try to save particular approaches by following certain styles of argument, for example, "If one adaptive argument fails, try another"; "If one adaptive argument fails, assume that another must exist; a weaker version of the first argument"; or, "In the absence of a good adaptive argument in the first place, attribute failure to imperfect understanding of where an organism lives and what it does" (Gould and Lewontin 1979:586-587).

CONCLUSION

My objective in this paper has been to point out some of the problems and traps which need to be resolved and avoided in order for a utilitarian/adaptationist approach to be tested adequately in ethnobiology. My own belief is that we will ultimately understand folk classification systems as products of a number of complex, interacting factors: biological discontinuities in nature, chance historical events, "utilitarian" human concerns, human cultural concerns in a broader sense, intellectual curiosity, and constraints deriving from the nature of human perception and cognition.

Such a belief can itself be a trap, of course, when "a number of complex, interacting factors" becomes a shibboleth which excuses failure to pursue any particular factor as far as it will lead. I would hope that the suggestions in this paper will encourage, rather than discourage, the careful pursuit of a utilitarian/adaptationist perspective so long as it will be possible to also determine just how far it will *not* take us, and how much we will have to consider these other factors.

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LITERATURE CITED

- ALLAND, A. 1975. Adaptation. *Annu. Rev. Anthropol.* 4:59-73.
- BERLIN, B., D.E. BREEDLOVE, AND P.H. RAVEN. 1966. Folk taxonomies and biological classification. *Science* 154:273-275.
- _____. 1973. General principles of classification and nomenclature in folk biology. *Amer. Anthropol.* 75:214-242.
- _____. 1974. Principles of Tzeltal plant classification. Academic Press, New York.

LITERATURE CITED (Continued)

- BROWN, C. 1979. Folk botanical life-forms: their universality and growth. *Amer. Anthropol.* 79:317-342.
- . 1979. Folk zoological life-forms: their universality and growth. *Amer. Anthropol.* 81:791-817.
- DIAMOND, J.M. 1966. Zoological classification system of a primitive people. *Science* 151: 1102-1104.
- GOULD, S.J. and R.C. LEWONTIN. 1979. The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme. *Proc. Royal Soc. London B205*:581-598.
- HAYS, T.E. 1974. Mauna: explorations in Ndumba ethnobotany. Unpubl. Ph.D. disert. (Anthrop.), Univ. Washington.
- . 1976. An empirical method for the identification of covert categories in ethnobiology. *Amer. Ethnol.* 3:489-507.
- . 1980. Uses of wild plants in Ndumba, Eastern Highlands Province. *Science in New Guinea* 7:118-131.
- . n.d. Alternative measures of the relative cultural importance of plants. Unpubl. ms.
- HUNN, E. 1977. Tzeltal folk zoology. Academic Press, New York.
- . 1980. Folk biological classification: a utilitarian perspective. Paper read at Amer. Anthropol. Assoc. Annu. Meeting.
- REICHEL-DOLMATOFF, G. 1976. Cosmology as ecological analysis: a view from the rain forest. *Man* 11:307-318.