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VARIATION AND UNIFORMITY IN THE CONSTRUCTION OF BIOLOGICAL KNOWLEDGE ACROSS CULTURES

This chapter examines the extent to which knowledge of biological entities and processes varies according to different human life experiences and cultural traditions.[1] It attempts to relate this to global, transmodern, scientific biology, with its origins in Western cultural history. What connects the first with the second is the increasingly well-documented recognition that all peoples share a basic way of apprehending the natural world, grounded in a common evolutionary history, even though this cognitive underpinning is everywhere filtered through the local particularities of environmental and cultural experience. Such a shared infrastructure of perception and cognition has been termed "natural history intelligence" and is linked to modular theories of the mind. What this means usually includes (1) a shared concept of basic natural kind (a species-like concept) reflecting a view of the biological world as a series of discontinuous entities; (2) an ability to recognise and respond to things as living matter, and more specifically an "algorithm for animacy" (Bulmer, 1970; Reed, 1988; Atran, 1998; Ellen, 1996; Boster, 1996); (3) a capacity to intuit certain kinds of behaviour based on expectations derived in part from common experiences linked to phylogenetic similarities or observations of human behaviour, and (4) strategies for classifying biological diversity (Atran, 1990; Boster, 1996; Keil, 1994; Mithen, 1996: 52–54). Because none of this is accessible other than through its local cultural versions, distinguishing what are shared human universals from what are simply culturally widespread is problematic. This has given rise to some lively debates.

DIFFERENT WAYS IN WHICH KNOWLEDGE IS CULTURALLY EMBEDDED

Although underlying cognitive strategies influence how people construct what they know about the biological world, most knowledge is culturally transmitted and shaped by environmental and social forces which vary from place to place. In part, what people know is constrained by local ecology, although what is uniquely human is the capacity for acquired biological knowledge to diffuse independently of what can be experienced in local habitats. Thus, people may

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have concepts for snakes, even if they have never seen one. Scientific biology is, in one sense, an extreme development of such an intuitive biology, augmented by the possibilities offered by effective cultural transmission, since the capacity to generalise and hypothesise is grounded in the way science aggregates knowledge of species and ecologies beyond what a scientist might have local first-hand experience of as a non-scientist.

Before going further it is useful to reflect on the relationship of culture to knowledge, knowledge to intelligence and on different kinds of knowledge. This has become necessary because of recent developments in anthropology and cognitive science. The default understanding of knowledge, at least in anthropology, is usually of what we might call "conscious", "cognised" or "reflective" knowledge: something we are aware of acquiring and using, and often do so purposefully in order to solve various technical and social problems. However, people also acquire knowledge unobtrusively and unreflectively as part of the process of socialisation and growing up. This is no less knowledge than that which we consciously articulate or recognise. One example of this kind of knowledge is "bodily knowledge" – knowledge acquired and stored as part of doing and recognising in particular practical contexts. An example is learning how to harvest rice with a Javanese finger knife, which requires sensory and motor skills which are often readily transmitted across generations but which are not explicitly formulated into a set of rules. Such techniques are, rather, acquired through mimicry, experience and informal apprenticeship. Much knowledge of the first (cognitive) kind is clearly encoded in language; in other words it is "lexical knowledge" (such as in plant and animal nomenclatures), and where this yields regularities in how people relate different living kinds, it translates into "classificatory knowledge". However, much knowledge, particularly of natural processes, is only partially lexically expressed. Where classificatory knowledge generates categories with no lexical markers, these are termed "covert categories" (Taylor, 1990: 42–51), but where knowledge is manifestly evident although not necessarily systematically expressed in language, we might speak of "substantive knowledge" (Ellen, 1999). Most knowledge of the biological world is substantive in this sense and classifications can be understood as codes to access and manipulate it.

There is another way of looking at the knowledge people have of objects and processes in their environment: not in terms of how they engage with nature, or the degree to which that engagement is encoded in cultural representations, but in terms of its division into empirically organised areas of substantive knowledge (the so-called "ethnosciences": ethnobotanical (plant) knowledge, ethnozoological (animal) knowledge, ethnoanatomical knowledge, ethnoveterinary knowledge and so on). Although people themselves may seem to divide their knowledge of the natural world in this way, this approach – displaying the bias of encyclopaedic, literary-based theoretical knowledge – is best reflected in the conventional partitioning of Western science, which in turn has influenced the development of ethnobiology. One of the great problems in researching how other people understand their biological worlds is ensuring that these conventional etic[2] divisions are not imposed on the subjects of our research. It is true that this framework for looking at pragmatic knowledges of biological form and process is helpful when seeking to make inventories of what people know about individual species or varieties. However, from the point of view of comparative study it is probably more useful to distinguish several kinds of knowledge organisation, irrespective of the type of organism or uses involved. Such an approach distinguishes (a) classificatory knowledge from (b) knowledge of anatomy, autoecology and processes with respect to individual organisms, or groups of organisms; from (c) knowledge of ecological systems (synecology: plant interaction, dynamics of various kinds of landscape, seasonality, food chains, pest ecology); and from (d) knowledge of the general principles of plant and animal biology. In the past research on local "folk" knowledge tended to emphasise the first of these (predominantly, the classification of macro-organism diversity), although increasingly it has become apparent that the application of insights from the second three may more than compensate for detailed knowledge of the first. However, how all this ethnoecological knowledge connects up into some larger whole presents considerable analytical difficulties, since it is less easy to disaggregate in local emic terms, partly because it is characteristically intermeshed with symbolic and aesthetic representations.

Another problem in studying biological knowledge cross-culturally is knowing to what extent we can generalise about the knowledge of particular populations, or indeed of societies or cultures. Knowledge is distributed geographically between populations, and it is also important to distinguish levels within the same population. Not all persons are equally expert, and important knowledge is always disseminated through social networks. For example, there are now some excellent demonstrations of the mechanisms which transmit genetic variability in *Manihot esculenta* (manioc, cassava, tapioca) amongst Aguaruna (Boster, 1986) and Guyanase Makushi women (Elias, Rival and McKey, 2000). Commonly applied knowledge, shared by all the members of the community, needs to be distinguished from more specialised knowledge shared by only one category of users. An example of one extremity of such a distribution is that of individual healers, where knowledge is hidden, secret, and transmitted to very few people. Important practical questions arise as to which of these – the individualised or the shared – are the most significant, or indeed what we mean by "significance", since this can be measured along a number of different (indeed, contrasting) axes (say, ecological versus social) and especially when it is evident that knowledge is dynamic and changing. Many descriptions of ethnobiological knowledge tend to aggregate knowledge obtained from different individuals in an unweighted fashion, or present the knowledge of a few individuals as if it were that of the entire population. When this methodological relationship between aggregated data and inference is transparent and its limitations understood, it can be described as the "omniscient speaker-hearer convention", but when the relationship is obviously misunderstood and abused through the drawing of false inferences, then we might speak of the "omniscient speaker-hearer fallacy" (Berlin, Breedlove and Raven, 1974: 58–59; Gardner, 1976).

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