UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

INSTITUTE OF INTERNATIONAL STUDIES BERKELEY, CALIFORNIA 94720

215 Moses Hall

September 18, 1984

Documentation Coordinator
Office of Development Informatic
and Utilization
Bureau for Science & Technology
U.S. AID
Washington, D.C. 20523

Dear Coordinator:

Enclosed is a copy of a Mexico trip report submitted by Dr. Pertti Pelto. This report covers period January 11 to June 27, 1984.

Sincerely,

Felomena Brown
Administrative Assistant

Enclosure

PD-AAQ-157 37125

MEXICO TRIP REPORT: JAN 11 TO JUNE 27, 1984

Pertti J. Pelto

ITINERARY

I arrived in Mexico City January 11, and took up residence in the Colonia Romero de Terreros, approximately 20 minutes by automobile from the Instituto Nacional de Nutricion (INN) in Tlalpan. Regular meetings took place with Dr. A. Chavez, Dr. A. Mata, Mr. R. Lira, and other project people at INN, as well as Drs. Lindsay Allen and Gretel Pelto. Several visits were made to the Solis research site. Three meetings were held with epidemiological and health data personnel of the Secretaria de Salubridad y Asistencia(SSA) in Toluca, including Dr. Gustavo Bas, Dr. M. Herrero, Dr. R. Bravo and Dr. Pavon.

Returned to Connecticut briefly in April (at own expense), to attend to some University matters. Conferred with data-processing staff at Connecticut. Returned to Mexico City April 17. I departed from Mexico City Jun 27, 1984.

OBJECTIVES

Since the full-scale Phase II data-gathering was already in progress from the latter part of 1983, a major emphasis during the first half of 1984 has been:

1. to monitor the field data gathering processes;

2. to examine incoming data in methodological terms;

3. to refine the processing of data and transfer of data to North America.

Throughout the period from January to June 1984 I have worked especially closely with Dr. Alfonso Mata concerning field operations, and with Mr. Ramon Lira concerning the processing of

data. Meetings with Dr. Mata took place 1 - 2 times per week, in addition to which I also attended several general research mee n the field site at Solis. Meetings with Mr. Lira took pla the INN headquarters in Tlalpan.

DATA QUALITY CONTROL IN THE FIELD

The essential first step to maintain quality control of data at the point of origin, in the field, is the careful training of field staff. This training task was accomplished during Phase I of the project, in addition to which new field crew members recruited in 1984 were trained by the already established staff.

Long-term field projects, involving frequently repeated visits to the prime sample of households, are highly vulnerable to "attrition" as families refuse to continue participation in the project. This attrition is especially likely if the research team remains totally strange and distant from the families in the research sample. In order to prevent such erosion of the sample, our strategy has been to establish resident "social workers" in each research village, whose role it is to schedule appointments for specific interviews, assist interviewers in locating their "target families" on specific occasions, and to visit families who threaten to "drop out", in order to identify reasons for disaffection in order to convince these people to continue their cooperation. A system for monitoring family cooperation was developed and maintained throughout the period being reported. At weekly meetings with senior project staff the social workers review all the families in their respective communities. They discuss recent events in each family as well as the levels of

cooperation. Options concerning management of problems are discussed and decisions are made concerning who should visit individual "trouble cases."

The social workers also play a role in direct data quality control. Since they have gradually become acquainted with all the families in the sample, they are now in a position to know important social, cultural and economic information about the eamilies. Therefore they can re-check household census data, alert the project to cases of illness and accident, and report any other activities in the community that seem likely to affect the quality of our data-gathering. The social workers also take part in planning the details of interview scheduling for each week.

The weekly meetings of central staff with the social workers also discuss in detail issues of data quality, including missing data and evidence of problems in reliability. The various issues raised in field staff meetings are then discussed in our data meetings at the Institute headquarters in Tlalpan.

METHODOLOGICAL PROBING OF IN-COMING DATA

Beginning in January, it was decided to examine the quality of incoming data using small samples analyzed with the microcomputer (APPLE 2 PLUS). The A-STAT statistical program was used for these methodological analyses because it is especially designed for intensive, multiple variable processing of small samples. Approximately 50 households were entered in the first test data set. The raw-form responses in socio-economic, cultural, and migration interviews were analyzed to identify primary variables of significance for later hypothesis-testing.

The variables in these files have methodological significance in two basic ways:

1. the primary socio-economic-status data (SES) constitute a significant independent variable affecting energy intakes in households.

2. a series of cultural and social factors such as labor migration, attitudes about childrens' school and future careers, and levels of literacy (including reading, radio listening, TV behaviors) must be examined in order to identify their probable confounding effects in relation to hypothesis-testing of the primary linkages between intake and function parameters. (cf. Susser, 1973; CAUSAL THINKING IN THE HEALTH SCIENCES).

Failure to control important confounding variables could under certain circumstances produce spurious correlations among our prime research variables. Equally likely is the failure to identify significant relationships because of the obfuscating effects of suppressor variables and other "distorter factors" (Susser, chapters 8 and 9)

SOCIO-ECONOMIC STATUS: SOME CONCEPTUAL PROBLEMS

Researchers in rural populations often forget the fact that the concept of "socio-economic status" has been developed, and is most notably successful, in urban industrialized social settings. There are, of course, important differentials in social status in most rural communities, but the problem remains: how are these status differentials operationalized? Which economic and social factors make a difference in rural communities such as the Solis Valley in Mexico?

Socio-economic status became entrenched in community-based research after the success of the Hollingshead-Redlich epidemiological investigations in mental illness in New Haven.

The prime indicators of "status" were income, educational level, and occupation. Neighborhood of residence was also seen as a partial indicator.

In rural agricultural populations "income" is notoriously difficult to measure. Frequently there is an attempt to identify cash income, but farm families have very irregular influx of cash, and they don't keep records. They are notoriously cautious about revealing income data in part because of fears concerning imposition of new taxes. Cash income, of course, ignores the importance of in-kind income, which is a primary consideration in many agricultural families. Level of education has been found to be unrelated to economic status in many rural peasant villages(in Mexico and elsewhere), except perhaps to identify one or two clearly "middle class" families such as the school teacher and the local merchant. Educational attainments in our research site in Solis hover around the 0 to 4 year level, giving very little meaningful variation. Occupation is similarly restricted in range of variation, since practically all the families in our sample are "campesinos." (To be statistically effective any variaole such as SES should divide the population into approximately equal segments (e.g., 50-50, 30-30-30, 20-20-20-20-20).

In the experience of a number of social epidemiological and other researchers, one highly successful measure of SES has been the "material style of life"--the level of accumulation of significant consumer goods in the household. If the inventory of materials consists mainly of items such as tractors, motor vehicles, and other "practical equipment" this index may be regarded as measuring "economic resources." On the other hand, a

material style of life (MSL) scale consisting of consumer goods such as beds, television, radio, blender, is best seen as an expression of "purchasing power." All recent research in which a MSL scale has been used among rural families has demonstrated that this index generally ranks first or second among predictors of patterns of behavior in households, particularly patterns affecting food use and health levels. (K. DeWalt, 1984)

The main items in our Solis Valley "material style of life" (MSL) scale are beds, television, radio, blender, wardrobe, vehicle, electric iron, gas stove, "dining table", and a series of items concerning the condition of the house, including dirt vs. cement floor, adobe vs. cement/stone walls, and numbers of rooms and numbers of windows The numbers of items are multiplied by their approximate values in the Solis Valley region.

Detailed analysis by villages (sometimes by neighborhoods) is important for further refining our material style of life scale. For example, in the ethnographic research we have found that there was a sewing machine project in <u>one of the communities</u> during which people were able to purchase the machines extremely cheaply. Therefore, most households in that one village have sewing machines. That item, therefore, must be eliminated from the MSL scale, because it does not reflect "true economic status" in one of the communities. This example is a particularly clear reflection of the importance of continuing ethnographic work in the research area.

By itself the material style of life scale does not appear to capture all the important variation in socio-economic standing

in rural communities. Particularly in areas where cattle, sheep, horses or other forms of animal husbandry are important, it is generally found that herds constitute a kind of "bank" of reserves, that can be drawn on for needed cash. In areas where animals constitute the primary industry, wealth in animals may be more important that material style of life in expressing social status.

In the Solis Valley area, as in most parts of Mexico, animals are an important secondary economic resource. To some unknown extent, the importance of wealth in animals (for the majority of families) may be changing in a complex manner related to the extent and type of labor migration to industrial areas. In any event, "animal wealth" is a significant socio-economic variable, which almost always correlates with material style of life in about the range .35 to .45 in rural Mexico. In our initial probes with the 1983-84 data we find a correlation of .43 between these two variables.

The "Animal wealth" scale is constructed from the sums of individual types of animals multiplied by a factor to reflect differential value. In our tentative scale the values of cows, horses, mules and oxen were given a weight of 10, compared with 5 for burros, 3 for sheep and goats, 1 for turkeys, and .5 for chickens. The scale has now been modified to more accurately reflect the value differentials of the animals.

Another economic scale of potential usefulness is the possession of farm implements such as plows, harrows, tractors (rare), shovels, and others. The list of key implements was

constructed after a number of pilot interviews in different sizes of farmsteads. Plotting the distribution of farm implements for the 50 households demonstrates that families differ a great deal in the numbers of implements, reflecting different micro-level adaptations (specializations) in farming patterns, different lengths of time in the area (which may be especially important in San Antonio with its large numbers of in-migrant families), and other factors. At this time it appears that "value of farm implements" is less important than either MSL or "animal wealth" as an indicator, but further tests of this variable will be made.

Productivity of farming and non-farming activity, in terms of annual harvest totals, sales and home use of animals, sales of other products, plus cash-earning activities will be another major indicator of socio-economic status. Construction of this variable requires careful aggregation of a number of different raw materials from the socio-economic interviews. Because this interview is scheduled in three parts, to cover key portions of the agricultural cycle, we did not have all the data available to begin analysis of this variable during the period from January to June, 1984.

Migration for wage-earning purposes from the Solis Valley has traditionally occurred in a markedly seasonal pattern. That is, the peak migration occurred in June-July, after crops were planted. Household heads, who have been the chief migrants, generally stayed at construction sites and other work for periods of 4 to 6 months, returning home for harvesting. Now the labor migration pattern appears to be shifting dramatically in reaction to the continuing economic crisis in Mexico. Apparently many men

have continued in wage work throughout the winter months, and into the planting season of April--June.

The numbers of family heads who go to the city for temporary work has greatly increased during the past two years, reflecting the continuing economic crisis in Mexico, especially the impact of the massive devaluation of the peso. When our research project began, the Mexican peso was valued at approximately 24-25 per U.S. dollar. The following fall it devalued to approximately 76 to the dollar. In the spring of 1984 the rate was around 180 per dollar. The prices of goods and services have risen sharply in almost all sectors, reflecting these devaluations. Whereas urban wages and salaries have risen considerably to (partially) offset the rapid inflation, farm prices and incomes have lagged behind. Consequently, more and more of the farmers have sought to augment their slender resources through wage labor.

(The outmigration of females is not concentrated in a particular season, and tends to be more permanent in nature, as young girls go to the city to work as domestics.)

Family heads who migrate to the city for wage work generally return home at least once a month on week ends. Some return home almost every week end. These men generally carry out significant farming activities--cultivation, weeding, planting, and later, harvesting--when they are home for the weekend. Although Sunday is observed as a day of rest in some families, many working men engage in farming activities on both Saturday and Sunday.

In earlier decades there had been considerable wage labor migration from the Solis Valley to the United States and Canada. A small percent (less than 10 percent) of our families report migration to the U.S. or to Canada in the past 5 years. These labor migrations are also temporary in nature, and the men return home after the summer-fall season of crop harvesting in the north. Over the past decades a few families have risen substantially in socio-economic status through investing North American earnings in vehicles, a store, or other income-producing capital.

Our migration variable appears to be best operationalized in terms of <u>number of months per year in migration</u> and secondarily the <u>intensity of labor migration in past 5 years.</u> Both these measures appear to be significantly related to socio-economic status variables as well as to food intake variables. In our first probe we found that the "hhld head migrates" variable was correlated at .30 with "weekly food expenditures" and .27 with the MSL scale.

The following table of inter-correlations, based on 50 cases, illustrates some of the probable relationships among our socio-economic variables in the first methodological probe.

TABLE I. CORRELATIONS OF ECONOMIC/SOCIAL VARIABLES

	Food Exp. (weekly)	MSL	Animals	Migrat.	Ed.for* Sons	Liter.**	Inform***
Food Exp. (weekly)	1.00	.60	.20	.30	.26	-.12	.13
MSL		1.00	.43	.27	.22	-.01	.25
Animals			1.00	-.03	.08	-.15	.43
Migration				1.00	.30	-.07	.14
Desired Ed. for sons *					1.00	.00	.31
Literacy **						1.00	.08
Information (Identif.) ***							1.00

* Stated desired level of schooling for sons
** Self-report of ability to read and write.
*** Based on number of correct answers to series of questions about important social figures, current events, geography(e.g. name the current president of Mexico).

Based on this small sample probe, we examined the multi-variable inter-relationships with a multiple regression analysis. Using "weekly food expenditures" as a surrogate for family food intake (because we did not yet have analyzed food intake data on these families), we obtained the following results:

TABLE II

(Prediction of "weekly food exp." (n= 42 with complete data)

	BETA	R	STD ERR.	PROB.
MSL	.57	.60	.031	.0003
ANIMALS	- .048	.20	.001	.74
MIGRATION	.118	.30	.03	.40
ED.FOR SON	.10	.26	.08	.49
MULTIPLE R=	.63			
R SQUARED=	.40			
ADJ. R SQ.=	.33			

With such a small sample one does not of course consider these numbers to reflect exact values or exact measures of relationships. On the other hand, we see in these data the "power" of the MSL variable, and the indication of a clear relationship to food expenditure (as a proxy for food intake) at the family level of analysis. These data also show us that both the migration variable and the animal wealth variable are potentially important, and must be controlled. On the other hand, the attitudinal variable (expected education level for sons) does not show much influence directly on food expenditure in this initial probe. That is fortunate. We do, however, expect that the "educational expectations" (for both sons and daughters) will be a significant control variable in relation to our cognitive dependent variables.

At a later stage these same probes should be repeated employing more refined definitions of the MSL, "animal wealth" and other variables. We are engaged in examining the month-by-month patterning of the migration variable to see if certain nuances of migration turn out to have special impacts on socio-economic status and on family food intakes.

DEVELOPING THE DATA PROCESSING AND STORAGE SYSTEM

During the first part of 1984 we have explored several alternative possibilities for the most effective processing and transfer of data. Mr. Ramon Lira has worked closely with data processing persons at the Secretaria de Salubridad y Asistencia (SSA), where large numbers of data processing people were theoretically available to to receive data to enter into computerized form. Until March, 1984 it seemed clear that the SSA facilities would be the most convenient and practical system for transferring our data to computerized format. At the same time, Mr.Lira and Dr. Alfonso Mata have maintained close ties with IBM, where data analysis was conducted for us during phase 1. However, as time moved on, and data tapes were not forthcoming, it became increasingly clear that an alternative solution to data processing and analysis would have to be found.

In February and March a number of complications developed in relation to data processing at SSA. A small fire in one of the departments disrupted their operations for several days, at a crucial time when we were expected our data to be processed quickly. More important, a national reorganization in Mexico's

overall health care system has been put into effect. Mexico is decentralizing many basic services, turning these over to the states. As a result of large-scale changes, the data-processing operations at SSA have become less predictable, and are less available to our project.

A variety of bureaucratic and technical issues have also developed in relation to our data-processing at IBM. In any case, the services at IBM are likely to prove costly and cumbersome for the project.

The third alternative solution for our data recording, coding, and processing has been the APPLE IIE, which Mr. Lira and his assistants use for a variety of data processing needs. At one point earlier we had experimented with direct computerized data entry at the field site in Solis. The clear advantage of field-based data entry is that the field team can immediately verify data, identify missing data, and correct errors. The alternatives, involving data coding and "key punching" in Mexico City, require that printouts of data be sent back to the Solis field site for verification and correction, often a week or more after the data have been entered from the data-capture forms. The many advantages of direct data-entry at the field site have been clear to us, but the relationships with SSA had appeared to offer rather large advantages in personnel time, since SSA usually has excess data entry personnel that would not be charged to the project.

With the arrival of the project's APPLE IIE in Mexico we are now in a position to carry out all the primary data entry, coding, and cleaning in the field. The APPLE was selected for

this purpose because a number of people at the Nutrition Institute and IBM are familiar with the APPLE, Mr. Lira has extensive experience with it, and APPLE services have been available in Mexico for several years. In addition, an Intitute-owned APPLE II has been in use earlier at the Solis research site.

Therefore, it has been decided that data will be entered from the raw protocols onto diskettes at the field site in Solis, so that copies of the data can then be sent via diskette to Connecticut. The cost of express mail for diskettes will be much lower than costs for mailing large computer tapes.

Diskettes of data sent to Connecticut will be transferred from APPLE format to IBM mainframe format by means of an on-campus modem. This is becoming a common practice in many large enterprises and projects in which data from the field (or from outlying branches) are developed using microcomputers.

Storage of basic data on APPLE diskettes facilitates data cleaning, as the field team in Solis can make corrections directly at the microcomputer, rather than laboriously transferring written lists of corrections to Mexico City for entry at SSA or IBM. In addition the APPLE diskettes will be convenient for the kinds of small-scale methodological probes described above.

ANALYSIS OF SELECTED CASE STUDIES

In anticipation of the May meeting of the Scientific Coordinating Board, various types of data from case studies were analyzed. Approximately 70 variables were coded, including energy intake, anthropometric data (height, weight, skins folds), a range of social-economic variables, and data from activity records. All these intensive quantified "case data" were on adult females. During April a large number of correlational relationships were examined in these cases, and multiple-variable relationships were analyzed using multiple regression techniques. These analyses were all carried out with the A-STAT statistical program designed for the augmented APPLE IIPLUS (WITH 64 K).

Because of the simplified data format used in the A-STAT program, and the limitation of no more than 35 variables in a data set, We prepared three separate files of data, with the socio-economic data repeated on each file. Analysis of these 17-20 cases in statistical terms permitted us to compare numerical patterns with the qualitative descriptive information in the ethnographic notes.

Some important leads and suggestions arising from this, second, statistical-methodological probe in a small number of cases include:

1. The measure of pulque (alcoholic beverage prepared from fermented sap of the maguey plant) consumption (both total household pulque consumption, and pulque as a percent of weekly food expenditures) appeared to be an important variable, affecting a number of other measures. For example, higher pulque consumption correlates with lower activity levels of women;

higher pulque consumption is found in families with lower socio-economic status as measured in terms of MSL. Higher pulque consumption also appeared to correlate with the age of adult females.

2. The MSL measure of socio-economic status showed considerable importance, in correlations with body composition, activity patterns, and other variables.

3. The various measures of activity patterns, in both qualitative (types of activities) and quantitative (duration) terms show marked variations among these adult females. Social and economic measures such as MSL and pulque consumption (and family size) show correlations with the activity measures. Also, the percent of time devoted to animal care and other agricultural activity seems to have important effects on other patterns. Higher activity levels in housekeeping appear related to higher MSL; whereas higher activity expenditures in food preparation appear to be related to lower socio-economic status.

4. Total activity expenditures (caloric costs of activities) were, of course, related to body weight as well as "percent fat." The data indicate that statistical sorting out of body composition characteristics from other factors must be done with great care.

CONFERRING WITH PERSONNEL OF THE STATE OF MEXICO SSA

Dr. Bas, head of Secretaria de Salubridad y Asistencia of the State of Mexico, in Toluca, initiated discussions with us concerning the structure and conceptualization of health and nutrition data in the State of Mexico. He and his data chief, Dr. Herrero, were interested in discussing the status of general health/nutrition statistics in the state, and the conceptualization of the socio-economic characteristics of households affecting health and nutritional status. The state-wide statistics, based on survey data from all the municipios, are of course of considerable importance to our project, as they can provide a means for "locating" the Solis Valley population in relation to the general range of variation in food intakes, and epidemiological indicators, throughout the state.

Three meetings were held in April and May at the SSA offices in Toluca, with Drs. Bas, Herrero, Bravo, and Pavon, plus the heads of the various departments of the public health service. The State of Mexico has excellent computer facilities (the largest computer in Mexico). The SSA staff made a number of suggestions concerning the general structuring of socio-economic and other background variables. They also made available some statistics from their general survey on food use, health care and sanitation.

Summary Comments

The continuing methodological monitoring of our data through analysis of small-scale data sets is essential at this time, in order to insure that later large-scale data analysis can be carried out with full understanding of the distributions of

prime variables, the presence of suppressor variables and other confounding factors, and other elements essential to hypothesis testing. Fortunately the "micro-computer revolution" has made it possible to carry out these small-scale sub-analyses totally independently of mainframe computers and their technical-bureaucratic complications. The use of microcomputers for data capture and initial processing has been discussed in many circles, and it seems to me that future research will depend heavily on this further decentralization of computer utilization.

The issues raised in this trip report concerning alternative ways to record and transmit data illustrate the fact that the Mexican research group has maintained a policy of flexibility and experimentation essential to successful conduct of complex research. The complications that arise in countries such as Mexico, particularly in an era of greatly increased economic pressures, require project planners to continually maintain alternative strategies in relation to key operations. Thus far the researchers have been able to react and modify procedures quite effectively in response to changes in the research environment. To me it has been particularly gratifying to note the extreme care that the field team, and researchers at all levels have exercised in maintaining and improving data quality. In the course of the small-scale methodological probes described above I have found the primary data to reflect this meticulous attention essential to accomplishing the projects long-range goals.