

1999

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George E. Luber
University of Georgia, Department of Anthropology

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Luber, George E.. "An Explanatory Model for the Maya Ethnomedical Syndrome *Cha'lam tsots*." *Journal of Ecological Anthropology* 3, no. 1 (1999): 14-23.

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An Explanatory Model for the Maya Ethnomedical Syndrome *Cha'lam tsots*

GEORGE E. LUBER

DEPARTMENT OF ANTHROPOLOGY
UNIVERSITY OF GEORGIA

Abstract

Although the ethnomedical system of the Highland Maya is generally well understood, little is known about the Tzeltal Maya ethnomedical syndrome Cha'lam tsots, or 'second hair.' In an attempt to better understand the emic conceptualization, and possible biomedical equivalence of Cha'lam tsots, ethnographic data from semi-structured interviews was collected from the Tzeltal Maya municipality of Tenejapa, in the central highlands of Chiapas, Mexico. Analysis of explanatory models elicited from 20 informants revealed a generalized agreement as to the etiology, symptomatology, course, prognosis, and treatments of this illness. Analysis of these findings will help guide further research into the etiology and biomedical correlate of Cha'lam tsots. This paper concludes with a discussion of the potential significance of this approach for an ethnoepidemiological study of ethnomedical systems, and for the improvement of basic health care services.

Introduction

One of medical anthropology's most valuable contributions to western medicine has been to demonstrate that indigenous peoples frequently possess detailed knowledge and beliefs about the factors that influence their own health and illness. Although it is widely held that the cognitive structures underlying illness behavior and decision making are implicit in utterances that can be systematically elicited from informants (Frake 1961; Metzger and Williams 1963), much contemporary medical anthropological research has focused on symbolic and epistemological dimensions, rather than the biological and physiological realities to which these utterances refer (Browner et al. 1988). Research on the ethnoepidemiology of the Highland Maya of Chiapas, Mexico by Berlin and Berlin (1996) has identified an ethnomedical syndrome, *Cha'lam tsots*. This syndrome presents an unique opportunity to examine how an analysis of these cognitive structures of illness belief and behavior can benefit our understanding of the potential biological and physiological basis of

ethnomedical syndromes.

Cha'lam tsots 'second hair,' is a complex Tzeltal Maya health condition characterized primarily by the presence of short, bristly hairs growing close to the scalp under the normal layer of hair, and is often accompanied by severe diarrhea (Berlin and Berlin 1996). It is considered a serious, potentially fatal condition that typically affects children.

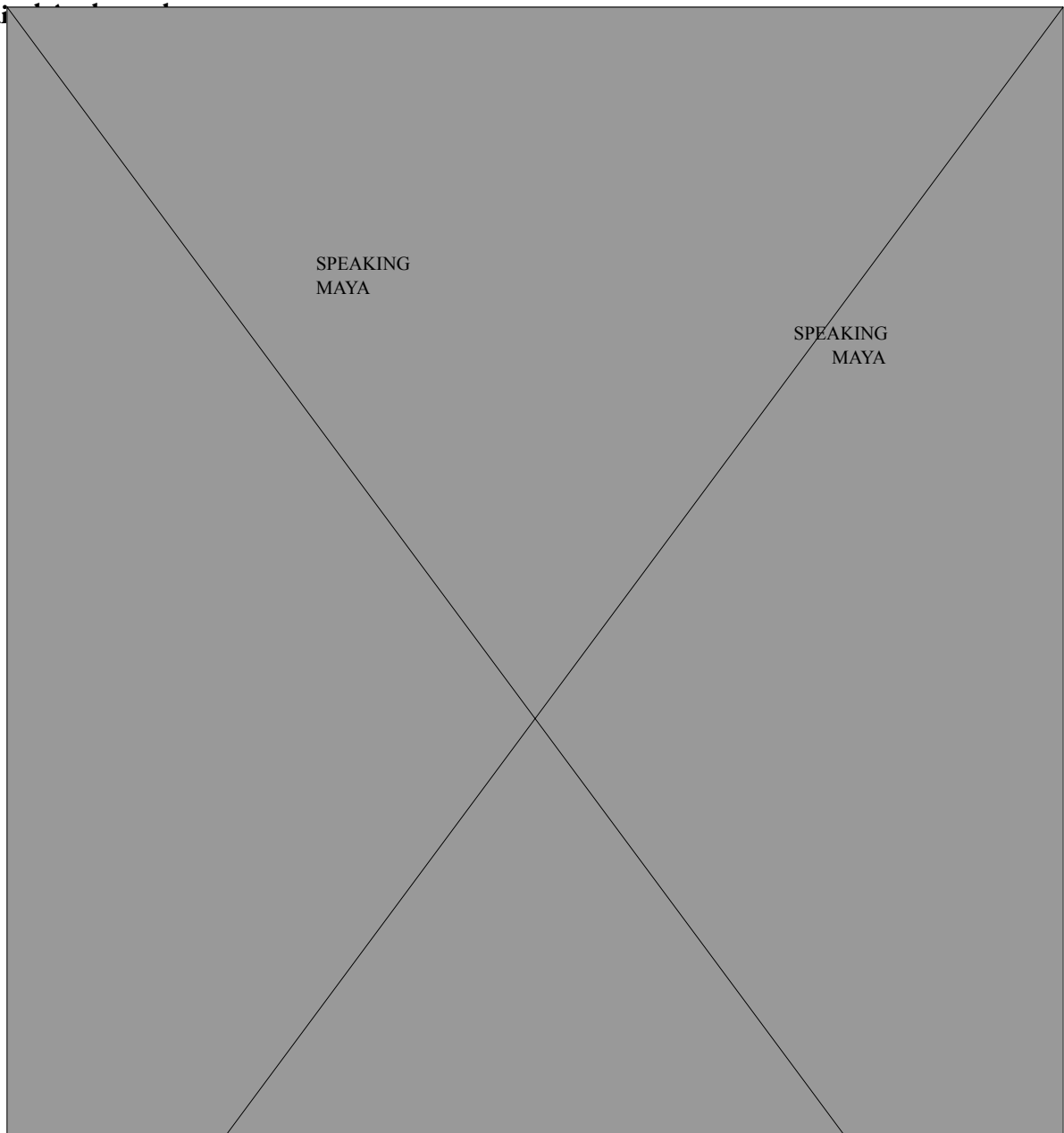
Although *Cha'lam tsots* is associated to some extent by the Maya with gastrointestinal illnesses, it is a condition which presents an enigmatic symptomatology and unclear etiology. Currently there is no biomedical equivalent for this condition, and efforts to understand its etiology have been preliminary at best, although low serum zinc has been identified among those afflicted (Berlin and Berlin 1996). Interestingly, *Cha'lam tsots* is only found in the adjoining Tzeltal Maya municipalities of Tenejapa, Cancuc, and Oxchuc, in the Central Highlands of Chiapas (Figure 1).

This paper reports on ethnographic research

conducted in the Tzeltal Maya municipality of Tenejapa, and was designed to launch a preliminary investigation of *Cha'lam tsots* by eliciting the Maya explanatory model for this illness. An explanatory model describes an illness' attributed etiology, typical onset and preliminary signs and symptoms, course and evolution, prognosis, or predicted outcome, and healing strategies from the emic perspective. This study is founded on the premise that explanatory models form an important vehicle through which the complexities of ethnomedical syndromes can be explored, and by which researchers can better identify and improve the basic health care needs of societies in transition.

Interpretive and Ecological Approaches in Medicine

Anthropologists have generally used two distinct approaches in their study of human illness and disease: ethnomedical and ecological approaches. Cultural anthropologists often use an ethnomedical model to interpret the cultural response to disease. In this approach, emphasis is placed on the society's emic (insider's) definition of disease. From this perspective "the basic features of the social system are revealed as the group organizes itself to control the disease" (Swedlund and Armelagos 1990:3). The ethnomedical approach has typically taken the form of a meaning-based ethnography of illness, which focuses on the "words, situations, context and feelings which are associated with illness and give it meaning for the sufferer" (Good 1977:39). In meaning-based, or interpretive, medical anthropology "sickness is



seen, not as a reflection or causal product of somatic processes but as a meaningful human reality . . . [therefore] human illness is fundamentally semantic or meaningful" (Good and Good 1981:174).

The ecological approach to the study of disease explicitly places health, illness and disease within a system of "mutually interacting organic, inorganic and cultural environments" (Armelagos et al. 1992:41). Here, human behavior and ethnomedical systems are viewed as primarily adaptive mechanisms responding to an often dynamic disease ecology. This approach differs from the biomedical-epidemiological model employed by public health researchers in that it places prime importance on the sociocultural factors affecting disease classification, transmission, and treatment.

A significant recent development in medical anthropology has been the advocacy for increased integration of the interpretive and biological-adaptationist perspectives on health and illness (Hahn and Kleinman 1983; Armelagos et al. 1992; McElroy 1990). This biocultural model of health focuses on the integration of the ethnomedical and ecological approaches by investigating the complex association between disease agents, biological organisms, cultural beliefs and behaviors, and the ecosystems in which they are located (Moore et al. 1980).

Towards this biocultural synthesis, Browner et al. (1988) proposed an analytic framework that combined the emic perspective of the ethnomedical approach with the etic measures that bioscience and the ecological model can generate. The goal of this approach is to develop a methodology that will produce a set of criteria or 'external referents' that will allow for the comparison between medical systems. While they do not claim that this approach is appropriate for all medical anthropological research, it is appropriate for those studies that aim for "cross-cultural comparisons of human physiological processes, and the ways in which such processes are perceived by informants, and the culture-specific behaviors these perceptions produce" (Browner et al. 1988:682).

This study is an attempt to develop a set of

'external referents' for an ethnomedical syndrome, which will allow for the cross-cultural comparison and investigation of its potential biomedical equivalence.

Explanatory Models

This paper seeks to describe and analyze the Tzeltal Maya ethnomedical syndrome *Cha'lam tsots* from a biocultural perspective, with the ultimate goal of identifying its potential equivalence with biomedical disease. In order to generate an ethnomedical description and biomedical explanation of *Cha'lam tsots*, the explanatory model methodology set forth by Kleinman (1980), and modified by Berlin and Berlin (1996) is employed. The explanatory model approach uses a semi-structured ethnographic interview to explore emic understandings of a specific illness. This methodology involves asking a patient (or a sufferer of an illness) open-ended questions concerning their knowledge of an illness. It has become a core methodology in medical anthropology, though it is most often used to explore the experiential aspects of health (Browner et al. 1988) and is rarely used to investigate the biological nature of an illness (cf. Berlin and Jara 1993).

Explanatory models are sets of beliefs or understandings, held by laypersons and specialists alike, that specify attributed etiology, typical onset and preliminary signs and symptoms, course or evolution, and prognosis, or predicted outcome and healing strategy. They are "formed and employed to cope with a specific health problem and need to be analyzed in that concrete setting" (Kleinman 1980:106). Therefore, they are explanations for specific illnesses, not illness in general.

An individual's explanatory model can differ depending on the setting in which it is elicited. Anthropologists with experience in the local community, familiar with local customs and conventions, and accompanied by a native collaborator have the best chance of eliciting an accurate explanatory model for an illness. To obtain as accurate a model as possible it is important to elicit

information in the informant's home, as models often differ when discussed in the clinical setting. Thus, the home elicited model "usually represents a more accurate and full disclosure of the patient's model" (Kleinman 1980:106).

Study Site and Sample

Explanatory models for *Cha'lam tsots* were elicited from Tzeltal Maya informants in the municipality of Tenejapa, Chiapas, Mexico (Figure 1). Located in the Central Highlands, Tenejapa has a population of roughly 30,000 people spread over 99.4 km². The principal mode of production is subsistence agriculture, centered on maize, beans, squash, and fruits, with some coffee growing for national and global markets. The raising of livestock, mainly sheep and cattle, is gaining importance in the local economy, as are several weaving and rug-making cooperatives.

Epidemiological data from this region of the Highlands reflect the low socioeconomic status of the Tzeltal Maya. Gastrointestinal conditions comprise the majority of health reports (c. 275/1000), followed by respiratory infections (c.180/1000) and intestinal parasites (c.175/1000) (Berlin and Berlin 1996). The high frequency of gastrointestinal conditions is typical of populations living in impoverished conditions. Thatched-roof housing and lack of adequate sewage treatment or access to potable water characterize communities of the Highland area.

Three groups of individuals were targeted for this study: past sufferers of *Cha'lam tsots*, current sufferers of *Cha'lam tsots*, and *curanderos* (or *jpoxtawanej* 'specialist healers'). I was fortunate enough to have access to the records from the 1991 PROCOMITH ethnoepidemiological study conducted by Berlin and Berlin (1996). Through reviewing these records I identified those individuals, by name and locale, who had been reported as suffering from *Cha'lam tsots* in 1991. Ten individuals were located and interviewed from this group.

With the help of a Maya collaborator I was able to locate eight individuals who either self-identified, or were identified by a parent as being

currently afflicted with *Cha'lam tsots*. To minimize error, all current sufferers of *Cha'lam tsots* were screened either by a *curandero* or by an adult who knew how to identify the signature characteristics of *Cha'lam tsots*: the appearance of spiny hair close to the scalp. Two *jpoxtawanej* from Tenejapa were located and interviewed. In order to obtain as accurate and representative an explanatory model of *Cha'lam tsots* as possible, individuals in the first two groups of informants (past and present sufferers of *Cha'lam tsots*) were recruited from five different *parajes*, 'villages,' throughout the municipality.

The semi-structured ethnographic interview was my principal data collection technique. A modified version of the explanatory model questionnaire previously developed by Berlin and Berlin (1996) was used. All interviews, with two exceptions, were conducted in patients' homes, either directly with the sufferer of the illness, or in the case of small children, with their primary care giver. All interviews were conducted in Tzeltal with the help of a Maya collaborator, and were transcribed first into Tzeltal and then translated into Spanish by the same Maya collaborator. After translation into English, the interviews were imported into QSR NUD*IST (Scolari, Inc. 1999) for text management and analysis.

The Explanatory Model for *Cha'lam tsots*

The following discussion will focus on describing the Tzeltal Maya explanatory model for *Cha'lam tsots*. This explanatory model was generated from an analysis of the frequency of responses to specific questions regarding the components of the model. This is fairly standard procedure; as Pelto and Pelto note: "the exploration of explanatory models does not generally depend upon statistical analysis other than, at most, frequencies of recognition of taxonomic categories" (Pelto and Pelto 1990:289).

As there is a degree of variability in any explanatory model, this analysis will focus on the principal components of the model; the most sa-

lient features as elucidated by frequency of reports by the informants. Again, as these explanatory models are representations of the cognitive structures individuals invoke when thinking about, and acting upon an illness, it is not claimed that they are immutable or invariable. Rather, the explanatory model approach is viewed as an effective method for arriving at a cross-cultural understanding of an illness that can illuminate possible points for comparison and correlation. In the following description of the components of the explanatory model, informant responses are given as a frequency of total informant responses to a particular question.

Attributed Etiology

Two primary questions were asked concerning the cause, or etiology, of *Cha'lam tsots*: "What are the causes of *Cha'lam tsots*?" and "Why does one get it?" A third question "Who gets *Cha'lam tsots*?" was included to determine who are the main sufferers of *Cha'lam tsots*. Whereas the first question was typically answered by describing the major signs and symptoms of the illness, the second question elicited responses that described why these major signs and symptoms appeared in the first place (Table 1).

It appears that there is marginal agreement on the actual cause of *Cha'lam tsots*. Physical burden and trauma on the sufferer are the etiologic agents cited most often, with a combined 53% of reports. The following two quotes illustrate the nature of these traumas and physical burdens:

Because sometimes it begins when they are little and they fall down. Because of this, they say, the sickness, *Cha'lam tsots*, comes.

Because s/he (the child) doesn't want the heat because we harvest and we carry the child to work . . . just so it arrives on the head.

Children (87%) were identified as the primary sufferers of *Cha'lam tsots*, although it is possible for adults to become afflicted (46%).

It is worthwhile to note that the different responses to the first two questions regarding etiology are quite possibly due to the timing of the question. The first question "What are the causes of *Cha'lam tsots*?" was the first question asked and invariably resulted in a 'laundry list' of the most salient characteristics of this illness. These items are most likely the first things that come to mind when an individual thinks about *Cha'lam tsots*. The question "Why does one get *Cha'lam tsots*?" elicited a rather different set of responses, again due to its timing; it was the last question asked in the interview. Two quotes regarding etiology given by a specialist healer help to clarify some of the confusion regarding the salient features of *Cha'lam tsots* and its etiology:

The sickness comes if one had fever, and their hair falls out. If the fever is serious, the hair falls out and later the *Cha'lam tsots* begins. The children have *Cha'lam tsots* a lot because of fever. Sometimes fever happens a lot and for this reason they have *Cha'lam tsots*. Sometimes they hit their head, and there begins the sickness because they hit their heads a lot. Sometimes children don't behave well, they hit their heads and there the sickness *Cha'lam tsots* begins.

In summary, *Cha'lam tsots* is often seen as the result of physical trauma or excessive physical burden to the individual. Conditions that are as-

TABLE 1: ATTRIBUTED ETIOLOGY FOR *CHA'LAM TSOTS* (N=20).

¹Percentage of informants who gave that response to a particular question.

sociated with *Cha'lam tsots*, and are often viewed as causal agents or necessary conditions are fever, diarrhea and stomachache.

Onset and Preliminary Symptomatology

Three different but complimentary questions were developed to understand how and when a *Cha'lam tsots* illness episode begins and how individuals come to recognize and classify their illness as *Cha'lam tsots*. These questions are: "How does it begin and what are the preliminary signs and symptoms?" "Does it have a time?" and "How do you know it's *Cha'lam tsots*?"

The most common response to the question "How does *Cha'lam tsots* begin?" was "It just appears" (73%). This response mirrors the responses to the attributed etiology and most likely refers to a general lack of knowledge of the etiologic nature of this illness. When probed, individuals were able to identify several preliminary signs and symptoms of *Cha'lam tsots*, the most frequently being diarrhea (46%), cough (40%), fever (33%), and hair loss and the head turns red (33%). Again, these responses are quite similar to the 'causes' of *Cha'lam tsots* elicited by questions concerning its etiology. Seventy-five percent of the informants reported that *Cha'lam tsots* does not occur in any specific season or time of the year. The other 25% of informants did not know if the illness occurred in any specific time of the year.

The most common response to the question "How do you know it's *Cha'lam tsots*?" was that the diagnosis of *Cha'lam tsots* required a traditional healer, *curandero*, or a person knowledgeable in

the diagnosis of *Cha'lam tsots* (40%): "Curanderos know if it is *Cha'lam tsots*, also, those who know how to examine your scalp." Although 'specialist' diagnoses are important in Maya ethnomedicine, non-specialists are able to provide a positive diagnosis based upon two factors: the appearance of the characteristic spiny hair (33%) and the presence of mucoid diarrhea (27%). Only one individual mentioned both criteria as being necessary for the diagnosis of *Cha'lam tsots*.

Course of Illness

A description of the course of this illness was elicited from the responses to the following three questions: "What parts of the body does *Cha'lam tsots* affect?" "What does it do to the body?" and "How does it feel, or appear to a person?" The first two questions elicited responses that described the physical and largely exterior symptoms of this illness. The third question, with the exception of diarrhea, generated responses that described the internalized and psychological or emotive aspects of *Cha'lam tsots*. The responses to these questions are summarized in Table 2.

It is important for an explanatory model to elicit both the physiological as well as the psychological dimensions of an illness, for both can give important clues to potential biomedical equivalents for ethnomedical syndromes. In the case of *Cha'lam tsots*, it becomes clear that hair loss and swelling are not the only salient features that need to be considered in determining a biomedical equivalent for the symptoms of general weakness, because lack of appetite, and dreams (most prob-

TABLE 2: SUMMARY OF RESPONSES DESCRIBING COURSE OF ILLNESS FOR *CHA'LAM TSOTS*.

²Percentage of informants who gave that response to a particular question.

ably due to feverish sleep) can be equally illuminating. It is interesting to note that there was no discussion of the humoral quality of *Cha'lam tsots* in any of the interviews, perhaps owing to the relatively recent emergence of this illness (pers. comm. E.A. Berlin 1998).

Prognosis and Healing Strategies

The most agreed upon elements of the explanatory model for *Cha'lam tsots* were those pertaining to the prognosis or predicted outcome of this illness. If an individual does not seek treatment, that person will invariably die (100%): "They die if they don't find the medicine of that plant. One dies, one dies, a person dies. If he finds the medicine, he doesn't die—only their head hurts them." There were two variants describing how a person might die from this illness: "One dies, one gets thin" and "one dies, it causes swelling."

Interviews revealed that the treatment options were not well known. Little was agreed upon except for the fact that a plant or animal-based treatment is employed. Several treatments of first and second recourse were identified. These are summarized in Table 3.

Many individuals knew that the treatments were plant-based, but could not recall or were unfamiliar with the name of the medicinal plant. Two animal-based remedies were identified. Horse manure (13%) was reported to be mixed with medicinal plant material and rubbed into the scalp: "they told me for my first son to put horse manure—with this he improved with this I covered his head, but it stunk." The mode of application for the second animal-based treatment, a gopher

skull (13%), was not well explained, save for the fact that it is ground to a powder and consumed in some manner.

The two *jpoxtawanej* (or *curanderos*) that were interviewed both claimed that only plant remedies work for *Cha'lam tsots*. The first *curandero* stated that *Chimaphila macolata* was the sole cure. This plant is ground to a poultice, mixed with water and applied cold to the scalp of the sufferer once a day for three consecutive days. The head of the patient is kept wrapped in a cloth for the duration of the treatment. The second *curandero* did not mention the previous treatment, and instead identified *Verbena carolina* as the cure. This plant is applied in the same manner as *Chimaphila macolata*.

Synopsis of the Explanatory Model for Cha'lam Tsots

Cha'lam tsots is an illness believed to be the result of physical trauma or excessive physical burden on individuals, especially children. This physical burden initially manifests itself in the form of mucoid diarrhea, fever, and stomachache. Bad dreams and weakness with no appetite are symptoms that typically co-occur with the diarrhea and fever. *Cha'lam tsots* can occur at any time of the year and is often diagnosed as such by *curanderos* and other laypersons by the presence of the characteristic spiny hair close to the scalp, or the mucoid diarrhea. The preliminary symptoms include mucoid diarrhea, fever, cough, and a red scalp.

The head is the main part of the body affected by *Cha'lam tsots*, through the loss of hair and a reddening of the scalp. Some swelling of the body can also be seen. During the course of the illness a

TABLE 3: FIRST AND SECOND RECOURSE FOR HEALING STRATEGIES.

³Percentage of informants who gave that response to a particular question.

patient experiences general weakness, bad dreams, and a poor appetite. The diarrhea and fever do not abate, and often worsen.

Unless treatment is sought, the symptoms will deteriorate, and, according to informants, the patient will invariably die. If proper treatment is sought, one can expect to recover. The typical treatments for *Cha'lam tsots* include several different medicinal plants, pharmaceutical tablets, and occasionally animal-based remedies such as horse manure and gopher skulls. There is little general knowledge about the specific plant or pharmaceutical remedies used.

Explanatory Models and Biomedical Equivalence

Foster and Anderson's (1978) classification of illness etiologies in ethnomedical systems distinguishes two basic types: personalistic and naturalistic. Personalistic illnesses are attributed to the purposeful, active intervention of an agent such as a supernatural being or another human. Naturalistic illnesses have their etiologies in natural forces, or in conditions such as excessive cold, heat, or an individual's disequilibrium with their social environment. They are empirically determined and based primarily on apparent signs and symptoms (Berlin and Berlin 1996). The etiologies given by the explanatory model of *Cha'lam tsots* clearly fall within the naturalistic category. This is significant because it provides more evidence to support the 'disease agent' approach to its etiology, and removes it from the sphere of the 'culture-bound syndromes.'

Other clues to follow in the generation of biomedical equivalences are in two of the primary signs of *Cha'lam tsots*: the presence of mucoid diarrhea and short, spiky hair. Mucoid diarrhea, glossed *sim nak'al tza'nel* 'mucoid-hidden feces,' occurs among the Highland Maya population. According to ethno-epidemiological records, 4.8 per 1000 illnesses are reported and there is a high reported frequency of mortality due to this condition (Berlin and Berlin 1996:169). Mucoid diarrhea begins with slow onset of pain in the lower abdomen, which grows in intensity. There is a general loss of appetite that occurs, and at times this may be severe enough to

result in general wasting and debilitation. In addition, children are more likely to experience mucoid diarrhea than their adult counterparts (Berlin and Berlin 1996:169).

There are several features of this illness which correspond with the explanatory model for *Cha'lam tsots*. First, mucoid diarrhea primarily affects children, which is the case for *Cha'lam tsots*, and there is an associated high mortality rate with mucoid diarrhea. Although we have no data on the mortality rate of *Cha'lam tsots*, interviews indicate that it is often fatal. While stomachache does not appear to be a major symptom of *Cha'lam tsots*, it was mentioned as one of the primary etiologic agents, or conditions closely associated with *Cha'lam tsots*.

Another possible biomedical point of equivalence for the reported symptomatology of *Cha'lam tsots* is that it might be an infestation of *lukum*, or 'regular worms.' Prominent in this category of intestinal nematodes is *Ascaris lumbricoides*. The Maya explanatory model for *lukum* infestation includes symptoms of stomach pain, cough, and diarrhea (not mucoid, but the 'watery' and 'droplet' types) (Berlin and Berlin 1996). The individual experiences weakness and fatigue, which can lead to death. Children, again, are the group most affected by this condition. Stool analysis, completed on a sample of *Cha'lam tsots* sufferers in 1991 indicated that *Ascaris lumbricoides* infection was quite common, although a sample of the general population might reveal the same.

Reports from nutritional epidemiology indicate that the hair loss seen in *Cha'lam tsots* might be due to an acute nutritional deficiency, most likely zinc or pantothenic acid. The appearance of 'short, spiky' hair can be attributed to either follicle breakage near the scalp, or to the regeneration of hair following a period of severe alopecia, or hair loss. Nutritional monitoring of individuals suffering from *Cha'lam tsots* would be necessary to prove this hypothesis.

It is quite probable that *Cha'lam tsots* is the combination of several conditions, including mucoid diarrhea, *Ascaris lumbricoides* infection, and possibly acute pantothenic acid or zinc deficiency.

This preliminary study of the explanatory model for *Cha'lam tsots* demonstrates that this

approach can yield valuable insights into both the biological basis of health and the empirical nature of ethnomedical systems. It is important to reiterate that the explanatory model alone cannot generate biomedical diagnoses. The purpose is not to translate Tzeltal ethnomedicine into biomedicine, but to identify points for comparison, if possible, by which the physiological and biological basis of *Cha'lam tsots* may be explored.

Conclusions

In conclusion, the preceding discussion of the Maya ethnomedical syndrome, *Cha'lam tsots*, demonstrates that the Tzeltal Maya of Highland Chiapas possess a significant amount of knowledge of the factors that influence their own health and illness. However, such knowledge is often embedded in culturally specific means of speaking about illness, and forms a major communicative barrier in indigenous attempts to seek treatment in a Western style medical system (Berlin and Jara 1993). The main objective of this discussion has been to illuminate potential areas for further investigation into the physiological and biological basis of *Cha'lam tsots*.

Historically, "health care providers have lacked the expertise, interest, and time to attempt

an understanding of folk syndromes" (Berlin and Jara 1993:677). Therefore, the application of this approach to the study of ethnomedical syndromes is crucial, for it can demonstrate that they are 'valid' health conditions, based upon detailed empiricism, that are worthy of attention and treatment by biomedical health providers. This is significant, as all too often, such illnesses are quickly deemed 'personalistic' and 'spiritual' in nature, are discredited as nonvalid health conditions, and go untreated. Through careful attention to the cognitive models underlying illness beliefs and behaviors, we, as anthropologists, can significantly impact efforts aimed at identifying and improving the basic health care needs of Maya communities. This cannot be done by merely regarding ethnomedicine as a semantic or meaning-based system, for we must also come to terms with the biological and physiological realities that impinge upon human health.

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