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Cross-Cultural Concepts of Illness: Variation and Validation

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## RESEARCH REPORTS

### Cross-Cultural Concepts of Illness: Variation and Validation

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Anthropologists have long had an interest in studying and recording ways in which different cultures deal with, think about, and integrate disease into their wider system of beliefs and values. Because the culturally salient disease terms in one culture can be different from those in another culture, much of the cognitive research has been focused on the description of a single culture rather than on comparisons between cultures (Frake 1961; Kay 1977; Fabrega 1970, 1971; Young 1978; Lieberman and Dressler 1977). In this paper I illustrate a technique that allows for the comparison of equivalent domains with nonidentical items on the basis of their "dimensions of meaning".<sup>1</sup> A major part of the research reported here is concerned with validating dimensions utilized in classifying diseases and utilizing those dimensions to make cross-cultural comparisons. Central to the topic of validating dimensions is the degree of intracultural variation or variability among informants.

In attempts to describe a culture, often so much emphasis has been placed on describing the "typical" belief pattern that little attention has been paid to variability. Individuals vary in the amount and kind of cultural information that they report (Roberts 1964; Nerlove and Walters 1977). It makes little sense to speak of a "typical" pattern if the variability is extreme (Foster 1979; Pelto and Pelto 1975). In this paper, I measure agreement among informants to assess the relative cultural salience of each illness concept. It is assumed that illness concepts with the highest agreement are culturally more salient than those with lower agreement.

Important to the study of disease concepts are methods that allow a precise, quantifiable representation of disease concepts and facilitate hypothesis testing. In a cross-cultural study,

D'Andrade, Quinn, Nerlove, and Romney (1972; D'Andrade 1973) explored the conceptual organization of the domain of illness terms for Mexican-Spanish speakers and American-English speakers. An initial assumption of the D'Andrade et al. (1972) study was that the properties that defined and distinguished diseases would be the most important characteristics of disease. However, the statements regarding the diseases seemed to represent preconditions or consequences of the diseases and were not the features that the informants used to define and classify the diseases. The results indicated that Americans categorized the diseases and their properties on two main dimensions: contagion and severity. The Mexican sample was interpreted to have a different organization: one major concept appeared to be a hot-cold dimension of illness and medicine,<sup>2</sup> and the other concept contrasted "epidemic illnesses affecting children" with those "more likely to affect older people."

In the present study the dimensions proposed by D'Andrade (1973) are tested for their cultural salience among Guatemalan-Spanish and American-English speakers. A "conceptual model" of disease was derived from similarity data among disease terms and represented in a Euclidean, spatial model through the use of multidimensional scaling (MDS). Complete rank-orders of the disease terms on the hypothesized concepts were obtained from each informant so that variability could be evaluated. The relative cultural salience of each dimension was evaluated by measuring the degree of fit between the rank-order data and the "conceptual model of illness" and the degree of variability among informants. The salient dimensions were then utilized to make cross-cultural comparisons between Guatemala and the United States.

#### DATA COLLECTION

Data were collected from samples of literate, urban women with children in the United States and Guatemala. The United States data were collected in Huntington Beach (population 160,000), California, and the Guatemalan data

in Antigua (population 21,000), Sacatepequez. Women were chosen because of their accessibility and experience with family health issues. Interviews were conducted in the native language of the informants and were obtained by going door to door or through introductions by friends. To ensure that culturally relevant items would be used, 20 women in each country were asked to name all the illnesses they could think of and to describe each. Using the most frequently mentioned items, a domain of 29 English and 27 Spanish disease terms was selected (Table 1) and used in the subsequent data collection tasks.

In a second set of interviews, data were collected from 24 women in each country. The American women ranged in age from 25 to 60 (median age, 35.5 years) with an average of 2.3 children per woman. The Guatemalan women ranged in age from 22 to 70 (median age, 28.5

years) with an average of 2.4 children. The women were asked to sort the illness terms into piles according to their similarity, making as many or as few piles as they wished (Burton 1972, 1975; Burton and Romney 1975). Similarity data were collected to minimize *a priori* assumptions; women were allowed to discriminate between the items on any basis that they wished. To provide a check on comprehension as well as interpretive data, the women also were asked to describe the way in which illnesses in each pile were similar. After finishing the pile-sort task, each woman was asked to rank-order the illness terms on the hypothesized concepts: (1) most to least contagious; (2) most to least serious/grave; (3) most common in children to most common in adults; and (4) those needing the hottest remedy or medicine to those needing the coldest remedy or medicine. In the United States, women rank-ordered the illness

Table 1. Disease terms.

Frequency	U.S. terms	Frequency	Guatemalan terms
15	Cancer*	15	Sarampion (Measles)*
13	Mumps*	12	Varicela (Chicken pox)*
12	Measles*	11	Amigdalitis (Tonsilitis)
9	Chicken pox*	11	Gripe (Flu)*
9	Leukemia	10	Rubeola (Rubella)*
9	Tuberculosis*	9	Tosferina (Whooping Cough)*
7	Diabetes*	8	Tifoidea (Typhoid Fever)
7	Multiple sclerosis	8	Paperas (Mumps)*
7	Pneumonia	7	Hepatitis (Hepatitis)*
6	Cold	7	Tuberculosis (Tuberculosis)*
6	Flu*	6	Gastritis (Gastritis)
6	Muscular dystrophy	5	Artritis (Arthritis)*
5	Emphysema	5	Tetano (Tetanus)
5	Heart disease	5	Viruela (Smallpox)*
5	Polio*	4	Alergias (Allergies)
5	Scarlet fever	4	Apendicitis (Appendicitis)
5	Venereal disease	4	Cancer (Cancer)*
4	Arthritis	4	Difteria (Diphtheria)*
4	Migraine	4	Infeccion intestinal (Intestinal Infection)
4	Whooping cough*	4	Polio (Polio)*
3	Diphtheria	3	Amebas (Amoebas)
3	Headache	3	Colicos (Colic)
3	Hepatitis*	3	Diabetis (Diabetes)*
3	Mononucleosis	3	Diarrreas (Diarrhea)
3	Rubella*	3	Dolor de rinones (Kidney pain)
3	Smallpox*	3	Paludismo (Malaria)
3	Strep throat	3	Reumatismo (Rheumatism)
3	Stroke		
3	Ulcers		

\* Overlapping items

terms on only the first three concepts. The order of presentation of the rank-order tasks was counterbalanced to avoid systematic interactions between tasks.

### ANALYSIS AND RESULTS

A conceptual model of illness terms was derived from the similarity data through MDS (Kruskal et al. 1973). The pile-sort similarity data were tabulated by giving each pair of items a "point" of similarity each time they occurred together in a pile and then summing across individuals. Multidimensional scaling was utilized to represent the structure within the similarity data because of its reliability as a technique for analyzing and representing conceptual data (Romney et al. 1972; Shepard 1974, 1975; Kruskal and Wish 1978). The two-dimensional solution was considered adequate because the addition of a third dimension did not appreciably reduce the stress. Stress was .14 for the Guatemalan sample and .16 for the U.S. sample. Also, the two-dimensional solution facilitated visual representation and comparison with D'Andrade et al.'s (1972) results. The MDS representation spatially illustrates the relationships among illness terms as judged by the women.

#### *Verification of Dimensions within the Domain Structure*

The concepts proposed by D'Andrade (1973) were tested by comparing the rank-ordered illness terms on the hypothesized concepts to the MDS representation. A technique of property fitting (PROFIT, Chang and Carroll 1968) facilitates dimensional verification by comparing independently obtained scales to the MDS solution in a manner that is conceptually similar to that of Burton (1972). PROFIT has been used to test for similar dimensions in multiple samples (Romney et al. 1979) and to explore the cross-cultural salience of the dimension of occupational prestige (Burton et al. 1982).

PROFIT provides a visual display of the response vectors in relation to the MDS configuration and reports correlation coefficients as a measure of "fit." The PROFIT algorithm performs a multiple regression analysis between the MDS coordinates and an independently obtained "scale," normalizes the scale, and places it optimally within the MDS structure. Only those vectors with large correlation coefficients (greater than .9) or those significant beyond the

.01 level are considered reliable in interpreting the MDS structure (Kruskal and Wish 1978). For this analysis the data were assumed to be from an interval scale and each subject's ranking was considered a separate dependent variable.

The results for the United States women's rankings are displayed in Figures 1 to 3. Each line or vector represents a subject's ranking of the diseases, with some superimposed. In Figure 1, vectors begin in the upper left with the most contagious diseases and end in the lower right with the least contagious diseases. The correlation coefficients for each subject appear in Table 2. Correlation coefficients were averaged using Fisher's  $Z$  transformation. The average correlation is .79 and all subjects but one are significant at the .01 level. In Figure 2, the vectors begin in the lower right with the diseases judged to be the most serious and end in the upper left with the least serious diseases. In Figure 3, the vectors begin on the left with diseases most common in children and end on the right with diseases most common in adults. Agreement among subjects, independent of the MDS model, was assessed with Kendall's coefficient of concordance ( $W$ ) and may be visualized in Figures 1 to 3 by the spread of the vectors. All vectors lie within 60 degrees of each other indicating a high degree of agreement on contagion ( $W = .73$ ), severity ( $W = .65$ ), and age ( $W = .69$ ).

The Guatemalan results appear in Figures 4 to 7. In Figure 4, the vectors begin in the lower left with the most contagious diseases and end in the upper right with the least contagious diseases. In Figure 5, the vectors begin at the bottom with the most serious diseases and end at the top with the least serious diseases. In Figure 6, vectors begin in the upper left with diseases judged to be common in children and end in the lower right with diseases most common in adults. In Figure 7, vectors begin with diseases judged to need cold remedies and end with diseases that need hot remedies. A high amount of agreement is found for contagion ( $W = .69$ ), severity ( $W = .54$ ), and age ( $W = .50$ ). Agreement is low ( $W = .27$ ) on the hot-cold concept, although the responses of a moderate number of women reach statistical significance. Results provide little evidence for a consistent and culturally shared definition of the hot-cold concept as applied to illness in medicine even when older women or those whose responses reached statistical significance are considered.

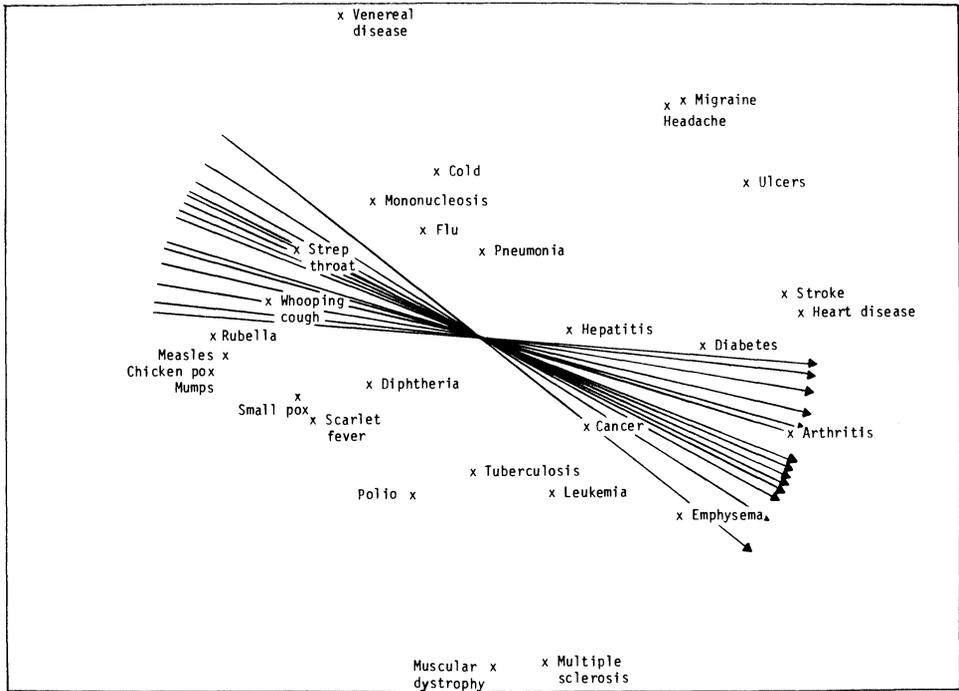


Figure 1. PROFIT display for the concept of contagion in the United States.

### Comparison of Equivalent Terms

As a check on the validity of the dimensional interpretation, an independent analysis was conducted comparing the subset of illness terms that were common to both domains. Approximately half (14) of the Guatemalan and U.S. illness terms are equivalent in meaning (Table 1). Concordance between the two structures was assessed with Individual Differences Scaling (INDSCAL, Carroll and Chang 1970; Carroll 1972) and Quadratic Assignment Program (QAP, Hubert and Schultz 1976; Schultz and Hubert 1976). The INDSCAL model accounted for 87% of the variance in two dimensions, indicating a high agreement between the two groups in terms of their common dimensions. QAP permits an inferential assessment of the concordance between two matrices or structures. QAP revealed a highly significant degree of similarity among the Guatemalan and U.S. overlapping terms ( $Z = 5.65$ ,  $p < .001$ ).

### DISCUSSION AND CONCLUSIONS

In this analysis I have attempted to interpret the conceptual structure of disease for Guate-

malan-Spanish speakers and American-English speakers. Independent rank-orders of disease terms on contagion, severity, age-of-the-infirm, and a hot-cold dimension of medicine and illness were evaluated for their saliency both in terms of "fit" to the MDS representation and in terms of intracultural variation. All four concepts were tested on the Guatemalan sample and the first three were tested in the United States. The dimensional analysis and the analysis on overlapping terms reveal a high degree of correspondence between the illness classification systems in urban Guatemala and urban United States.

The results indicate that all three of the concepts tested on the United States sample performed well. Each shows a high amount of between-subject agreement and a reliable fit to the MDS structure, indicating that they are probable dimensions of discrimination and classification of disease terms in American-English. The results tend to be congruent with D'Andrade's (1973) interpretation of the American-English system as being characterized by the dimensions of contagion and severity. However, because of a moderate association between the dimensions of contagion and severity, con-

Table 2. Correlations between each subject's rankings and the multidimensional scaling representation.

Subject	For the United States			For urban Guatemala			
	Contagion	Severity	Age	Contagion	Severity	Age	Hot-Cold
1	.71**	.74**	.66**	.74**	.66**	.86**	.21
2	.82**	.65**	.77**	.71**	.44	.53*	.51*
3	.82**	.70**	.67**	.73**	.41	.36	.28
4	.90**	.56**	.78**	.67**	.42	.41	.21
5	.74**	.38	.77**	.81**	.64**	.35	.21
6	.80**	.67**	.75**	.75**	.36	.17	.78**
7	.86**	.73**	.70**	.71**	.56*	.40	.56*
8	.72**	.63**	.74**	.53*	.40	.25	.65**
9	.74**	.63**	.73**	.83**	.43	.25	.45
10	.73**	.71**	.68**	.69**	.46	.21	.09
11	.71**	.70**	.77**	.81**	.61**	.36	—
12	.82**	.51*	.71**	.67**	.26	.21	.52*
13	.70**	.69**	.82**	.58**	.52*	.55*	.47*
14	.83**	.74**	.83**	.65**	.62**	.25	.54*
15	.84**	.30	.78**	.81**	.67**	.61**	.63**
16	.76**	.59**	.75**	.88**	.63**	.29	.38
17	.85**	.62**	.65**	.79**	.44	.30	.18
18	.53**	.38	.67**	.71**	.42	.34	.31
19	.84**	.49*	.77**	.79**	.65**	.29	.62**
20	.84**	.72**	.74**	.69**	.58**	.28	.34
21	.87**	.50*	.74**	.66**	.40	.37	.56*
22	.62**	.77**	.61**	.73**	.33	.36	.33
23	.77**	.66**	.71**	.58**	.40	.52	.12
24	.79**	.73**	.69**	.67**	.65**	.36	.53*
Average r	.79	.63	.74	.73	.51	.39	.43
Kendalls W	.73	.65	.69	.69	.54	.50	.27

\* Significant at the .05 level.

\*\* Significant at the .01 level.

tagious diseases tend to be less serious, and because of the association between contagion and age, contagious diseases tend to be childhood diseases; the American-English classification scheme might be characterized best by the dimensions of severity and age because of their relative independence.

The conceptual structure of disease terms for the Guatemalan-Spanish speakers is best characterized by the concepts of contagion and severity. The concept of severity appears to be important in discriminating between and classifying disease terms but does not yield quite the same degree of reliability as contagion. The age-of-the-infirm dimension reveals low correlations between individual rank-orders and the model and low between-subject agreement. The hot-cold dimension has slightly higher correlations, but much less agreement. In fact, the

variation on the hot-cold dimension is so extreme that it seems to indicate there may not be a culturally shared definition of that concept (for a further exploration of the hot-cold concept, see Weller 1983).

The Guatemalan results underscore the necessity of measuring intracultural variation. In Burton et al. (1982), aggregate data are presented without first assessing variability among informants. A single underlying dimension should not be assumed without first examining the variation (Nerlove and Walters 1977), and it is inappropriate to present an average when the variation is extreme (Pelto and Pelto 1975). If the rank-orders of the Guatemalan respondents had been combined, presenting a single aggregated scale, the results would have been misleading and inaccurate. This emphasizes the importance of collecting adequate

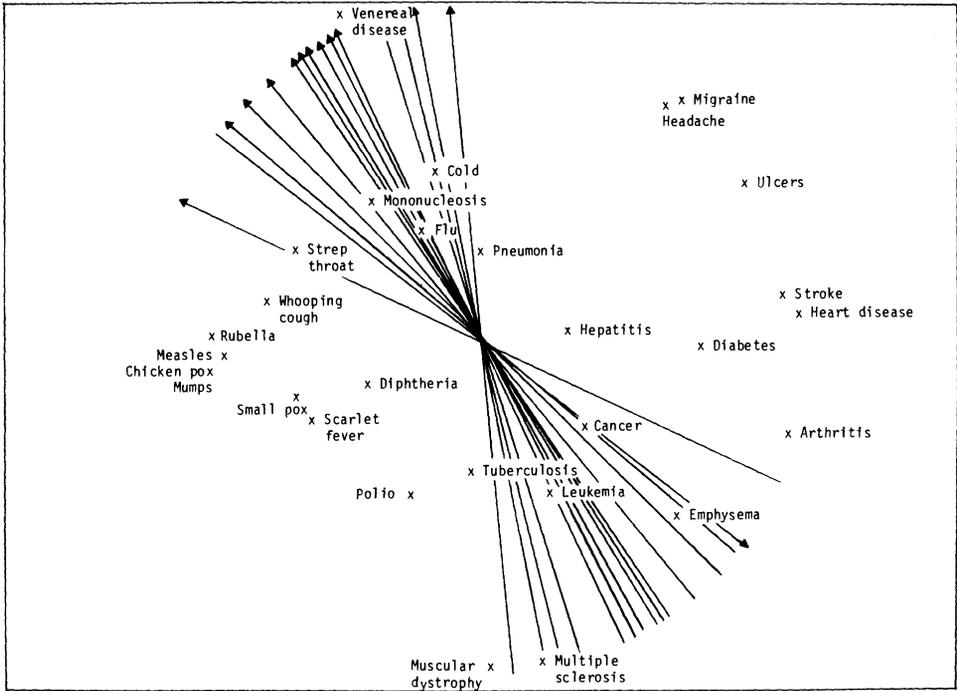


Figure 2. PROFIT display for the concept of severity in the United States.

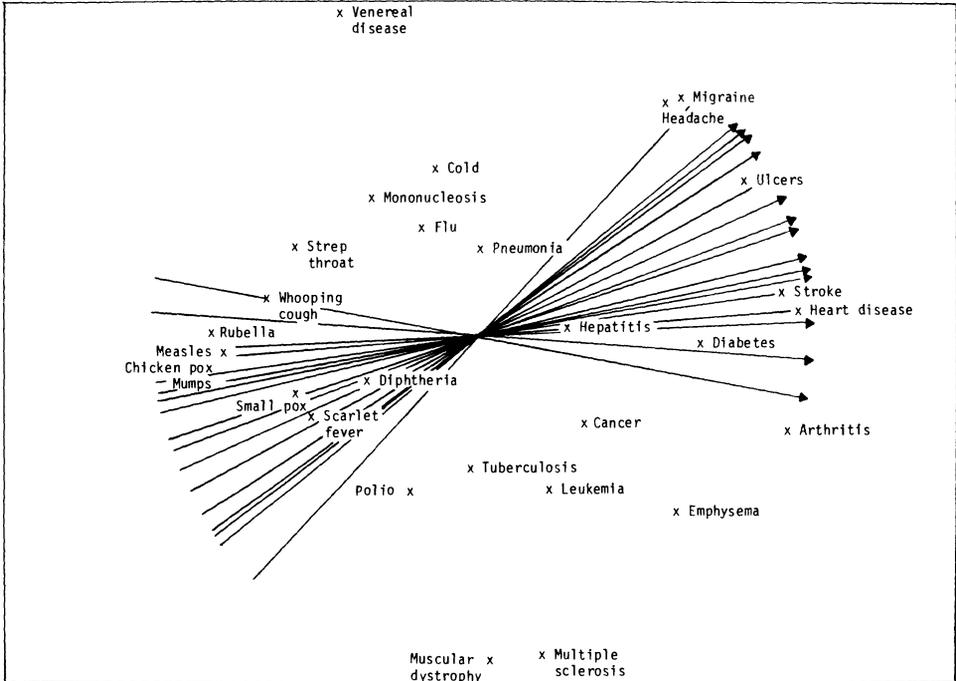


Figure 3. PROFIT display for the concept of age-of-the-infirm in the United States.



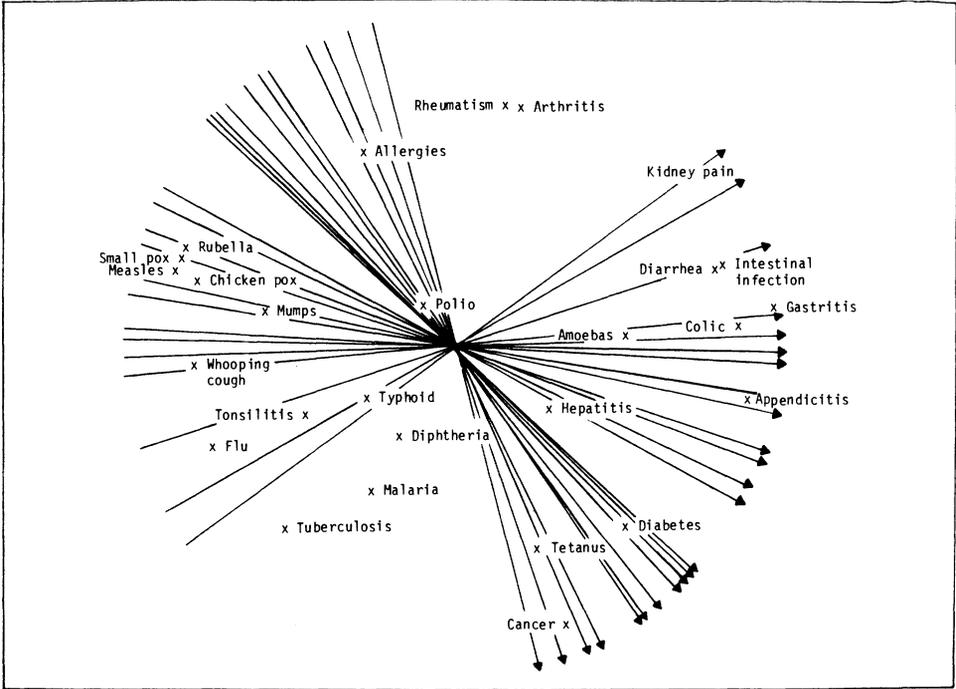


Figure 6. PROFIT display for the concept of age-of-the-infirm in urban Guatemala.

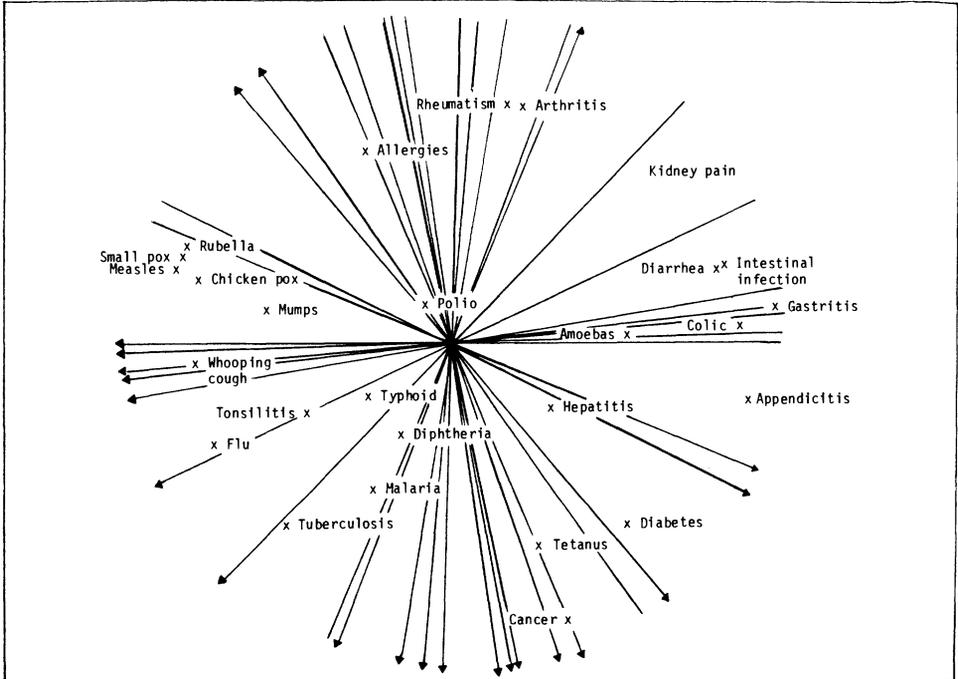


Figure 7. PROFIT display for the concept of hot-cold in urban Guatemala.

data from each respondent so that the degree of variability can be measured.

The Guatemalan-Spanish results are somewhat in accord with those of Young (1978), who also did not find the hot-cold dimension to be paramount, but instead found the most important global distinction to be a differentiation based on the locus of causality between diseases that were "caught when one gets wet" and those that were not caught by getting wet; second, a distinction is made in terms of severity; and third, a distinction is made according to the age or "life stage of the characteristic victim."

The difference between the results of D'Andrade (1973) and those presented here may be due to the different methods used to interpret the results or due to sample differences. D'Andrade et al. (1972) interprets the structure of disease terms by superimposing sentence frames onto the structure of disease terms. Although certain disease terms appear alongside particular sentence frames, it does not necessarily mean that the particular sentence frame is a major influence on the overall structure. In this type of interpretation technique, by definition, all sentence frames must go somewhere, and frames that are "opposites" will appear within 180 degrees of each other, implying a dimension whether or not one may exist. For example, D'Andrade et al.'s "needs hot medicine" appears by the illness or illness cluster thought to need hot medicine the most, and "needs cold medicine" appears by those thought to need cold medicine. However, "needs hot or cold medicine" may not be a conceptual dimension that is appropriate or graded for all illness terms. If different sentence or belief frames had been used to guide the interpretation, the Mexican-Spanish structure might have been interpreted differently. Because there were no sentence frames to indicate lack of severity or lack of contagion, the dimensions of severity and contagion possibly could not be ascertained.

This research has implications for health care providers as well as possibilities for measuring changes in beliefs. With experimental and control groups the methodology has possibilities for the evaluation of the effectiveness of health education programs by providing accurate pre- and postintervention measures. For example, an intervention program aimed at teaching sanitation in a rural Guatemalan village might begin by evaluating how diarrheal diseases are perceived in relation to other diseases. If the program is aimed at teaching not only sanitation measures but also facts about diarrhea—

that is, that it is "contagious" (it can be passed from person to person), and also that it can be "serious" (because babies die of diarrheal dehydration)—a baseline study might include an evaluation of all diseases along the concepts of "contagion" and "severity." A postintervention study would then reexamine the position of diarrhea in relation to other illnesses to measure possible cognitive change in perceptions of diarrhea as "contagious" and "serious."

#### NOTES

<sup>1</sup> "Dimensions of meaning" is used here to refer to the dimensions utilized in classifying disease terms, that is, denotative dimensions, and not the connotative dimensions discussed by Osgood, et al. (1975).

<sup>2</sup> The hot-cold concept of illness and medicine has been reported throughout Latin America. Illness is thought to be caused by an excess of "coldness" or "hotness" and a healthy equilibrium can be restored by treatment with foods, remedies, and medicines of the opposite valence. Hotness or coldness does not necessarily refer to temperature, but rather to a quality inherent in things, similar to our own concept of hard and soft water.

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## Some Problems and Prospects in Residence and Marriage

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The complementarity of relationships is an important analytical tool that can provide new insights into the nature of social interaction. This is illustrated here by reference to three problems in social anthropology: (1) the simultaneous occurrence of matrilineal residence and general polygyny, (2) the nonexistence of amitalocal residence, and (3) the factors underlying the preponderance of matrilineal cross-cousin marriage.

The first problem involves an unusual form of social organization recorded for the Comorian archipelago (Ottenheimer and Ottenheimer 1979). In these islands of the western Indian Ocean, men marry two or more unrelated women who maintain separate households with their mothers and sisters in distinct quarters, towns, or islands. The wives are then visited by the men who attempt to spend equal time with each wife. This simultaneous occurrence of matrilineality and general polygyny in the western Indian Ocean area is not only intriguing, illustrating a pattern of social organization rarely reported, but is also problematic, since it has been argued that the combination of matrilineal residence and general polygyny is not possible.

George Murdock (1965) was the first to argue that matrilineal residence and general polygyny would not occur together. He considered matrilineal residence to be "practically impossible" with general polygyny because (1965:205-206, 217f.) the two are inconsistent, this inconsistency leads to conflict within a society, and the conflict must be resolved. They are inconsistent because each represents a different group's control over resources and affairs. Matrilineality, for Murdock, implied female control in a society. Male control, on the other hand, manifests itself in polygyny. Thus, Murdock supposed that if the two occurred

together, conflict would arise over the control of affairs, and this conflict would have to be resolved if the society were to function normally. He further assumed that the dominance of the males would ensure the resolution of the conflict in favor of the men. Polygyny would continue, therefore, and matrilineality would disappear.

The other major argument with the conclusion that matrilineality and general polygyny will not occur simultaneously has been stated by Marvin Harris (1980:282-283), who, following Helms (1970), first points out that matrilineal residence is suited to conditions in which men are away from their natal locale for extended periods of time. These conditions are met, for example, when men are engaged in long-distance trade such as the maritime trade that was common in the past in the Indian Ocean. But if these conditions are removed and the movement of the men away from home ceases, then, according to Harris, matrilineality will be replaced by patrilineality. This change occurs because of conflict between husbands' and wives' kin groups for control of the sons. The wives' kin groups, because matrilineal residence allows them to live together with the male children, have control over the sons while the men are away. When the men, who want control over their sons, return they will try to take control away from their wives' kin groups by having their sons come live with them. Supposedly, the men can't simply live with their sons under the pattern of matrilineality because they are polygynous and will not be able to maintain wives in different locales while, at the same time, taking control away from the wives' kin groups. Although not spelled out by Harris, it is obvious that he eliminates the possibility of men marrying women in separate households and visiting their wives on some system of rotation. Were the men to do that, they would be relinquishing control to the household they just left. Thus, to maintain polygyny and take away the control of their sons from their wives' kin groups, the men will attempt to establish patrilineal residence as the prevalent pattern. Harris believes they will succeed, because he, like Murdock, assumes the domination of males.

In the Comoro Islands, men and women have resided together for some time with both matrilineal residence and general polygyny, a form of social organization that may have begun with the ancient maritime trade of the Indian Ocean. The conflict that should have arisen over resources, affairs, or male children has not appeared, although the conditions specified by