

ETHNOSCIENCE AND MEDICAL ANTHROPOLOGY

Donald Pollock

State University of New York at Buffalo, Buffalo, NY USA.

Keywords: anthropology, disease, ethnomedicine, ethnoscience, illness, medical anthropology, schemas, taxonomy.

Contents

1. Introduction
 2. Medical Anthropology and Ethnomedicine
 3. Taxonomies and Componential Analysis
 4. Prototypes and Schemas
 5. Cultural Models and Explanatory Models
 6. Conclusions
- Glossary
Bibliography
Biographical Sketch

Summary

This chapter reviews the contributions of ethnoscience to medical anthropology, focusing on the study of illness beliefs and practices across cultures. The chapter's approach is broadly historical. It starts by describing the early cognitive anthropological research on illness that explored taxonomies of illness concepts, and the features of those concepts as linguistic phenomena. It then surveys more recent work on prototypes and schema theory, drawing connections to ethnomedical beliefs and practices. Finally, it discusses the modern concept of "explanatory models," and relates it to issues in cognitive anthropology. Since "ethnoscience" is a concept that emerged from, and has been explored within cognitive anthropology, this chapter foregrounds the cognitive science agendas that intersect with the research and practical concerns of medical anthropology, and does not attempt to provide a widely comprehensive overview of either ethnoscience or medical anthropology.

1. Introduction

1.1. Ethnoscience

Ethnoscience, most broadly, is the study of what the members of any culture know about the world, usually the natural world, and the relationships among the parts, components, or features of their knowledge of that world. The prefix "ethno-" refers to culture, in the sense of the beliefs and practices shared by the members of a community; the term "science" refers to the naming, describing and understanding of the natural world. In this broad sense, ethnoscience has been a part of cultural anthropology at least since the early 20th century, which focused on the content and extent of cultural knowledge found in societies around the world.

More narrowly, *ethnoscience* refers to a perspective on cultural knowledge that emerged in the 1950s as a part of the newly coalescing field of cognitive anthropology that argued that “culture” consisted of mental or cognitive phenomena that should be approached using rigorous methods and analytic tools such as those that were being developed in linguistics and in cognitive psychology. This chapter will discuss the field of ethnoscience in that more restricted sense, and will focus on the place of ethnoscience in medical anthropology, the study of the relationship between disease and society/culture, in particular the study of any culture’s knowledge of and practices regarding disease and illness.

1.2. Emic and Etic

Ethnoscience relies in part on the distinction between “*emic*” and “*etic*” phenomena. The terms derive from linguistics, where Kenneth Pike (1967) distinguished “phonetics” – the study of all possible sounds that make up human natural language – from “phonemics” – the study of the specific sounds used by the speakers of any given language. One analog in ethnoscience is the difference between a botanist’s Linnaean universal taxonomy of all plants and the ‘folk’ taxonomy of plants that are recognized by a specific culture. There are a number of differences between the ‘etic’ or universal taxonomy and the ‘emic’ or culturally-specific taxonomy of a given culture. For example, research suggests that “folk” taxonomies – the “*emic*” taxonomy – are normally about 5 levels deep, while the Linnaean scientific or “*etic*” taxonomy of a natural domain such as animals or plants is about 12 levels deep: kingdom; subkingdom; phylum; subphylum; class; subclass; superorder; order; family; subfamily; genus; and species.

Diseases, as natural phenomena, were an early focus of ethnoscience research. One of the foundational figures of cognitive anthropology, Charles Frake, devoted an early article to disease categorization among the Subanon of the Philippines (Frake 1961). Though Frake was not a medical anthropologist, he recognized that beliefs about diseases could be understood through the same categorizing principles as any ‘natural’ object, be it a plant or animal, a geological formation or object, or weather phenomena, though the ways in which any specific culture formulates and organizes those principles will likely be unique.

Ethnoscience research on the organization of knowledge of plants and animals suggested that there is considerable overlap between the emic or folk categorization of natural species found in most cultures and the scientific categorization, most likely because both rely to a great extent on overt morphological features of plants and animals, features that are available to scientists as well as lay people. Folk categorizations tend to diverge from scientific categorizations among folk ‘experts’ – for example, especially knowledgeable horticulturalists, hunters or fishers, who may categorize living species in terms of practical uses or living habits, while scientific classifications rely exclusively on presumed genetic networks. Illness and disease offer similar types of comparisons, as will be discussed in this chapter.

2. Medical Anthropology and Ethnomedicine

2.1. Medical Anthropology

Medical anthropology is a complex discipline that includes a wide variety of approaches to the study of disease and illness from anthropological perspectives. Medical anthropology includes research into the impact of society and culture on the evolution and genetic history of humanity and vice-versa, the nature of beliefs about illness in traditional healing systems, and the study of medical care in settings ranging from traditional folk healing to high-tech hospitals as social systems, among many other issues and subjects. Since the focus of this chapter is ethnoscience and medical anthropology, it will concentrate on that component of medical anthropology that considers disease and illness to be cultural knowledge systems, the subfield often referred to as ‘ethnomedicine.’

2.2. Ethnomedicine

As in other forms of ethnoscience, ethnomedicine starts with a distinction between etic and emic concepts. Just as a Linnaean classification of living species may be said to comprise an *etic* catalogue of all living things, ethnomedicine posits that there is a comparable catalogue – hypothetical if not actual – of all possible diseases that could afflict human beings, and that this catalogue consists of pathological states or entities that are often called “disease”. For convenience, many medical anthropologists refer to the International Statistical Classification of Diseases and Health Related Problems (the ICD, now in its 10th edition) developed by the World Health Organization. This etic catalogue or nosology of *diseases* may be compared or contrasted to *illnesses*: the sicknesses that any given culture recognizes or believes in. Each culture possesses its own emic catalogue or nosology of illnesses, and may even have a set of illnesses familiar to lay people that differs from the set of illnesses familiar to folk practitioners (Fabrega 1970: 306).

Not surprisingly, an etic catalogue of diseases such as the ICD-10 includes thousands of pathological conditions that are not labeled or even recognized in the ethnomedical knowledge systems of any culture. A Western folk medical concept such as “cancer” refers to hundreds of complex pathological phenomena, most of which have no ‘emic’ or popular label. Even a familiar form of illness such as “breast cancer” appears in several more specific forms in the disease catalogue. In that sense, “breast cancer” is an emic illness term, while “ductile carcinoma *in situ*” is an etic disease term that refers to one type of “breast cancer,” and is moreover a term that the average lay American is unlikely to recognize. Just as there are numerous phonetic sounds that the speakers of a given language do not use and might not even recognize, there are numerous diseases that the members of any culture do not recognize, do not label, and about which they have no particular beliefs or practices.

Unlike the phonetic/phonemic distinction in language however, anthropologists typically find that any given culture posits the existence of some illnesses for which there are no corresponding diseases in the universal catalogue or disease nosology. Such culturally distinct illnesses often include forms of witchcraft or sorcery, or other

illnesses of a non-material nature such as *susto*, commonly found in Hispanic cultures and often translated or understood as “fright” illness. Such illnesses are often dismissed as imaginary, or are said to be misrecognized when compared to scientific categories of disease. For example, Arthur Kleinman argued that the Chinese illness he translated as “neurasthenia” would be identified as Depression in the scientific nosology, though Kleinman also recognized that the decision to regard the Western concept of “depression” as the real disease of which the Chinese concept is merely a culturally shaped variation is largely a political issue of the dominance of Western medicine and psychiatry. In the U.S., debates over the reality of Chronic Fatigue Syndrome or Chronic Lyme Disease suggest that there is also a grey zone of folk illnesses that may or may not be included in any universal, etic catalogue of diseases. This has led some anthropologists to suggest that all efforts to create a universal nosology of disease are hampered by cultural biases of Western medicine. Nonetheless, an important value of an ‘etic’ or universal catalogue of disease, even if imperfect, is that it provides a common frame of reference for social scientists working in widely different cultures.

Ethnoscience approaches to ethnomedicine have, consequently, been sensitive to the possibility that the catalogue of illness concepts held by a specific culture may overlap to a highly variable extent with any comprehensive scientific or etic catalogue of disease, and will certainly include beliefs, concepts and practices that are unique to that culture. Indeed, one of the benefits of an ethnoscience approach to medical anthropology is that it takes seriously the beliefs and practices of members of a culture, whether those beliefs and practices bear any relationship to a scientific understanding of disease.

For example, Charles Frake, in his early effort to analyze the illness categories of the Subanun of the Philippines (1961), noted at least two conceptual problems with the use of Western medical labels for diseases in translating Subanun illness. First, the overlap between the etic and the emic categories was not perfect. The Subanun illness he translated as “chronic cough” sometimes matched up with the Western disease “tuberculosis,” but sometimes did not. By the same token, cases of tuberculosis among the Subanun were not all given the same illness diagnosis (1961: 124). Second, the Subanun use distinct illness category labels for different *phases* of conditions that would be labeled or diagnosed as a single disease in the Western scientific catalogue. Both of these limitations or cautions on the simple use of etic disease categories in the analysis of emic illness categories apply in most cultures.

Anthropologists researching cultural knowledge systems are also attentive to the fact that “knowledge” is not evenly distributed among the members of a community. Ethnoscience research on illness concepts reveals the presence of idiosyncratic knowledge held by a single individual or family; knowledge held more broadly but not universally within a community; knowledge that is shared by “experts” (e.g. healers or curers); and knowledge that is held by virtually all members of a community. Ethnoscience research normally requires that specific beliefs be expressed by some minimum percentage of a population in order to be counted as “ethnomedical” knowledge rather than as an idiosyncratic belief.

3. Taxonomies and Componential Analysis

3.1. Introduction

Early in the development of the field, cognitive anthropologists recognized that the members of any culture are faced with the task of making sense of a complex world, and that one strategy for doing so in a cognitively efficient way is to order the things in the world into categories or classes, that is, into sets that bear specifiable relationships to other classes or sets of things, thereby reducing the potentially overwhelming complexity of nature from billions of individuals to a more cognitively manageable set of categories. The propensity of humans to categorize things in the natural world into groups, and those groups into other groups, was recognized by Charles Darwin in 1859, who wrote in *The Origin of Species* that “organic beings have been found to resemble each other in descending degrees, so that they can be classed into groups under groups. This classification is not arbitrary like the grouping of stars in constellations.”

When the categories of things are related hierarchically, when the members of one category may be said to be ‘kinds of’ another category, the hierarchical relationship is defined as a taxonomy. A simple taxonomy of “animals” might include a category of “cats” that is different from the category of “dogs” or the category of “fish.” The category of “cats” might include several types: lions, tigers, jaguars, housecats, etc. The category of “housecat” might include several types: Manx; Siamese; Tabby; Burmese, etc. This section discusses several key efforts to analyze illness terms as taxonomic systems, and highlights the benefits and drawbacks of the componential or feature analysis of illness concepts.

3.2. Taxonomies and Ethnomedicine

Early cognitive anthropologists conceived of ethnoscientific knowledge in taxonomic form, especially knowledge of the natural world, including plants and animals. Some of the first ethnoscientific efforts to understand medical concepts in other cultures adopted this taxonomic framework. In the early work already mentioned, Frake elicited Subanun illness terms – diagnoses – from question frames of the “kind of” type, and set out Subanun ethnoscientific knowledge of illness in taxonomic form (1961). Frake identified 186 illness names recognized and used by the Subanun, and proposed that these could be ordered into a series of taxonomic levels and categories. For example, the term he translated as “shallow proximal ulcer” was a kind of “proximal ulcer”, and a “proximal ulcer” was a kind of “sore.” Further, a “sore” was a kind of “skin disease.”

The taxonomy of “*nuka*” (“skin disease”) could be laid out, in part, as follows:

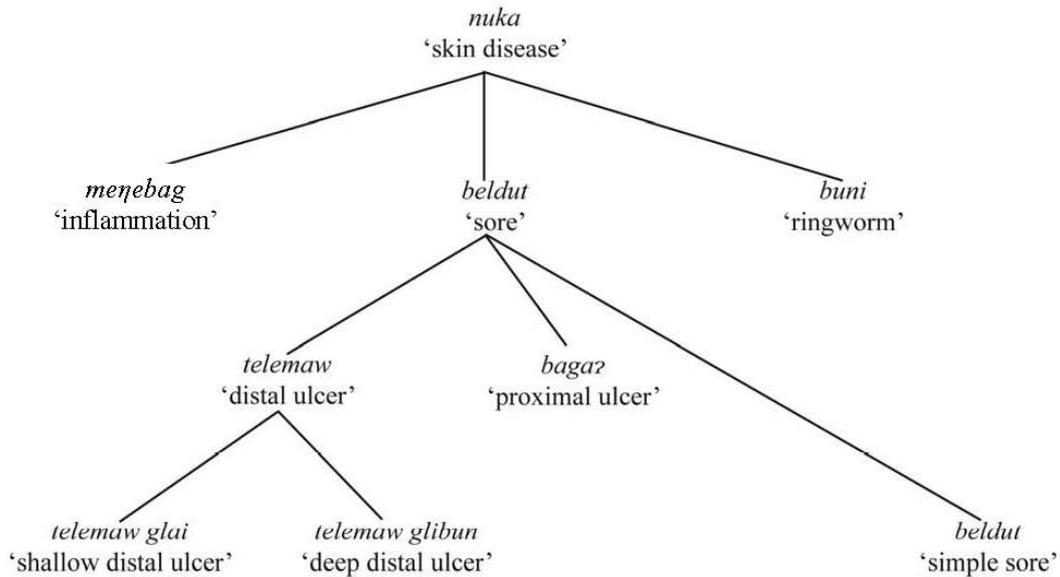


Figure 1. Kinds of 'sores' among the Subanun.

Taxonomies are useful for displaying the structure of associations that members of a culture make among illness types or categories. One limitation of the taxonomy approach, however, was that it did not specify exactly what those associations were. In the Subanun case, for example, *meñebag* and *beldut* are kinds of *nuka*, but the taxonomy is silent on why or how, and without a great deal more information the taxonomy itself does not reveal on what basis Subanun categorize both *meñebag* and *beldut* as kinds of *nuka*.

3.3. Componential Analysis

One approach to answering the question of how the members of taxonomic categories were related to each other and to the members of other taxonomic categories was the multidimensional or componential analysis of illness terms. Roy D'Andrade and his colleagues collected data on American illness terms and Mexican illness terms in a series of questions or belief frames suggested by interviews with informants, such as: "[X illness] cannot be cured" or "Your skin breaks out with [X illness]" (D'Andrade et al 1972). The American sample included 30 illness terms, each of which was inserted into 30 belief frames. "Measles," to take a single example, was the focus of 30 statements, including "Most people get measles at some time or other," "You can have measles and not know it," and "Measles gets better by itself." Respondents expressed their agreement with, or rejection of, the 900 resulting statements (30 terms in each of 30 frames), and the anthropologists analyzed the rates of agreement among the respondents. In this way, D'Andrade and his colleagues were able to identify a more or less unique set of semantic features associated with each illness term (if two sets of semantic features had been identical, there would be no way for the 'natives' to distinguish one illness from another illness that shared all and only those features associated with the first illness). Moreover, they were also able to identify clusters of features that defined categories of illness such as "childhood illnesses" versus "illness of old age".

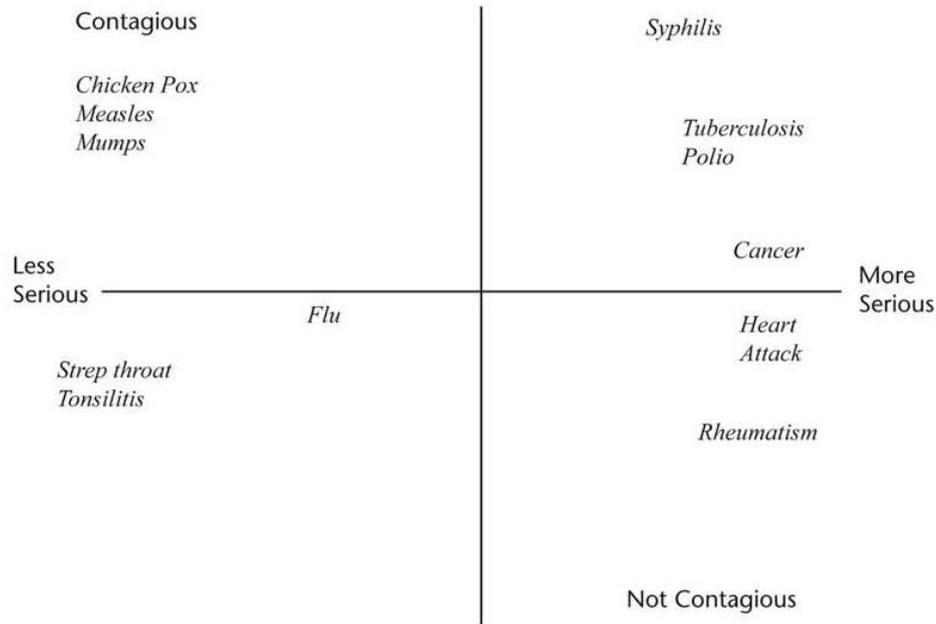


Figure 2. Two dimensional American illness analysis.

Susan Weller conducted a similar comparative study of American and Guatemalan communities, collecting data on illnesses using a file card pile sort technique in which informants were asked to sort similar illnesses into piles, and informants were asked in what ways the illnesses in each pile were similar (1984). Weller analyzed the level of agreement among informants on the similarity of illness concepts, finding high levels of agreement on dimensions of contagion, severity, and age among her American informants, but less agreement among her Guatemalan informants on those dimensions, and even less agreement on the dimension of “hot-cold” (1984:345). This last dimension illustrated some of the power of the multidimensional analytic technique, since it has long been assumed that Hispanic conceptions of illness included a cognitively significant dimension of hot-cold: that is, many illnesses are considered to be (or result from) an imbalance of hot and cold elements in the body, and treatment requires re-establishing a balance of hot and cold.

It is worth mentioning that the hot-cold dimension of illness in Hispanic culture is also interesting for being related historically to one of the earliest versions of an ethnoscientific approach to illness. Galen, the Greek physician in 2nd century AD Rome, conceptualized illnesses in terms of a balance among four “humors”: black bile; yellow bile; blood; and phlegm. A componential analysis of illnesses in Galen’s categorization would focus on the balance or imbalance of humors underlying the overtly expressed illness. This humoral balance theory of illness spread widely around the world, and as part of the Islamic theory of illness was introduced into Spain during the Moorish occupation, and from there to the New World, where it was simplified and transformed into a hot-cold balance conception of illness. Recent research by Weller and others has suggested, however, that there is less agreement among Hispanic community members about the hot-cold dimension of illness than was previously assumed, and less importance placed on hot-cold features in the diagnosis and treatment of illness.

Multidimensional analysis is a powerful way to analyze the semantic features of illness terms, and to reveal major axes along which illnesses are ordered, as well as clusters or categories of illness that share a set of semantic features. However, one limitation to the multidimensional analysis is the problem of cognitive salience: does the complex set of features actually model what the members of a culture believe, or how they really think about illness, or does the analysis display connections that the members of a culture might recognize if asked to do so, but do not normally make. For example, childhood illnesses are also believed by Americans to be contagious, and to be caused by germs. Consequently, knowing that “measles” is a childhood illness might be sufficient for a member of American culture to assume or conclude that “measles” is contagious and is caused by germs. Moreover, and at the extreme, as D’Andrade himself noted, many of the 900 statements evaluated by informants in his study struck those respondents as odd: “Runny nose is a sign of a heart attack,” for example, would prompt an initial puzzled look; members of a culture might use knowledge of one or two features of an illness to make assumptions about other features of that illness, but a configuration of related features might block assumptions about other features.

-
-
-

TO ACCESS ALL THE 25 PAGES OF THIS CHAPTER,
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

Bibliography

D’Andrade, Roy, N. Strauss, S. Nerlove, and A. K. Romney (1972) “Categories of Disease in American English and Mexican Spanish.” In *Multidimensional Scaling*. Volume II. A. K. Romney et al (eds). New York: Seminar Press. [The most influential study of illness terms using componential analysis methods]

Fabrega, Horacio (1970) “On the Specificity of Folk Illnesses” *Southwestern Journal of Anthropology* 26(3): 305-314. [An influential effort to identify the specific features of illnesses in a formal, ethnoscientific framework]

Frake, Charles (1961) “The Diagnosis of Disease among the Subanun of Mindanao” *American Anthropologist* 63(1):113-132. [An early classic in the ethnoscientific study of illness concepts]

Heybye, Mette Terp and Tine Tjørnhøj-Thomsen (2014) “Encounters in Cancer Treatment: Intersubjective Configurations of a Need for Rehabilitation” *Medical Anthropology Quarterly* 28(3): 305-322. [A recent study of cultural models of rehabilitation for cancer in Denmark]

Kleinman, A. (1980) *Patients and healers in the context of culture: an exploration of the borderland between anthropology, medicine, and psychiatry*. Berkeley: University of California Press. [A major statement of the concept of Explanatory Models]

Nuckolls, Charles (2006) “Ambivalence and Anxiety in the Psychiatric Systems of the United States and Japan” *Anthropology and Medicine* 12(2): 173-186. [A comparative study of cultural models of anxiety disorders in the U.S. and Japan]

Pike, Kenneth (1967) *Language in Relation to a Unified Theory of the Structure of Human Behavior*. The Hague: Mouton & Co. [A useful early discussion of the difference between “emic” and “etic” phenomena]

Wierzbicka, Anna (1984) "Apples are not a 'kind of fruit': the semantics of human categorization" *American Ethnologist* 11(2): 313-328. [A detailed discussion of the nature of taxonomies and semantic theory]

Weller, Susan (1984) "Cross-Cultural Concepts of Illness: Variation and Validation" *American Anthropologist* 86: 341-351. [An innovative approach to the componential analysis of illness terms, useful also for its methodological value]

Young, James C. (1978) "Illness Categories and Action Strategies in a Tarascan Town" *American Ethnologist* 5(1): 81-97. [An insightful approach to expanding componential analysis into the realm of action]

Biographical Sketch

Donald Pollock did his undergraduate work in Anthropology at the University of Minnesota, graduate work in Anthropology at the University of Chicago, and studied medicine at Harvard Medical School. He has taught at Harvard Medical School and Boston University, and since 1990 has been on the faculty of the State University of New York at Buffalo, where he is assistant professor of Anthropology, director of the program in Medical Anthropology, and adjunct professor of Geographic Medicine. He has conducted research on ethnomedicine among the Kulina Indians of western Brazil, and on the culture of tertiary care medicine, and has published extensively on those and other subjects. His current research projects include cross-cultural research on post-partum depression and studies of the corporatization of hospitals in the U.S.