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AN ASSESSMENT OF THE RELEVANCE OF EDUCATION IN EL SALVADOR

Center for Studies in Education and Development
Harvard University, Cambridge, Mass.

November, 1977

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PART ONE

INTRODUCTION

TO FOUR STUDIES OF EDUCATIONAL RELEVANCE IN EL SALVADOR

The Assessment of the Relevance of Education and Training Programs in El Salvador

Background Note

On July 1, 1973, the government of El Salvador, specifically ODEPOR (The Office of Planning of the Ministry of Education), with the assistance of the United States Agency for International Development, undertook a sector analysis of education in El Salvador. The El Salvador sector analysis, designed as a profound and comprehensive investigation into the status and functioning of education and training throughout the national domain, has now been more than three years in course; and with this and a series of accompanying reports the analysis is nearing completion.

A description of the underlying theory, the central assumptions, the scope and coverage, and the methods and criteria guiding the analysis in El Salvador are amply documented in other project reports and the brief introduction to this report will be limited to fitting one small piece into the heroic and complex body of the major work. Originally, the analysis was structured around three central themes or assessment criteria-- 1) The Equity, Coverage or Outreach of Education in El Salvador; 2) The Efficiency of Schooling and Training and; 3) The Relevance of Education and Training in El Salvador.

This report covers the theme or topic of Relevance. It does not, however, represent a third of the vast effort that went into the analysis of the education sector in El Salvador. For reasons that will be briefly sketched out in this report, the relevance issue, amorphous in concept, opaque to analysis, and intractable in practice, received about

the same treatment in El Salvador as elsewhere. It is a tribute to the El Salvador analysts that the issue of educational relevance was raised at all, and that some substantial, though discrete and disparate, efforts were made to deal with the topic. A comprehensive design for analyzing relevance in the education sector in El Salvador was never developed in the same sense that efficiency and coverage were approached. This should not surprise, in that a comprehensive design for analyzing educational relevance had never been developed anywhere else previously, and one of the major activities underlying this report has been an attempt to develop a first cut at such a design. Nevertheless, several attempts were made to assess aspects, facets and pieces of educational relevance in El Salvador; and this report, begun in the third year of the project life, attempts to pull some of this work together.

The El Salvador Educational sector analysis was based on several large bodies of data, designed and collected specifically for purposes of the study, or gathered in from other research studies and data collections and analyzed according to the special purposes of the project. The most ambitious undertaking was the development and application of an achievement test in four curricular areas, covering three sets of contiguous grades (Grades 2-3, 5-6 and 8-9) at the primary and middle school level. The test assessed the school achievement of 55,000 students. The test was accompanied by a subsampling of responses from 2600 households of parents of students tested. When the model of relevance developed in this report is explicated, the achievement test data will be viewed as a very thorough test of one small arc of a larger circle which depicts educational relevance relationships. The achievement tests assess the relevance relationship between curricular objectives and cognitive

learning outcomes, and though the tests do not assess the relationship between national social or economic goals and the curricular objectives, nor assess the relationships of cognitive learning to performance of workers or citizens in the economy or society at large, the assessment deals with a limited segment of relevance. Inasmuch as the test results are analyzed and reported in other project documents, they will not be discussed further in this part of the study, except to note that test results do address relevance realtionships under a limited arc, and the testing does happily provide some evidence that curricular objectives do get transformed into cognitive learning at a reasonable level by the instructional programs of the primary schools of El Salvador. The average percent correct response across grades and curricular areas was 62.3%.

Volumes of data were also collected and analyzed to assess the coverage of Salvadorean education as revealed in the percentage of enrollments of various groups at various levels in the school system. The efficiency with which these enrollments were processed through the system, governed by the flow parameters of drop-out, repetition and promotion, and measured by input-output indices and completion ratios, was also assessed. This assessment was matched with cost data and related to structural and organizational features of the system. Hence, coverage and, with appropriate inter-group comparisons, equity, were assessed in the analysis; as was efficiency, measured by throughput, in time and at various levels of cost. These analyses are not incorporated in this report, but are noted because the results do bear on certain relevance issues. Specifically, four bodies of data, and some partial treatment of a fifth study, form the basis of this report on relevance, and because there will be constant reference to these studies a

standard title for each study will be adopted and used throughout the report. These studies were not developed within a comprehensive design for assessing relevance, i.e. they were not systematically linked as parts of an overall analysis of relevance. The studies were not always designed primarily to assess relevance, as the model developed in this report will portray the issue. They did provide bodies of data which can be used for partial studies of relevance, and that is the most that can be said. The five studies in descending order of pertainance for analyzing educational relevance, (Note that this ranking is not on magnitude or quality of the study) are:

1. Worker-Employer Study (Patronos/Obreros)

This is a rich data base, though limited by sampling and measurement problems. The relationship of in-service training to worker learning (lower and higher-order cognitive, psychomotor and social) and worker performance are assessed.

2. High School Follow-Up Study (Seguimiento de los Graduados del Bachillerato Diversificado)

General differences in secondary school programs are related to employment and earnings in the first year following graduation, by a follow-up study of a small "sample" (600) of graduates of the differentiated bachiller programs in the secondary schools of El Salvador. The study, somewhat less rich than the Bosses/Workers in that learning results were not assessed, has about the same sampling problems but fewer measurement problems than Study 1.

3. Audience for NonFormal Education Programs (Audiencia)

This study did not approach relevance in the same way as the previous studies. It did not assess outcomes of non-formal education,

but rather sought to assess what kinds of non-formal education programs different population groups thought they needed and wanted, and had available. To assess the relevance of existing non-formal education programs would require comparison of the Audience study with existing program coverage, and assessment of the resulting learning, performance and outcomes of such programs. Audience was a market survey of potential clients of non-formal education. The results can be useful for improving the relevance of future program offerings identified as necessary and desirable.

4. The Work-Force Study (Also referred to as Manpower or Mano de Obra)

This data base was furnished by the largest coverage (33,000 respondents representing somewhat less than one percent of the households in El Salvador), and is the most adequate in sampling and measurement. It was not designed as a relevance study and not conducted by the analysts working on sector analysis, but the tape was made available to the study by the National Census and Statistics office, and a limited number of the items were analyzed to assess the relationship of educational attainment to economic and social outcomes. In this study it was used to provide a broad background to the issue of the relationship of education to economic performance and fertility.

5. The Household Study (Hogares)

When the national achievement test was administered to 55,000 students, a sub-sample of the student households was drawn and a questionnaire administered to household members (parents). Sampling and measurement were adequate to the purposes of the study, which was not to assess relevance. A few of the items, on parental responses, were analyzed in this study, as a supplement to the previous study, but most of the results of the analysis appear in other reports on the sector analysis.

Only moderate use of the results will be made here.

Summary Comment on The Format of the Studies and Analysis to Follow

The Structure of the Report will be:

I. Introduction

This will have two parts: A) This introductory section to the report and B) An Introductory section which develops a planning perspective on Relevance and a general schema for assessing the coverage of Relevance studies.

II. Results of the Analysis of the Four Major Data Collections

This section will cover analysis of the first four collections of data (1. Worker/Employer, 2. High School Follow-Up, 3. Audience, 4. Work-Force), presented in a standard format:

A. Introduction, Describing the Purpose, Method and Coverage of the Study

B. Results Based on Selected Descriptive Statistics

C. Results Based on Further Analysis

In the case of the Worker-Employer Study, the study most explicitly designed to assess relevance, there will be a further elaboration of the model of relevance underlying this study. It should also be noted that Study 5 -- Household -- will not be included under Part II because it has been extensively analyzed and described in other documents prepared for the sector analysis.

III. Summary of Conclusions from Analysis of the Data Collections

The major findings and conclusions from the analysis of the four studies, also including some general findings from analysis of the Household study, will be presented in summary form.

IV. Implications of the Study of Relevance in El Salvador

A. Policy Implications

Such policy implications as emerge from the study will be highlighted for inclusion in a final document synthesizing the results of the entire sector analysis in El Salvador (This final document will not be prepared as part of this relevance study.)

B. Methodological Implications

In the light of the model and in light of the limitations in the design and conduct of the studies on which this relevance analysis is based, a suggested design for future studies of relevance will be offered.

B. EDUCATIONAL RELEVANCE IN BROAD PERSPECTIVE

1. An Opening Note

A broad perspective on the problem of tracing the relevance of education to economic performance is offered in Schema I. The schema, and this preliminary discussion, will be limited to tracing a series, chain or system of relationships, R_1 to R_6, from Economic and Social Goals, to System Policies and Plans (in this case the educational system) to Program/Project Objectives, to Education Training Results, to Work Performance (learned productive behavior), to Work Performance Outcome (Production, Productivity and Earnings) and back to Economic and Social Goals. The direction of the trace in the schema is primarily clockwise, although the bi-directional arrows indicate that some relationships can be assessed in either direction. For example in the relationship R_4 between Education/Training Results and Work Performance (Learning), the analyst could analyze a given job for its performance requirements and trace this back to the results which would be required in a training program; or the analysis could go from training results to a comparison with work performance and thus assess the relevance relationship between learning and performance.

In general the relationships which characterize the relevance are Adaptation (or Conformation) and Effectiveness. There is an adaptive relationship for example, when the national economic

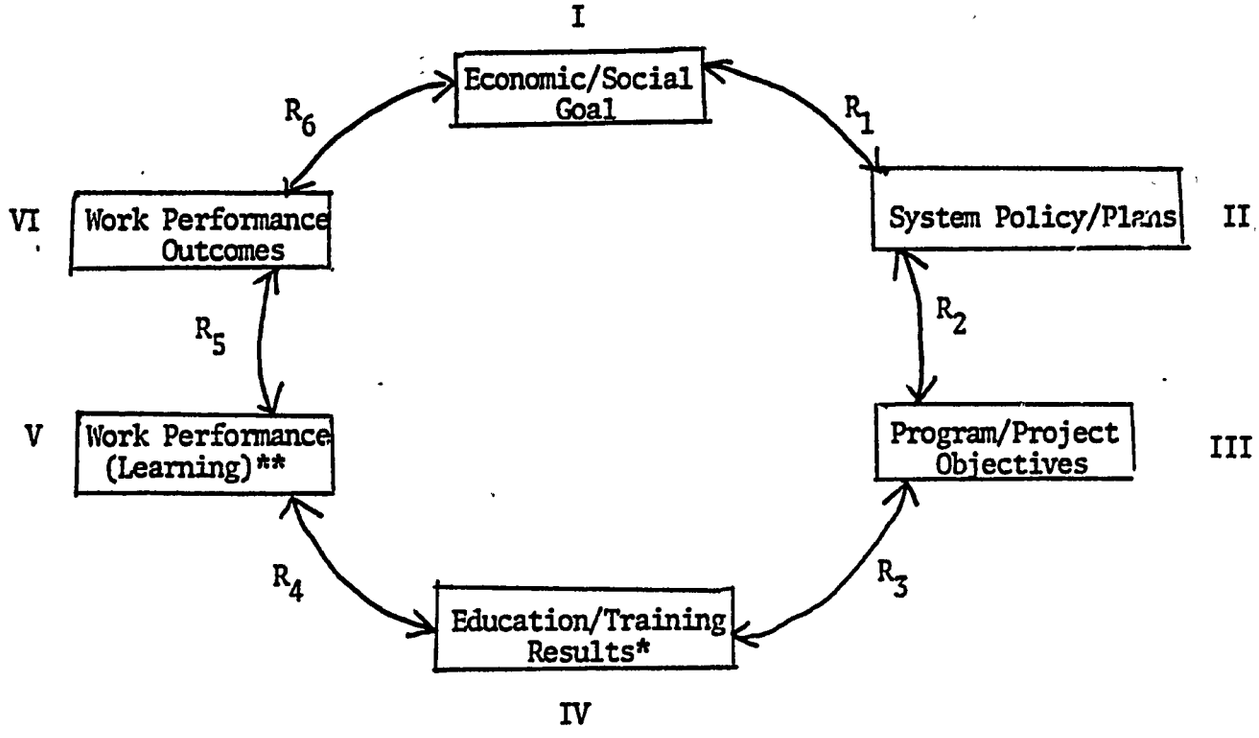
and social goals correspond to the goals of the education system, i.e. conform to the same purpose or set of purposes. There is an effectiveness relationship when educational program objectives are accomplished, i.e. the behavior specified in the objective is observed in the results, and the results are attributable to the teaching, learning activities, which were designed to accomplish the results. At this point further specification of the nature of the relationships which define relevance will be deferred to the discussion preceeding the analysis of the Worker-Employer data collection.

Here the purpose of the discussion is to emphasize the complexity of assessing the relevance of education to economic performance in El Salvador. The perspective in the schema is that of a planner or policy maker who must make use of the results of the educational sector analysis to develop plans and policies for the formal system of education and training, and coordinate these plans and policies with other education and training activities which go on in that broad and amorphous domain termed the "education sector." The education sector covers all explicit education and training activities which go forward in the country, in or outside of the formal school system within or outside of government auspices. The perspective of the planner may differ from that of an educational specialist working within the system where the task of assessment might be limited to the relationship R_3 where the issue of relevance is whether or not program, project or institutional objectives are accomplished, as measured in education and training results.

The perspective of the planner, or analyst working at the education systems level, is idealized in Schema I. Clearly, the chain of relationships depicted inthe schema are rarely examined in explicit form. The logico-deductive exercise required to assess the correspondence of education systems goals to national economic and social goals is rarely carried out in explicit form. It was not done in El Salvador, despite an analysis of unusual breadth and depth, and it has yet to be done elsewhere, although this study will end in a proposal for carrying the work forward toward such a model.

In El Salvador, as in other studies, certain of the relevance relationships were analyzed, and others were not. Of the relationships analyzed, some were examined in depth and completely, and others less so. The bulk of the effort went into assessment of the relationship R_3. This work is reflected in the application of the national achievement test. The cognitive learning objectives of the formal school system in four curricular areas were accepted as given, and the mastery of the curriculum content was assessed by test. In this assessment, within its imposed limits, one important segment of the chain of relevance relationships was analyzed, and the effectiveness of the system, again within limits, was demonstrated. There was an implicit attempt to relate the program, in this case the curricula of grades 1-9, to systems level policies and plans for coverage and provision of basic education

SCHEMA I: EDUCATIONAL RELEVANCE IN THE BROAD VIEW



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* a. Cognitive, e.g. achievement test
b. Standard, e.g. grade level, educational attainment
** Cognitive, Psychomotor, Organizational
*** Employment, Promotion, Earnings

to the school age population. and a faint trace from national, social and economic goals to systems goals can be discerned. The relationship of cognitive learning exhibited by test performance to broader goals of enhanced social well being and increased economic productivity was not analyzed. To do so would require moving forward in the schema to assess the relevance of the cognitive learning resulting from schooling to learning exhibited in work behavior (or social performance for other objectives),and from work performance to the outcomes of that performance measured by production, productivity and earnings. Beyond that it would entail analysis of what, if any, relationship holds between production, productivity and earnings, in the individual and the aggregate case, and it is at this point that analysis, whether that of the economist or sociologist, runs against the ideology buried under the acceptance or rejection of marginal productivity wherein the wage rates equals the marginal product. Also at issue is whether there can be any meaningful aggregation of the units involved, for comparison with broadly stated social or economic goals.

Despite the problems at the end of the trace, the schema has some heuristic value if only to protray the difficulty of any assessment of the relevance of education, even when that notion is confined to relevance for economic performance. The schema also serves as a structure for describing the coverage, and the limits of coverage, of the data collections that were analyzed in this report. The Worker-Employer study covers three segments in the sequence of relationships that reflect relevance as it is conceived of in this study. The Worker-Employer

study does assess, albeit imperfectly, the relationship R_3, between Program Objectives and Education/Training Results, and R_4 between Education/Training Results and Work Performance. The study also makes an attempt to examine the relationship R_5 between Work Performance and Work Performance Outcomes, in that there is an item in the questionnaire which seeks to assess whether the training and resultant learning were followed by a raise in salary or wages. Unlike the national achievement test which assessed academic performance within the schools, the Worker-Employer study examines learning and its application within the context of in service training in industries and business establishments.

From a standpoint of an overall design for the assessment of relevance in El Salvador all studies are unconnected and deal with different populations and age-groups in different settings. This is characteristic of the general design of the relevance assessment in El Salvador. The studies are discrete and do not overlap, and this report attempts to fit these fragments together to form some sort of mosaic. It is a mosaic with much blank space and only an uncertain framework and border. The single study which comes closest to assessing a significant arc of the relevance relationships depicted in the schema is, however, the Worker-Employer study.

The High School Follow-Up Study (Seguimiento de los Graduados del Bachiller Diversificado) covers the schema from Program/Project Objectives to Work Performance Outcomes, but skips lightly over several stages and relationships in this sequence. It examines the employment and earnings of graduates of the diversified secondary school programs of El Salvador in the first year after graduation. The study covers graduates of twelve different programs (1. Academic-Mathematics,

2. Academic--Humanities, 3. Commercial, 4. Industrial--Mechanical, 5. Industrial--Electrical, 6. Tourism--Hotel Management, 7. Arts, 8. Navigation and Fishing, 9. Teaching, 10. Agriculture, 11. Health, 12. Vocational). Inasmuch as each program has a defined set of objectives expressed in terms of preparation and vocational orientation and a specified curriculum for accomplishing these objectives the study can be grounded in program objectives. These objectives are not derived from an analysis of educational systems or general economic social goals in any systematic way. The fields were not selected on the basis of any manpower requirements analysis for example.

The Follow-Up study did assess education/training results in the twelve programs in a limited way. The grade-point averages of students in the programs were computed, but this teacher-subjective assessment was limited to cognitive learning, measured by academic grades in the curricular fields of mathematics, science, social studies and language. There was no assessment of vocationally oriented learning (acquisition of skills or psychomotor learning). Hence, only one part of the relationship R_3 was covered: effectiveness, insofar as it is measured by teacher grades, of attainment of limited curricular objectives was assessed.

There was no assessment of the relationship R_4 in the Follow-Up study. There was no attempt to assess whether or not the learning resulting from the program was utilized in work performance. There was a general question on job satisfaction. There was an assessment of economic outcomes of the program in the questions which measured the employment or study status of the graduate and the earnings for those employed. This was not a systematic assessment of the Relationship

R_4 and R_5 of the schema, but it did provide some trace of the relevance relationship from Program Objectives to Work Performance Outcomes. Even this tracing had limited validity because of the brief time, one year following graduation, in which outcomes were assessed. Imperfect though it was in design the study did attempt to trace relevance relationships from school performance into the work force.

The study of Audience for Non-Formal Education Programs differed markedly from the other studies covered in this report. It has been noted that Schema I has bi-directional arrows, indicating that relationships may be examined forward or backward between the stages of the schema. For example, the relationship R_5 when traced back from Work Performance Outcomes to Work Performance (Learning) might be exemplified in a study of rates and salaries for a given type or level of performance. The relationship R_4 traced from Work Performance, or learning requirements, back to Education and Training Results would be exemplified by a job performance analysis for purposes of setting up a skill training program. The sequence could then be traced back through R_3 to the setting up of behavioral objectives and instructional activities. The Audience study is an example of a trace back from Work Performance Requirements to Program Objectives and Systems Policy and Plans. The assessment covers the fields of study in non-formal education and training that potential clients perceive as required and needed for work and social performance. To be incorporated usefully into the framework of a relevance assessment would require that the results of the Audience study be compared with the existing programs in non-formal education in order to assess their address to what potential clients view as required and needed coverage.

The study responses cover both content areas, e.g. agricultural production, arts and health, and the media through which the content might be transmitted, e.g. radio. The response is subjective, based on the opinion of the potential client of the programs, and the choice is not validated by observation of program results and economic or social outcomes. Hence the results of the Audience survey do not so much provide a basis for assessing the relevance of existing programs as for planning future programs which might be more relevant. It is a market survey reflecting preference for programs, and the preference expressed is based on expressed social, economic and cultural needs.

The Work-Force Study results trace out the relationships from Education and Training, crudely measured by level of attainment, to Work-Force Performance Outcomes in employment and earnings. This analysis as many classic studies which cover a similar arc (rate-of-return and education production function studies in the literature of the economics of education, and the Jenck's study) relate crude measures of educational attainment levels to differences in employment and earnings. The Work-Force Study data permit no analysis of intervening stages or relationships, no systematic assessment (as in Coleman) of the differences in educational programs or input, no measurement of the learning that results from education measured by formal schooling, no measurement of learning exhibited in work force performance, and no possibility of relating work force performance to employment or earnings differences. All measures, especially of educational results, are crude, and significant relevance relationships are unexamined. The study results provide only the broadest indications that differences in education are associated

with differences in employment and earnings. In this report the study results provide only a background and framework for relevance assessment.

In this report the study serves two main purposes, in addition to a general indication that educational attainment goes with higher earnings: 1) The results indicate clearly the generational and locational inequities in educational provision in El Salvador, and through generational analysis show socio-economic class biases which limit access to education and consequently employment and earnings; 2) the results also indicate the effect of educational attainment on childbearing and fertility of women.

The Household study covers the same area as the major results of the Work Force study and provides a basis for assessing in a very general and cursory fashion the relationship between educational attainment and employment and earnings.

Summary Comment

Data from the five studies which form the basis of this report can be used to assess some aspects of some important relationships which reflect the relevance of education to economic performance in El Salvador. No single study covers any major portion of the sequence of relationships traced in Schema I. The schema is admittedly an idealized portrayal of the important relationships which define relevance. It is a general perspective more appropriate for analyzing relevance for purposes of systems level planning and policy formulation. In a later section of this report, where the Worker/Employer data collection is examined, a more detailed and refined model for relevance assessment will be developed.

This later model will be more appropriate for examining the issue of relevance within educational organizations.

The schema and the data collections and the analysis which follows are in general limited to examining the relevance of education and training to economic outcomes. Educational relevance is by no means limited to that narrow area. The goals of education in El Salvador, as in other countries, also cover broader social and cultural purposes. There is an attempt to broaden one part of the analysis to assess the relationship between education and fertility, and in the Audience survey there is coverage of non-formal education from a broader standpoint than mere fit to economic performance requirements. Still the analysis reported here is mainly limited to the relevance of education for economic purposes. Even for these limited and seemingly straightforward ends the schema has limitations as a model for relevance.

Even as no single study or data collection covers the broad sequence of relevance relationships, so too the set of studies do not cover the domain. Nor were the studies designed as a set to accomplish this. Here an attempt has been made to fit the studies together, to the extent possible, and to supply a few pieces in the mosaic of relevance relationships. In fairness to the designers of the studies in El Salvador, it must be noted that no study or set of studies developed elsewhere covers more than a small segment of the relationship set that traces educational relevance. The end product of this study will not be limited to findings on the relevance of education in El Salvador or elsewhere, but rather will attempt to develop a more adequate and comprehensive design for future analysis of educational relevance.

PART TWO

FOUR STUDIES OF EDUCATIONAL RELEVANCE IN EL SALVADOR

I. Worker-Employer Study: An Analytical Report

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1.0 Introduction

This discussion deals with the problem of determining the relevance of education. It asks not what all education should be, but whether or not a given educational effort accomplishes what it attempts to do.

Questions about education relevance, as defined below, differ from those of educational efficiency, and educational equity (or access). Efficiency is concerned with assessing the productivity and the economic costs (time, financial resources) of education; or with the assessment of input/output ratios of student flows through the system. It deals with education unit costs and resource allocation/benefit ratios, related to the operational output of the system itself. Equity refers to the appraisal of both the education system's criteria of allocation of learning opportunities, and the system's processing capacity of instruction possibilities to provide access to and progress through the instructional processes offered in the system. Relevance is concerned with the degree of correspondence between the quality of education that is delivered with the quality of education that is needed and, also with how well such quality is being attained by the system. In brief, the equity question is, Who benefits from education? Efficiency assesses: Are educational outcomes obtained at least or lesser costs measured in money or time? Relevance debates: What is appropriate and effective education?

In the "real world" these three foci of educational analysis are inextricably interwoven, but here they have been differentiated for analytical convenience. As viewed here, relevance appraisals do not settle questions regarding what education ought to be, but they do inform the debate and policy-decision-making about this issue. Since the notion of relevance makes sense only if related to something, a relevance assessment

must start by establishing, as objectively as possible, what the goals and objectives of education are. Reaching consensus on universal educational needs is utopic, hence needs statements must be established in each particular case. Furthermore, although questions of needs have an empirical ground, they can not ultimately be settled empirically, for the norms that are assumed have first to be sorted out in non-technical argument and deliberation (Dearden, 1971, p. 94). Thus, what might be relevant to someone, might be irrelevant to someone else. It follows then that relevance can be assessed only in a specific context with reference to concrete situations.

This paper argues that in planning, developing, or appraising even the most seemingly simple education or training program, anyone charged with these responsibilities requires a basic information system that would cover:

a. Social, economic, political, and cultural goals that may be translated into observable indicators of required traits and performance characteristics of citizen/worker participants.

b. Analysis of characteristics of school (and other) programs that develop such traits and lead to such performance. This analysis must go down to the level of specification of inputs and the mode of utilizing them.

c. Characteristics of students -- social, intellectual, motivational -- and the manner in which these interact with school programs (and of other kinds as well) and lead to enhanced development of appropriate traits and performance in the society, polity, and work force (Davis, 1975, p. 176).

The plan here is to discuss the concept of relevance, to suggest a relevance assessment framework, and to suggest its usefulness for ways for increasing productivity in El Salvador

A. The Concept of Relevance

Scheffler (1971) states:

> Relevance is, in particular, not an absolute property; nothing is either relevant or irrelevant in and of itself. Relevant to what, how, and why? -- that is the question. That is, at any rate, the question if the current demand for relevance is to be taken not merely as a fashionable slogan but as a serious educational doctrine. (p. 109)

We will explore briefly the key question of relevance in education.

For Barnard (1938) purpose is the basis of relevance.

> ". . .essential to give any meaning to the rest of the environment, The environment must be looked at from some point of view to be intelligible. A mere mass of things, atoms, movements, forces, noises, lights, could produce some responses from a sensitive creature or certainly would have some effect on it, or on other things, but the reduction of this mass of everything significant requires a basis for discrimination, for picking out this and that as pertinent, relevant, interesting. This basis is that in this situation something is or is not to be done. The situation aids, obstructs, or is neutral from this point of view. The basis for this discrimination is a purpose. (p. 196)

Purpose is not an end state but "only a set of governing dynamic relations, driven by judgments of required behavior. . ." in order to accomplish an objective. That is, purpose and objective are not the same thing. Purpose and objectives must be logically related among themselves. This is essentially a qualitative relationship and it will be called an adaptive (or fitness) relationship. Another matter is the degree of accomplishment of an objective. This is an effectiveness relationship and is susceptible to empirical verification.

In general, relevance can be viewed as a system of relationships within and between activities, and can be conceptualized in terms of two basic kinds of relationships: one of adaptation, the other of effectiveness. For example, A (e.g., curricular unit) is adapted to B (educational program or activity), when the objective of A (e.g., type of learning outcome) is

logically related to the purpose of B (e.g., to evoke certain learning behavior). A is effective when it's objective is accomplished, i.e., the behavior specified in the objective is matched by behavior in the outcome. But the criterion of relevance, in the sense of effectiveness, is more exigent than a mere match between one behavior specified in the objective and the behavior observed to result from the activity. The resultant behavior must be demonstrably affected by the learning activity and not a fortuitous concommitant or accident. It is this stringency that makes the measurement of educational relevance complex, for most educational activities take place in a welter of surrounding influences and as a result of a long chain of previous learning experiences. Separating out the effect of one program activity with one learner or groups of learners is not a simple matter, and hence true relevance is rarely assessed in the sense of identifying the unique effect of an educational program.

Adaptation indicates the directionality of behavior, whereas effectiveness measures the intensity of behavior. A system is irrelevant if: (1) A and B are adapted to each other but A is ineffective, and (2) A and B are not adapted, irrespective of A's effectiveness of ineffectiveness. A system is relevant if: A and B are adapted to each other, and A is also effective. Only then relevance measures the degree to which A accomplishes its objective in the direction given by B. Whether or not that direction is worthy is another matter. Consequently, the aim of relevance assessment is not to define the purpose of an activity, but to assess how well an established purpose is being fulfilled.

So far we have discussed relevance with respect to one single activity related to a specific environment. In education, programs or systems are comprised by multiple activities. We shall therefore extend the previous concept of relevance to cover more than one activity.

Suppose that to fulfill a certain purpose, education activity Y has been established (e. g., planning), which in turn is sytemically connected to activity X (e.g., instruction). Furthermore, Activyt Y has set for itself Objective O_y, and the required Behavior B_y to accomplish that objective. Likewise, Activity X has set Objective O_x and Behavior B_x, respectively. Thus a system of relevance relationships has been established as symbolized in Figure I.1.

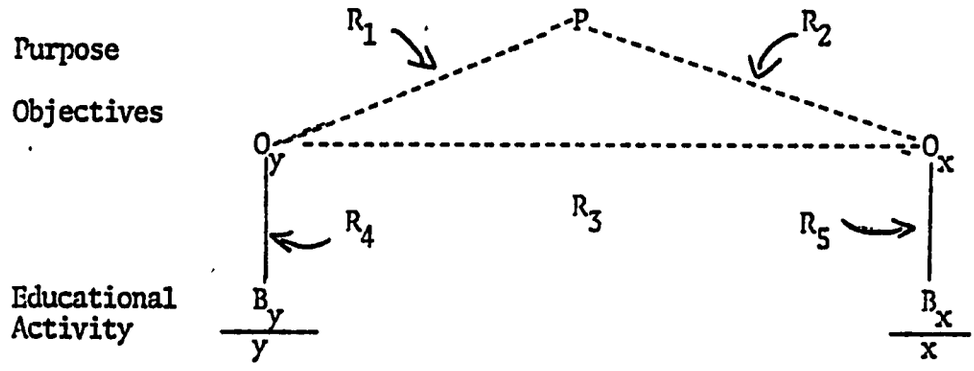


Figure I.1: System of Relevance Relationships

According to this system, Objectives O_y and O_x are linked to each other and to Purpose P, and define relevance relationships R_1, R_2, and R_3. In turn, Behaviors B_y and B_x are related to their respective objectives O_y and O_x and delineate relevance relationships R_4 and R_5. Two sorts of relevance connections can be differentiated here: one which assesses the adpatation among objectives and purpose (R_1, R_2, R_3): and one which establishes the effectiveness or effect of an activity with repect to its objective (R_4, R_5). Whereas adaptation occurs essentially between activities, effectiveness occurs within them. Consequently, for an activity to be relevant, it must stand the tests of both appropriateness and effectiveness. And the logical steps to be followed to evaluate a situation are to appraise first fitness and then effectiveness. From this type of analysis four alternative results may turn out: (See Figure I.2)

a. The objective of an educational activity is appropriate to an established (accepted) purpose; and this activity is effective in terms of its objective.

b. The objective of an educational activity is adapted to an established purpose, but its behavior is ineffective according to its objective.

c. The objective of an educational activity fits an established purpose; but the behavior of this activity is effective in accomplishing that objective.

d. Neither the objective nor the behavior of an educational activity are appropriate nor effective.

		Objective	
		r	i
Behavior	r	$B_r \longleftrightarrow O_r$	$B_r \longleftrightarrow O_i$
	i	$B_i \longleftrightarrow O_r$	$B_i \longleftrightarrow O_i$

r = relevant
i = irrelevant

Figure I.2: Alternative Outcomes of Relevance Analyses

Of these four alternatives only the first is relevant. Alternative four requires a revision of both objective and behavior. Alternative three requires a revision of means to achieve a pertinent objective, whereas the second alternative implies a redefinition of objectives and possible too a readaptation of activities to the redefined objective. This type of analysis must be done for each of the systematically related activities of education (e.g., planning, organizing, teaching-learning, performing-realizing), or must cover the complete chain of relationships among these activities.

Summarizing, relevance can be defined as a system of relationships between and within activities of education, whereby their objectives are adapted to each other and to some defined purpose, and their actual behaviors

produce changes according to these objectives.

The necessary and sufficient conditions for an educational system or program to be relevant are:

a. That the objectives of all the activities be adapted among themselves and to an (accepted) purpose; and

b. That the behaviors of all the activities be effective in terms of their own objectives.

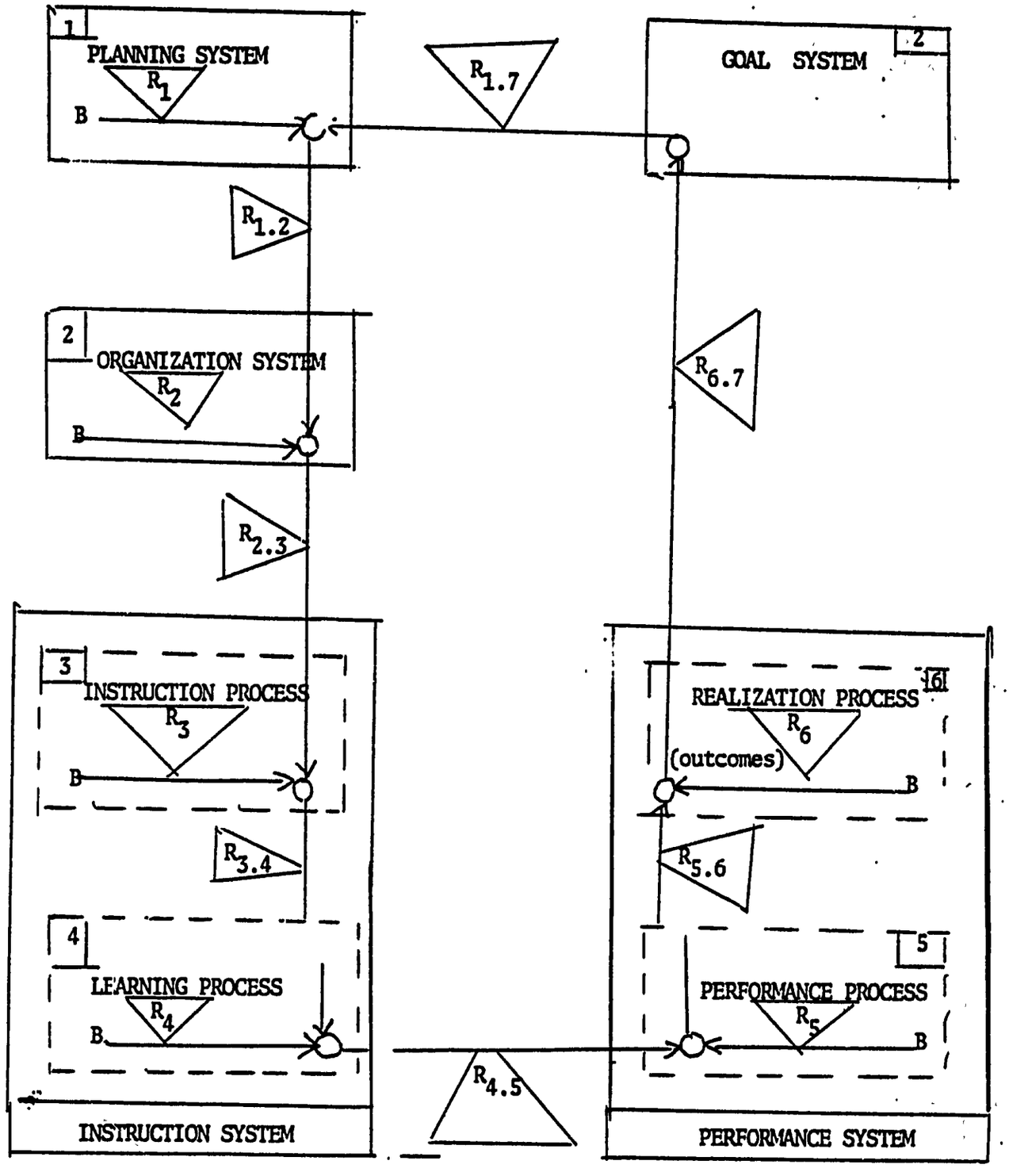
B. From a Relevance Model to the Worker/Employer Study in El Salvador

Figure I.3 is a model of a system for appraising educational relevance. It is included here, only for purposes of demonstrating what segments of relevance relationships are covered in the analysis of the data which follow. However, the complete chain of relationships represented in that figure will not be analyzed, for several reasons:

First, when the survey was originally conceived and designed by the Educational Planning Office of El Salvador, the survey did not attempt to provide all the data that would have been required to assess the complete chain of relationships specified here. For example, no data were gathered on the planning of instruction programs and the possible associations of different planning approaches and processes adopted by the enterprises covered in the study, with generally stated company training goals or with organizational variables of the instruction programs sponsored by these forms. Hence, the Relevance Relationships R_1, $R_{1.2}$, and $R_{1.7}$ depicted in Figure I.3 cannot be analzed.

Second, even though the survey did generate data to assess most of the remaining relationships, some of these data were qualitatively not adequate for this purpose. Therefore, some data had to be discarded from the analysis. Such was the case, for instance, of the general

Figure I.3: The Educational Relevance System (ERS)



Nomencalture:

R= Relevance Analysis Relationship
$R_{1.2}$ = Adaptive Relevance Relationship between systems 1 and 2
R_1 = Effectiveness Relevance Relationship within system 1
O = Objective; B = Behavior
Both the numerical order of systems and processes and their direceions as indicated by the arrows, are conventional.

instructional "goals" reported by employers. The level of responses was extremely low, and among the few valid responses that were obtained, most were classified as "other goals." Consequently the relevance relationship that links the Realization Process with the Goal System ($R_{6.7}$) cannot be analyzed.

Third, in other cases the frequencies of variables were sufficient to allow statistical analyses, but the cross-tabulations or correlation of these variables with their corresponding key variables, revealed associations that were meaningless for assessing relevance relationships. An example of this was the analysis of the relationship between the skills workers acquired and the skills they had utilized in the workplace. This association was found to be perfect. But a relationship of this strength seems rather unlikely. Hence, the relevance relationship $R_{4.5}$ could not be studied. Instead, it was decided to avoid distinctions between learning in a classroom and performing in the workplace, and to relate them directly to a realization, by assessing whether performance s(or learning) was related to an outcome such as raise. Even though this relationship does not appear in Figure I.3, it may well be represented by $R_{4.6}$ (e.g.: a direct link between the learning process (4) and the realization process (6), by-passing the performance process (5)).

Even screening the data, as described, the remaining collection is a rich as well as large data base that lends itself to an appraisal of an important segment of the relevance relationships of training programs conducted in El Salvador. The Worker/Employer study has in general the following coverage of relevance relationships:

a. The study assesses the relationship $R_{2.3}$, the association between organizational characteristics of firms and institutions that offered training programs to their employees, with the instructional resources,

inputs, and methods these organizations utilized in these programs.

b. The study assesses the effectiveness relationship of the instruction process (R_3), by relating the instructional resources and aids that organizations had available to conduct training programs, with those inputs that participants say were applied to programs.

c. THere is also coverage of the relationship $R_{3.4}$, the adaptation of the instructional process to the learning (and performance) process, by relating the instructional resources, inputs, and methods available for training with the learning requirements of workers, as viewed by their corresponding employers or supervisors.

d. Relationship R_4 is also studied, namely, the effectiveness of the learning (or performance)process. This is done by relating the skills workers did actually acquire as perceived by themselves, with those skills supposedly required according to their bosses opinions.

e. An attempt is also made to assess the adaptation of the learning or performance process ($R_{4.6}$) with some related outcome, which in the model corresponds to the realization process. This is done by relating the skill required according to employers with the salary increases obtained by workers subsequent to their attending the last company sponsored training program.

f. Finally, the effectiveness of the realization process (R_6) is assessed by studying the relationships between the skills workers did acquire or utilize to perform on the job with the raises they received thereafter.

Each of the above relationships are assessed with respect to different occupational categories, since it is assumed that each of these categories requires some particular sets of skills to perform effectively on the job. Finally, the study attempts to analyze comparatively, the relevance

of training programs conducted either inside or outside the Salvadorian enterprises and institutions included in this study. It is assumed that the programs conducted outside these organizations are more apt to be intervened by public policies than those conducted inside.

2.0 Objectives of the Worker-Employer Survey:

As part of the Education Sector Analysis the Educational Planning Office of El Salvador (ODEPOR) conducted a survey of workers and employers to assess the relevance of training offered to workers within and outside firsm. In general, the aims of the survey were to explore: (a) "...the changes produced among program participants as the result of the nonformal training they received through companies - public and private, ...and, (b) whether such change conformed to those intended by the companies (ODEPOR, 1975 (a)). An internal document of ODEPOR (1975 (b)) further specifies the objectives of the survey:

a. To find out the criteria used by companies for selecting and promoting personnel and for raising their salaries.

b. To determine the program content that is effective in improving the economic conditions of workers and the productivity of companies.

c. To determine the type of programs that are effective in facilitating workers access to employment and subsequent job promotion.

d. To find out the effect of educational attainment (formal and nonformal) on workers' employability and salary increases.

e. To measure the impact of training programs on productivity (p. 6).

Among the reasons the Ministry of Education had for undertaking the survey were "...to establish with precision and detail the company resources, their availability and modes of utilization for training, as well as the

company training needs according to production sector and types of workers, so as to better relate the (formal) education system with the training needs of other sectors, specially the occupational sector." (Ibid, pp. 4-5).

The Worker/Employer survey, referred to as "the survey" in this report, assesses educational relevance, as distinguished from the access and efficiency objectives set forth in the El Salvador Five Year Educational Plan 1973-77 (Plan Quinquenal de Educacion). According to this plan, the general objectives of relevance are that "...the products of education and culture be necessarily related to the national economic and social development and individual progress" (Memória de Labores, 1975-76).

In the Documento Tecnico 76-3 (1977), national development is defined as "the increase of national production concomitant with a better distribution of income" (p. 223). Hence the education sector is expected to respond to the developmental needs of both the country and individual. Based on this definition, ODEPOR has determined two sorts of criteria to assess educational relevance: one of equity, the other of productivity.

The equity criteria attempts to appraise the role of the state in increasing personal incomes and in distributing these increases more equitably. Hence education becomes more relevant if it contributes to accomplishing these objectives.

The productivity indicator attempts to measure contribution to the growth of GNP. Hence education gains in relevance if its outcomes effect significantly such development.

In the light of these general relevance objectives and using the data gathered through the survey, this report attempts to analyze both the process by which the survey was conducted and the data itself, so as to allow some policy recommendations about nonformal education and training. Specifically, the plan here is to discuss briefly the methodology and instru-

ments employed by ODEPOR and to describe how they were implemented, to describe the process of data analysis, and to present the findings.

Clearly, this is an exploratory study of some interesting and important data related to the relevance of nonformal education programs offered in a sample of Salvadorean enterprises and institutions. Later analyses will probe these relevance relationships more completely with other data collections that address the issue of educational relevance.

3.0 Methodology Employed in the Survey

A. Questions addressed in the Survey

An internal document of ODEPOR lists some preliminary research questions which served as guidelines to design the overall study, define concepts, and develop the questionnaire. These questions are:

a. Which public and private enterprises develop educational projects, programs, or activities? (These enterprises are classified according to production sector, zone, department, type of activities).

b. What is the content of programs in each of three learning domains: cognitive, affective, psychomotor? (These domains will be defined below).

c. What kinds of delivery systems are employed by organizations to provide training to their workers?

d. What kind of personnel organizes and conducts training programs by sector and type of activity?

e. What kinds of instruction techniques are used in training programs?

f. What are the major sources of financing to support training programs, according to sector and activities?

g. To what audiences are these programs directed; by sex, age, educational attainment, occupation, sector, zone, and geographical location?

h. What kinds of materials and equipment are used in training programs?

i. What is the cost of training by worker, company, sector, activity?

B. Definition of Concepts

The major concepts defined by ODEPOR are:

a. Sector

The economic sectors to which each organization included in the sample belongs are:

i. Agriculture Sector: companies engages in agricultural ("agropecuaria") production, such as "fincas," "haciendas," "granjas."

ii. Commercial Sector: Concerns that buy and sell goods directly to the consumer: e.g., drugstores, grocery stores, retail stores in general.

iii. Service Sector: Concerns and institutions that provide services to the general public: e.g., laundries, repair shops, clinics, transportation.

iv. Administrative Sector: Government entities and whatever service they provide or activities they perform: e.g., Post Office, Ministries, ANTEL.

v. Industrial Sector: Plants were the principal activity is to transform manually or mechanically raw materials or semi-processed products into the production of final goods of a same class.

vi. Financial Sector. Companies engaged in financial transactions such as providing credits, insurance, guarantees: e.g. banks,

insurance companies, credit institutions, FIGAPE, INSAFI.

b. Occupation:

Principal occupation of the interviewer within the organization: e.g., manager, personnel director, accountant, electrician, mechanic, driver, classified according to the International Standard Classification of Occupation (ISCO) with minor recoding.

c. Total Work Experience:

The total number of years the Respondent has worked, no matter where.

d. Company Work Experience:

The total number of years the respondent has worked in the present organization.

e. Educational Level:

The highest level of education attained within nine possible educational levels: illiterate; literate but with no formal schooling; three levels of basic education (Cycles I, II and III); middle education, three levels of higher education (three years or less, three years till graduation, and graduate or post-graduate education). Further the level of education may refer to that attained by respondents either at job entry level or at present.

f. Institutional resources provided by the organization in the most recent instruction program.

i. Written materials: Any printed material provided by the organization: e.g., programs, guidelines, notes.

ii. Expendable materials: Raw materials processed or semi-processed, the company made available for instruction: e.g. stationary, chemical products, wood, wire.

iii. Equipment: Light or heavy, specialized or not, owned or not by the company.

iv. Library: Access to any kinds of books on specialized or general subjects, owned or not by the company.

v. Other: Any other facilities or materials provided by the company: e.g., the land in the case of an agricultural enterprise.

g. Program contents (learning objectives)

Drawing form Bloom's taxonomy of learning objectives, program objectives are classified according to the cognitive, affective, and psychomotor domains.

i. The cognitive domain: includes those aspects that relate to memory or evoking knowledge, and the development of intellectual capabilities and technical skills such as: the recording and itnerpretation of messages, application of formulas, analysis and synthesis, evaluation.

ii. The affective domain: includes such aspects as the development of individual interests, attitudes and values as well as forms of relating to other people, as for example: spirit of service and work, acceptance of errors, overcoming emotional disturbances, relations with equals, superiors, subordinates.

iii. The psychomotor domain: corresponds to the development of skills that allow individuals to organize and control their physical movements or dexterity, such as: digital and manual dexterity, muscular sensorial coordination, temporal spatial orientation.

The cognitive domain includes nine specific skills, while

both the affective ans psychomotor domains include ten skills These twenty-nine skills were recoded into five categories formed by four skills each.

C. Questionnaires

ODEPOR designed and administered two questionnaires: one to workers, the other to employers.

a. Workers Questionnaire

The purpose of this questionnaire is "to gather information about the training received by workers through the company while in service." The information refers not only to training programs offered to company personnel within an organization but also to training outside the firm.

The instrument has three main sections: General Information Personal Background, and Basic Information of the Survey.

i. The General Information section is designed to identify and characterize the organization in which the interviewee works (e.g., Company name, location, activity, sector), and includes six major survey items.

ii. The Personal Background section is intended to identify the respondent and to describe some of his characteristics e.g., occupations, sex, age, work experience--total and company, educational attainment--at entry level and present). This section contains eight survey items.

iii. The Basic Information section is intended to classify the information provided by respondents in relation to the last training received by him and the possible effects of this training on him. Among the major items covered in this section are:*

*The order in which these items are presented here does not necessarily follow the one of this questionnaire.

- Outcomes of Last Training received:
  - Respondents perceived change in his own productivity (Question 8).
  - Respondents salary raise (if any) and timing of raise (Questions 19 and 20).
- Training and Learning Objectives of the Program (Page 6 of the Questionnaire).
  - Skills transmitted to respondents (e.g., cognitive, affective, psychomotor).
  - Skills acquired (or learned) by respondents
  - Skills utilized eventually by respondents
- Training strategies and resources employed in the last program
  - Method(s) experienced by respondent (e.g., job rotation, seminars, courses) and the usefulness of method(s) as perceived by him (Questions 1 and 2, respectively).
  - Instructors (e.g., company, personnel, others) (Questions 14)
  - Training facilities and materials (e.g., locale, written materials, expendable materials, equipment (Question 15).
  - In-company or out-of-company training (Question 9).
  - Duration of the program (Question 8)
  - Time schedule (Question 12)
  - Admissions requirements (Question 13)
  - Tuition costs (Question 16)
  - Fellowships awarded (Questions 5 and 6)

Other

- Reasons for attending last training program (Question 3)

- Previous training experience (Question 7).

This section of the questionnaire includes thirty general survey items.

b. Employers Questionniare

This questionnaire was designed "to gather information about the instruction systems used by public and private enterprises to train their workers," and is composed of three major sections: General Information, Personal Background, Basic Information.

i. The General Information Section identifies and characterizes the employer's organization (e.g., Company name, location, activity, sector, juridical organization, size.) It includes eight major survey items.

ii. The Personal Background section identifies the employer and describes some of his characteristics (e.g., occupation sex, age, work experience, educational attainment, nationality, specialty). This part of the questionnaire contains nine general items.

iii. In the Basic Information section respondents report on company general goals and strategies for training their personnel. This section contains 19 major survey items and 4 fairly elaborated survey tables. Some of these items are:*

. General training goals

- (e.g., to improve health and/or economic conditions of workers) (Question 10).

---

*The survey items presented here do not follow the same sequence of the questionnaire

- Expected outcomes of training programs
  - Increase worker productivity
- Skills required by workers
  - Skills required by workers according to occupations, in the cognitive, affective, psychomotor domain
- Company training strategies and resources
  - Training methods utilized (e.g., courses, seminars, conferences) (Question).
  - Equipment used for training (e.g., mimeograph, recorder, projector) (Question 6).
  - Technical assistance used over the past years (Question 7)
  - Fellowship or scholarship Aid (Question 2)
  - Production equipment and facilities (e.g.,manual tools, workshops, heavy equipment, specialized equipment, computation system). (Question 5).
  - Financing (e.g., internal, external) (Question 8)
  - Staff (Question 11).
- Company employment and promotion policies.
  - Requirements for selecting and hiring company personnel by occupations (e.g., educational attainment, experience, recommendations, tests)
  - Company criteria for promoting workers within occupations (e.g., training received, educational attainment, company experience; behavior,recommendations, special skills).

D. Sampling Design

To provide the sample frame from which firms were selected, the following main sources were used by ODEPOR: the Salvadorian Institute of Social Security, the General Statitistics and Census Bureau, and the Ministry of Agriculture. In addition to these sources, several directories were consulted, such as those published by the Salvadorian Industrial Association, Chamber of Commerce, Commercial Registry, the Central American Directory of Industries, and the lists of firms contributing to the Social Security system in El Salvador.

For sampling purposes, twelve sectors of economic activity were identified. The total number of firms identified was 276,741, of which 389 were randomly selected for inclusion in the sample. Each firm received the same weight irrespective of the number of workers or employees. The percentage of firms selected varied by economic activity. For example, 5% of the identified firms in the transport and cargo business were selected, while 25% of the sugar refineries were included.

Because of cost and time constraints, the number of firms actually visited was approximately half of those selected. These firms were also randomly selected. To ensure an adequate sample size for investigation all selected firms in the smaller sectors of production were included in the final sample investigation. Hence, the firms or employers finally interviewed may not constitute a fully representative sample of the Salvadorian economic activity.

In order to select the workers to be interviewed, firms were classified according to the size and type ("obreros"/"empleados") of their workforce in each of the sectors. Over 5,000 employees and workers were thus

identified and listed, and 1,993 were randomly selected for interviewing. In small concerns, the total workforce was surveyed, and in large organizations a percentage of the workforce was selected for interviewing. The final tabulation included 1,502 workers. This represents about one third of the total workforce of the sampled firms.

4.0 Recoding and Formation of Variables

To facilitate the task of analyzing the data as well as to obtain frequencies and cross-tabulations on variables more useful for analysis, certain variables were recoded and created.

A. Worker skills

As already indicated, the 29 categories of skills listed in both employer and worker questionnaires were recoded and reduced, by means of "factor analysis" to 5 major categories composed of 4 skills each. These are: Social Skills, Relationship Skills, and Clerical Skills. For each of these categories, the study determined whether the skills had been acquired and utilized by the worker (as perceived by him), and whether the skills were required (as viewed by the employer). In order to look into the Required, Acquired and Utilized relationships, the worker and employer data file was merged. Following are the three sets of skills described.

Type of skills	Required	Acquired	Utilized
a. Social Skills	(BOSSSOC)	(SOCAQ)	(SOCUT)
Spirit of Service Spirit of Work Acceptance of errors Overcomes emotional Disturbances			
b. Relationship Skills	(BOSSREL)	(RELAQ)	(RELUT)
Relation with equals Relation with superiors Relation with subordinates Relation with Public			
c. Analytical Skills	(BOSSANA)	(ANAAQ)	(ANAUT)
Analysis and Synthesis Application of formulas Evaluation Interpretation of Graphical Messages			

Types of Skills, Cont.	Required	Acquired	Utilized
d. Perception/Dexterity Skills	(BOSSPER)	(PERAQ)	(PERUT)
Manual dexterity Visual Perception Muscular Sensorial Coordination			
e. Clerical Skills	(BOSSCLE)	(CLEAQ)	(CLEUT)
Recording messages Interpretation of oral messages Interpretation of written messages Remembering of persons and objects			

B. Worker occupations

The 83 occupational categories of workers listed in both the worker and employer questionnaires were reduced to six basic categories in descending order of educational level required.

a. Professionals

b. Top management

c. White collar workers

d. Skilled workers

e. Semi-skilled operators

f. Unskilled workers

4.1 Univariate Analysis

The data for analyzing frequency distributions are all from the merged worker-employer file. In order to structure this analysis in terms of relevance assessment, several variables have been selected and classified according to four major categories. This categorization follows the model for appraising educational relevance depicted in Figure I.3 , namely: Realization (Outcome) Variables, Learning and Performance Variables,

Instructional Variables and Organization Variables.* In addition to these training variables a set of variables which describe workers' personal traits have been selected and grouped under the heading Worker Characteristics Variables.

A. Outcome Variables

a. Raise received by workers

Salary increase per month is intended to reflect an eventual outcome of the training received by workers. Table I.1 reveals that over 57% of the respondents got no salary increases at all, while 32% got monthly raises of 50 colones at most, and 11% of 51 colones at least. The mean raise of all workers amounted to ¢18 per month, and the mean of those receiving raises was ¢43 in that same period.

Table I.1 Frequencies of Monthly Salary Increase Received by Workers (colón = $.40)

Monthly Raise Interval ¢	Monthly Raise Average ¢	Frequencies Absolute	Frequencies Percent		Cum %	Aggregate Monthly Raise ¢
0	0	848	57.1		57.1	0
0-25	13	229	15.4	31.5	72.5	2,977
25-30	38	239	16.1		88.6	9.082
50-75	63	48	3.2	11.3	91.9	3,024
75-100	88	64	4.3		96.2	5,632
100-more	113	57	3.8		100.0	6,441
		N=1485	99.9			¢27,156

* Note that this categorization excludes both Goal Variables and Planning Variables.

b. Timing of raise received

In addition to the amount of raise received, workers reported the date on which their salaries were increased subsequent to their participation in the last training program. Missing cases represent 67% of the total sample. Of 33% remaining cases, 52% reported having received a raise within three months after the last program attended, and similarly nearly 48% reported having received raises between 3 to 12 months later. (Table I.2)

Timing	Absolute	Relative	Cumulated %
0-3 weeks	88	17.6	17.6
1-3 months	173	34.7	52.3
3-6 months	97	19.4	71.7
6-12 months	141	28.3	100.0
	N= 499	100.0	

Table I.2 : Frequencies of Raises Received by Workers Subsequent to Last Training

It is uncertain whether the amount and timing of salary increase can be attributed directly to training rather than to other causes, such as: job promotion not related to training; companies' general salary policies; or legal raises decreed by government. For example, Table I.2 indicates that over 28% of the workers got salary increases between 6-12 months subsequent to the most recent training, which seems a relatively long period for rewarding a person economically for the training received.

B. Learning and Performance Variables

Under this heading are classified the skills workers were (a) required to learn (as viewed by the employer), (b) had actually learned, and (c) had utilized to perform effectively on thejob (the two altter as perceived by the worker). Hence, the variables that follow are considered in this part of the analysis.

	Learning Variables		Performance Variables
Skills Domain	(a) Skills Required	(b) Skills Acquired	(c) Skills Utilized
Social	BOSSSOC	SOCAQ	SOCUT
Analytical	BOSSANA	ANAAQ	ANAUT
Clerical	BOSSCLE	CLEAQ	CLEUT
Relationship	BOSSREL	RELAQ	RELUT
Perception and Dexterity	BOSSPER	PERAQ	RERUT

Each of these Learning and Performance Variables (15 in total) are composed of four skills each (75 in total). Frequencies of each skill are shown in terms of either their total absence (e.g., no skills required according to employers, or no skills acquired nor utilized according to workers) or their presence in combinations of one or more skills with a maximum of four (e.g., a mix of skills required, acquired or utilized, respectively). The code number 0 indicates the absence of skills while the numbers 1, 2, 3 or 4 indicate the presence of one or more skills that comprise a given Learning and Performance Variable.

CODE	Absolute Frequencies BOSSANA	ANAAQ	ANAUT	Relative Frequencies BOSSANA	ANAAQ	ANAUT
o	828	770	775	55.1	51.3	51.6
1	355	395	393	23.6	26.3	26.2
2	160	198	198	10.7	13.2	13.2
3	93	92	90	6.2	6.1	6.0
4	66	47	46	4.4	3.1	3.1
	1502	1502	1502	100.0	100.0	100.0

Table I.3 Comparison of Frequencies of Analtyical Skills Required, Acquired, and Utilized

In analysing the Learning and Performance Variables from a relevance perspective, it is important to identify variations between Skills Required, Acquired and Utilized, and to seek possible interpretations of these variations and their relationships. For example, following the Relevance Assessment model represented in Figure I.3, the skills required according to employers opinions may be regarded as "Learning Objectives" and the skills acquired by workers may be viewed as "Learning Behavior." The skills utilized may represent the worker "Performance Behavior" on the job.

Table I.3 reveals that virtually no variations at all existed between the skills workers had acquired and utilized in the Analytical Skills Domain. This same lack of variation, with the only exception of Clerical Skills, was found in all remaining Skills Domain. This can be seen quite clearly in Table I.4.

which compares for each group of skills the respective means and medians. The medians, for example, of either the Social, Analytical, Relationship or Perception Skills Acquired and Utilized are identical, for each of these domains. The medians of Clerical Skills Acquired and Utilized show a difference of 0.3.

	Mean	Median		Mean	Median		Mean	Median
BOSSOC	2.1	2.3	SOCAQ	1.6	1.3	SOCUT	1.5	1.3
BOSSANA	.8	.4	ANAAQ	.8	.5	ANAUT	.8	.5
BOSSCLE	1.7	1.4	CLEAQ	1.4	1.2	CLEUT	1.1	.9
BOSSREL	1.9	1.8	RELAQ	1.7	1.7	RELUT	1.7	1.7
BOSSPER	1.6	1.6	PERAQ	2.0	2.1	RERUT	2.0	2.1

N = 150

Table I.4 : Comparison of Means and Medians of the Skills Required, Acquired, and Utilized, in each Skill Domain

Since it seems unlikely that in all cases the relative mix of skills learned by workers in training programs corrresponds exactly to the mix of skills utilized by them in the wor place, it is probable that this question was misinterpreted during the survey. Consequently, the subsequent analyses will include only the Skills Acquired, or will discard the Skills Utilized.

For the purpose of educational relevance assessment, it is important also to see the amount of skills workers reported to have acquired in each Skill Domain. As indicated in Table I.4 presumably the smallest number of skills were acquired in the Analytical Skill Domain (Mean = 0.8): The largest amount of skills were acquired in the Perception and Dexterity Domain (Mean = 2.0).

In contrasting the Skills Required with those Acquired, some variations can be found in all but the Analytical Skill Domain. The Means for Analtyical Skills Required and Acquired were both 0.8. This could be interpreted as a sort of "consensus" among workers and employers on the relative importance or number of skills that were required and utilized in performing within the different occupations. However, workers and employers seemed to have been in "disagreement" on the Social Skills Acquired and Required. Workers reported they acquired less skills in the Social Domain (Mean 1.6) than employers indicated workers required (Mean 2.1). On Perception and Dexterity Skills the pattern resulted inverse. Employers indicated a lesser requirement of these sort of skills (Mean 1.6) than workers seemed to have acquired (Mean = 2.0). On Clerical and Relationship Skills workers and employers seemed to agree.

C. Instructional Variables

a. Training Methods experienced by workers

Workers reported on the methods of training they had experienced. These were: Work Experience, Job Rotation, Seminars, Conferences, and Courses. During the survey they could indicate whether they had been trained under one or more of these alternative methods.

Table I.5 reveals that Work Experience was by far the predominant form of training received by respondents (91%). The next highest methods experienced were Job Rotation (29%) and Courses (26%), while the least common method was Seminars (6%).

Training Methods	Relative Frequencies Experienced %	Not Experienced %
Work Experience (METHOD 1)	91	9
Job Rotation (METHOD 2)	29	71
Courses (METHOD 5)	26	74
Conferences (METHOD 4)	12	88
Seminars (METHOD 3)	6	94

N = 1502

Table I.5 : Relative Frequencies of Training Methods Experienced by Workers

It is uncertain whether Work Experience (METHOD 1), which shows such high frequency, was interpreted during the survey as a deliberate form of instruction or simply as an outcome of the respondents normal activities on the job.

b. Training Methods imparted by Firms

The variables under this heading are to be distinguished from those in the previous one. In this case employers, instead of workers, were asked to describe the methods of instruction utilized in their organizations for training in general. Respondents had the option to indicate one or more of the instruction forms listed in Table I.6

Instruction Methods Imparted by Firms		Used %	Not Used %
Courses	(EMPMETH 1)	49	51
Seminars	(EMPMETH 2)	28	72
Conferences	(EMPMETH 3)	40	60
Round Tables	(EMPMETH 4)	12	88
Job Rotation	(EMPMETH 5)	47	53
Experience, Specialization	(EMPMETH 6)	60	40
Apprenticeship	(EMPMETH 7)	20	80

N = 1502

Table I.6 : Relative Frequencies of Training Methods Utilized by Firms

It is interesting to compare the data of Tables I.5 and I.6, since data on a same item (instruction methods) were drawn from different respondents (workers and employers).* For example, both workers and employers agreed that experience (METHOD 1 and EMPMETH 6) was the method used predominantly in training programs. However, the relative frequency of EMPMETH 6 (60%) is still considerably lower than that of METHOD 1 (91%). This might support the point made before that workers, generally, might have confused experience as a training method in the context of this survey.

* The two Methods Apprenticeship and Round Tables listed in Table I.6 are not explicitly included in Table I.5 . However, in order to make the data in these two tables more comparable, Apprenticeship might be assimilated to Experience, and Round Tables to Seminars.

Next to experience, the other instruction systems most commonly used by organizations were Courses (49%) and Job Rotation (47%). This tendency again coincides with that indicated by workers. Finally, Round Tables (12%) and Apprenticeship (20%) were the methods of instruction used least in the programs. In the case of Round Tables this seems reasonable, because this is a method commonly used for training people with higher educational levels, such as professionals and this occupational category was underrepresented in the survey.

c. Training Resources and Materials experienced by workers

Respondents were asked to report on the Training Resources and Aids their enterprises had made available during the last program attended.

Table I.6 indicates that the Training Resources and Aids which were provided predominantly by firms were Facilities (72%) and Instructors (65%). In fewer cases (over one third) did enterprises make available Machines and Expendable Materials. In even fewer cases did organizations provide Written Materials (19%) or allow access to Libraries (4%), for training their personnel.

Table I.7: Relative Frequencies of the Training Resources and Materials

Training Resources and Materials	Relative Frequencies Experienced %	Not Experienced %
Facilities (locales)	72	28
Instructors	65	35
Machines	37	63
Expendable Materials	34	66
Written Materials	19	81
Library	4	96

The variables "Machines" refers to equipment used for production, and "Expendable Materials" to raw materials and other inputs of production. If it is assumed that both Machines and Materials are more commonly used to support experimental modes of instruction, and Written Materials and Libraries to aid rather academic instruction procedures, the data in Table I.7 seem consistent with those presented earlier in Table I.5 , in that instruction programs conducted within firms tended to be experientially based.

d. Training Resources and Materials provided by firms

Employers were asked to report on the equipment and aids utilized in the training programs sponsored or conducted by their firms. Table I.8 shows that the means most frequently used were: Production Equipment (78%), Manual Tools (69%), and Expendable Materials (66%). In contrast, the aids used least commonly were Recorders (20%) and Projectors (33%). These frequencies seem reasonable, given that the predominant form of instruction was work experience followed by job rotation, and the least common instructional formats were seminars and conferences.

Training Equipment and Aids	Relative Frequencies Utilized %	Not Utilized %
Production Equipment	78	22
Manual Tools	69	32
Expendable Materials	66	35
Raw Materials	47	53
Specialized Instruments	45	55
Mimeograph	42	58
Projector	33	67
Recorded	20	80

N = 1502

Table I.8 : Instructional Equipment and Aids Utilized in Training Programs, As Reported by Employers

e. Instructors

Among the company personnel reported to have instructed workers more often were the Department Heads (23%). General Managers also taught in programs (19%), while Technical Personnel were least often instructors (13%). Non-company personnel ranked fairly hgih (20%), although this is no indication whether they conducted programs within or outside firms. (Table I.9)

Instructors	Relative Frequencies Did Instruct %	Did Not Instruct %
Department Head	23	77
General Manager	19	81
Technical Company Personnel	13	87
Non-Company Personnel	20	80

Table I.9 : Type of Instructors Who Taught in Programs

f. Location of training programs

As to where the training was imparted, 80% of the respondents participated in programs within companies and 20% outside. These are consistent with other data analysed above. For example, it was indicated that 1) the non-company personnel reported to have taught in programs was 20% (Table I.10).

	Relative Frequencies Inside Firms	Outside Firms
Location of Training Programs	80%	20%

N = 1486

Table I.10 : Location of Training Programs

For educational and training policy-decision-making it is important to assess, comparatively, the characteristics and outcomes, or the relevance, of programs conducted either inside or outside firms. Outside programs are more apt to be influenced by public policy.

g. Duration of Training Programs

The duration of programs varied from less than a week to one year or more. Most of theprograms (42%) were of relatively short duration, namely three months or less. For example, almost one third of theprograms lasted less than a week. Next in percentage are programs which lasted 4-6 months (21%) and 6-12 months (22%). Furthermore, nearly 15% or the programs had a duration of one year or more. Unless Work Experience and Job Rotation were relatively common forms of explicit training, it seems unprobable that such long programs were carried on inside of companies. It is more likely they were run in out-of-company settings.

Duration	Relative Frequencies Adjusted %	Cumulative %
1 week or less	29	29
1-4 weeks	6	36
1-3 months	7	42
4-6 months	21	63
6-12 months	22	85
12 months or more	15	100
	100%	100%

N=1452

Table I.11: Relative Frequencies of the Duration of Training Programs

h. Time Schedule of Instruction

Workers attended training programs either full-time (75%) during working hours (20%) or during extra working hours (5%).

Time Schedule of Instruction	Relative Frequency
Full-time attendance	74.6%
During working hours	19.8
During extra working hours	5.6
	100.0%

N = 1487

Table I.12 : Relative Frequencies of the Time Schedules of Instruction

i. Tuition Cost

The vast majority of workers did not pay any tuition cost (93%). Among the 7% (99 workers) who did pay tuition, 47% paid 100 colones or more for tuition, 22% paid 24 colones or less, and 31% paid between ¢25-¢99, respectively. (Table I.13).

Tuition Costs (in Colones)	Relative Frequencies Adjusted %	Cumulative %
0	93.3	93.3
0-24	1.5	94.8
25-49	0.5	95.3
50-74	0.9	96.2
75-99	0.7	96.9
100 or more	3.1	100.0
N = 1481	100.0	100.0

Table I.13 : Relative Frequencies of Tuition Costs of Training Programs

j. Reason for getting training

The major motives workers reported for receiving training were: because this was either a company routine, a company requirement, or because they were selected by the company. That is, 73% respondents attended programs in response to a company training policy. On the other hand, only 27% of the workers went to programs because they requested it, were interested in upgrading themselves, or had other reasons. Substantially fewer workers got training because of their own initiatives.

Motives for receiving training	Relative frequency
Company Policy	73.1%
Personal Initiative	26.9
	100.0%

N = 1466

Table I.14 : Relative Frequencies of Workers' Motives for Getting Training

From the point of view of assessing the relevance of training programs, it is interesting to note that even though 43% of the workers did receive monthly salary increases subsequent to the last training program they had attended (see Table I.7), only one fourth of these workers had decided by themselves to participate in these programs. This might be an indication that a raise is not the only motive workers had for upgrading themselves educationally.

D. Organizational Variables

a. Size of Organizations

The median size of the firms sampled was 28 employees. Twenty-five percent of the firms had 82 or more workers, and 75 percent of the firms had ten or more workers. This indicates some biasing toward selection of larger and organized firms in El Salvador.

b. Legal Form of Organization of Firms

The legal form of organization of enterprises and institutions included in the sample was reported by employers. Table I.15 indicates that one third of these organizations were incorporated, less than one third were unipersonal, less than one fifth were state owned, fifteen percent were societies of individuals (sociedades de personas), and only one half percent were cooperatives. The data shows that the sample tended to over-represent highly organized firms and institutions.

Legal Organization	Relative Frequency
Incorporated	33.8%
Unipersonal	30.4
State owned	17.6
Societies of persons	15.1
Cooperatives	0.5
Other	2.6

N = 1184

Table I.15 : Relative Frequencies of the Juridical Organizations of Enterprises and Institutions that Carried Out Instruction Programs

c. Sectors of Production

The firms that offered or sponsored programs of instruction are classified according to six major Sectors of Production. Of these sectors, Industrial seems to have been over-represented in the sample (37%), the Service, Commerce, and Agricultural Sectors, are equally represented (around 18%) and both the Agricultural and Financial Sectors have low representation (7% or less).

Sectors of Production	Relative Frequencies (N=1248)
Industrial	37.0%
Administration	18.5
Service	17.9
Commerce	17.8
Agriculture	6.7
Financial	2.2
	100.0%

Table I.16 : Relative Frequencies of the Sectors of Production to Which the Sampled Organizations Belong

E. Worker Characteristics Variables

a. Workers Occupations

A classification of workers by occupational categories in descending order of educational levels is presented in Table I.17 .

Occupational Categories	Absolute Frequencies	Relative Adjusted
Professionals and Top Management [a]	323	21.6%
White Collar Workers	347	23.1
Skilled and Semi-Skilled Workers [b]	295	19.7
Unskilled Workers	534	35.6
	N= 1,499	100.0%

[a] Includes 79 Professionals and 244 Top Managers

[b] Includes 172 Skilled Workers and 123 Semi-Skilled Workers

Table I.17 : Frequencies of Workers' Occupational Categories

For purposes of assessing the relevance of the training it is important to distinguish different occupations since it is assumed that workers performances require the use of different skills. This report will attempt to assess the relevance of the last training received by workers for each of the four occupational groups, namely: Professionals and Top Managers, White Collar Workers, Skilled and Semi-Skilled Workers, and Unskilled Workers. Each group is fairly well represented in the sample.

b. Levels of Education Attained by Workers

The years of education attained by workers are reported for two periods: 1) at the time the worker was first employed by the present firm (EDATTN), and 2) at the time the survey was conducted (EDWICO). Workers between these two periods changed their general educational status very little.

Levels of Education Attained	Relative Frequencies (N-1502) (EDATTN) Adjust.	(EDWICO) Adjust.
Illiterate	5.3 %	5.5 %
Uneducated but literate	3.1	3.0
Basic Education: Cycle I	12.6	11.5
Basic Education: Cycle II	30.9	27.2
Basic Education: Cycle III	19.2	20.8
Middle Education	24.6	24.2
Higher Education: at least 3 yrs.	1.9	5.1
Higher Education: 3 yrs. - graduation	1.3	1.6
Higher Education: Graduate & Post. Grad.	1.0	1.1

Table I.18: Levels of Education Attained by Workers at job entry level (EDATTN) and Present (EDWICO)

c. Years of Work Experience

The work experience of respondents was measured in numbers of years, in relation to two periods: 1) a person's total work experience since first employed, no matter where (GENEXP), and ii) a person's work experience in the present firm (GNEXEM).

Half the number of respondents had worked three years or less in the present company, and the same proportion of workers had had an overall work experience of 11 years or less. Three fourths of the surveyed work force had company experience of nine years or less, and total experience up to 20 years. As a curious note, one worker appears to have worked for 75 years, and three workers for 50 years, in their present firms, respectively!

d. Age.

The age of the participants can be summarized as follows: less than one fourth were aged under 24 years: less than one half were aged under 29; and three fourths were 39 years old or less. These data indicate that the workers who were trained in company sponsored programs tended to be relativey young.

e. Sex.

Among the sampled workers who got training, two thirds were males and one third females. This sample suggests a preference towards employment of males.

4.2 Bivariate Analysis

This section searches for meaningful associations between Training Variables and Worker Characteristics Variables. The analysis has been patterned after the model for appraising relevance in Figure I.3 .

A. Associations Between Learning (or Performance) Variables and Raise.

This section assesses relevance relationships between the skills workers acquired in five domains (perception, Analytical, Social, Relationship, and Clerical) during the last training program they attended, and the salary raises workers had received subsequent to this training. Basically, two relationships will be examined, first whether acquiring skills is associated with receiving raises, and second whether acquiring more skills (within a skill domain) is associated with obtaining higher raises.

a. General associations between the skills workers acquired and the raises workers received.

Table I.19 shows for each skill domain the percent of workers who fell into one of the following possible situations:

i. workers who did acquire skills and did get raises;

ii. workerd who did not acquire skills but did get raises;

iii. workers who did acquire skills but did not get raises;

iv. workers who neither acquired skills nor obtained raises.

Percentage of Workers Who:	Skill Domains (N=1485) PERAQ %	ANNAQ %	SOCAQ %	RELAQ %	CLEAQ %	General* Pattern %		
acquired skills and obtained raises	38	20	29	30	31	30	66	43
acquired no skills but obtained raises	5	23	14	13	12	13		
acquired skills but obtained no raises	49	29	36	37	35	36	34	57
neither acquired skills nor obtained riases	8	28	21	20	22	21		
Totals	100	100	100	100	100	100		
Gamma coefficients	(-0.10)	(0.00)	(0.12)	(0.15)	(0.21)			

*Excluding PERAQ and ANAAQ

Table I.19 : General Associations Between the Skills Workers Acquired and the Raises Workers Received.

For each cross-tabulation of raise by type of skill acquired there is a gamma which indicates the strength of association of a raise with skill type. (cf. statistical appendix 1)

Table I.19 indicates that the proportion of workers who reported having received salary increases as well as acquired skills, was the highest in relation to Perception Skills (PERAQ by Raise: 38%). Note that gamma has for

PERAQ a very low negative value (p = -0.10), indicating a weak and inverse relationship. Because a high proportion (49%) acquired skills and received no raise in the case of Analytical Skills acquired and Raise received, gamma is zero, denoting no relationship.

The relationships of each SOCAQ, RELAQ, and LCEAQ by RAISE, are all positive (p = 0.12, 0.15, 0.21, respectively). The following can be generalized about those three skill domains:

i. Of all the workers, 43% got raises while 57% got no raises, and 66% acquired skills while 34% acquired no skills.

ii. Among those workers who received raises (43%), 30% had acquired skills and 13% had not.

iii. Among those who received no raises (57%) 36% had acquired skills and 21% had not.

iv. Among those who had acquired skills (66%), 30% received raises and 36% had not.

v. Among those who had acquired no skills (34%), 13% received raises and 21% had not.

In general, acquiring skills goes with receiving a raise, and not acquiring goes with no raise.

b. <u>Social Skills Workers Acquired by Raise Workers Received.</u>

Within the Social Skill Domain the pattern of association between skills Acquired and Raise obtained by workers was, the more skills acquired the greater amounts of raise received (=0.12). At higher levels of monthly riases (e.g., 76 colones or more), in 47% of cases respondents acquired three or four Social Skills.

Among the employees whose salaries were increased, those ho acquired greater numbers of skills tended also to obtain higher levels of raise.

SOCAQ Number of Skills Acquired	RAISE (Colones per month) 0	1-25	26-50	51-75	76-100	100+
					N = 1485 γ = 0.12	
0	37%	38%	32%	27%	28%	23%
1	19	19	18	10	6	19
2	18	18	23	19	19	12
3	9	14	11	15	16	9
4	16	11	16	29	31	37
Totals	99%	100%	100%	100%	100%	100%

Table I.20 : Cross-tabulation of Social Skills Workers Acquired by Raises Workers Received.

c. Relationship Skills Workers Acquired and the Raise Received

At higher raise levels, there is a positive association between the number of Relationship (Social)Skills workers acquired and the proportion of employees who get raises: the more Relationship Skills workers acquired the higher the monthly salary raises (γ= 0.15). Respondents seem to have become rewarded more for the acquisition of a greater number of Relationship Skills.

RELAQ Number of Skills Acquired	RAISE (Colones per month) 0	1-25	26-50	51-75	76-1000	100+
0	35%	35%	29%	27%	14%	21%
1	14	14	9	4	14	7
2	18	22	22	13	17	14
3	21	21	26	31	28	18
4	13	5	14	25	27	40
Totals	101%	99%	100%	100%	100%	100%

N = 1485
γ = 0.15

Table I.21 : Cross-tabulation of Relationship Skills Workers Acquired by Raises Workers Received.

d. Clerical Skills Workers Acquired by Raise Workers Received

In the Clerical Domain the acquisition of fewer, rather than more, skills tended to be rewarded more frequently at almost every range of salary increase. For example, in Table I.22 , at every raise level, except when the interval was ¢76-¢100, the relation was stronger between raise and the acquisition of two skills, rather than three skills.

Generally, however, at lower levels of raise, workers did acquire fewer skills than at higher levels of raise.

CLEAQ Number of Skills Acquired	RAISE (Colones per month) 0	1-25	26-50	51-75	76-100	100+
0	39%	37%	24%	23%	19%	18%
1	25	25	21	19	19	23
2	16	16	23	25	17	26
3	10	14	18	19	27	18
4	10	9	15	15	19	16
Totals	100%	101%	101%	101%	101%	101%

N = 1485
γ = 0.21

Table I.22 : Cross-tabulation of Clerical Skills Acquired by Raises Workers Received.

The gamma coefficient for the Clerical Skill Domain has the highest value, namely 0.21 versus 0.15 or less for the other two domains. Perhaps this is so because among the four skills that comprise the Clerical Domain, one or two are key skills, while two or three skills are not as important to perform clerical tasks effectively.

B. Associations Between Instructional Variables and Learning (or Performance) Variables.

a. Methods of Instruction Workers Experienced by Skills Worker Acquired.

Table I.23 shows that in 88% of the cases those who had been instructed by means of Work Experience, acquired one Perception Skill at least. The respective Gamma coefficient of this relationship is 0.27, which suggests that this association is relatively strong and positive.

When Work Experience was used as a method of instruction, program participants tended to acquire predominantly Perception and Dexter-

ity skills (88%: γ =0.27), and to a lesser degree, Clerical and Social Skills. The sort of skills learned least frequently through this method were those in the Analytical Domain (49%: γ=0.19).

Job Rotation when used as a deliberate form of instruction was related more strongly (although inversely) to the learning of Perception Skills (85%: γ = -0.11) than to the remaining Skill Domains. Analytical Skills, for example, were learned least frequently when taught by means of Job Rotation (62%: γ = 0.33). Whereas Clerical, Social, and Relationship Skills seemed to have been associated with the instruction method Job Rotation.

METHOD OF TRAINING EXPERIENCED	SKILLS ACQUIRED				N = 1502
Work Experience:	Perception	Clerical	Social	Relationship	Analytical
Percent who experienced	88%	67%	66%	69%	49%
Gamma	(0.27)	(0.10)	(0.14)	(-0.11	(-0.19)
Job Rotation					
Percent who experienced	84%	71%	70%	77%	62%
Gamma	(-0.11)	(0.12)	(0.13)	(0.18)	(0.33)
Courses					
Percent who experienced	74%	71%	66%	71%	60%
Gamma	(-0.34)	(0.09)	(0.12)	(0.23)	(0.31)
Conferences					
Percent who experienced	73%	72%	72%	73%	66%
Gamma	(-0.42)	(0.08)	(0.14)	(0.19)	(0.37)
Seminars					
Percent who experienced	60%	74%	76%	82%	77%
Gamma	(-0.53)	(0.20)	(0.26)	(0.36)	(0.60)

Table I.23 : Cross-tabulation of Methods of Instruction Workers Experienced, by Skills Workers Acquired Thereafter

Clerical, Social, and Relationship Skills seemed to have been associated with the instruction method Job Rotation.

Courses were inversely related to acquiring Perception Skills (74%: γ=0.34), and associated mostly (positively) to Relationship Skills (71%: γ=0.23).

Respondents who attended Conferences as part of their training tended to learn skills in the Social, Relationship, and Ahalytical Domains, for example, that Gamma is 0.37 for the Conference/Analytical Skills relationship.

Finally, Seminars were associated least with learning Perception and Dexterity Skills (60%: γ=-0.53), and most with both Relationship Skills (82%: γ=0.36) and Analytical Skills (77%: γ=0.60).

The two dotted diagonal lines drawn in Table I.23 delimit roughly the data according to the relative strength as well as the direction of each Training Method/Skills Acquired relationship analysed. The central area, encompassed by the two lines, covers those relationships which not only are among the strongest in terms of the percentages, but also whose directions are positive in terms of Gamma.

From the point of view of assessing the relevance of training, Table I.23is quite interesting: if Methods of Training are arranged from top to bottom, from "Experiential Methods" (e.g., Work Experience and Job Rotation) to rather "Academic Approaches" (e.g., the remaining methods). Skill Domains are organized horizontally from Lower Order Skills (e.g., Perception and Dexterity Skills) to Higher Order Skills (e.g., Analytical Skills). With this arrangement of the variables, a general pattern of association between these two sets of variables can be observed: first, the experiential methods of training tend to be related more with the acquisition of lower order skills, while second, the academic procedures tended to

associate better with the learning of higher order skills. This is a pattern that will be examined in more detail in subsequent sections of this report.

b. Instructional Resources and Aids Used and Skills Workers Acquired.

Table I.24 shows that instruction supported with either Facilities, Machines, or Expendable Materials, was associated with about the same acquisition of skills in either the Clerical, Social, or Relationship Domains. The relationships between these two sets of variables range from a high 69% (Facilities by Relationship Skills) to a low 62% (Machines by Relationship Skills). This last relationship has the highest Gamma value, but it is negative, which suggests that
were used as training aids, the less frequently Relationships Skills were acquired.

Rather strong variations existed in those cases where Facilities, Machines, and Expendable Materials were provided by firms to teach Perception and Analytical Skills. The use of these Instructional Resources and Aids was strongly associated with the acquisition of Perception Skills (e.g., in the order of 89 to 96 percent); yet these same teaching devices were associated to a lesser degree with the learning of Analytical Skills (51 to 59 percent).

In the cases where written Materials had been handed out to program participants, they tended to learn mostly Clerical Skills (83%: γ =0.37). The relationship between Written Materials and the acquisition of Perception Skills seems to have been strong but inverse (75%: γ=-0.41). Finally, the association

between Written Materials and the learning of Analytical Skills was fairly strong (60%: γ =0.30).

INSTRUCTIONAL RESOURCES AND AIDS	SKILLS ACQUIRED				N = 1502
	Perception	Clerical	Social	Relationship	Analytical
Facilities					
Percent who experienced	89%	67%	65%	69%	51%
Gamma	(0.10)	(0.09)	(0.07)	(0.02)	(0.14)
Machines					
Percent who experienced	96	65	65	62	59
Gamma	(0.35)	(-0.05	(-0.08)	(-0.22)	(0.24)
Expendable Materials					
Percent who experienced	89	67	65	66	58
Gamma	(0.03)	(0.06)	(-0.03)	(-0.06)	(0.23)
Written Materials					
Percent who experienced	75	83	75	79	60
Gamma	(-0.41)	(0.37)	(0.25)	(0.21)	(0.30)
Instructors					
Percent who experienced	90	69	67	72	50
Gamma	(0.18)	(0.12)	(0.18)	(0.19)	(0.08)

Table I.24: Instructional Resources and Aids Workers Experienced by Skills Workers Acquired

c. Type of Instructors and Skills Acquired.

The data in Table I.25 suggests the mix of trainers who imparted skills in the several skill domains. Whenever workers received instruction by General Managers, in 92% of these cases they acquired Perception Skills, and in only 43% instances did they acquire Analytical Skills. Instruction conducted by General Managers was related about the same proportion with the acquisition of Relationship, Social, or Clerical Skills. The

Instructor/Analytical Skills relationship is negative (γ=-0.16), suggesting that instruction through General Managers was inversely related to acquiring Analytical Skills. Similarly where Department Heads and Technical Company Personnel acted as instructors, there was a relatively stronger association with Lower Order Skills (Perception Skills, 93%:γ=0.16) and weaker one with Higher Order Skills (Analytical Skills: 50%: γ=0.17).

TYPE OF INSTRUCTORS	SKILLS ACQUIRED Perception	Clerical	Social	Relationship	Analytical
General Managers[a/]					
Percent who experienced	92%	67%	72%	74%	43%
Gamma	(0.11	(0.06)	(0.16)	(0.05)	(-0.16)
Department Heads[b/]					
Percent who experienced	93	69	68	70	50
Gamma	(0.16)	(0.05)	(0.07)	(0.02)	(0.17)
Technical Company Personnel[b/]					
Percent who experienced	89	72	69	73	58
Gamma	(0.01)	(0.21)	(0.18)	(0.18)	(0.18)
Non-Company Personnel[c/]					
Percent who experienced	69	67	66	71	59
Gamma	(-0.47)	(0.02)	(0.05)	(0.15)	(0.26)

a/ N = 1500; b/ N = 1502; c/ N = 1501.

Table I.25 :Cross-tabulations of Instructors Workers Experienced by Skills Workers Acquired

When Non-company Personnel instructed workers, the Instructor/Skills Acquired association resulted in less frequent and in-

verse relationships with respect to Perception Skills (69%: β =-0.47), and slightly more frequent but stronger in regard to Analytical Skills (59%: β =0.26). The analysis suggests that instruction conducted by Company Personnel (General Managers, Department Heads, Technical Company Personnel) tended to be related about equally with the acquisition of skills in either the Clerical, Social, or Relationship Domains; quite strongly with learning of Perception Skills; and weakly with Analytical Skills. Whereas when Non-company Personnel instructed workers in training programs, a stronger association was found to exist with acquiring Analytical Skills (or Higher Order Skills).

d. Location of Training Programs and the Skills Workers Acquired.

A key relevance relationship, important because of obvious policy implications, is the association between the location of the training programs and the skills which program participants acquired (Table I.26) indicates that 80 percent of the workers were trained inside firms and 20 percent outside.

Of those workers who were trained inside firms, the great majority (90%) acquired one Perception Skill at least: and of those who got their training outside, fewer (78%) acquired one Perception Skill. Hence, the difference between these two percentages (90% - 78% = 12%) suggests that the acquisition of Perception Skills was associated more strongly with inside rather than outside training. This difference is slightly stronger (15%) with respect to having learned three or more Perception Skills. The learning of three Analytical

Skills was associated 11% more with outside rather than inside training programs.

SKILLS ACQUIRED

Skill Domain	Number of Skills Acquired	Inside Firms	Outside Firms	Differences (a-b)	Gamma (c)
Perception:	1 or more	90%	78%	12%	(-0.31)
	3 or more	39%	24%	15%	
Social:	1 or more	66%	58%	8%	(-0.06)
	3 or more	28%	28%	0	
Clerical:	1 or more	66%	65%	1%	(-0.03)
	3 or more	25%	23%	2%	
Relationship:	1 or more	68%	67%	1%	(0.09)
	3 or more	34%	41%	-7%	
Analytical:	1 or more	47%	58%	-11%	(0.24)
	3 or more	8%	16%	- 8%	

---------- Total Training Inside: 80% Total Training Outside: 20%

Table I.26 : Cross-tabulation of Skills Workers Acquired by Location of the Training Programs They Attended

The acquisition of Clerical or Relationship skills was apparently unrelated to where they were acquired, since in both cases the difference was one percent. However, the acquisition of 3 or more skills in the Relationship domain seems to have been associated more (7%) with outside training.

Finally, the learning of Social Skills tended to be related somewhat more (8%) with in-company training programs.

In general, there was a tendency to acquire lower order skills in programs conducted inside firms and higher order skills in outside programs.

e. Location of Training Programs Workers Attended by Methods of Training.

The data in Table I.27 reveal a marked trend towards offering experiential instruction inside firms and academic instruction outside.

METHODS OF TRAINING	LOCATION OF TRAINING PROGRAM		N = 1486
	Inside Firms (a)	Outside Firms (b)	Gamma
Work experience	84%	17%	(0.67)
Job rotation	77	23	(-0.14)
Conferences	60	40	(-0.54)
Courses	56	44	(-0.73)
Seminars	43	57	(-0.74)

a/ = 81% of N, b/ = 19% of N

Table I.27 : Methods of Instruction Workers Experienced by Location of Training Programs

Work Experience and Job Rotation were the two methods used predominantly inside firms (84% and 74%). Conferences and Courses were conducted inside firms. However, Seminars were most frequently offered outside.

f. Summary of findings.

In summary, the findings most pertinent to the assessment of the relevance relationships between Instructional Variables and Learning (or Performance) Variables are:

(1) The Methods of Instruction used in training programs can be classified as Experiential Methods (Work Experience and Job Rotation), and Academic Procedures (Courses, Conferences, and

Seminars). Similarly, the skills workers acquired through training can be arranged from Lower Order Skills (e.g., Perception and Dexterity Skills) to Higher Order Skills (e.g., Analytical Skills).

(2) Given the above classification of variables, Experiential Methods of Instruction related more to the acquisition of Lower Order Skills;;while Academic Procedures relate more to the learning of Higher Order Skills.

(3) Production Equipment and Materials, when used as instructional aids, relate to the acquisition of Lower Order Skills. Whereas Written Materials used in training programs, associate more with the acquisition of Higher Order Skills.

(4) When company personnel acted as instructors (General Managers, Department Heads, Technical Personnel) the skills workers acquired were more often Lower Order Skills. Instruction conducted by Non-company personnel associated with Higher Order Skills.

(5) Workers trained inside companies more often acquire Lower Order Skills. Employees who attend programs outside firms more frequently acquire Higher Order Skills.

(6) Programs of training conducted within firms more frequently used Experiential Methods of instruction; programs carried on outside firms use Academic Procedures.

C. Associations between Instructional Variables and Raise in Pay

This section will analyze relationships between Instructional Variables and Raise directly, without the mediation of the Skills Workers did acquire.

a. Methods of Instruction Related to Raises Workers Received

(N = 1485)

Methods of Instruction	Raise (Colones per month) 0	1-50	51+	Gamma
Work Experience (Method 1)	57%	32%	11%	(0.03)
Job Rotation (Method 2)	60	23	18	(-0.05)
Courses (Method 5)	57	24	20	(-0.10)
Conferences (Method 4)	62	18	21	(-0.01)
Seminars (Method 3)	60	11	30	(-0.12)

Table I.28 : Methods of Instruction - Workers by Raises Workers Received Thereafter

First whatever method there was employed, between 57% and 62% of workers receive no raise thereafter. Among those who did receive salary increases, the lower Raise level (1 to 50 colones per month) tended to be associated more with Experiential methods of Training; while the higher Raise level tended to relate more strongly with Academic Procedures. Among those who got training by means of Work Experience, 32% received salary increases of 1 to 50 colones per month, and only 11% of the Raises were 51 colones or more. This same sort of relation is exactly the opposite among those who experienced Seminars as a mode of training.

These findings seem reasonable inasmuch as Experiential Instruction was related more strongly to the acquisition of Lower Order Skills, and Academic Approaches were associated with Higher Order Skills. Lower income workers were more often trained on the job, whereas higher income workers (who normally required Higher Order Skills) were trained more frequently by means of Seminars or Conferences.

b. Type of Instructors Associated with Raises

Workers trained by company personnel received more salary increases than those trained by non-company personnel. Company instructors tended to be associated more strongly with lower salary increases (36% or more) than with higher ones (14% or less). Non-company personnel were associated in exactly the same proportion (19%) with receiving either higher or lower salary increases.

Instructors	Raise (Colones per month) 0	1-50	51+	Gamma	N
General Manager	51%	37%	12%	(-0.10)	1483
Department Head	55	36	10	(-0.04)	1485
Technical Company Personnel	50	36	14	(-0.13)	1485
Non-Company Personnel	62	19	19	(-0.01)	1484

Table I.29 : Cross-tabulations of Instructors Workers Experienced by Salary Increases Workers Received Thereafter

D. Associations between Organizational Variables and Raises

a. Sector of Production within which training was conducted by Raise

The majority of people trained in the various Sectors of Production, with the exception of the Financial Sector, got no raises. The raises received tended to be low (50 colones per month at most). Among the few who received high raises (50 colones a month or more), very few were in the Agriculture Sector (7%),

Sector of Production	Raise (Colones per month) 0	1-50	50+
Financial	33%	48%	19%
Industrial	51	39	10
Service	56	31	13
Commerce	57	31	12
Agriculture	69	24	7
Administration	70	16	14

[N = 1244, χ = 0.08]

Table I.30 : Sectors of Production by Raises Workers Received

b. Size of the Organizations by Raise

Company size, measured by the number of workers, was unrelated to the raises workers received. In both large and small firms, most workers got no raises. Among the personnel who got raises, the majority received small increases (50 colones or less) whatever the size of the organization.

Number of Workers	RAISE (Colones per month) 0	1-50	51+	[N = 1209 γ = 0.00]
2 - 10	59%	28%	13%	
11 - 25	50	43	8	
26 - 50	54	32	13	
51 - 75	65	25	10	
76 - 1000	48	31	21	
100+	62	26	12	

Table: I.31 Cross-tabulation of Organizational Size by Raise Workers Received (C:26)

E. Associations between Worker Characteristics and Other Variables

a. Workers' occupations by Methods of Instruction

It is interesting to see which sorts of Methods of Instruction were used for training workers in different occupations. The different instruction modalities are classified in terms of whether they required that program participants be involved in either authentic real-life, on-going work situations (e.g.,Work Experience and Job Rotation), or exposed to rather classical academic procedures (e.g., Courses, Conferences, and Seminars). The occupational categories are classified from higher status activities (e.g., Professionals) to lower level activities (e.g., Blue Collar Workers). The Blue Collar category includes skilled, semi-skilled, and unskilled workers.

Training Methods	Occupations				(N = 1499)
	Professionals	Top Management	White Collar	Blue Collar	Gamma
Work Experience (Method I)	5%	17%	22%	56%	(-0.21)
Job Rotation (Method 2)	7	11	32	50	(0.10)
Courses (Method 5)	8	18	36	38	(0.28)
Conferences (Method 4)	16	16	35	33	(0.36)
Seminars (Method 3)	19	24	41	16	(0.56)
	43%				

Table I.32: Instruction Methods by Occupations

The data above reveal a marked tendency toward the use of Experiential Methods of instruction to train workers in lower rather than higher occupational categories (e.g., Blue Collar workers 50% or more versus Professionals 7% or less). Academic Methods were used more frequently to instruct workers in higher status occupations. Blue Collar workers received training through seminars in only 16% instances, while Professionals and Top Management together experienced this method in 43% of the cases.

In general, Instruction Methods based primarily on experience were used more often to train people in lower occupations; whereas classical or academic training approaches were used to instruct people in higher occupational levels. This general observation is supported partly by the gamma coefficients, which in this Table range from -0.21 to 0.56.

b. Workers' Instructional Resources/Aids

Physical equipment resources tended to be associated more with the training of lower status workers, while academic resources tended to be related more with the training of higher level employees.

Instructional Resources/Aids		Occupations				(N=1499)
		Profes-sionals	Top Man-agement	White Collar	Blue Collar	Gamma
Production Equipment	37%	5%	7%	20%	68%	(-0.16)
Facilities	72	6	14	22	58	(-0.10)
Instructors	65	6	17	21	56	(0.02)
Expendable Materials	34	7	13	30	51	(0.09)
Written Materials	19	11	19	47	23	(0.46)

Table I.33 : Instructional Resources and Aids by Occupations

Where companies provided Production Equipment for training (37%), it was utilized mainly to train Blue Collar Workers (68%) and least to train higher level workers, such as Professionals (5%). Written Materials, made available by firms in only 19% of instances, were used to train higher level workers rather than lower ones (e.g., Blue Collar, 23%).

These relationships seem reasonable from a relevance standpoint. Lower status workers were trained mostly by means of Experiential Methods of Instruction, for which production equipments constitute a basic instructional aid. Conversely, higher status workers tended to participate in Seminars and Conferences, for which it is more common to hand out Written materials.

c. Workers' Occupations by Instructors

Table I.34 indicates that one-fifth of the instructors were non-company personnel and four-fifths were company employees. In

general, the tendency was to train workers in lower status occupations through employees, and those in higher level occupations through non-company instructors. In the majority of cases, Blue Collar Workers were trained by Department Heads (64%) or General Managers (59%), and in fewer instances by non-company instructors (39%).

Instructors	Occupations						
	Experienced	Professionals	Top Management	White Collar	Blue Collar	Gamma	N
General Manager	19	2%	22%	17%	59%	(-0.09)	1497
Department Head	23	8	8	21	64	(-0.16)	1499
Technical Company Personnel	13	10	17	21	52	(0.15)	1499
Non-Company Personnel	20	6	18	38	39	(0.24)	1498

Table I.34 : Instructors by Workers' Occupations

d. Levels of Education Wrokers acquired While Employed in Present Firm by Raise Workers received.

In order to study the relationships between the improvement in years of education workers attained while employed in the present firm and the increase of salaries they received since the last training program, the variable EDDIFF was created. EDDIFF represents the educational difference, in number of years of schooling between the workers' educational levels: (i) at the time they were first employed by the firm (EDATIN), and (ii) at the time the survey was conducted (EDWICO).

EDDIFF Improvement of educational level (Number of Years)	RAISE (Colones per month) 0	1-50	51+	Totals
None	51%	28%	9%	88%
		37%		
Three years at least	6	3	3	12
		6%		
Totals	57%	31%	12%	100%
		43%		

[N = 1485, γ = 0.15]

Table I.35: Levels of Education Workers Attained While Working in Present Firm by Raise Workers Received

Additional years of education attained tended to be associated weakly (γ = 0.15) with improved income status of workers employed in the sampled organizations. The great majority (88%) did not improve their educational status.

5.0 Multivariate Analysis: Regression & Canonical

This section describes the multiple variable analysis of data from the Worker-Employer Survey. Many of the relationships have already been commented upon in the preceding sections on Univariate and Bivariate analysis. Therefore, the main purpose of this analysis is to examine how the simple or zero-order relationship between two variables is affected by the influence of additional variables.

To accomplish the identification of direct and indirect (or mediated) relationships, we suggest a general model of relationships among variables in the study. The theoretical basis for the model has been described in the Introduction. In that statement, relevance is defined as a relationship between objectives and ensuing events in the generation of educational outputs and outcomes that result in the achievement of those objectives. For this study, the general objectives have to do with the training of workers to meet the productivity needs of industry and commerce in the economy of El Salvador. The study makes several assumptions. First, it is assumed that employers do in fact attempt to increase productivity. Second, it is assumed that employers reward increased worker productivity by giving them raises in salary. Third, the study assumes that individual firms included in the study have the technical and legal competence to create training programs that will result in increased productivity.

The model we propose states that increased worker productivity should be the direct outcome of learning skills associated with production. The learning of skills occurs as workers participate in training programs designed to teach these skills. That participation is possible to the

extent that firms create training programs, either located within the firm itself, or conducted outside the company. Firms are more likely to create training facilities and programs when employers are convinced of the need for their workers to obtain skills associated with productivity. Finally, the model says that this is most likely to occur in large firms in the modern sector, where the demands for training should be greatest. If these relationships hold, then the worker-training system of El Salvador (as described in this study) can be said to be relevant.

The system would be considered to have serious irrelevancies if, for example, it were shown that the relationships between learning variables and the productivity measure were the result of a third variable. For example, if it were shown that both learning and productivity increases can be accounted for by the size of the firm, and that learning has no direct effect on productivity if we take firm size into account, then we can not conclude that the learning that occurs is relevant for productivity. Or, if it is shown that employers raise salaries irrespective of the kind of training their workers receive, then the training received by workers could be considered not relevant for productivity. These kinds of conclusions can best be drawn from a multivariate analysis.

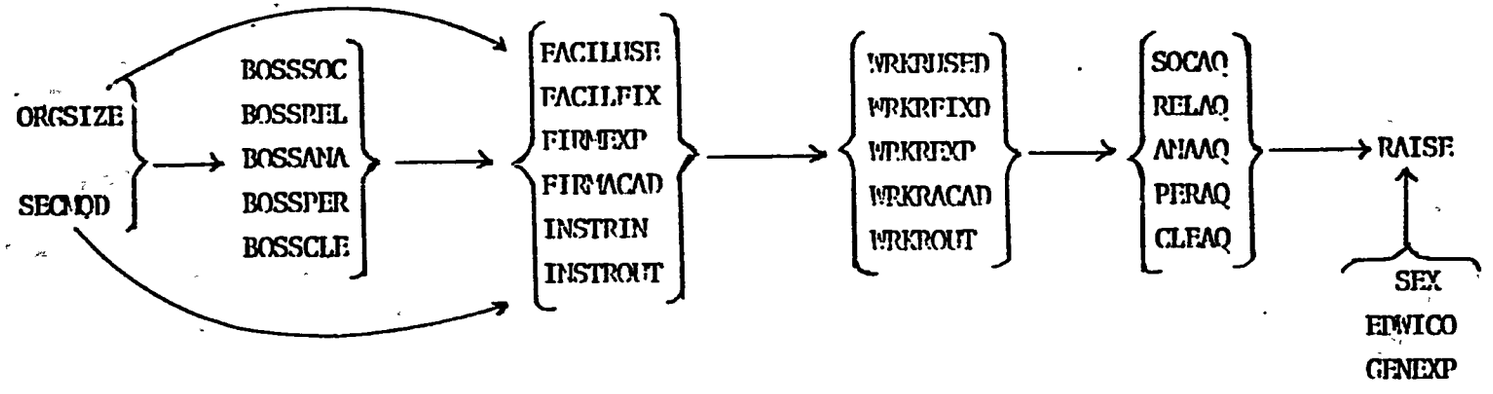
5.1 Definition of Variables

Although most of the variables used in the model have been described earlier, we review them once again quickly for the purposes of clarity in the presentation of results. Figure I.4 presents the acronyms used to identify the variables, arranged in the sequence used to test the relevance of the training system. Lines with arrowheads are used to represent the

Figure I.4

Variables Used in the Multivariate Analysis Arranged in the Sequence of the General Model

(Worker and Firm Variables Combined)



presumed direction of causality. Each worker questionnaire was matched with its corresponding employer questionnaire to build a file of workers that includes not only workers' responses but also their firm's attributes.

ORGSIZE is a measure of thesize of the firm in terms of number of employees. SECMOD refers to the degree of modernity of the firm. (All firms classified as manufacturing or finance are included in the "modern" group and scored as 1; all others are considered as "traditional" and scored as 0)

The next five variables are based on what employers feel are the skills requered by their workers. BOSSOC refers to social skills, BOSSREL to perceptions of need for relationship skills, BOSSCLE refers to analytical skills, BOSSPER to perceptual skills, and BOSSCLE to clerical skills. The employer's perception of his workers' need for training is hypothesized to be a direct result of ORGSIZE and SECMOD, i.e., in larger and modern firms perceptions of skills required will be higher than in smaller and less modern firms, because modern firms are more likely to use technologies that require trained workers.

The next set of six variables measures characteristics of the training program created in the firm. The first two variables attempt to distinguish between facilities that are used in the training process (FACILUSE) and those that are relatively fixed or durable (FACILFIX). Firms differ in the extent to which their training programs are essentially experiential in nature (FIRMEXP), and the extent to which they have a strong academic component (FIRMACAD). Firms can use their own personnel for training (INSTRIN) or can go outside to public or private training agencies (INSTROUT). It is hypothesized that with increased size and modernity, firms will

have more of all kinds of training available to their employees.

The following set of variables is designed to match the firm training programs. (WRKREXP adds work based methods and WRKRACAD adds together academic methods. WRKROUT combines measures of training within and outside the firm, and is scaled from inside to outside, low to high.

The next set of variables measures the worker's perception of the extent to which he or she has acquired skills as a result of a training program. These scales measure the same skills as included in the set of perceptual measures for the employers (BOSSOC, etc.)

RAISE is a simple measure based on answers to the question of whether the worker has received a raise within the past twelve months, and the amount of th raise received. EDWICO is, it will be recalled, a measure of the years of education attained by the employee. GENEXP measures the total number of years of work experience of the worker.

5.2 Definition of Occupational Groups

Because the different occupational groups vary significantly in their scores on the variables defined above, we divided the sample into four categories. In the first group we combined Professionals and Managers, to provide a group of reasonable size for the purposes of the analysis. The category Manager includes people running large firms who have high levels of education, as well as the small shopkeeper who is a "self-made man." Similarly the professional group includes the engineer and the accountant with only high school training. This group is labelled PROFMGMT.

The second group is the whitecollar category (WHCOLLAR) most of whom are secretaries, typists and clerks in commercial firms and government.

The third occupational grouping combined those workers previously classified as skilled, or semi-skilled. Labelled as SKILSEMI, this grouping is fairly homogeneous, at least in terms of job titles. The final occupational grouping is that of unskilled workers (UNSKIL).

5.3 Differences Between the Occupational Groups

Tables I.36 through I.39 present the means and standard deviations of the variables used in the multiple variable analysis, for each of the four occupational categories.

The results indicate that skilled and semi-skilled workers come from larger firms than do unskilled or white collar workers. About 46 percent of the unskilled workers come from modern sector (industrial) enterprises, compared to only 20 percent of the white collar workers, and 11 percent of the professionals and managers. Employers' perceptions of training needs are highest in firms with unskilled, skilled and white collar workers. Perceptions are lowest for professionals and managers. This group also tends to be located in firms that do not provide as much in the way of training facilities and opportunities, as is provided in firms with white collar and skilled workers. Firms with unskilled workers provide less in the way of training than do those with more skilled workers.

Skilled and unskilled workers are more likely to report training experiences of all kinds than are those in the PROFMGMT and WHCOLLAR categories. The average years of education for professionals and managers is lower than that for white collar workers, perhaps a result of having included self-taught "professionals" in the first category.

5.4 Simple Correlations Among Variables

Tables I.40 through I.43 present the zero-order correlation matrices

Table I.36

Means and Standard Deviations
on Variables Included in the Multivariate Analysis

PROFMGMT

VARIABLE	MEAN	STANDARD DEV	CASES
ORGSIZE	3.2460	2.0223	187
SECMOD	0.1053	0.3074	323
BOSSOC	1.5511	1.7884	323
BOSSREL	1.6347	1.7560	323
BOSSANA	1.0774	1.5006	323
BOSSPER	1.0000	1.3943	323
BOSSCLE	1.2755	1.6021	323
FACILUSE	0.7245	0.8533	323
FACILFIX	1.8019	2.1024	323
FIRMEXP	0.8483	0.9450	323
FIRMACAD	0.8854	1.3360	323
INSTRIN	0.5387	0.5295	323
INSTROUT	0.2105	0.4083	323
WRKRFIXD	0.9783	0.8092	323
WRKRUSED	0.5666	0.7294	323
WRKREXP	1.1362	0.5345	323
WRKRACAD	0.6223	0.8915	323
WRKROUT	0.8452	0.8710	323
SOCAQ	1.8978	1.5012	323
RELAQ	2.2043	1.4322	323
ANAAQ	1.0248	1.2079	323
PERAQ	1.7988	1.1172	323
CLEAQ	1.6347	1.3683	323
RAISE	1.0978	1.5447	317
EDWICO	9.4396	4.6397	323
SEX	1.3313	0.4714	323
GENEXP	14.3115	11.5873	321
FRMFACIL	4.2601	4.7998	323
INOUT	0.6718	0.8175	323
BOSSPCPN	6.5387	6.9560	323
WKRFACIL	1.5449	1.3445	323
SKILLSAQ	4.9628	4.0957	323

Table I.37

Means and Standard Deviations
on Variables Included in the Multivariate Analysis

WHCOLLAR

VARIABLE	MEAN	STANDARD DEVIATION	CASES
ORGSIZE	2.8705	1.6859	278
SECMOD	0.1988	0.3997	347
BOSSOC	2.1614	1.6155	347
BOSSREL	2.3516	1.5776	347
BOSSANA	0.8847	0.9816	347
BOSSPER	1.2421	1.1298	347
BOSSCLE	2.0893	1.5823	347
FACILUSE	0.9280	0.7626	347
FACILFIX	2.4352	1.7857	347
FIRMEXP	1.1095	0.7971	347
FIRMACAD	1.1787	1.2868	347
INSTRIN	0.4697	0.5112	347
INSTROUT	0.3170	0.4660	347
WRKRFIXD	1.0490	0.7530	347
WRKRUSED	0.8127	0.7843	347
WRKREXP	1.2622	0.5298	347
WRKRACAD	0.6916	0.8899	347
WRKROUT	0.9510	0.8705	347
SOCAQ	1.7637	1.5419	347
RELAQ	2.2507	1.4793	347
ANAAQ	1.0634	1.2124	347
PERAQ	1.4294	1.0466	347
CLEAQ	2.0461	1.4578	347
RAISE	1.1831	1.6049	344
EDWICO	11.5735	2.8472	347
SEX	1.5331	0.4996	347
GENEXP	12.6081	10.8958	347
FRMFACIL	5.6513	3.8131	347
INOUT	0.8473	0.8617	347
BOSSPCPN	8.7291	5.2681	347
WKRFACIL	1.8617	1.2462	347
SKILLSAQ	5.6945	3.9129	347

Table I.38

Means and Standard Deviations
on Variables Included in the Multivariate Analysis

SKILSEMI

VARIABLE	MEAN	STANDARD DEVIATION	CASES
ORGSIZE	3.5370	1.9505	257
SECMOD	0.4814	0.5005	295
BOSSOC	2.4169	1.5603	295
BOSSREL	1.7932	1.2155	295
BOSSANA	0.8915	1.0794	295
BOSSPER	2.2814	1.3748	295
BOSSCLE	1.7051	1.5156	295
FACILUSE	1.1661	0.8429	295
FACILFIX	3.0237	1.9716	295
FIRMEXP	1.2780	0.9058	295
FIRMACAD	1.3458	1.3835	295
INSTRIN	0.5864	0.5136	295
INSTROUT	0.1831	0.3874	295
WRKRFIXD	1.4203	0.7140	295
WRKRUSED	0.4441	0.5798	295
WRKREXP	1.2610	0.5114	295
WRKRACAD	0.3220	0.5959	295
WRKROUT	0.9085	0.8300	295
SOCAQ	1.2407	1.3701	295
RELAQ	1.2237	1.3264	295
ANAAQ	0.9797	1.0431	295
PERAQ	2.2814	1.0329	295
CLEAQ	1.0441	1.2350	295
RAISE	0.8741	1.2989	294
EDWICO	7.2847	2.6980	295
SEX	1.1695	0.3758	295
GENEXP	15.3525	11.5437	295
FRMFACIL	6.8136	4.5389	295
INOUT	0.5966	0.7932	295
BOSSPCPN	9.0881	4.9369	295
WKRFACIL	1.8644	0.9838	295
SKILLSAQ	2.2068	3.5525	295

Table I.39

Means and Standard Deviations
on Variables Included in the Multivariate Analysis

UNSKIL

VARIABLE	MEAN	STANDARD DEVIATION	CASES
ORGSIZE	2.9226	1.8267	491
SECMOD	0.4569	0.4986	534
BOSSOC	2.2715	1.5854	534
BOSSREL	1.7491	1.3026	534
BOSSANA	0.5618	0.9060	534
BOSSPER	1.9045	1.3969	534
BOSSCLE	1.7022	1.3912	534
FACILUSE	0.9551	0.8498	534
FACILFIX	2.3539	1.8398	534
FIRMEXP	1.0449	0.8342	534
FIRMACAD	0.9738	1.2611	534
INSTRIN	0.6030	0.5085	534
INSTROUT	0.1124	0.3161	534
WRKRFIXD	1.1199	0.7174	534
WRKRUSED	0.3652	0.5194	534
WRKREXP	1.1667	0.5165	534
WRKRACAD	0.2378	0.5212	534
WRKROUT	0.7903	0.7559	534
SOCAQ	1.3858	1.4225	534
RELAQ	1.3446	1.2970	534
ANAAQ	0.4925	0.7766	534
PERAQ	2.3614	0.9870	534
CLEAQ	1.1330	1.2171	534
RAISE	0.7211	1.0428	527
EDWICO	5.3895	3.3149	534
SEX	1.2828	0.4549	534
GENEXP	15.5706	12.1914	531
FRMFACIL	5.3277	4.0991	534
INOUT	0.5094	0.6977	534
BOSSPCPN	8.1891	4.8732	534
WKRFACIL	1.4850	0.9928	534
SKILLSAQ	1.9944	3.6751	534

Table I.40 Correlation Matrix for PRISM

	ORGSIZE	SECMOD	BOSSOC	BOSSREL	BOSSANA	BOSSPER	BOSSCLE	FACILUSE	FACILFIX	FIRMEXP	FIRMACAD	INSTRIN
ORGSIZE	1.00000	0.34122	0.31883	0.25726	0.47518	0.17671	0.01505	0.70862	0.79418	0.42367	0.66745	0.04399
SECMOD	0.34122	1.00000	0.24442	0.19230	0.38628	0.21739	0.26886	0.33589	0.32072	0.23690	0.21852	0.07031
BOSSOC	0.31883	0.24442	1.00000	0.90684	0.65524	0.57040	0.68388	0.64720	0.71301	0.70929	0.56459	0.12172
BOSSREL	0.25726	0.19230	0.90684	1.00000	0.65309	0.62279	0.70817	0.64349	0.66618	0.65145	0.49440	0.08540
BOSSANA	0.47518	0.38628	0.65524	0.65309	1.00000	0.59521	0.66026	0.58180	0.60928	0.51857	0.51408	0.14280
BOSSPER	0.17671	0.21739	0.57040	0.62279	0.59521	1.00000	0.72155	0.48287	0.48521	0.51381	0.37010	0.15986
BOSSCLE	0.01505	0.26886	0.68388	0.70817	0.66026	0.72155	1.00000	0.44188	0.47357	0.51384	0.38913	0.08075
FACILUSE	0.70862	0.33589	0.64720	0.64349	0.58180	0.48287	0.44188	1.00000	0.84883	0.68741	0.69681	0.11647
FACILFIX	0.79418	0.32072	0.71301	0.66618	0.60928	0.48521	0.47357	0.84883	1.00000	0.73510	0.86754	0.12130
FIRMEXP	0.42367	0.23690	0.70929	0.65145	0.51857	0.51381	0.51384	0.68741	0.73510	1.00000	0.66262	0.09556
FIRMACAD	0.66745	0.21852	0.56459	0.49440	0.51408	0.37010	0.38913	0.69681	0.86754	0.66262	1.00000	0.11385
INSTRIN	0.04399	0.07031	0.12172	0.08540	0.14280	0.15986	0.08075	0.11647	0.12130	0.09556	0.11385	1.00000
INSTROUT	0.03324	0.07033	0.10431	0.10327	0.04935	0.02727	0.10095	0.10461	0.17898	0.15546	0.15251	-0.51196
WKRFIXD	0.21387	0.13406	0.29154	0.27635	0.22134	0.12111	0.07868	0.27916	0.33335	0.27184	0.29644	0.34627
WKRUSED	0.23874	0.14873	0.26223	0.23241	0.24354	0.04886	0.09189	0.24161	0.30024	0.21969	0.23889	0.17223
WKREXP	0.16845	0.13928	0.06742	0.03333	0.02940	-0.09584	-0.04034	0.11659	0.06554	0.00415	0.01322	0.05813
WKRACAD	0.25708	0.11154	0.34716	0.32620	0.40960	0.20987	0.24704	0.30365	0.38080	0.24142	0.38074	-0.04131
WKROUT	0.02574	-0.02015	0.07487	0.08474	0.13751	0.07672	0.09298	0.12629	0.09852	0.13363	0.05944	-0.24288
SOCAQ	0.04191	0.01665	0.22000	0.18019	0.00628	0.14244	0.09568	0.14039	0.18446	0.10725	0.14899	0.34297
RELAQ	-0.01831	0.07092	0.17293	0.15449	-0.02183	0.06221	0.11209	0.07670	0.13106	0.08951	0.10153	0.23117
ANAAQ	0.32319	0.18538	0.33869	0.34543	0.38959	0.18624	0.20669	0.41942	0.44830	0.34066	0.37128	-0.04035
PERAQ	-0.05918	-0.00143	-0.21011	-0.16740	-0.17592	-0.05702	-0.09558	-0.14304	-0.28081	-0.20265	-0.20066	0.02108
CLEAQ	0.16678	0.08433	0.21451	0.16788	0.04406	0.13836	0.14523	0.17949	0.18058	0.22359	0.16908	0.19533
RAISE	0.20983	0.15650	0.21684	0.13561	0.08830	0.02840	0.05826	0.18228	0.24489	0.20821	0.17242	0.14735
EDWICO	0.19899	0.10682	0.35584	0.34492	0.38629	0.22467	0.30411	0.38994	0.43144	0.36586	0.38841	0.04994
SEX	0.07077	-0.15568	-0.04408	-0.04468	-0.04075	0.08505	0.00624	-0.05031	-0.03697	0.00859	0.05058	0.14134
GENEXP	0.12537	-0.02507	-0.13839	-0.13436	-0.11749	-0.14853	-0.18541	-0.13696	-0.15407	-0.15175	-0.13753	-0.16470
FRMFACIL	0.80669	0.30767	0.72419	0.68082	0.61552	0.50257	0.49548	0.87890	0.97516	0.82554	0.91271	0.12434
INOUT	-0.01060	-0.01041	-0.02673	-0.00373	-0.06783	-0.08991	-0.00188	-0.02318	0.01084	0.01576	0.00244	-0.90328
BOSSPCPN	0.34011	0.30022	0.89923	0.91443	0.82044	0.79891	0.87199	0.65292	0.69429	0.68082	0.54468	0.13430
WKRFACIL	0.25293	0.16137	0.31773	0.29240	0.26533	0.09940	0.09732	0.29989	0.36351	0.28279	0.30801	0.30184
SKILLSAQ	0.18863	0.11413	0.36997	0.32369	0.17227	0.19088	0.20981	0.30095	0.36376	0.30183	0.31080	0.25415

	INSTROUT	WKRFIXD	WKRUSED	WKREXP	WKRACAD	WKROUT	SOCAQ	RELAQ	ANAAQ	PERAQ	CLEAQ	RAISE
ORGSIZE	0.03324	0.21387	0.23874	0.16845	0.25708	0.02574	0.04191	-0.01831	0.32319	-0.05918	0.16678	0.20983
SECMOD	0.07033	0.13406	0.14873	0.13928	0.11154	-0.02015	0.01665	0.07092	0.18538	-0.00143	0.08433	0.15650
BOSSOC	0.10431	0.29154	0.26223	0.06742	0.34716	0.07487	0.22000	0.17293	0.33869	-0.21011	0.21451	0.21684
BOSSREL	0.10327	0.27635	0.23241	0.03333	0.32620	0.08474	0.18019	0.15449	0.34543	-0.16740	0.16788	0.13561
BOSSANA	0.04935	0.22134	0.24354	0.02940	0.40960	0.13751	0.00628	-0.02183	0.38959	-0.17592	0.04406	0.08830
BOSSPER	0.02727	0.12111	0.04886	-0.09584	0.20987	0.07672	0.14244	0.06221	0.18624	-0.05702	0.13836	0.02840
BOSSCLE	0.10095	0.07868	0.09189	-0.04034	0.24704	0.09298	0.09568	0.11209	0.20669	-0.09558	0.14523	0.05826
FACILUSE	0.10461	0.27916	0.24161	0.11659	0.30365	0.12629	0.14039	0.07670	0.41942	-0.14304	0.17949	0.18228
FACILFIX	0.17898	0.33335	0.30024	0.06554	0.38080	0.09852	0.18446	0.13106	0.44830	-0.20081	0.18958	0.24489
FIRMEXP	0.15546	0.27184	0.21969	0.00415	0.24142	0.13363	0.10725	0.08951	0.34066	-0.20255	0.22359	0.20821
FIRMACAD	0.15251	0.29644	0.23889	0.01322	0.38074	0.05944	0.14899	0.10153	0.37128	-0.20066	0.16908	0.17242
INSTRIN	-0.51196	0.34627	0.17223	0.05813	-0.04131	-0.24288	0.34297	0.23117	-0.04035	0.02108	0.19533	0.14735
INSTROUT	1.00000	-0.13654	-0.00549	-0.01797	0.41535	0.41503	-0.06613	0.01118	0.23497	-0.22681	-0.00088	0.05235
WKRFIXD	-0.13654	1.00000	0.52597	0.13608	0.22969	-0.09731	0.15924	0.16729	0.28651	-0.00140	0.12746	0.21872
WKRUSED	-0.00549	0.52597	1.00000	0.12801	0.36831	-0.02284	0.10692	0.09693	0.27659	-0.10356	0.08356	0.13763
WKREXP	-0.01797	0.13608	0.12801	1.00000	0.01707	0.00541	0.02901	0.02843	0.08615	0.02524	0.11920	0.17063
WKRACAD	0.41535	0.22969	0.36831	0.01707	1.00000	0.27643	0.08942	0.10928	0.37786	-0.29793	0.06729	0.18173
WKROUT	0.41503	-0.09731	-0.02284	0.00541	0.27643	1.00000	-0.08102	-0.10651	0.26343	-0.04807	-0.05542	0.03048
SOCAQ	-0.06613	0.15924	0.10692	0.02901	0.08942	-0.08102	1.00000	0.60341	0.07847	-0.08081	0.45651	0.15881
RELAQ	0.01118	0.16729	0.09693	0.02843	0.10928	-0.10651	0.60341	1.00000	0.08862	-0.08485	0.42645	0.21417
ANAAQ	0.23497	0.28651	0.27659	0.08615	0.37786	0.26343	0.07847	0.08862	1.00000	-0.04692	0.19339	0.07784
PERAQ	-0.22681	-0.00140	-0.10356	0.02524	-0.29793	-0.04807	-0.08081	-0.08485	-0.04692	1.00000	0.04927	-0.10397
CLEAQ	-0.00088	0.12746	0.08356	0.11920	0.06729	-0.05542	0.45651	0.42645	0.19339	0.04927	1.00000	0.24798
RAISE	0.05235	0.21872	0.13763	0.17063	0.18173	0.03048	0.15881	0.21417	0.07784	-0.10397	0.24798	1.00000
EDWICO	0.30836	0.28296	0.25011	0.03839	0.49902	0.16291	0.17100	0.29536	0.42863	-0.31479	0.29344	0.21711
SEX	-0.08917	-0.04625	-0.19529	-0.04407	-0.13734	-0.12633	0.10064	0.14322	-0.24353	-0.02634	0.09191	-0.04928
GENEXP	0.02887	-0.06132	0.14032	0.06208	0.03704	0.04949	-0.20166	-0.21917	0.07001	0.04859	-0.18107	-0.06466
FRMFACIL	0.17006	0.33169	0.28422	0.05393	0.37430	0.10846	0.16835	0.11693	0.44135	-0.20912	0.20602	0.22854
INOUT	0.83094	-0.29245	-0.11428	-0.04662	0.23420	0.36459	-0.25515	-0.14413	0.14349	-0.12693	-0.12694	-0.06903
BOSSPCPN	0.09225	0.23491	0.20959	0.00359	0.35893	0.10710	0.15399	0.11704	0.34326	-0.16783	0.16822	0.12813
WKRFACIL	-0.08515	0.88719	0.85906	0.15135	0.33805	-0.07096	0.15384	0.15327	0.32248	-0.05702	0.12204	0.20621
SKILLSAQ	0.11054	0.24432	0.21082	0.07892	0.28618	0.00535	0.77523	0.76260	0.43208	-0.32945	0.69413	0.26870

	EDWICO	SEX	GENEXP	FRMFACIL	INOUT	BOSSPCPN	WKRFACIL	SKILLSAQ
ORGSIZE	0.19899	0.07077	0.12537	0.80669	-0.01060	0.34011	0.25293	0.18863
SECMOD	0.10682	-0.15568	-0.02507	0.30767	-0.01041	0.30022	0.16137	0.11413
BOSSOC	0.35584	-0.04408	-0.13839	0.72419	-0.02673	0.89923	0.31773	0.36997
BOSSREL	0.34492	-0.04468	-0.13436	0.68082	-0.00373	0.91443	0.29240	0.32369
BOSSANA	0.38629	-0.04075	-0.11749	0.61552	-0.06783	0.82044	0.26533	0.17227
BOSSPER	0.22467	0.08505	-0.14853	0.50257	-0.08991	0.79891	0.09940	0.19088
BOSSCLE	0.30411	0.00624	-0.18541	0.49548	-0.00188	0.87199	0.09732	0.20981
FACILUSE	0.38994	-0.05031	-0.13696	0.87890	-0.02318	0.65292	0.29989	0.30095
FACILFIX	0.43144	-0.03697	-0.15407	0.97516	0.01084	0.69429	0.36351	0.36376
FIRMEXP	0.36586	0.00859	-0.15175	0.82554	0.01576	0.68082	0.29279	0.30183
FIRMACAD	0.38841	0.05058	-0.13753	0.91271	0.00244	0.54468	0.30801	0.31080
INSTRIN	0.04994	0.14134	-0.16470	0.12434	-0.90328	0.13430	0.30184	0.25415
INSTROUT	0.30836	-0.08917	0.02887	0.17006	0.83094	0.09225	-0.08515	0.11054
WKRFIXD	0.28296	-0.04625	-0.06132	0.33169	-0.29245	0.23491	0.88719	0.24432
WKRUSED	0.25011	-0.19529	0.14032	0.28422	-0.11428	0.20959	0.85906	0.21082
WKREXP	0.03839	-0.04407	0.06208	0.05393	-0.04662	0.00359	0.15135	0.07892
WKRACAD	0.49902	-0.13734	0.03704	0.37430	0.23420	0.35893	0.33805	0.28618
WKROUT	0.16291	-0.12633	0.04949	0.10846	0.36459	0.10710	-0.07096	0.00535
SOCAQ	0.17100	0.10064	-0.20166	0.16835	-0.25515	0.15399	0.15384	0.77523
RELAQ	0.29536	0.14322	-0.21917	0.11693	-0.14413	0.11704	0.15327	0.76260
ANAAQ	0.42863	-0.24353	0.07001	0.44135	0.14349	0.34326	0.32248	0.43208
PERAQ	-0.31479	-0.02634	0.04859	-0.20912	-0.12693	-0.16783	-0.05702	-0.32945
CLEAQ	0.29344	0.09191	-0.18107	0.20602	-0.12694	0.16822	0.12204	0.69413
RAISE	0.21711	-0.04928	-0.06466	0.22854	-0.06903	0.12813	0.20621	0.26870
EDWICO	1.00000	-0.00432	-0.42130	0.43846	0.12167	0.37697	0.30598	0.47627
SEX	-0.00432	1.00000	-0.22847	-0.00937	-0.13607	-0.01292	-0.13378	0.05304
GENEXP	-0.42130	-0.22847	1.00000	-0.16028	0.12108	-0.16726	0.03926	-0.20349
FRMFACIL	0.43846	-0.00937	-0.16028	1.00000	0.00441	0.70570	0.35382	0.35863
INOUT	0.12167	-0.13607	0.12108	0.00441	1.00000	-0.04090	-0.23801	-0.10939
BOSSPCPN	0.37697	-0.01292	-0.16726	0.70570	-0.04090	1.00000	0.25509	0.30054
	[illegible]	[illegible]	0.03926	0.35382	-0.23801	0.25509	1.00000	0.26141
	[illegible]	[illegible]	[illegible]	[illegible]	-0.10939	[illegible]	0.26141	1.00000

Table I.41: Correlation Matrix for WHCOLLAR

	ORGSIZE	SECMOD	BOSSOC	BOSSREL	BOSSANA	BOSSPER	BOSSCLE	FACILUSE	FACILFIX	FIRMEXP	FIRMACAD	INSTRIN
ORGSIZE	1.00000	0.34122	0.31883	0.25726	0.47518	0.17671	0.01505	0.70862	0.75418	0.42367	0.66745	0.04399
SECMOD	0.34122	1.00000	0.24442	0.19230	0.38028	0.21739	0.20886	0.33589	0.32072	0.23695	0.21852	0.07031
BOSSOC	0.31883	0.24442	1.00000	0.90684	0.65524	0.57040	0.68388	0.64720	0.71301	0.70929	0.56459	0.12172
BOSSREL	0.25726	0.19230	0.90684	1.00000	0.65309	0.62279	0.79817	0.64349	0.66616	0.65145	0.49846	0.08540
BOSSANA	0.47518	0.38028	0.65524	0.65309	1.00000	0.59521	0.66026	0.58180	0.60926	0.51857	0.51408	0.14280
BOSSPER	0.17671	0.21739	0.57040	0.62279	0.59521	1.00000	0.72155	0.48287	0.48521	0.51381	0.37310	0.15986
BOSSCLE	0.01595	0.20886	0.68388	0.70817	0.66020	0.72155	1.00000	0.44188	0.47357	0.51384	0.38913	0.08075
FACILUSE	0.70862	0.33589	0.64720	0.64349	0.58180	0.49287	0.44185	1.00000	0.84683	0.68741	0.69681	0.11047
FACILFIX	0.79418	0.32072	0.71301	0.66610	0.60928	0.48521	0.47357	0.84833	1.00000	0.73516	0.86754	0.12136
FIRMEXP	0.42367	0.23690	0.70929	0.65145	0.51857	0.51381	0.51384	0.68741	0.73510	1.00000	0.66262	0.09556
FIRMACAD	0.66745	0.21852	0.56459	0.49440	0.51408	0.37010	0.39913	0.69681	0.86754	0.66262	1.00000	0.11385
INSTRIN	0.04399	0.07031	0.12172	0.08541	0.14283	0.15986	0.08675	0.11047	0.12130	0.09556	0.11385	1.00000
INSTROUT	0.03324	0.07033	0.10431	0.10327	0.04935	0.02727	0.10695	0.10461	0.17898	0.15540	0.15251	-0.51186
WRKRFIXD	0.21347	0.13406	0.29154	0.27635	0.22134	0.12111	0.07088	0.27910	0.32335	0.27184	0.29044	0.34627
WRKRUSED	0.23874	0.14873	0.20223	0.23241	0.24354	0.04806	0.09189	0.24161	0.30024	0.21309	0.23889	0.17223
WRKREXP	0.16845	0.13928	0.00742	0.03333	0.02945	-0.09584	-0.04934	0.11657	0.06554	0.00415	0.01322	0.05813
WRKRACAD	0.25798	0.11154	0.34716	0.32620	0.40960	0.20987	0.24704	0.30305	0.38060	0.24142	0.30074	-0.04131
WRKROUT	0.02574	-0.02015	0.07487	0.08474	0.13751	0.07672	0.09298	0.12629	0.05852	0.13363	0.05344	-0.24288
SOCAQ	0.04191	0.01665	0.22609	0.18019	0.00628	0.14244	0.09568	0.14039	0.16446	0.10725	0.14899	0.34297
RELAQ	-0.01831	0.07092	0.17293	0.15449	-0.02183	0.00221	0.11209	0.07073	0.13106	0.08951	0.10153	0.23117
ANAAQ	0.32319	0.16535	0.33869	0.34543	0.38959	0.18024	0.26669	0.41942	0.44830	0.34066	0.37125	-0.08036
PERAQ	-0.05918	-0.00143	-0.21011	-0.16740	-0.17592	-0.05782	-0.09558	-0.14304	-0.20181	-0.20255	-0.20066	0.02108
CLEAQ	0.16678	0.08433	0.21451	0.16788	0.04406	0.13836	0.14523	0.17949	0.16958	0.22359	0.16900	0.19533
RAISE	0.20993	0.15053	0.21694	0.13561	0.08030	0.02342	0.05826	0.18228	0.24409	0.20821	0.17242	0.14735
EDWICO	0.19899	0.10682	0.35584	0.34492	0.38629	0.22407	0.30411	0.38994	0.43144	0.36386	0.38841	0.04996
SEX	0.07077	-0.15568	-0.04438	-0.04468	-0.04075	0.08505	0.03624	-0.05031	-0.03697	0.06459	0.05058	0.14134
GENEXP	0.12537	-0.02507	-0.13839	-0.13436	-0.11749	-0.14853	-0.18541	-0.13696	-0.15407	-0.15175	-0.13753	-0.16470
FRMFACIL	0.83669	0.30767	0.72419	0.68084	0.61552	0.59257	0.43568	0.87893	0.97516	0.82554	0.91271	0.12434
INOUT	-0.01066	-0.01041	-0.02673	-0.00373	-0.06783	-0.08991	-0.00188	-0.02318	0.01086	0.01576	0.00244	-0.00326
BOSSPCFN	0.34011	0.30022	0.89923	0.91443	0.82044	0.79891	0.87199	0.05292	0.65429	0.08032	0.54468	0.13430
WKRFACIL	0.25293	0.16137	0.31773	0.29240	0.26533	0.09940	0.09732	0.29504	0.36351	0.28279	0.30801	0.30184
SKILLSAQ	0.18863	0.11413	0.36997	0.32309	0.17227	0.19008	0.20281	0.30095	0.36376	0.30163	0.31086	0.25415

	INSTROUT	WRKRFIXD	WRKRUSED	WRKREXP	WRKRACAD	WRKROUT	SOCAQ	RELAQ	ANAAQ	PERAQ	CLEAQ	RAISE
ORGSIZE	0.03324	0.21387	0.23874	0.16845	0.25798	0.02574	0.04191	-0.01831	0.32319	-0.05918	0.16678	0.20983
SECMOD	0.07033	0.13406	0.14873	0.13928	0.11154	-0.02315	0.01665	0.07692	0.16535	-0.00143	0.08433	0.15650
BOSSOC	0.10431	0.29154	0.20223	0.00742	0.34716	0.07487	0.22609	0.17293	0.33869	-0.21511	0.21451	0.21604
BOSSREL	0.10327	0.27635	0.23241	0.03333	0.32620	0.08474	0.18019	0.15449	0.34543	-0.10740	0.10786	0.13561
BOSSANA	0.04935	0.22134	0.24354	0.02945	0.40960	0.13751	0.00628	-0.02183	0.38959	-0.17592	0.04406	0.08030
BOSSPER	0.02727	0.12111	0.04806	-0.09584	0.20987	0.07672	0.14244	0.06221	0.18024	-0.05782	0.13836	0.02340
BOSSCLE	0.10695	0.07088	0.09189	-0.04934	0.24704	0.09298	0.09568	0.11209	0.21669	-0.09558	0.14523	0.05826
FACILUSE	0.10461	0.27316	0.24161	0.11659	0.30305	0.12629	0.14039	0.07670	0.41942	-0.14304	0.17349	0.18228
FACILFIX	0.17898	0.33335	0.39024	0.06554	0.38080	0.09852	0.18446	0.13106	0.44630	-0.20081	0.18958	0.24409
FIRMEXP	0.15546	0.27184	0.21969	0.00413	0.24142	0.11363	0.10725	0.08951	0.34066	-0.20255	0.22359	0.20821
FIRMACAD	0.15251	0.29044	0.23889	0.01322	0.38074	0.05944	0.14899	0.10153	0.37125	-0.23066	0.16900	0.17242
INSTRIN	-0.51186	0.34627	0.17223	0.05813	-0.04131	-0.24288	0.34297	0.23117	-0.04035	0.02108	0.19533	0.14735
INSTROUT	1.00000	-0.13054	-0.00549	-0.01797	0.41535	0.41563	-0.06613	0.01118	0.23497	-0.22081	-0.00088	0.05235
WRKRFIXD	-0.13659	1.00000	0.52597	0.13860	0.22964	-0.09731	0.15924	0.16729	0.28651	-0.00141	0.12746	0.21872
WRKRUSED	-0.00549	0.52597	1.00000	0.12801	0.30831	-0.02384	0.10092	0.09693	0.27655	-0.10356	0.08356	0.13763
WRKREXP	-0.01797	0.13860	0.12401	1.00000	0.01707	0.00541	0.02901	0.02843	0.08615	0.02524	0.11920	0.17063
WRKRACAD	0.41515	0.22969	0.30931	0.01707	1.00000	0.27643	0.08942	0.10928	0.37766	-0.29793	0.06729	0.18173
WRKROUT	0.41523	-0.09731	-0.02284	0.00541	0.27643	1.00000	-0.08102	-0.10651	0.26343	-0.04807	-0.05542	0.03048
SOCAQ	-0.06613	0.15924	0.10692	0.02901	0.08942	-0.08102	1.00000	0.00341	0.37847	-0.08081	0.45651	0.15881
RELAQ	0.01118	0.16729	0.09693	0.02843	0.10928	-0.18051	0.00341	1.00000	0.08862	-0.08485	0.42645	0.21417
ANAAQ	0.23437	0.28651	0.27659	0.08615	0.37780	0.28343	0.07847	0.08852	1.00000	-0.04692	0.19339	0.07784
PERAQ	-0.22641	-0.00140	-0.10356	0.02524	-0.29793	-0.03807	-0.08081	-0.08485	-0.04692	1.00000	0.04927	-0.10397
CLEAQ	-0.05088	0.12746	0.08356	0.11922	0.06729	-0.05542	0.45651	0.42645	0.19339	0.04927	1.00000	0.24798
RAISE	0.05215	0.21872	0.13763	0.17063	0.18173	0.03348	0.15881	0.21417	0.07784	-0.10397	0.24798	1.00000
EDWICO	0.39835	0.24246	0.25011	0.03939	0.49932	0.16291	0.17100	0.29536	0.42863	-0.31479	0.29344	0.21711
SEX	-0.04917	-0.04025	-0.19529	-0.04407	-0.13734	-0.12433	0.10064	0.14322	-0.24353	-0.02034	0.09191	-0.04928
GENEXP	0.02817	-0.06132	0.14632	0.06208	0.03704	0.34949	-0.20166	-0.21917	0.37001	0.04859	-0.18167	-0.06466
FRMFACIL	0.17036	0.33169	0.28422	0.05391	0.37436	0.19846	0.16035	0.11693	0.44135	-0.20912	0.20602	0.22854
INOUT	0.81094	-0.29245	-0.11428	-0.04662	0.23420	0.36459	-0.25515	-0.14413	0.14349	-0.12093	-0.12694	-0.06903
BOSSPCFN	0.09225	0.23491	0.20959	0.00359	0.35893	0.10716	-0.15399	0.11704	0.34326	-0.10703	0.16822	0.12013
WKRFACIL	-0.08515	0.88719	0.85906	0.15135	0.33805	-0.07096	0.15384	0.15327	0.32248	-0.05702	0.12204	0.20621
SKILLSAQ	0.11034	0.24432	0.21682	0.07892	0.28618	0.00535	0.77523	0.70263	0.43208	-0.32345	0.09413	0.26870

	EDWICO	SEX	GENEXP	FRMFACIL	INOUT	BOSSPCFN	WKRFACIL	SKILLSAQ
ORGSIZE	0.19899	0.07077	0.12537	0.83663	-0.01066	0.34011	0.25293	0.18863
SECMOD	0.10682	-0.15568	-0.02507	0.30767	-0.01041	0.30022	0.16137	0.11413
BOSSOC	0.35584	-0.04438	-0.13839	0.72413	-0.02673	0.89923	0.31773	0.36997
BOSSREL	0.34432	-0.04468	-0.13436	0.68082	-0.00373	0.91443	0.29242	0.32309
BOSSANA	0.38629	-0.04075	-0.11749	0.61552	-0.06783	0.82044	0.26533	0.17227
BOSSPER	0.22467	0.08505	-0.14853	0.59257	-0.08991	0.79891	0.09940	0.19088
BOSSCLE	0.30411	0.00624	-0.18541	0.49548	-0.00188	0.87199	0.09732	0.20981
FACILUSE	0.38994	-0.05031	-0.13696	0.87890	-0.02318	0.05292	0.29909	0.30095
FACILFIX	0.43144	-0.03697	-0.15467	0.97516	0.01084	0.65429	0.36351	0.36376
FIRMEXP	0.36586	0.02859	-0.15175	0.82554	0.01576	0.08092	0.28279	0.30163
FIRMACAD	0.38841	0.05058	-0.13753	0.91271	0.00244	0.54468	0.30801	0.31083
INSTRIN	0.04996	0.14134	-0.16470	0.12434	-0.00328	0.13430	0.30183	0.25415
INSTROUT	0.39936	-0.08417	0.02897	0.17796	0.83054	0.09225	-0.08515	0.11054
WRKRFIXD	0.24236	-0.04025	-0.06132	0.33169	-0.29245	0.23491	0.88719	0.24432
WRKRUSED	0.25011	-0.19529	0.14032	0.28422	-0.11428	0.20459	0.85906	0.21082
WRKREXP	0.03939	-0.04407	0.06208	0.05393	-0.04662	0.00359	0.15135	0.07892
WRKRACAD	0.49932	-0.13734	0.03704	0.37437	0.23420	0.35893	0.33805	0.28618
WRKROUT	0.16211	-0.12433	0.04949	0.10846	0.36459	0.13716	-0.07096	0.00535
SOCAQ	0.17100	0.10064	-0.20166	0.16835	-0.25515	0.15399	0.15384	0.77523
RELAQ	0.29536	0.14322	-0.21917	0.11693	-0.14413	0.11704	0.15327	0.70263
ANAAQ	0.42851	-0.24353	0.37001	0.44135	0.14349	0.34326	0.32248	0.43205
PERAQ	-0.31479	-0.02034	0.04859	-0.22912	-0.12093	-0.10783	-0.05702	-0.32345
CLEAQ	0.29744	0.09191	-0.18167	[illegible]	[illegible]	0.16822	0.12204	0.09413
RAISE	0.21711	-0.04928	-0.06466	0.22834	-0.06903	0.12813	0.20621	0.26873
EDWICO	1.00000	-0.00432	-0.42130	0.43140	0.12167	0.37097	0.30598	0.47827
SEX	-0.00432	1.00000	-0.22647	[illegible]	-0.13067	-0.01292	-0.13378	0.35304
GENEXP	-0.42130	-0.22447	1.00000	[illegible]	[illegible]	-0.16726	[illegible]	-0.22344
FRMFACIL	0.43140	[illegible]	[illegible]	1.00000	[illegible]	0.73570	[illegible]	0.35863
INOUT	0.13107	-0.13067	0.12173	[illegible]	[illegible]	-0.04090	-0.21061	[illegible]
BOSSPCFN	0.37097	[illegible]	-0.10726	0.70570	[illegible]	1.00000	0.25514	[illegible]
WKRFACIL	0.30598	-0.11378	[illegible]	0.35942	-0.23081	[illegible]	1.00000	0.26141
SKILLSAQ	0.47827	[illegible]	-0.03349	0.35863	-0.10923	0.33035	0.26141	1.00000

Table I.42: Correlation Matrix for SKILSEMI

	ORGSIZE	SECMOD	BOSSOC	BOSSREL	BOSSANA	BOSSPER	BOSSCLE	FACILUSE	FACILFIX	FIRMEXP	FIRMACAD	INSTRIN
ORGSIZE	1.00000	0.40099	0.53157	-0.03000	0.02882	0.31927	0.29950	0.66106	0.74365	0.36761	0.71073	0.10049
SECMOD	0.40099	1.00000	0.44337	0.11385	0.10957	0.50948	0.33575	0.45486	0.46806	0.43913	0.34828	0.15516
BOSSOC	0.53157	0.44337	1.00000	0.56039	0.29354	0.71262	0.56855	0.59635	0.65356	0.49775	0.58691	0.11829
BOSSREL	-0.03000	0.11385	0.56039	1.00000	0.29913	0.45424	0.49298	0.12992	0.27030	0.20067	0.16604	0.08594
BOSSANA	0.02882	0.10957	0.29354	0.29913	1.00000	0.13794	1.00000	0.30401	0.24096	0.05182	0.46963	0.04765
BOSSPER	0.31927	0.50948	0.71262	0.45424	0.13794	1.00000	0.30278	0.49671	0.52835	0.46963	0.34980	0.12201
BOSSCLE	0.29950	0.33575	0.56855	0.49298	1.00000	0.30278	1.00000	0.29409	0.47701	0.34980	0.58979	0.08748
FACILUSE	0.66106	0.45486	0.59635	0.12992	0.30401	0.49671	0.29409	1.00000	0.79588	0.58979	0.65591	0.11208
FACILFIX	0.74365	0.46806	0.65356	0.27030	0.24096	0.52835	0.47701	0.79588	1.00000	0.65101	0.76632	0.08363
FIRMEXP	0.36761	0.43913	0.49775	0.20067	0.05182	0.46963	0.34980	0.58979	0.65101	1.00000	0.65047	0.05054
FIRMACAD	0.71073	0.34828	0.58691	0.16604	-0.06363	0.41007	0.52408	0.61855	0.76632	0.65047	1.00000	0.02481
INSTRIN	0.10049	0.15516	0.11829	0.08594	0.04765	0.12201	0.08748	0.11208	0.08363	0.05054	0.02481	1.00000
INSTROUT	-0.06708	-0.15778	-0.02541	0.08066	0.13714	-0.09704	0.02754	-0.01010	0.08337	0.07481	0.01478	-0.04143
WRKRFIXD	0.11846	0.16478	0.01923	-0.07587	0.01082	0.10088	0.02065	-0.00902	-0.01194	-0.07609	-0.03356	0.29944
WRKRUSED	0.11907	0.13598	0.12175	-0.03819	0.10441	0.08169	0.10697	0.14784	0.16333	0.15924	0.13868	0.11624
WRKREXP	0.24288	0.13202	0.25956	0.13636	0.13156	0.24350	0.12159	0.25415	0.19960	0.16591	0.16044	0.08663
WRKRACAD	0.03700	-0.01972	0.17702	0.25189	0.16554	0.09247	0.27498	0.09630	0.17586	0.08566	0.20278	0.10573
WRKROUT	-0.10856	-0.18016	-0.17530	-0.00534	0.06107	-0.21881	-0.01071	-0.05113	-0.03608	-0.03443	-0.03751	-0.29657
SOCAQ	-0.09005	-0.06039	0.13110	0.17907	0.04761	0.04338	0.13585	0.08013	0.05202	0.13502	0.03849	0.05976
RELAQ	-0.07763	0.01655	0.18487	0.25664	0.06690	0.05676	0.22413	0.12181	0.10462	0.12359	0.07262	-0.01351
ANAAQ	0.12339	-0.07260	0.09166	0.07983	0.20951	-0.03158	0.04137	0.08510	0.08624	0.06721	0.09681	0.12393
PERAQ	-0.00096	0.02005	0.01138	0.00044	-0.08236	0.07341	-0.06849	-0.01089	-0.05006	-0.03298	-0.04689	0.13674
CLEAQ	-0.13635	-0.15549	0.06280	0.20548	0.08014	-0.07744	0.20140	0.01582	0.02890	0.03462	-0.00298	0.09318
RAISE	-0.15350	-0.08991	-0.03304	0.00041	-0.03493	-0.03757	0.03521	-0.09596	-0.08285	-0.12120	-0.09891	-0.00692
EDWICO	0.14816	0.05566	0.16158	0.11240	-0.04192	-0.00792	0.26862	0.13170	0.20590	0.21528	0.29156	-0.04728
SEX	0.21478	0.28810	0.16510	-0.08682	-0.12222	0.16414	0.12985	0.19000	0.17358	0.22084	0.24016	0.00481
GENEXP	-0.18119	-0.33325	-0.07277	0.12593	0.12729	-0.01120	-0.10276	-0.02666	-0.10633	-0.15254	-0.22149	0.00348
FRMFACIL	0.76844	0.47984	0.67286	0.23220	0.15207	0.54046	0.49137	0.83765	0.95377	0.79449	0.89105	0.07479
INOUT	-0.09655	-0.17750	-0.08900	-0.01625	0.03612	-0.12638	-0.04271	-0.07750	-0.01343	-0.03750	-0.00885	-0.01103
BOSSPCPN	0.40551	0.43703	0.89116	0.76653	0.46648	0.73854	0.72308	0.51553	0.61935	0.45621	0.48754	0.12079
WKRFACIL	0.15366	0.20207	0.08570	0.15621	0.25963	0.15667	0.01961	0.23815	0.11004	0.10905	0.13958	0.08298
SKILLSAQ	-0.07374	-0.09826	0.15621	0.25963	0.15667	-0.01961	0.23815	0.11004	0.10905	0.13958	0.08298	0.04703

	INSTROUT	WRKRFIXD	WRKRUSED	WRKREXP	WRKRACAD	WRKROUT	SOCAQ	RELAQ	ANAAQ	PERAQ	CLEAQ	RAISE
ORGSIZE	-0.06708	0.11846	0.11907	0.24288	0.03700	-0.10856	-0.09005	-0.07763	0.12339	-0.00096	-0.13635	-0.15350
SECMOD	-0.15778	0.16478	0.13598	0.13202	-0.01972	-0.18016	-0.06039	0.01655	-0.07260	0.02005	-0.15549	-0.08991
BOSSOC	-0.02541	0.01923	0.12175	0.25956	0.17702	-0.17530	0.13110	0.18487	0.09166	0.01138	0.06280	-0.03304
BOSSREL	0.08066	-0.07587	-0.03819	0.13636	0.25189	-0.00534	0.17907	0.25664	0.07983	0.00044	0.20548	0.00041
BOSSANA	0.13714	0.01082	0.10441	0.13156	0.16554	0.06107	0.04761	0.06690	0.20951	-0.08236	0.08014	-0.03493
BOSSPER	-0.09704	0.10088	0.08169	0.24350	0.09247	-0.21881	0.04338	0.05676	-0.03158	0.07341	-0.07744	-0.03757
BOSSCLE	0.02854	0.02065	0.10697	0.12159	0.27498	-0.01071	0.13585	0.22413	0.04137	-0.06849	0.20140	0.03521
FACILUSE	-0.01010	-0.00902	0.14784	0.25415	0.09630	-0.05113	0.08013	0.12181	0.08510	-0.01089	0.01582	-0.09596
FACILFIX	0.08337	-0.01194	0.16333	0.19960	0.17586	-0.03608	0.05202	0.10462	0.08624	-0.05006	0.02890	-0.08285
FIRMEXP	-0.00979	-0.07609	0.15924	0.16591	0.08566	-0.03443	0.13502	0.12359	0.06721	-0.03298	0.03462	-0.12120
FIRMACAD	0.01478	-0.03356	0.13868	0.16044	0.20278	-0.03751	0.03849	0.07262	0.09681	-0.04689	-0.00298	-0.09891
INSTRIN	-0.04143	0.29944	0.11624	0.08663	-0.10573	-0.29657	0.05976	-0.01351	0.12393	0.13674	0.09318	-0.00692
INSTROUT	1.00000	-0.43907	-0.02598	-0.12181	0.43630	0.47546	0.13460	0.21130	0.03450	-0.31619	-0.00270	0.07313
WRKRFIXD	-0.43907	1.00000	0.14737	0.07111	-0.23129	-0.30220	-0.04466	-0.13556	0.06632	0.27725	-0.06737	0.01288
WRKRUSED	-0.02598	0.14737	1.00000	0.08955	0.08677	-0.03541	0.03199	0.01633	0.07685	0.06329	0.14359	0.03843
WRKREXP	-0.12181	0.07111	0.08955	1.00000	0.09155	-0.09577	0.04110	0.02895	0.11200	-0.03003	0.00327	0.01381
WRKRACAD	0.43630	-0.23129	0.08677	0.09155	1.00000	0.30736	0.12554	0.20976	0.13096	-0.22587	0.02225	0.14371
WRKROUT	0.47546	-0.30220	-0.03541	-0.09577	0.30736	1.00000	0.03439	0.01866	0.23750	-0.17618	0.01058	0.05267
SOCAQ	0.13460	-0.04466	0.03199	0.04110	0.12554	0.03439	1.00000	0.61411	0.17480	-0.01677	0.21484	0.09158
RELAQ	0.21130	-0.13556	0.01633	0.02895	0.20976	0.01866	0.61411	1.00000	0.05984	-0.15286	0.33657	0.13949
ANAAQ	0.03450	0.06632	0.07685	0.11200	0.13096	0.23750	0.17480	0.05984	1.00000	0.02427	0.14064	0.07538
PERAQ	-0.31619	0.27725	0.06329	-0.03003	-0.22587	-0.17618	-0.01677	-0.15286	0.02427	1.00000	0.08357	-0.08561
CLEAQ	-0.00270	-0.06737	0.14359	0.00327	0.02225	0.01058	0.21484	0.33657	0.14064	0.08357	1.00000	0.16702
RAISE	0.07313	0.01288	0.03843	0.01381	0.14371	0.05267	0.09158	0.13949	0.07538	-0.08561	0.16702	1.00000
EDWICO	0.18103	-0.10296	0.06675	0.03716	0.23472	0.18332	0.01084	0.17794	0.15197	-0.19607	0.14526	0.04286
SEX	-0.12038	0.01246	0.07488	0.10528	-0.00154	-0.11366	-0.10591	-0.08315	-0.23412	-0.00936	-0.18470	0.00902
GENEXP	0.05170	-0.02299	-0.08395	0.05465	0.07343	0.08539	0.16924	0.08924	0.08930	0.08608	0.06404	0.07606
FRMFACIL	0.03689	-0.03136	0.17245	0.21591	0.17318	-0.04427	0.07616	0.11486	0.09619	-0.04464	0.02149	-0.10611
INOUT	0.03887	-0.40825	-0.08990	-0.11686	0.33330	0.42419	0.02704	0.11193	-0.06339	-0.24294	-0.06165	0.04021
BOSSPCPN	0.02355	0.02419	0.10749	0.24950	0.26432	-0.10760	0.14972	0.22095	0.08686	-0.01489	0.12823	0.00207
WKRFACIL	-0.11627	0.01257	0.09625	0.10438	-0.11672	-0.24018	-0.01356	-0.08875	0.09342	0.23850	0.03573	0.03190
SKILLSAQ	0.23193	-0.15238	0.07252	0.06941	0.23836	0.14487	0.74724	0.78924	0.42521	-0.31810	0.57471	0.18056

	EDWICO	SEX	GENEXP	FRMFACIL	INOUT	BOSSPCPN	WKRFACIL	SKILLSAQ
ORGSIZE	0.14816	0.21478	-0.18119	0.76844	-0.09655	0.40551	0.15366	-0.07374
SECMOD	0.05566	0.28810	-0.33325	0.47984	-0.17750	0.43703	0.20207	-0.09826
BOSSOC	0.16158	0.16510	-0.07277	0.67286	-0.08900	0.89116	0.08570	0.15621
BOSSREL	0.11240	-0.08682	0.12593	0.23220	-0.01625	0.76653	-0.07757	0.25963
BOSSANA	-0.04192	-0.12222	0.12729	0.15207	0.03612	0.46648	0.06938	0.15667
BOSSPER	-0.00792	0.16414	-0.01120	0.54046	-0.12638	0.73854	0.12135	-0.01961
BOSSCLE	0.26862	0.12985	-0.10276	0.49137	-0.04271	0.72308	0.07802	0.23815
FACILUSE	0.13170	0.19000	-0.02666	0.83765	-0.07750	0.51553	0.08058	0.11004
FACILFIX	0.20590	0.17358	-0.10633	0.95377	-0.01343	0.61935	0.08759	0.10905
FIRMEXP	0.21528	0.22084	-0.15254	0.79449	-0.03750	0.45621	0.03862	0.13958
FIRMACAD	0.29156	0.24016	-0.22149	0.89105	-0.00885	0.48754	0.05955	0.08298
INSTRIN	-0.04728	0.00481	0.00348	0.07479	-0.01103	0.12079	0.28581	0.04703
INSTROUT	0.18103	-0.12038	0.05170	0.03689	0.03887	0.02355	-0.11627	0.23193
WKRFIXD	-0.10296	0.01246	-0.02299	-0.03136	-0.40825	0.02419	0.01257	-0.15238
WKRUSED	0.06675	0.07488	-0.08395	0.17245	-0.08990	0.10749	0.09625	0.07252
WKREXP	0.03716	0.10528	0.05465	0.21591	-0.11686	0.24950	0.10438	0.06941
WKRACAD	0.23472	-0.00154	0.07343	0.17318	0.33330	0.26432	-0.11672	0.23836
WKROUT	0.18332	-0.11366	0.08539	-0.04427	0.42419	-0.10760	-0.24018	0.14487
SOCAQ	0.01084	-0.10591	0.16924	0.07616	0.02704	0.14972	-0.01356	0.74724
RELAQ	0.17794	-0.08315	0.08924	0.11486	0.11193	0.22095	-0.08875	0.78924
ANAAQ	0.15197	-0.23412	0.08930	0.09619	-0.06339	0.08686	0.09342	0.42521
PERAQ	-0.19607	-0.00936	0.08608	-0.04464	-0.24294	-0.01489	0.23850	-0.31810
CLEAQ	0.14526	-0.18470	0.06404	0.02149	-0.06165	0.12823	0.03573	0.57471
RAISE	0.04286	0.00902	0.07606	-0.10611	0.04021	0.00207	0.03190	0.18056
EDWICO	1.00000	0.10185	-0.37144	0.24572	0.11901	0.14928	-0.03539	0.74724
SEX	0.10185	1.00000	-0.31253	0.22796	-0.10075	0.09092	0.05717	-0.20212
GENEXP	-0.37144	-0.31253	1.00000	-0.14909	0.02301	-0.01111	-0.06616	0.12205
FRMFACIL	0.24572	0.22796	-0.14909	1.00000	-0.01041	0.60442	0.07887	0.12095
INOUT	0.11901	-0.10075	0.02301	-0.01041	1.00000	-0.07253	-0.34926	0.08281
BOSSPCPN	0.14928	0.09092	-0.01111	0.60442	-0.07253	1.00000	0.08090	0.21520
WKRFACIL	-0.03539	0.05717	-0.06616	0.07887	-0.34926	0.08090	1.00000	-0.06786
SKILLSAQ	0.74724	-0.20212	0.12205	0.12095	0.08281	0.21520	-0.06786	1.00000

Table I.43: Correlation Matrix for INSKIL

	ORGSIZE	SECMOD	BOSSOC	BOSSREL	BOSSANA	BOSSPER	BOSSCLE	FACILUSE	FACILFIX	FIRMEXP	FIRMACAD	INSTRIN
ORGSIZE	1.00000	0.27876	0.47301	0.21055	0.10491	0.32665	0.28778	0.62890	0.77155	0.34555	0.71572	0.03907
SECMOD	0.27876	1.00000	0.43849	0.06999	0.17412	0.25940	0.11265	0.31865	0.32650	0.28432	0.15933	0.05083
BOSSOC	0.47301	0.43849	1.00000	0.54092	0.27241	0.53443	0.56326	0.48255	0.45393	0.25746	0.34703	0.10371
BOSSREL	0.21895	0.06999	0.54092	1.00000	0.27390	0.35386	0.59643	0.19996	0.27982	0.11227	0.15475	-0.03172
BOSSANA	0.10491	0.17412	0.27241	0.27390	1.00000	0.29450	0.31308	0.21806	0.20241	0.09065	0.13280	0.04521
BOSSPER	0.32665	0.25940	0.53443	0.35386	0.29450	1.00000	0.34752	0.29824	0.24313	0.22425	0.17643	0.04953
BOSSCLE	0.28778	0.11265	0.56326	0.59643	0.31308	0.34752	1.00000	0.28382	0.35131	0.19261	0.32812	0.10044
FACILUSE	0.62890	0.31865	0.48255	0.19996	0.21806	0.29824	0.28382	1.00000	0.72900	0.48981	0.55737	0.13229
FACILFIX	0.77155	0.32650	0.45393	0.27982	0.20241	0.24313	0.35131	0.72900	1.00000	0.53849	0.77628	0.10435
FIRMEXP	0.34555	0.28432	0.25746	0.11227	0.09065	0.22425	0.19261	0.48981	0.53849	1.00000	0.46838	0.04656
FIRMACAD	0.71572	0.15933	0.34703	0.15475	0.13280	0.17643	0.37812	0.55737	0.77628	0.46838	1.00000	0.09784
INSTRIN	0.03907	0.05083	0.10371	-0.03172	0.04521	0.04953	0.10044	0.13229	0.10435	0.04656	0.09784	1.00000
INSTROUT	0.07112	-0.01685	0.04758	0.04126	0.08708	0.02435	0.01222	0.01883	0.03795	0.06619	0.01211	-0.39893
WRKRFIXD	0.28923	0.33964	0.20722	0.03626	0.11560	0.21550	0.06778	0.30736	0.23930	0.12265	0.14242	0.12552
WRKRUSED	0.19625	0.22385	0.15505	-0.07783	0.04964	0.06884	0.10401	0.26253	0.19434	0.24783	0.13781	0.02426
WRKREXP	0.28563	0.22100	0.29063	0.01766	0.04010	0.12872	0.00392	0.37191	0.29717	0.23080	0.15940	0.18097
WRKRACAD	0.14750	-0.10851	-0.03289	0.11017	0.04232	0.04929	0.04351	0.10889	0.12727	0.05736	0.12939	-0.15984
WRKROUT	-0.02173	-0.09371	-0.00718	0.04363	-0.00296	0.01120	0.08323	-0.00886	-0.01533	0.08341	0.00603	-0.16334
SOCAQ	0.10570	-0.02150	0.20221	0.11107	0.23042	0.02802	0.12830	0.15095	0.18431	0.16086	0.19914	0.22249
RELAQ	0.13083	-0.13077	0.18617	0.20009	0.16068	0.09068	0.25452	0.18260	0.15794	0.12265	0.18104	0.16513
ANAAQ	0.19950	0.19782	0.11213	-0.03710	0.10732	0.08667	-0.06198	0.23544	0.19817	0.22640	0.10708	-0.00279
PERAQ	-0.04281	0.04503	-0.09881	-0.15551	0.10192	0.02236	-0.13053	-0.04770	-0.03545	-0.12458	-0.04664	0.11072
CLEAQ	0.08170	-0.08793	0.14169	0.18913	0.08867	0.01521	0.28713	0.12551	0.16747	0.17519	0.15752	0.13091
RAISE	0.03743	0.12076	0.07690	0.12092	0.09757	-0.00676	0.06665	0.05362	0.07351	-0.01672	-0.02589	0.05687
EDWICO	0.30882	0.18458	0.34291	0.13999	0.04507	0.16646	0.20012	0.30793	0.34528	0.28607	0.30270	0.04961
SEX	-0.10036	0.12410	0.12226	0.01232	0.09637	0.15181	0.12143	0.00867	-0.15343	0.03566	-0.12768	-0.11397
GENEXP	0.02405	-0.08897	-0.13082	-0.02561	-0.02186	-0.04401	-0.14690	-0.10608	-0.08503	-0.13055	-0.12204	-0.05312
FRMFACIL	0.78354	0.31949	0.46294	0.23750	0.19536	0.27087	0.35666	0.80567	0.94838	0.69085	0.86694	0.11384
INOUT	0.00433	-0.04468	-0.05404	0.04181	0.00650	-0.02507	-0.06767	-0.08789	-0.05886	-0.00395	-0.06582	-0.90961
BOSSPCPN	0.43172	0.30025	0.83455	0.76590	0.52154	0.70764	0.78454	0.41749	0.43008	0.24989	0.32320	0.07654
WKRFACIL	0.31106	0.36253	0.23085	-0.01452	0.10950	0.19173	0.10339	0.35944	0.27459	0.21828	0.17501	0.10340
SKILLSAC	0.16770	-0.05389	0.24113	0.21016	0.17056	0.06019	0.25653	0.22699	0.23393	0.24487	0.22829	0.15742

	INSTROUT	WRKRFIXD	WRKRUSED	WRKREXP	WRKRACAD	WRKROUT	SOCAQ	RELAQ	ANAAQ	PERAQ	CLEAQ	RAISE
ORGSIZE	0.07112	0.28923	0.19625	0.28563	0.14750	-0.02173	0.10570	0.13083	0.19950	-0.04281	0.08170	0.03743
SECMOD	-0.01685	0.33964	0.22385	0.22100	-0.10851	-0.09371	-0.02150	-0.13077	0.19782	0.04503	-0.08793	0.12076
BOSSOC	0.04758	0.29722	0.15505	0.29063	-0.03289	-0.00718	0.20221	0.18617	0.11213	-0.09881	0.14169	0.07690
BOSSREL	0.04126	0.03626	-0.07783	0.01766	0.11017	0.04363	0.11107	0.20009	-0.03710	-0.15551	0.18913	0.12092
BOSSANA	0.08708	0.11560	0.04964	0.04010	0.04232	-0.00296	0.23042	0.16068	0.10732	0.10192	0.08867	0.09757
BOSSPER	0.02435	0.21550	0.06684	0.12872	0.04929	0.01120	0.02802	0.09068	0.08467	0.02236	0.01521	-0.00676
BOSSCLE	0.01222	0.06778	0.10401	0.00392	0.04351	0.08323	0.12830	0.25452	-0.06198	-0.13053	0.28713	0.06665
FACILUSE	0.01883	0.30736	0.26253	0.37191	0.10889	-0.00886	0.15095	0.18260	0.23544	-0.04770	0.12551	0.05362
FACILFIX	0.03795	0.23930	0.19434	0.29717	0.12727	-0.01533	0.18431	0.15794	0.19817	-0.03545	0.16747	0.02351
FIRMEXP	0.06619	0.12265	0.24783	0.23080	0.05736	0.08341	0.16086	0.12265	0.22640	-0.12458	0.17519	-0.01672
FIRMACAD	0.01211	0.14242	0.13781	0.15940	0.12939	0.00603	0.19914	0.18104	0.10708	-0.04664	0.15752	-0.02589
INSTRIN	-0.39893	0.12552	0.02426	0.18097	-0.15984	-0.16334	0.22249	0.16513	-0.00279	0.11072	0.13091	0.05687
INSTROUT	1.00000	-0.10913	0.05016	-0.05746	0.37272	0.35010	-0.00478	0.01980	0.04165	-0.18452	-0.05353	0.06156
WRKRFIXD	-0.10913	1.00000	0.27002	0.19411	0.01394	-0.00892	0.02999	-0.06060	0.27101	0.16923	-0.01828	0.09864
WRKRUSED	0.05016	0.27002	1.00000	0.17835	0.08749	0.03297	-0.07929	-0.07294	0.16726	-0.04200	-0.01759	0.01187
WRKREXP	-0.05746	0.19411	0.17835	1.00000	-0.11268	-0.12176	0.21622	0.15218	0.17785	-0.00797	0.07810	-0.00412
WRKRACAD	0.37272	0.01394	0.08749	-0.11268	1.00000	0.23639	0.02785	0.04230	0.08089	-0.13458	-0.01149	0.09195
WRKROUT	0.35010	-0.00892	0.03297	-0.12176	0.23639	1.00000	-0.01011	0.03175	0.08362	-0.13963	0.03853	0.07065
SOCAQ	-0.00478	0.02999	-0.07929	0.21622	0.02785	-0.01011	1.00000	0.57864	0.14188	-0.10751	0.42545	0.09198
RELAQ	0.01980	-0.06060	-0.07294	0.15218	0.04230	0.03175	0.57864	1.00000	0.06217	-0.19419	0.40830	0.13295
ANAAQ	0.04165	0.27101	0.16726	0.17785	0.08089	0.08362	0.14188	0.06217	1.00000	0.01945	0.11122	0.00228
PERAQ	-0.18452	0.16923	-0.04200	-0.00797	-0.13458	-0.13963	-0.10751	-0.19419	0.01945	1.00000	-0.17751	-0.10001
CLEAQ	-0.05353	-0.01828	-0.01759	0.07810	-0.01149	0.03853	0.42545	0.40830	0.11122	-0.17751	1.00000	0.12334
RAISE	0.06156	0.09864	0.01187	-0.00412	0.09195	0.07065	0.09198	0.13295	0.00228	-0.10001	0.12334	1.00000
EDWICO	0.07096	0.13969	0.12645	0.13297	0.16672	0.04090	0.17895	0.19390	0.15636	-0.17614	0.21221	0.05636
SEX	0.03958	-0.03505	0.05447	-0.00133	-0.04678	-0.02908	-0.11670	-0.09231	-0.00727	-0.04837	-0.07481	0.01099
GENEXP	0.03651	0.00831	-0.05292	0.04042	0.06534	0.03879	0.05645	0.03727	0.07073	-0.07176	0.02234	0.04488
FRMFACIL	0.03814	0.23950	0.23449	0.20649	0.13118	0.01012	0.20802	0.18940	0.21677	-0.06558	0.10530	0.01028
INOUT	0.74384	-0.14093	0.00867	-0.15794	0.28537	0.27767	-0.16433	-0.11139	0.02091	-0.16431	-0.11967	-0.01323
BOSSPCPN	0.05317	0.17972	0.08829	0.14474	0.05317	0.03575	0.18297	0.24258	0.05367	-0.08562	0.19946	0.09542
WKRFACIL	-0.04843	0.86387	0.71827	0.23357	0.05584	0.01081	-0.01981	-0.08195	0.28333	0.10031	-0.02241	0.07748
SKILLSAC	0.04576	-0.00401	-0.01563	0.20214	0.07514	0.07522	0.79103	0.77739	0.31978	-0.43339	0.71112	0.15027

	EDWICO	SEX	GENEXP	FRMFACIL	INOUT	BOSSPCPN	WKRFACIL	SKILLSAC
ORGSIZE	0.30882	-0.10036	0.02405	0.78354	0.00433	0.43172	0.31106	0.16770
SECMOD	0.18458	0.12410	-0.08897	0.31949	-0.04468	0.30025	0.36253	-0.05389
BOSSOC	0.34291	0.12226	-0.13082	0.46294	-0.05404	0.83455	0.23085	0.24113
BOSSREL	0.13999	0.01232	-0.02561	0.23750	0.04181	0.76590	-0.01452	0.21016
BOSSANA	0.04507	0.09637	-0.02186	0.19536	0.00650	0.52154	0.10950	0.17056
BOSSPER	0.16646	0.15181	-0.04401	0.27087	-0.02507	0.70764	0.19173	0.06019
BOSSCLE	0.20012	0.12143	-0.14690	0.35666	-0.06767	0.78454	0.10339	0.25653
FACILUSE	0.30793	0.00867	-0.10608	0.80567	-0.08789	0.41749	0.35944	0.22699
FACILFIX	0.34528	-0.15343	-0.08503	0.94838	-0.05886	0.43008	0.27459	0.23393
FIRMEXP	0.28607	0.03566	-0.13055	0.69085	-0.00395	0.24989	0.21828	0.24487
FIRMACAD	0.30270	-0.12768	-0.12204	0.86694	-0.06582	0.32320	0.17501	0.22829
INSTRIN	0.04961	-0.11397	-0.05312	0.11384	-0.90961	0.07654	0.10340	0.15742
INSTROUT	0.07096	0.03958	0.03651	0.03814	0.74384	0.05317	-0.04843	0.04576
WRKRFIXD	0.13969	-0.03505	0.00831	0.23950	-0.14093	0.17972	0.86387	-0.00401
WRKRUSED	0.12645	0.05447	-0.05292	0.23449	0.00867	0.08829	0.71827	-0.01563
WRKREXP	0.13297	-0.00133	0.04042	0.20649	-0.15794	0.14474	0.23357	0.20214
WRKRACAD	0.16672	-0.04678	0.06534	0.13118	0.28537	0.05317	0.05584	0.07514
WRKROUT	0.04090	-0.02908	0.03879	0.01012	0.27767	0.03575	0.01081	0.07522
SOCAQ	0.17895	-0.11670	0.05645	0.20802	-0.16433	0.18297	-0.01981	0.79103
RELAQ	0.19390	-0.09231	0.03727	0.18940	-0.11139	0.24258	-0.08195	0.77739
ANAAQ	0.15636	-0.00727	0.07073	0.21677	0.02091	0.05367	0.28333	0.31978
PERAQ	-0.17614	-0.04837	-0.07176	-0.06558	-0.16431	-0.08562	0.10031	-0.43339
CLEAQ	0.21221	-0.07481	0.02234	0.10530	-0.11967	0.19946	-0.02241	0.71112
RAISE	0.05636	0.01059	0.04488	0.01028	-0.01323	0.09542	0.07748	0.15027
EDWICO	1.00000	-0.04954	-0.41759	0.37016	-0.00401	0.26220	0.16710	0.28832
SEX	-0.04954	1.00000	-0.08099	-0.09909	0.10100	0.13917	0.00317	-0.09107
GENEXP	-0.41759	-0.08099	1.00000	-0.12426	0.05524	-0.10809	-0.02166	0.07679
FRMFACIL	0.37016	-0.09909	-0.12426	1.00000	-0.06569	0.42987	0.29603	0.27212
INOUT	-0.00401	0.10100	0.05524	-0.06569	1.00000	-0.03170	-0.09730	-0.09400
BOSSPCPN	0.26220	0.13917	-0.10809	0.42987	-0.03170	1.00000	0.17606	0.25682
WKRFACIL	0.16710	0.00317	-0.02166	0.29603	-0.09730	0.17606	1.00000	-0.01108
SKILLSAC	0.28832	-0.09107	0.07679	0.27212	-0.09400	0.25682	-0.01108	1.00000

for the four occupational groupings. As expected, there is a strong relationship between firm size and degree of modernity. There is a general "halo effect" in the ratings by employers of the training needs. That is, employers tend to see workers as needing training in all areas, or in none. This shows in the pattern of high correlations among the five BOSS variables. Consistency is highest for the PROFMGMT group, lowest for the SKILSEMI group. Because these five variables are so highly related to each other it seemed legitimate to add them together to form a single variable labelled BOSSPCPN, which appears near the bottom of the list in each table.

Altough the relationships are not quite as strong, it is also the case that the first four firm measures of training opportunities correlate highly with each other. Four variables have been added together to form a single measure of firm training opportunities labelled FRMFACIL. The suggestion is that firms tend to provide training experiences and opportunities of all kinds, or little training at all.

The WRKRUSED and WRKRFIXD variables have been added together to form the variable WKRFACIL, meant to reflect the extent to which the worker has used any kind of training facility.

SOCAQ, RELAQ, CLEAQ, ANAAQ and PERAQ added together for the path analysis, with the PERAQ variable being given a negative sign to reflect its negative relationship to the other variables. The new variable is labelled SKILLSAQ; as the tables show, it has a moderate to high correlation with SOC, PER and CLE, and a negative correlation with CLEAQ.

The first of the multivariate analyses, using regression, asks the question, "What is the combination of independent variables, using the

different sets presented, that accounts for the largest portion of variance in RAISE?" This analysis presents results that could be useful for the decision-maker looking at how to allocate resources within each of the sets of variables.

The second analysis is based on canonical correlation. Whereas in regression analysis the technique looks for that combination of two or more variables that will account for the largest amount of variance in a single dependent variable, the cononical correlation procedure looks for the combinations of variables in two sets of two or more variables each, that will account for the greatest amount of variance in each.

The third technique is path analysis. Our intention is to use path analysis to apply the general relevance model to these data describing part of the worker training system in El Salvador. With a path analysis it should be possible to distinguish direct influence of one variable on another from relationships mediated by a third variable. (Details of the procedure of path analysis are presented in Appendix 1).

5.5 Regression Analysis

In this section we look at the regression of RAISE on the learning variables, the measures of worker training experiences, the measures of firm opportunities and programs, and the perceptions of the employer with regard to skill requirements. Results are presented for each occupational category.

PROFMGMT. Table I.44 presents the regression results for the five employer perception variables. About 8 percent of the total variance in RAISE can be accounted for by a combination of the five variables in which a strong positive weight is given to scores on BOSSOC, and smaller

Table I.44

Regression of RAISE on Selected Variables

PROFMGMT

Dependent Variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B	
BOSSOC	0.216	0.119	0.551	0.476	
BOSSREL	0.136	-0.035	-0.261	-0.229	R^2 = 0.0759
BOSSANA	0.088	-0.001	-0.014	-0.014	
BOSSPER	0.028	-0.001	-0.053	-0.058	Constant = 0.9150
BOSSCLE	0.058	-0.005	-0.087	-0.084	
FACILUSE	0.182	-0.023	-0.127	-0.231	
FACILFIX	0.244	0.102	0.420	0.309	
FIRMEXP	0.208	0.017	0.083	0.136	R^2 = 0.0941
FIRMACAD	0.172	-0.033	-0.193	-0.223	
INSTRIN	0.147	0.026	0.175	0.509	Constant = 0.4399
INSTROUT	0.052	0.005	0.096	0.364	
WRKRFIXED	0.219	0.040	0.182	0.347	
WRKRUSED	0.138	-0.004	-0.031	-0.065	R^2 = 0.0876
WRKREXP	0.171	0.025	0.147	0.426	
WRKRACAD	0.182	0.027	0.147	0.253	Constant = 0.1442
WRKROUT	0.030	0.000	0.006	0.011	
SOCAQ	0.159	-0.004	-0.023	-0.024	
RELAQ	0.214	0.028	0.130	0.141	R^2 = 0.0873
ANAAQ	0.078	0.002	0.024	0.031	
PERAQ	-0.104	0.011	-0.104	-0.143	Constant = 0.6839
CLEAQ	0.248	0.050	0.203	0.230	

negative weights are assigned to scores on the other four scales. In effect the table suggests that there is a positive relationship between BOSSOC and RAISE that is increased by controlling (holding constant) the other four perception measures.

In Table I.44 we see also that 9 percent of the variance in RAISE can be accounted for by a combination of the firm opportunity variables in which the highest weight is given to FACILFIX. With FACILFIX in the equation, the simple correlation between RAISE and FIRMEXP is shown to be relatively unimportant, and academic training (FIRMACAD) contributes to "explaining" RAISE when it is weighted negatively. In other words, those forms that more often provide raises are also those that have a large installed capacity for training, and that send few of their workers outside for training.

In the next section of this table, almost 9 percent of the variance of RAISE is accounted for by a combination of variables in which expendable training materials (WRKRUSED) are most important, followed by both academic and on-the-job training. Although the presence of in-plant training capacity is associated with RAISE, use of that capacity by professionals and managers is not associated with RAISE.

The final part of Table I.44 shows that about 9 percent of the variance in RAISE is accounted for by weighting clerical skills highest, followed by relational skills. As with the other regression results, the variables with the highest simple correlations account for most of the variance and, because of modest to high correlations among the independent variables, reduce the regression weights of the other variables. The results are counter-intuitive in that one would not expect that raises

for professionals and managers would be a function of the extent to which they had acquired clerical or relational skills. (Especially striking is the low zero-order correlation between ANAAQ and RAISE. We have no explanation for this finding, other than to suggest that professional and managerial productivity in Salvadorean enterprises may depend on skills usually associated with lower-level occupations.)

WHCOLLAR. In the first part of TableI.45 we can see that too little of the variance in RAISE can be accounted for by these variables to trust any conclusions that could be drawn.

SKILSEMI. In TableI.46 a significant result is obtained, using the skills acquired set of variables to account for RAISE. About 4 percent of the variance can be accounted for by weighting most highly clerical skills learned, followed by a negative weight on perceptual skills, and a positive weight on relational skills.

UNSKIL. Table I.47shows that about 3 percent of the variance in RAISE is accounted for weighting RELAQ most heavily, followed by ANAAQ and a negative weighting for PERAQ. (The combination of relational, perceptual and clerical skills combined as in the previous cases accounts for almost 3 percent of the variance in RAISE for this group of workers.)

Summary. Overall, these conclusions can be drawn. Not much of the variance in RAISE, our proxy measure for productivity can be accounted for by any combinations of the variables in each of the tar sets. The largest multiple regression coefficients are obtained for the PROFMGMT group, where 9 percent of the variance in RAISE is accounted for by taking into account the plant training facilities measures. The relevance model would suggest that the highest relationships should be between the measures

Table I.45

Regression of RAISE on selected variables

WHCOLLAR

Dependent Variable: RAISE

Variable	Simple r.	Contribution to R^2	Beta	B	
BOSSOC	-0.085	0.003	-0.037	-0.037	
BOSSREL	-0.094	0.002	-0.025	-0.025	R^2 = .0203
BOSSANA	0.009	0.000	0.037	0.061	
BOSSPER	-0.134	0.015	-0.111	-0.158	Constant = 1.4520
BOSSCLE	-0.076	-0.000	0.006	0.006	
FACILUSE	0.025	0.002	0.090	0.189	
FACILFIX	-0.049	0.002	-0.044	-0.040	
FIRMEXP	-0.023	0.000	-0.001	-0.002	R^2 = 0.0286
FIRMACAD	-0.083	0.009	-0.112	-0.140	
INSTRIN	0.076	0.011	0.143	0.448	Constant =0.9203
INSTROUT	0.031	0.004	0.129	0.446	
WRKRFIXED	0.041	0.003	0.080	0.170	
WRKRUSED	-0.070	0.007	-0.094	-0.192	R^2 = 0.0181
WRKREXP	0.081	0.007	0.082	0.247	
WRKRACAD	0.014	0.000	0.006	0.012	Constant = 0.7485
WRKROUT	0.031	0.002	0.053	0.097	
SOCAQ	0.102	0.010	0.095	0.099	
RELAQ	0.047	-0.001	-0.031	-0.033	R^2 = 0.0190
ANAAQ	0.056	0.002	0.037	0.049	
PERAQ	-0.059	0.004	-0.066	-0.101	Constant = 1.0348
CLEAQ	0.077	0.005	0.063	0.069	

Table I.46

Regression of RAISE on selected variables

SKILSEMI

Dependent Variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B	
BOSSOC	-0.033	0.003	-0.087	-0.072	
BOSSREL	0.080	0.012	0.150	0.160	R^2 = 0.0196
BOSSANA	-0.035	0.002	-0.052	-0.063	
BOSSPER	-0.038	0.002	-0.046	-0.044	Constant = 0.8706
BOSSCLE	0.035	0.001	0.032	0.028	
FACILUSE	-0.096	0.005	-0.053	-0.082	
FACILFIX	-0.083	-0.003	0.038	0.025	
FIRMEXP	-0.121	0.011	-0.091	-0.131	R^2 = 0.0237
FIRMACAD	-0.099	0.004	-0.039	-0.037	
INSTRIN	-0.007	-0.000	0.055	0.139	Constant = 0.9687
INSTROUT	0.073	0.007	0.099	0.332	
WRKRFIXED	0.013	0.001	0.045	0.082	
WRKRUSED	0.038	0.001	0.023	0.052	R^2 = 0.0161
WRKREXP	0.014	0.000	0.001	0.003	
WRKRACAD	0.114	0.013	0.113	0.246	Constant = 0.6051
WRKROUT	0.052	0.002	0.032	0.051	
SOCAQ	0.092	0.001	0.015	0.014	
RELAQ	0.139	0.009	0.067	0.065	R^2 = 0.0431
ANAAQ	0.035	0.000	0.010	0.013	
PERAQ	-0.086	0.008	-0.088	-0.110	Constant = 0.8540
CLEAQ	0.167	0.025	0.147	0.155	

Table I.47

Regression of RAISE on selected variables

UNSKIL

Dependent variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B	
BOSSOC	0.077	0.004	0.053	0.035	
BOSSREL	0.129	0.017	0.132	0.105	R^2 = 0.0277
BOSSANA	0.098	0.008	0.086	0.099	
BOSSPER	-0.007	0.001	-0.095	-0.071	Constant = 0.5825
BOSSCLE	0.067	-0.002	-0.037	-0.027	
FACILUSE	0.054	0.004	0.077	0.095	
FACILFIX	0.024	0.001	0.060	0.034	
FIRMEXP	-0.017	0.001	-0.050	-0.062	R^2 = 0.0204
FIRMACAD	-0.026	0.003	-0.103	-0.085	
INSTRIN	0.057	0.005	0.092	0.189	Constant = 0.5469
INSTROUT	0.062	0.006	0.099	0.327	
WRKRFIXED	0.099	0.010	0.106	0.153	
WRKRUSED	0.012	-0.000	-0.024	-0.049	R^2 = 0.0212
WRKREXP	-0.004	0.000	-0.005	-0.010	
WRKRACAD	0.092	0.007	0.080	0.159	Constant = 0.4830
WRKROUT	0.071	0.004	0.053	0.073	
SOCAQ	0.092	0.000	0.003	0.003	
RELAQ	0.133	0.012	0.088	0.070	R^2 = 0.0281
ANAAQ	0.002	-0.000	-0.011	-0.014	
PERAQ	-0.100	0.007	-0.069	-0.073	Constant = 0.7295
CLEAQ	0.123	0.009	0.075	0.064	

of learning--the skill acquired variables--and RAISE, as the impact of the employer's perceptions, the plant's capacity for training, and the worker's experience in training should be mediated through learning. But that is not the case. If one had a great deal of confidence in the RAISE measure (which we do not) the conclusion would be that training and learning are not particularly relevant for increases in productivity. The other possibility is to doubt RAISE as a productivity proxy, and to look for other ways to test the general model.

5.6 Canonical Correlation Analysis

The canonical correlation procedure seeks to weight two sets of variables simultaneously to maximize the relationships between them.

In the tables below (I.47 - 52) the numbers before each variable are known as canonical variates and indicate the weighting to be assigned to each variable. The coefficient between each set of variables is the canonical correlation coefficient. The number is similar to other coefficients in having a range between -1 and +1. We have grouped the variables according to that section of the general model (see Figure I.4) being evaluated and can look across occupational groupings for each comparison of variable sets.

Organizational Factors and Employer's Perceptions. The first comparison is between the organizational factors; that is, the size and modernity versus the employer's perceptions of the skills required for workers in his or her firm. For the PROFMGMT grouping, a canonical coefficient of 0.57 can be generated by weighting ORGSIZE heavily, controlling on SECMOD, and weighting BOSSANA strong and positive, BOSSCLE fairly strong and negative. The relationship could be interpreted as follows (Table I.47):

Table I.47

Canonical Variates and Correlation Coefficients

Organizational Factors and Employer's Perceptions

PROFMGMT

.98 ORGSIZE .05 SECMOD	.57	.22 BOSSPER -.61 BOSSCLE .42 BOSSOC -.03 BOSSREL .87 BOSSANA

WHCOLLAR

-.04 ORGSIZE 1.00 SECMOD	.39	-.02 BOSSPER .51 BOSSCLE -.92 BOSSOC .56 BOSSREL .66 BOSSANA
1.00 ORGSIZE .02 SECMOD	.25	-.49 BOSSPER .76 BOSSCLE .34 BOSSOC -.88 BOSSREL .04 BOSSANA

SKILLSEMI

.74 ORGSIZE .44 SECMOD	.64	.36 BOSSPER .30 BOSSCLE .63 BOSSOC -.52 BOSSREL .05 BOSSANA

UNSKIL

.69 ORGSIZE .56 SECMOD	.56	.19 BOSSPER -.03 BOSSCLE .99 BOSSOC -.25 BOSSREL .06 BOSSANA

in firms with professional and managerial workers, those that are larger, controlling for degree of modernity, are more likely to have employers that emphasize analytical skills and that actively de-emphasize clerical skills.

The data for the WHCOLLAR group, in Table I.47, are such that it is not possible to produce a high canonical correlation.

For the SKILSEMI group the relationship between the two groups of variables is maximized when both ORGSIZE and SECMOD are weighted, the first more than the second, and when the largest weights are given to BOSSOC and to BOSSREL, the latter weighted negatively. The regression analysis showed that BOSSOC was themost important variable for predicting RAISE, followed by BOSSREL weighted negatively. This was true for the PROFMGMT group only. For the skilled and semi-skilled worker group the perception variables did not account for more than 1 percent of the variance in RAISE.

Finally, for the group of unskilled workers, ORGSIZE and SECMOD almost equally weighted have a canonical correlation of 0.56 with combination in which BOSSOC is weighted most heavily and the others have small weights. Using the perception variables to predict to RAISE the regression analysis showed that the best combination was BOSSREL followed by BOSSANA.

For the 1st, 3rd and 4th occupational categories, PROMGMT, SKILSEMI, UNSKIL respectively, there are fairly strong relationships between organizational factors and the employer's perception of the need for training, as the relevance model says there should be. This does not hold for the white-collar group. The findings seem to state that: in large

firms, employers want professional workers to develop analytical skills; in large firms in the modern sector employers want skilled workers to develop social skills (and not to develop relational skills); and in large and modern firms, social skills are even more important for unskilled workers. One would have thought that perceptual skills would be most important for skilled and unskilled workers in large and modern firms. The findings suggest that employers are more concerned about worker social behavior than they are about technical skills, or that they believe productivity follows from having a spirit of service, a spirit of work, a willingness to accept errors, and an ability to overcome emotional disturbances.

Employer's Perceptions and Firm Training Facilities. Table I.48 presents the relationships between the employer's perception of what workers should learn, and the facilities created or provided by the firm in order to secure this training. The relevance model states that there should be a strong relationship between perceptions of training needs, and the provision of training.

The results of the canonical correlation analysis suggest that is the case. Once again the lowest relationships found are for the WHCOLLAR group, but all the coefficients are fairly large. For the PROFMGMT group, the consistency is greatest when BOSSOC is weighted most heavily on the perception side, and when FACILFIX is weighted most heavily on the facilities side. This relationship could be stated as follows: firms with professional and managerial workers are more likely to invest in training facilities, to provide on-the-job training, and to avoid academic

Table I.48

Canonical Variates and Correlation Coefficients

Employer's Perceptions and Firm Training Facilities

PROFMGMT

.23 BOSSPER	.80	.11 FACILUSE
-.28 BOSSCLE		.84 FACILFIX
.63 BOSSOC		.44 FIRMEXP
.26 BOSSREL		-.38 FIRMACAD
.23 BOSSANA		.04 INSTRIN
		-.05 INSTROUT

WHCOLLAR

.12 BOSSPER	.46	.29 FACILUSE
.38 BOSSCLE		-.25 FACILFIX
.73 BOSSOC		.61 FIRMEXP
.01 BOSSREL		.56 FIRMACAD
-.30 BOSSANA		.13 INSTRIN
		.03 INSTROUT

SKILSEMI

.28 BOSSPER	.74	.29 FACILUSE
.36 BOSSCLE		.33 FACILFIX
.76 BOSSOC		.06 FIRMEXP
-.46 BOSSREL		.43 FIRMACAD
-.01 BOSSANA		.02 INSTRIN
		-.12 INSTROUT

UNSKIL

.02 BOSSPER	.53	.64 FACILUSE
.21 BOSSCLE		.33 FACILFIX
.91 BOSSOC		-.05 FIRMEXP
-.24 BOSSREL		.10 FIRMACAD
.19 BOSSANA		.18 INSTRIN
		.15 INSTROUT

training when the employer emphasizes social skills and deemphasizes clerical skills.

For white collar workers on the other hand, both experiential and academic training are emphasized when the employer sees a need for training in social skills and clerical skills, and little or not need for training in analytical skills. Fixed training facilities are less important in this case, and expendable materials become important. This finding seems particularly apt for white collar workers, although once again the importance given to development of social skills is striking.

For the group of skilled and semi-skilled workers, academic (or theoretical) training combined with both expendable and durable training facilities are best accounted for by a weighted combination with greatest emphasis on social skills and a negative weighting for relational skills. Almost the same combination of skill requirements was related, in the previous table, with firms being large and in the modern sector. The implication is that large, industrial firms provide theoretical (or classroom) training for skilled workers in preference to on-the-job training, and that training is most common where the employer is concerned about social attitudes. Perhaps for El Salvador this particular set of attitudes is associated with productivity in a modern industrial enterprise.

Academic training is of lesser importance for unskilled workers. Table I.48 shows that training for these workers is provided in circumstances in which social attitudes are most important. These occur in large and modern firms, replicating the results obtained for skilled workers.

In the summary, the results from this table would suggest that

the employer's perceptions of training needs are associated in a meaningful way with the kinds of training facilities that exist. In other words, training facilities are relevant for employers' objectives.

Organizational Factors and Training Facilities. The general model presented earlier suggested that there also is a direct relationship between organizational characteristics and the existence of training facilities. The correlation matrices (Tables I.40-43) showed high relationships between ORGSIZE and the facilities measures, but lower coefficients between SECMOD and the facilities measures. Modernity was unrelated to training facilities for the WHCOLLAR group who may be concentrated in finance and public offices. Table I.49 presents the canonical relationships between the two organization variables and the six training variables. The highests relationships are attained when ORGSIZE is weighted heavily, and SECMOD is controlled. For the PROFMGMT group of employees, large firms tend to invest in fixed facilities, and to some extent in expendable materials. There is no strong relationship with experiential and academic training (a finding that would not have emerged from examination of the correlation matrix only).

The results are similar for the white-collar group, except that expendable materials are of lesser importance. The weighting of the facilities variables is quite different than that for the perceptions-facilities comparison (Table I.48). Table I.49 reported a small canonical coefficient between organizational factors and employer's perceptions, but with quite different weightings on the perception side than are produced when matching perceptions and facilities.

As would be expected, given the results presented in previous

Table I.49

Canonical Variates and Correlation Coefficients

Organizational Factors and Firm Training Facilities

PROFMGMT			.34	FACILUSE
			.60	FACILFIX
1.04	ORGSIZE	.84	.11	FIRMEXP
			.11	FIRMACAD
-.14	SECMOD		-.04	INSTRIN
			-.08	INSTROUT
WHCOLLAR			.06	FACILUSE
			.81	FACILFIX
1.00	ORGSIZE	.61	-.02	FIRMEXP
			.24	FIRMACAD
-.03	SECMOD		.11	INSTRIN
			.01	INSTROUT
SKILSEMI			.34	FACILUSE
			.38	FACILFIX
1.00	ORGSIZE	.81	-.18	FIRMEXP
			.51	FIRMACAD
-.01	SECMOD		.03	INSTRIN
			-.05	INSTROUT
UNSKIL			.24	FACILUSE
			.51	FACILFIX
1.00	ORGSIZE	.81	-.09	FIRMEXP
			.40	FIRMACAD
-.02	SECMOD		-.01	INSTRIN
			.08	INSTROUT

tables, large firms tend to provide academic training for their workers. It will be recalled that for this group of skilled workers, size of firm is related to an emphasis on social skills and a de-emphasis on relational skills. That pattern of emphases is associated with having more training facilities and providing academic training. That pattern in turn is associated with size of the firm, indicating the degree of consistency or relevance that holds within the firm for this group of workers.

Large firms, ignoring firm modernity, are likely to emphasize training, especially academic training for unskilled workers as well. This relationship is less strong when modernity of the firm is taken into account, that is, when it is not ignored in the equation.

Firm Training Facilities and Worker Experiences. The results of Table I.50 allow us to compare the consistency between the kinds of training provided by the firm and those actually experienced by the worker. One would expect, from the relevance perspective, that firms with fixed training facilities would have workers trained using fixed facilities; that firms that provided training in the firm would have workers who reported having had training in the firm; that firms that emphasized academic training would have workers who reported having had academic training. These relationships can be evaluated one-by-one, using the correlation matrices.

The relationship between firm measures of training and the measures of worker training are lower than the relationships among the firm variables. The data for the former came from two different sets of respondents. The coefficients for the PROFMGMT and the UNSKIL groups are, however, moderately high.

Table I.50

Canoncial Variates and Correlation Coefficients

Firm Training Facilities and Worker Experiences

PROFMGMT				
-.22	FACILUSE	.48	.14	WRKRUSED
.74	FACILFIX		.80	WRKRFIXD
.01	FIRMEXP		.00	WRKREXP
.10	FIRMACAD		.13	WRKRACAD
.59	INSTRIN			
-.24	INSTROUT		-.34	WRKROUT
WHCOLLAR				
.43	FACILUSE	.33	.42	WRKRUSED
-.58	FACILFIX		.23	WRKRFIXD
.24	FIRMEXP		.52	WRKREXP
.89	FIRMACAD		.59	WRKRACAD
.41	INSTRIN			
.07	INSTROUT		-.29	WRKROUT
SEMISKIL				
.43	FACILUSE	.32	.49	WRKRUSED
.18	FACILFIX		-.08	WRKRFIXD
.12	FIRMEXP		.60	WRKREXP
.34	FIRMACAD		.44	WRKRACAD
.29	INSTRIN			
.12	INSTROUT		-.31	WRKROUT
UNSKIL				
.77	FACILUSE	.51	.30	WRKRUSED
.31	FACILFIX		.35	WRKRFIXD
.17	FIRMEXP		.70	WRKREXP
-.29	FIRMACAD		.31	WRKRACAD
.20	INSTRIN			
.21	INSTROUT		.09	WRKROUT

In firms that have professional and managerial workers, there is a positive relationship between what the firm provides in terms of fixed facilities, and what the worker experiences. There is no relationship between the provision of opportunities for on-the-job, or academic training, and the worker's report of one or the other kind of training. Firms that emphasize internal training have workers that report having been trained inside the firm.

There is slightly less consistency for white collar workers, who are likely to have received training that relied on expendable materials, with less emphasis on fixed facilities. (From Table I.49 one would conclude that these tend to be small firms.) The white collar workers report an equal mixture of academic and on-the-job training, but the firm emphasizes academic training. Finally, these workers tend to report training within the firm, and it is that kind of training that the firm emphasizes.

The findings are essentially the same for the skilled and semi-skilled group. The canonical variates for experiential training for workers are larger than those for the firm, but otherwise there is consistency between firm facilities and training experiences. The results for the unskilled group are more difficult to interpret. Firms that emphasize expendable training materials and that de-emphasize academic training do not always have workers that report using the expendable materials of fewer academic training experiences. On-the-job training reported by workers is found in firms that provide training with the use of expendable materials.

In general these results would suggest that there is consistency between workers' experiences and firms' training facilities, that is, that what workers receive is conditioned by what firms provide, a relationship

necessary to argue that the training system is relevant. It should be remembered that the data used in this set of comparisons came from two different respondents, so that the modest and moderate coefficients obtained are more reliable than would otherwise be indicated by their size.

Worker Experiences in Training and Skills Acquired. Although the model provides no specific hypotheses to relate the two sets of variables included in this comparison, the relevance model indicates that there should be some relationship between the kind of training received by the worker and the types of skills acquired by the worker. Except for the PROFMGMT group the canonical correlation coefficients are only modest in size, suggesting that the relationship between training and skill acquisition is not particularly high. (Table I.51)

Professional and managerial workers who report academic training, outside of the firm, on fixed equipment, are more likely to also report having acquired analytical skills as a result of that training. The data are not fine enough to indicate the kind of academic training, using fixed equipment, that they received. One possibility is that engineers and other technical professionals trained in special courses on measurement equipment would be included in this category. Managers and others that learned to use electronic data processing equipment would be included. The relationship could, in that way, make sense.

For white collar workers, analytical skills come about when training is academic but uses expendable materials. This seems a reasonable relationship.

The same set of relationships holds for the group of skilled and semi-skilled workers, except that the signs are reversed. That is,

Table I.51

Canonical Variates and Correlation Coefficients

Worker Experiences in Training and Skills Acquired

PROFMGMT				
.16	WRKRUSED	.52	-.39	PERAQ
.31	WRKRFIXD		-.05	CLEAQ
.04	WRKREXP		.08	SOCAQ
.67	WRKRACAD		..07	RELAQ
.31	WRKROUT		..89	ANAAQ
WHCOLLAR				
.27	WRKRUSED	.39	-.56	PERAQ
-.26	WRKRFIXD		-.30	CLEAQ
-.02	WRKREXP		.03	SOCAQ
.87	WRKRACAD		.12	RELAQ
.08	WRKROUT		.79	ANAAQ
SKILSEMI				
.03	WRKRUSED	.38	.78	PERAQ
.38	WRKRFIXD		.01	CLEAQ
.23	WRKREXP		.01	SOCAQ
-.59	WRKRACAD		-.36	RELAQ
.38	WRKROUT		-.43	ANAAQ
UNSKIL				
.07	WRKRUSED	.27	.73	PERAQ
.59	WRKRFIXD		.15	CLEAQ
-.70	WRKREXP		-.29	SOCAQ
-.48	WRKRACAD		-.41	RELAQ
-.38	WRKROUT		-.04	ANAAQ

little or no academic training is associated with acquisition of perceptual skills, not acquisition of analytical skills. In effect, the results indicate that for the SKILSEMI group, skill acquisition comes about much as for the white collar group, with the difference that training is more likely to be inside the firm, that relational skills are likely to be very low and clerical skills are not important.

Unskilled workers learn perceptual skills when they have training on durable equipment inside the firm. In terms of the model, these data would suggest that the worker's training experiences are not particularly relevant for what he thinks he has acquired from training.

Employer's Perceptions of Requirements and Skills Acquired. No direct relationship was expected between the perceptions employers have of the need for training of their workers, and the skills that workers report having acquired as a result of training. That relationship should be mediated through the creation of training opportunities in the firm and through the worker's participation in those opportunities. A direct relationship between employer's perceptions and learning would suggest that employers communicate their concerns to workers and that workers are both sensitive and acquiescent to employers' statements as to the right set of skills. In large and modern firms these conditions would not hold.

Evidence for a direct relationship between employer's perceptions and skills acquired would be, therefore, a disconfirmation of the relevance model. Table I.52 was generated for the purpose of assessing whether that relationship exists. Overall the canonical relationship between employer's perceptions and worker's skills acquired is not high. The coefficient is

Table I.52

Canonical Variates and Correlation Coefficients

Employer's Perceptions of Training Requirements and Skills Acquired

PROFMGMT				
-.15	BOSSPER	.48	-.43	PERAQ
-.45	BOSSCLE		.04	CLEAQ
.48	BOSSSOC		.15	SOCAQ
.29	BOSSREL		-.11	RELAQ
.75	BOSSANA		.86	ANAAQ
WHCOLLAR				
-.67	BOSSPER	.26	.55	PERAQ
.01	BOSSCLE		.35	CLEAQ
1.26	BOSSSOC		.81	SOCAQ
-.34	BOSSREL		-.58	RELAQ
-.63	BOSSANA		.13	ANAAQ
SKILSEMI				
-.74	BOSSPER	.38	.07	PERAQ
.42	BOSSCLE		.21	CLEAQ
.23	BOSSSOC		.67	SOCAQ
.64	BOSSREL		.27	RELAQ
.20	BOSSANA		.18	ANAAQ
UNSKIL				
-.40	BOSSPER	.32	.07	PERAQ
.19	BOSSCLE		.21	CLEAQ
.67	BOSSSOC		.67	SOCAQ
-.04	BOSSREL		.27	RELAQ
.65	BOSSANA		.18	ANAAQ

largest for the PROFMGMT group, but there is not a one-to-one correspondence between the sets of skills. Only for analytical skills do employers and workers correspond. There is more consistency for the group of skilled and semi-skilled workers. That is, the canonical variates for both employers and workers for relational and clerical skills are relatively high.

In sum, there is some correspondence between the two sets of ratings but the correspondence is not large nor always consistent. Relationships of that size could represent the mediational influence of the facilities and opportunities variables. In the path analysis that follows we examine the extent to which the influence of the employer's perceptions is in fact medaited through other variables.

6.0 Multivariate Analysis: Path Analysis

The components of the general model used in the multivariate analysis are described in Figure I.3. While it would be physically possible to include all of the 27 variables in a single analysis, the number of combinations would be so large as to make interpretation impossible. For that reason efforts were made to combine as many variables as possible and to eliminate those variables whose overall contribution to the explanation of variance in other variables was minimal.

The five variables assessing the employer's perception of needs for training were combined into the single variable, BOSSPCPN. The first four variables that refer to the firm's investment in training facilities were combined into the single variable FRMFACIL. (Correlations of these two variables with others appear in Tables I.40-43). In the path analyses that follow we have dropped INSTROUT, and employed only the variable INSTRIN. High scores on this variable indicate that the firm uses its own personnel to provide instruction.

It was possible to combine the variables WRKRUSED and WRKRFIXD into a new variable (WRKRFACIL) that measures the individual worker's exposure to different kinds of training facilities. An arbitrary decision was made to include WRKRACAD and not WRKREXP. The variable WRKROUT, with low correlations with any other variable except those that appear prior to it in the model, was excluded.

The five skills acquired variables were combined, weighting PERAQ negatively to create SKILLSAQ.

Finally, the initial analyses left SECMOD out of the equations, on the presumption it would contribute little to the analysis.

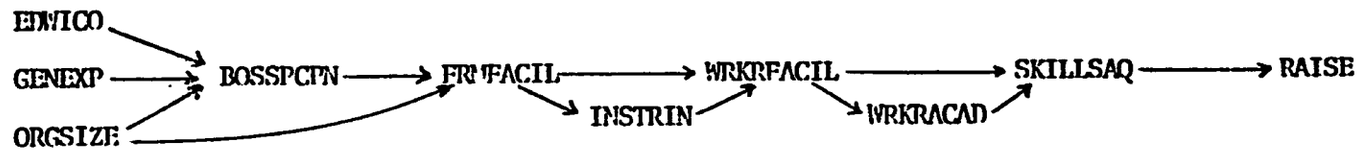
6.1 The General Model

Figure I.5 presents the model designed for the path analysis, using the reduced set of variables. Arrows in the model are meant to represent only the direct paths (presumed causal relationships) between variables. The model is read as follows. The education and experience of the work force (of a given occupational type) in a firm, and the size of the firm, act together to determine the perceptions that employers have of the need for training of their workers. Logically, one might expect that employers would set higher training requirements if their workers had low levels of education and few years of experience. Employers in large firms might be expected to set higher requirements than those in small firms. An examination of the correlation matrix suggests that the first two of these hypotheses are not correct. In general, employer's perceptions of needed training are higher when their workers have more not less education, and experience does not strongly influence employer's perceptions of need. We will return to discuss the significance of this finding for the ways in which employers think about the training needs of their workers.

The investments that firms make in facilities for training of their workers should be a direct function of the employer's perception of needs for training. We also expect that larger firms will have more in-plant training facilities than small firms. There should be a relationship between the availability of training facilities, and the use of company personnel as instructors in the firm.

Figure I.5

Structure of the General Path Model
(Worker and Firm Variables Combined)



The next three variables (beginning with WRKRFACIL) do not measure the characteristics of the firm, common to all workers in that company, but what the individual worker responding to the questionnaire has experienced. It seems reasonable to expect that workers will report more contact with training facilities in their firms, when those facilities exist within the firm. We also expect the WRKRACAD, as a measure of training received, should be associated with exposure to training facilities within the firm. Finally, the skills that a worker acquires should be a direct result of the experiences he has had with regard to training.

The model represents what should be found if the relevance model is correct, and if it is interpreted correctly. That is, if learning is relevant for productivity, there should be a direct relationship between SKILLSAQ and RAISE. Any other direct relationships (i.e. those not mediated through SKILLSAQ as a learning variable) would be, from the perspective of the model, not relevant, although they might make a good deal of sociological sense. For example, the finding that there is a strong direct relationship (or path) between FRMFACIL and RAISE could be interpreted to mean that firms with training facilities give raises to all workers, whether they have participated or not, learned or not. That is possible in situations in which raises and salaries are covered under collective bargaining or through government pay schedules. But the relationship is not relevant from a training perspective.

The failure to account for a large portion of the variance in RAISE (or any other dependent variable in the model) could be taken to suggest that the model proposed is trivial in importance, although it may be correct. We will use a less stringent criterion. If the path model

generates a multiple correlation or regression coefficient much smaller than what could be generated through ordinary multiple regression, then we will conclude that the particular path model employed is not an accurate representation of the relationships that do occur. In some cases, little of the variance in RAISE will be accounted for, as we have already found in the previous analyses. But we will evaluate the pat.. models in terms of whether the sequence of variables specified does (almost) as well in "predicting" the dependent variables, as does a multiple regression equation in which sequence is not specified.

Because this is an analysis of the relevance of the training system, there will be concern with more than one dependent variable. RAISE is taken as a proxy for productivity, one measure of eventual educational outcomes. SKILLSAQ will be treated as a dependent variable measuring the immediate outputs of training programs. WRKRFACIL and WRKRACAD will be taken as dependent variables measuring the participation of workers in training, as a function of the existence of training facilities (FRMFACIL) that in turn are the result of training objectives (BOSSPCPN). Attention will be focused, therefore, not just on the "prediction" of RAISE so much as the general fit of the relevance model to these data.

The presentation that follows will march through four sets of findings. First, we will analyze that subset of variables dealing with firm characteristics. Then we will look at a subset of variables dealing with worker experiences in training. Then we will test the combined model. Finally, we will present the results of a multiple regression analysis with all the variables, and suggest ways in which the path model could be reconstructed to generate a better solution. This will be done for each of the four occupational categories.

PROFMGMT Table I.53 presents the zero-order or simple correlation coefficients, and the path coefficients for a reduced model that uses firm characteristics to predict to RAISE. Figure I.6 represents the model graphically and includes the significant obtained paths. About 9 percent of the variance in RAISE is accounted for by this combination of variables. The more important predictors of RAISE are the education level of the workers, the size of the organization, and whether the firm provides its own instructors. We would interpret these findings as follows: larger firms, with professional and managerial employees with higher levels of education, are more likely to give raises to their professional and managerial employees (than are smaller firms with less-educated employees) especially when instruction is provided by company personnel.

The difference between the zero-order correlation and the path coefficient indicates the extent to which the variable's influence is direct or indirect. Although there is a positive (significant) correlation of BOSSPCPN with RAISE, it is reduced to zero as the influence of the employer's perception of training needs is mediated through the creation of training facilities. The impact of FRMFACIL appears to be mediated through the use of company personnel for instruction (or that impact is "lost" because other critical variables are left out of the model -- we shall examine this possibility shortly.

The model is not helpful in explaining the circumstances under which companies supply their own personnel for instruction. On the other hand, the model does very well in accounting for variance in the existence of training facilities. Large firms, with employers who believe their employees need training, have more training facilities than do smaller firms with less-concerned employers, at least this is so for professional and managerial employees. The simple correlation of education of workers

Table I.53

Zero-Order Correlations (r), Path Coefficients and R^2 for
PROFMGMT - Reduced Model
(Firm Variables)

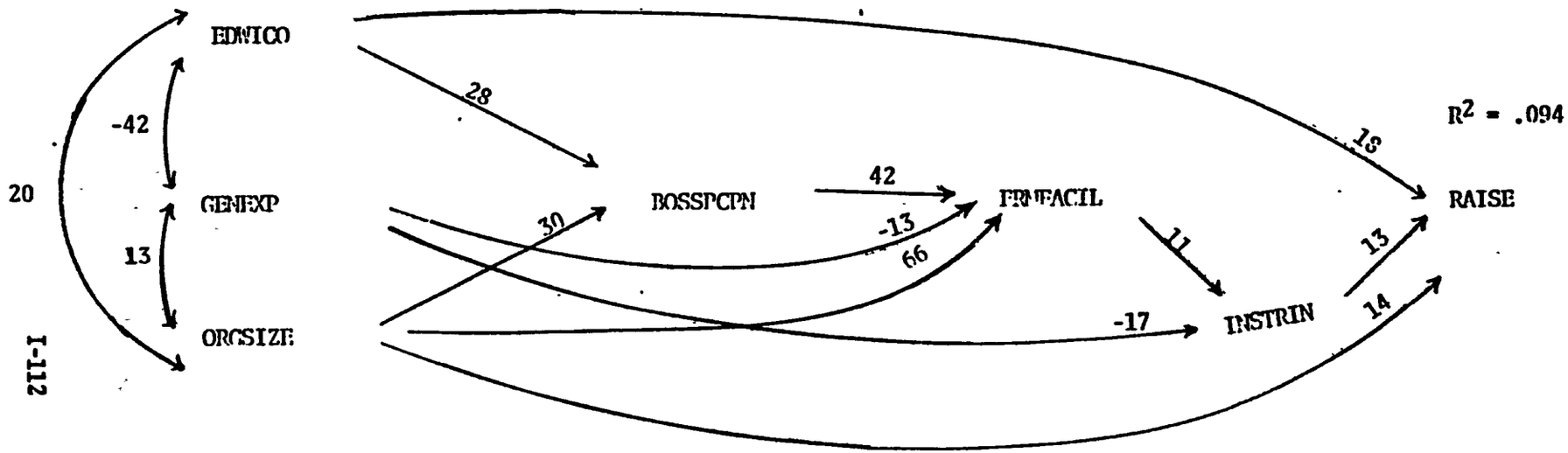
	GENEXP		ORGSIZE		BOSSPCPN		FRMFACIL		INSTRIN		RAISE	
	r	path	r	path	r	path	r	path	r	path	r	path
EDWICO	-421		199		377	282	438	090	050	-091	217	183
GENEXP			125		-167	-085	-160	-134	-165	-170	-065	019
ORGSIZE					340	295	807	661	044	-030	210	136
BOSSPCPN							706	424	134	073	128	-039
FRMFACIL									124	110	229	052
INSTRIN											147	134
R^2						221		894		046		094

Figure I. 6

Obtained Significant(≥ 0.10) Path

Coefficients for PROFMGT - Reduced Model

(Firm Variables)



with FRMFACIL is mediated through both organizational size and the employer's perceptions. In summary, it is not clear why employers should be more concerned for the training of better-educated professional and managerial employees, than for those who are less well-educated.

Table I.54 and Figure I.7 presents the results of the path analysis for the reduced model that examines the influence of the "worker" variables. This set of variables can account for almost 12 percent of the variance in RAISE. In addition to size of organization, RAISE is a function of learning by the worker. This is a confirmation of the relevance of training for acquiring skills. The high correlation (and path coefficient) between education and SKILLSAQ suggests that those who learn most (or who think they have learned) are those least in need of education.

It is not clear why the WRKRACAD variable does not contribute. There are two possibilities. First, it is possible that we have mis-specified the model, that participation in academic programs (courses, seminars, conferences) is prior to use of the company's training facilities. A second possibility is that some other variable, not included in the model, mediates between WRKRACAD and SKILLSAQ.

We could anticipate that the relationship between firm size and use of training facilities is a function of firm size being related to the existence of training facilities, and that the path coefficient will go to zero when we introduce the variable FRMFACIL. The same might be expected to occur with the education-WRKRFACIL relationship, and that with GENEXP-WRKRFACIL relationship.

In fact, those expectations were not fully born out in Table I.55 and Figure I.8, which present the path analysis results for the full model. WRKRFACIL has direct paths with education, experience, organizational size, and employer's perceptions. The positive relationship of education and

Table I.54

Zero-Order Correlations (r), Path Coefficients and R^2 for PROFMGMT - Reduced Model (Worker Variables)

	GENEXP		ORGSIZE		WKRFACIL		WRKRACAD		SKILLSAQ		RAISE	
	r	path	r	path	r	path	r	path	r	path	r	path
EDWICO	-421		199		306	342	499	546	476	381	217	037
GENEXP			125		039	163	037	251	-203	-059	-065	-035
ORGSIZE					253	165	257	081	189	082	210	136
WKRFACIL							338	141	261	113	206	100
WRKRACAD									286	036	182	044
SKILLSAQ											269	179
R^2						153		350		250		116

Figure I.7

Obtained Significant (≥ 0.10) Path Coefficients

for PROFMGMT - Reduced Model

(Worker Variables)

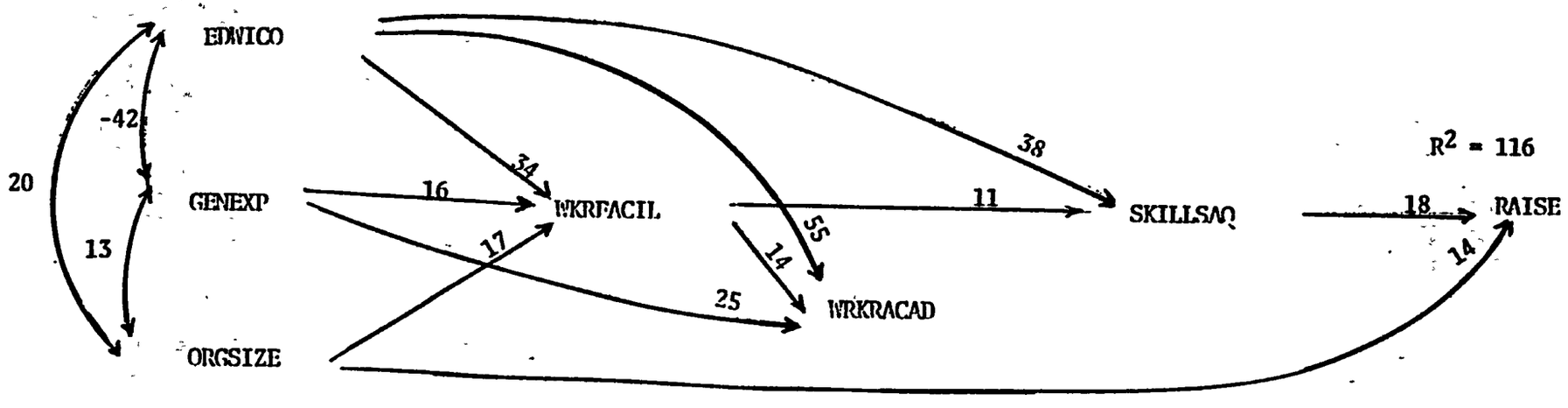


Table I.55

Zero-Order Correlations (r), Path Coefficients and R^2
for PROFMGMT. - Full Model
(Worker and Firm Variables Combined)

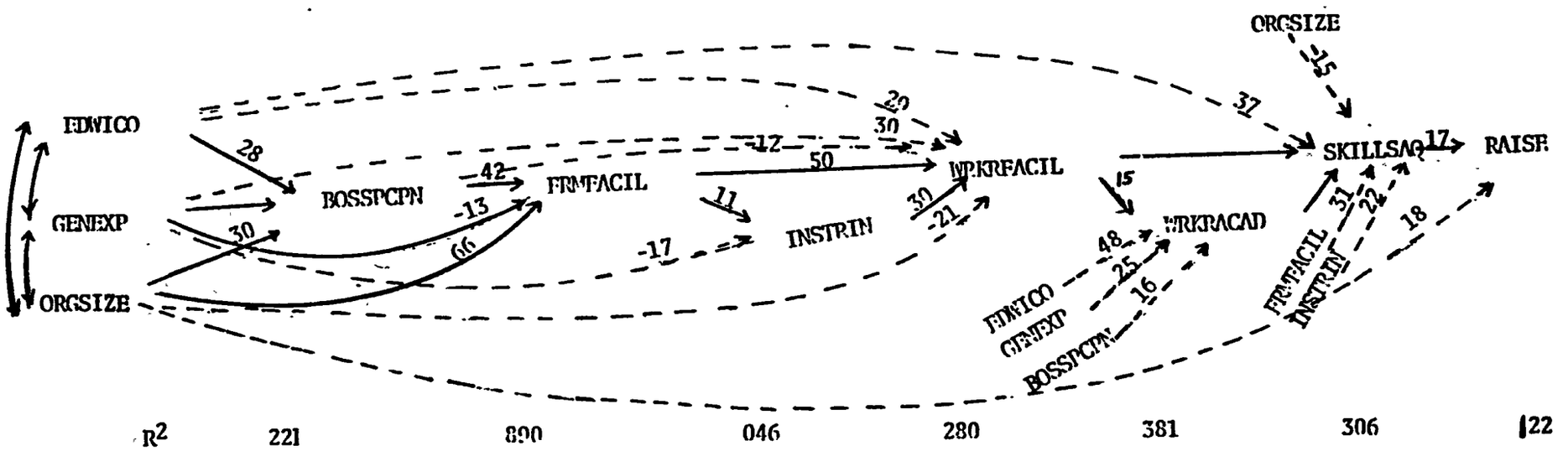
	WKRFACIL		WRKRACAD		SKILLSAQ		RAISE	
	r	path	r	path	r	path	r	path
EDWICO	306	286	499	483	476	374	217	060
GENEXP	039	295	037	251	-203	048	-065	-034
ORGSIZE	253	-212	257	006	189	-147	210	179
BOSSPCPN	255	-121	359	161	301	-046	128	-032
FRMFACIL	354	495	374	042	359	308	229	-047
INSTRIN	302	300	-041	-097	254	218	147	077
WKRFACIL			338	152	261	004	206	080
WRKRACAD					286	044	182	064
SKILLSAQ							269	167
R^2		280		381		306		122

Figure I.8

Original Structure of General Path Model - PROMOT

(Work and Firm Variables Combined)

(Solid lines = hypothesized paths; dotted lines = obtained paths)



experience with exposure to training suggests that employers select for training those candidates whose "certificates" (of formal education and years of experience) indicate they would improve with training. Another possibility is that better-educated and more-experienced workers have higher levels of motivation that lead to their participation in training programs. This latter interpretation would require an assumption that workers select themselves into training programs.

The negative path coefficient of ORGSIZE with WRKRFACIL is difficult to interpret. Controlling on education and experience and presence of facilities in the firm, what was a positive correlation is reversed in sign. It could be read as follows: firms, with better-educated employees with more years of experience, that are well-equipped with training facilities, get more participation of professional and managerial employees in training programs if those firms are small.

In any event, much of the explained variance in the worker-participation variable is the result of the contribution of "not relevant" variables. That is, even though the results "make sense" (or can be made to make sense), from a strict relevance perspective it would be better if worker participation in training was a function of availability of training and some measure of need for training.

The relationship between participation in <u>academic</u> training programs and individual characteristics also runs counter to the relevance model. It is reasonable that better-educated workers would be those most likely to receive theoretical training, but the argument could be made that those with less education are those most in need. As noted earlier, the WRKRACAD variable is not useful for accounting for variance in either the learning measure or the productivity measure.

Learning, or the report of having learned, is most common among professionals and managers with higher levels of education in firms with training facilities, irrespective of the degree of their participation in training programs. This result suggests that the skills acquired measure is not a valid indicator of learning so much as it reflects self-confidence or a tendency to describe oneself in a positive light. It is also possible that by investing in training facilities in the plant, employers create attitudes among their workers favorable to the acquisition of new skills; and that better-educated persons are socialized through formal education to expect that they should and will learn.

Overall, the results for the PROFMGMT occupational category provide some evidence that the training systems of Salvadorean firms have some relevance. There is a positive connection between reports of learning and the assignment of raises. There is a positive relationship between the perception by employers that training is required and the existence of facilities. And these perceptions vary systematically according to important characteristics of the firm and of the professional-managerial work force. Table I.56 shows that the best combination of 11 variables accounts for only 14.1 percent of the variance in RAISE, not much better than the 9-variable path model presented. The regression results suggest that the variables WRKREXP may have worked better than WRKRACAD (although that is not clear from an examination of the correlation matrix), and that addition of the SECMOD variable may have contributed more.

WHCOLLAR. The results are not nearly as favorable for the group of workers included in the white-collar category. As experienced in the previous analyses, not much of the variance in the important dependent variables is accounted for by the variables we have included in the study.

Table I.56

Regression Analysis Using All Variables
in Path Model, RAISE, or Dependent Variables
(Worker and Firm Variables Combined)
PROFMGMT

Dependent Variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B
EDWICO	0.217	0.012	0.055	0.018
GENEXP	-0.065	0.001	-0.018	-0.002
ORGSIZE	0.210	0.013	0.061	0.046
SECMOD	0.156	0.012	0.077	0.387
BOSSPCPN	0.128	-0.011	-0.089	-0.020
FRMFACIL	0.229	0.017	0.074	0.024
INSTRIN	0.147	0.011	0.077	0.226
WKRFACIL	0.206	0.011	0.052	0.060
WRKREXP	0.171	0.020	0.119	0.344
WRKRACAD	0.182	0.013	0.074	0.129
SKILLSAQ	0.269	0.042	0.155	0.058

$R^2 = 0.1410$

Constant =-0.1799

Table I.57 and Figure I.9 presents the results of the path analysis using the first reduced model to predict RAISE. The only variable for which a significant amount of variance can be accounted is FRMFACIL. As was the case for the PROFMGMT group, investment in training facilities is highest in larger firms in which employers believe their workers require training. For this group, there is also a significant (though smaller in size) path for the education variable. That is, firms with largest investments in training facilities have white collar workers with more formal education than firms with less investment in training. This finding makes sense if one assumes that firms with less complicated technologies (requiring less training of workers) also hire workers with lower levels of education to use those technologies. That is, if a firm employing white collar workers requires little of workers in terms of independence of action or judgment, if the work is highly routinized, then the firm can both hire people with lower levels of education and provide less training for these workers. If, on the other hand, the firm expects white collar employees to assume more responsibility (e.g., to initiate their own sales campaigns, to handle bookkeeping functions, to make decisions about personnel problems) then the firm could well seek to hire better educated people and to provide them with training. Firms with larger investments in training for white collar workers are not, according to the correlation matrix, necessarily in the modern sector.

In the next set of results shown in Table I.58 and Figure I.10, the same overall conclusion holds; that is, these results do not explain much of what happens with white collar workers. The amount of participation of a worker in academic training programs is a positive function of education

Table I.57

Zero-Order Correlations (r), Path Coefficients and R^2 for
WHCOLLAR - Reduced Model
(Firm Variables)

	GENEXP		ORGSIZE		BOSSPCPN		FRMFACIL		INSTRIN		RAISE	
	r	path	r	path	r	path	r	path	r	path	r	path
EDWICO	-144		033		002	-004	208	176	-116	-114	078	101
GENEXP			114		-041	-041	-052	-080	-112	-143	053	081
ORGSIZE					-014	-019	590	598	-003	091	-035	-054
BOSSPCPN							362	367	012	053	-104	-106
FRMFACIL									-068	-125	-051	009
INSTRIN											076	099
R^2						002		527		038		032

Figure I.9

Obtained Significant (≥ 0.10) Path

Coefficients for MICOLLAR - Reduced Model

(Firm Variables)

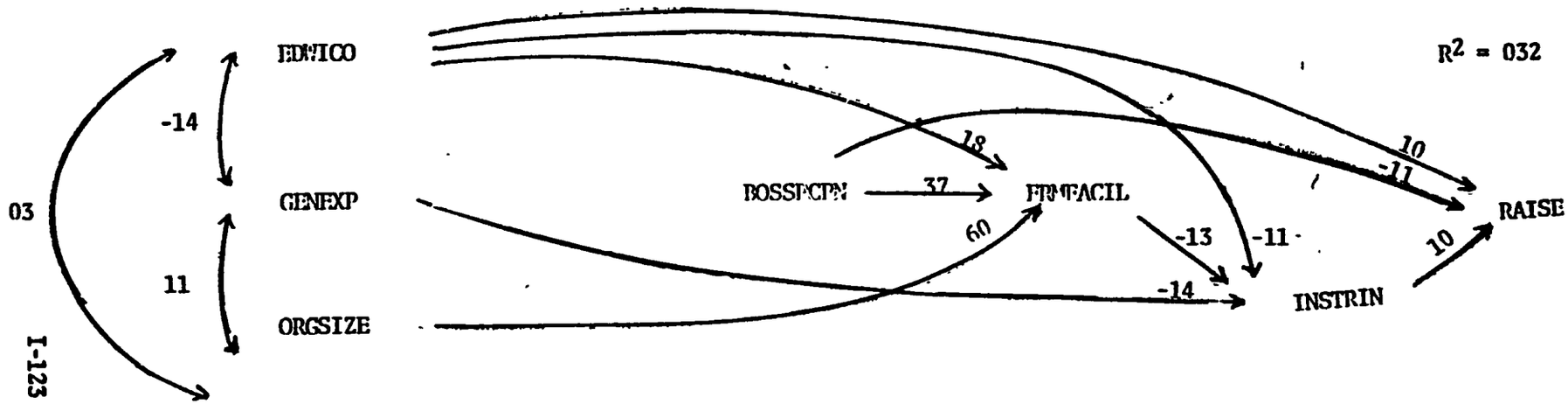


Table I.58

Zero-Order Correlations (r), Path Coefficients
and R^2 for WHCOLLAR - Reduced Model
(Worker Variables)

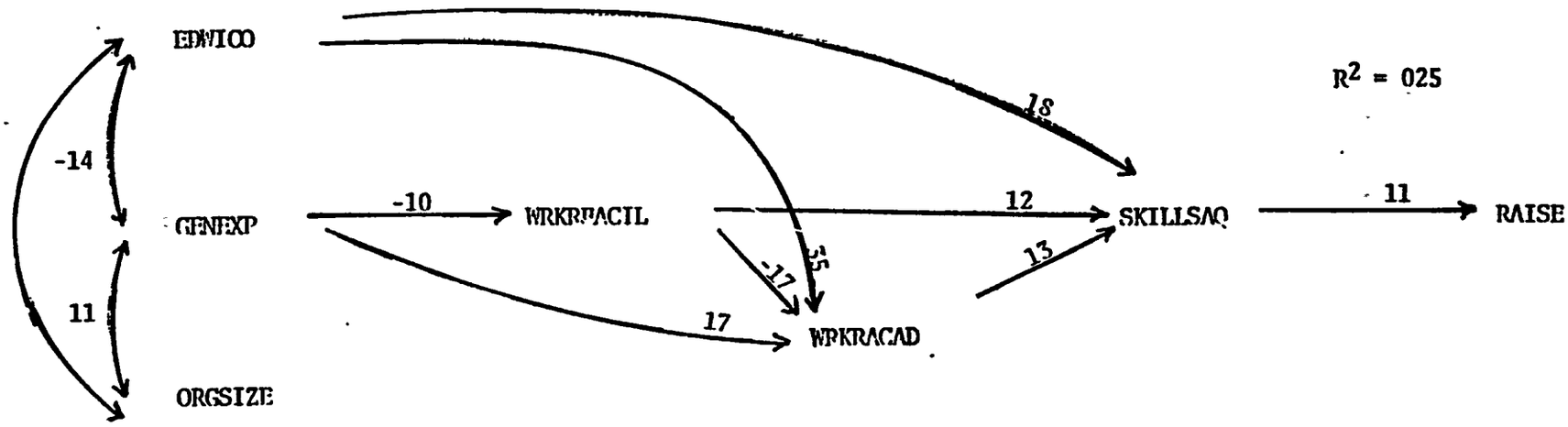
	GENEXP		ORGSIZE		WKRFACIL		WRKRACAD		SKILLSAQ		RAISE	
	r	path	r	path	r	path	r	path	r	path	r	path
EDWICO	-144		033		040	025	323	354	223	179	078	081
GENEXP			114		-096	-098	142	173	-032	-003	053	075
ORGSIZE					040	051	065	040	-073	-092	-035	-034
WRKFACIL							-169	-168	102	120	-020	-033
WRKRACAD									160	128	014	-044
SKILLSAQ											120	112
R^2						012		170		079		025

Figure I. 10

Obtained Significant (≥0.10) Path Coefficients

for WICOLLAR - Reduced Model

(Worker Variables)



and experience (as was the case with professional workers) and negatively related to having used training facilities in the firm. That is, firms tend to send their better educated (and more experienced) white collar workers outside the firm for training. What workers learn is both a function of their education level and their participation in training programs, a result that confirms the relevance model. The only significant (albeit tiny) path coefficient with RAISE is for SKILLSAQ.

Running the full model provides some additional information. Table I.59 and Figure I.11 present the results. Worker participation in training programs is highest in firms that provide their own personnel as instructors, and that have a larger investment in training facilities. In addition to learning, white collar workers are more likely to have received a raise if their employer thinks they do not require training. The system appears to be relevant, although clearly there are a number of other factors operating that are not included in the analysis.

Using 11 variables to predict RAISE, it is possible to account for 9 percent of the variance; the path model with 9 variables accounted for 4.5 percent. Table I.60 suggests that the predictive power of the path model could have been increased by inclusion of the SECMOD variable. Apparently industrial and financial firms in El Salvador were more likely to give raises to their white collar employers in 1975, than were other firms. The R^2 also would have been increased (slightly) by the inclusion of the WRKREXP variable instead of the WRKRACAD variable.

SKILSEMI. Results for the group of skilled and semi-skilled workers are presented in the next set of tables. In Table I.61 and Figure I.11 are the path analysis outcomes for the firm variables. Only a small proportion of the variance in RAISE can be accounted for by these variables,

Table I.59

Zero-Order Correlations (r), Path Coefficients and R^2
Full Model - WHCOLLAR
(Worker and Firm Variables Combined)

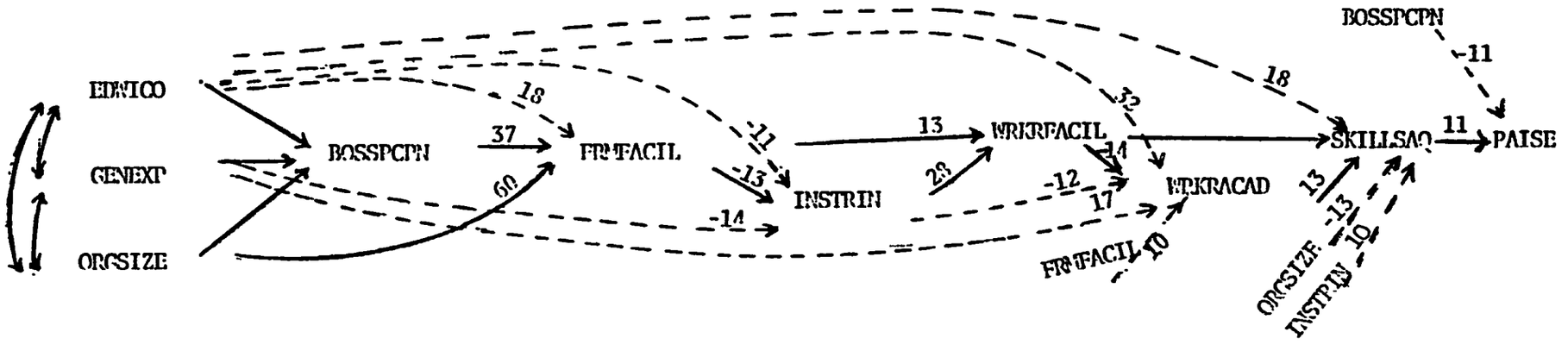
	WKRFACIL		WRKRACAD		SKILLSAQ		RAISE	
	r	path	r	path	r	path	r	path
EDWICO	040	039	323	319	223	180	078	086
GENEXP	-096	-050	142	170	-032	014	053	078
ORGSIZE	040	-034	065	-019	-073	-134	-035	-041
BOSSPCPN	019	-035	060	034	062	025	-104	-110
FRMFACIL	093	134	155	101	059	070	-051	008
INSTRIN	270	279	-221	-120	072	104	076	099
WKRFACIL			-169	-142	102	089	-020	-054
WRKRACAD					160	134	014	-021
SKILLSAQ							120	108
R^2		092		194		093		045

Figure I.11

Original Structure of General Path Model - WHCOLLAR

(Worker and Firm Variables Combined)

(Solid lines = hypothesized paths; dotted lines = obtained paths)



R^2	002	527	038	092	194	093	045

Table I.60

Regression Analysis Using All Variables
in Path Model, RAISE, or Dependent Variables
(Worker and Firm Variables Combined)
WHCOLLAR

Dependent Variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B
EDWICO	0.078	0.004	0.056	0.031
GENEXP	0.053	0.005	0.096	0.014
ORGSIZE	-0.035	0.002	-0.070	-0.067
SECMOD	0.162	0.033	0.205	0.823
BOSSPCPN	-0.104	0.016	-0.152	-0.046
FRMFACIL	-0.051	-0.001	0.026	0.011
INSTRIN	0.076	0.007	0.095	0.297
WKRFACIL	-0.020	0.001	-0.069	-0.089
WRKREXP	0.081	0.006	0.079	0.240
WRKRACAD	0.014	-0.000	0.007	-0.013
SKILLSAQ	0.120	0.015	0.129	0.053

R^2 = 0.0899

Constant = 0.4443

Table I.61

Zero-Order Correlations (r), Path Coefficients and R^2 for
SKILSEM II - Reduced Model
(Firm Variables)

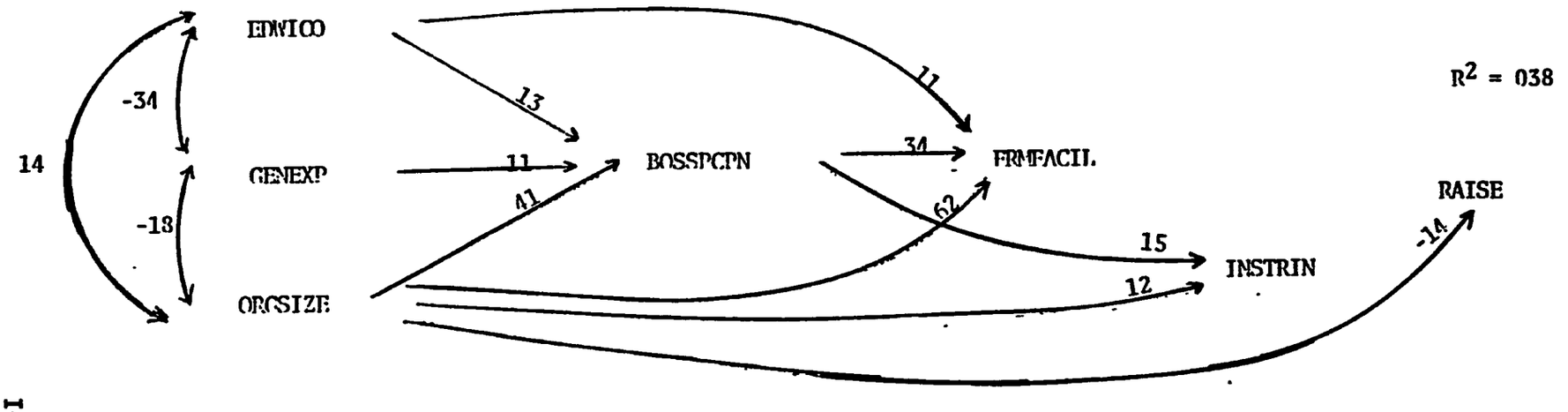
	GENEXP		ORGSIZE		BOSSPCPN		FRMFACIL		INSTRIN		RAISE	
	r	path	r	path	r	path	r	path	r	path	r	path
EDWICO	-336		144		149	126	246	107	-047	-067	042	090
GENEXP			-181		-011	105	-149	002	003	-010	076	073
ORGSIZE					406	406	768	616	100	117	-153	-139
BOSSPCPN							604	339	130	145	002	084
FRMFACIL									075	-088	-108	-064
INSTRIN											-007	005
R^2						182		704		027		038

Figure I.12

Obtained Significant (≥ 0.10) Path

Coefficients for SKILSFMI -Reduced Model

(Firm Variables)



and RAISE is solely a function of firm size. Professional and managerial workers were more likely to get raises if they worked in a large firm; skilled and unskilled workers are more likely to have received a raise if they work for a small firm.

The provision of company personnel as trainers is more common in larger firms, and there employers feel their workers need training. This is to some extent a function of the sector in which the firm is categorized. Industrial firms are more likely to use their own personnel as trainers (SECMOD - INSTRIN = 0.155). Larger firms, and those with concerned employers, provide more in the way of training facilities. About 70 percent of the variance in presence of training facilities is accounted for by a combination of firm size, employer's perceptions and worker education levels.

The employer's perceptions of the need for training are higher in larger firms, with better-educated and more experienced workers. This combination is like that found for white collar workers. The suggestion was that larger firms with more complicated production technologies may need to hire better-educated and more experienced workers expecting to train them in the technology. Smaller firms, on the other hand, may have less sophisticated technologies that require less training for workers who have less education and experience. For this group of skilled and semi-skilled workers there is a negative correlation between experience and firm size; larger firms tend to have workers with lower levels of experience. It is within those larger firms where workers do have more experience that we could expect to find more sophisticated technologies.

About 7 percent of the variance in RAISE is explained using the worker characteristics variables, as shown in Table I.62 and Figure I.13. As for both the professional and managerial, and the white collar workers,

Table I.62

Zero-Order Correlations (r), Path Coefficients
and R^2 for SKILSEMI - Reduced Model
(Worker Variables)

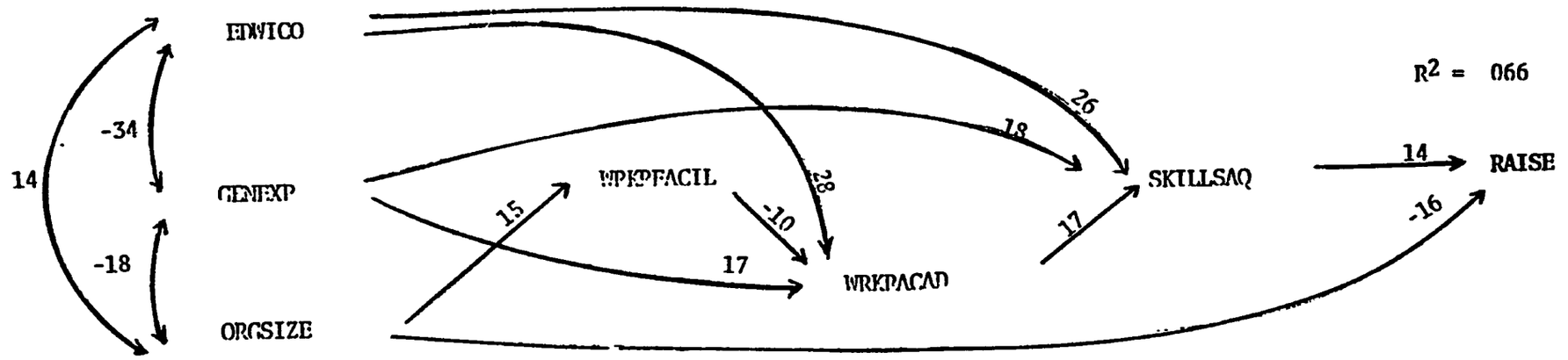
	GENEXP		ORGSIZE		WKRFACIL		WRKRACAD		SKILLSAQ		RAISE	
	r	path	r	path	r	path	r	path	r	path	r	path
EDWICO	-336		144		-035	-079	235	282	223	255	042	028
GENEXP			-181		-066	-065	073	169	122	180	076	039
ORGSIZE					154	153	037	043	-074	-082	-153	-155
WKRFACIL							-117	-102	-068	-015	032	079
WRKRACAD									238	166	114	086
SKILLSAQ											181	143
R^2						031		092		126		066

Figure I. 13

Obtained Significant (≥ 0.10) Path Coefficients

for SKILSFMT - Reduced Model

(Worker Variables)



RAISE is a function of firm size and of learning. Learning in turn is a function of worker experience and training and participation in academic training programs. We have already suggested the possibility that this relationship could reflect no more than a tendency of more experienced and educated workers to say they learned while those with less education and experience are less confident in themselves.

Better educated and more experienced workers are also more likely to receive some kind of theoretical (or academic training). This training is more frequently given in those cases where the firm has a smaller investment in training facilities. These could be smaller production-oriented firms that have expensive machinery requiring skilled and semi-skilled workers to receive classroom training.

In the full model about 7 percent of the total variance in RAISE is accounted for by the combination of variables. Increases in productivity are associated with learning of skills and occur more frequently in firms with fewer training facilities than in those with many training facilities. This latter finding is of doubtful reliability, both because the path coefficient is so small, and because it suggests that some structural variable is determining the assignment of raises to these employees during the particular period in question. If this finding is taken at face value, it would have to be interpreted to mean that firms that invest in training facilities are less productive than those that do not.

Learning, if that is what the SKILLSAQ variable really measures, is reported more frequently by skilled and semi-skilled workers in small firms, with higher levels of education and experience, who have had an academic training experience in firms that have training facilities and

an employer who believes that workers need training. Some of these relationships do not fit the relevance model. We have already commented on the problem of assuming that better educated and more experienced workers learn more. It is not clear why the presence of training facilities, independent of a worker's use of those facilities, should be associated with learning. Nor is it clear why there should be more learning reported in those instances where the employer feels that the workers need more training.

Participation in academic training programs (WRKRACAD) is associated with higher levels of education and experience and occurs more often in smaller plants that do not use their own personnel for instructors, but that do have some training facilities. Possibly in these instances trainers come into the firm from the outside to provide additional theoretical training for skilled and semi-skilled workers in critical positions.

Overall, use of the company's training facilities (WRKRFACIL) is associated with firm size (larger firms, more use) and with use of company personnel as instructors. Those firms do not have a large investment in training facilities, suggesting that the training provided is rather elementary, experiential (i.e., on-the-job or hands-on) in emphasis, probably related to basic production requirements of the firm. As can be seen in Table I.63 , the path model does as well as an 11-variable regression analysis (Table I.64), in terms of accounting for variance in RAISE.

UNSKIL. The set of firm variables are not useful for accounting for variance in the RAISE measure (Table I.65 ; Figure I.15).

Table I.63

Zero-Order Correlations (r), Path Coefficients and R^2
Full Model - SKILSEMI
(Worker and Firm Variables Combined)

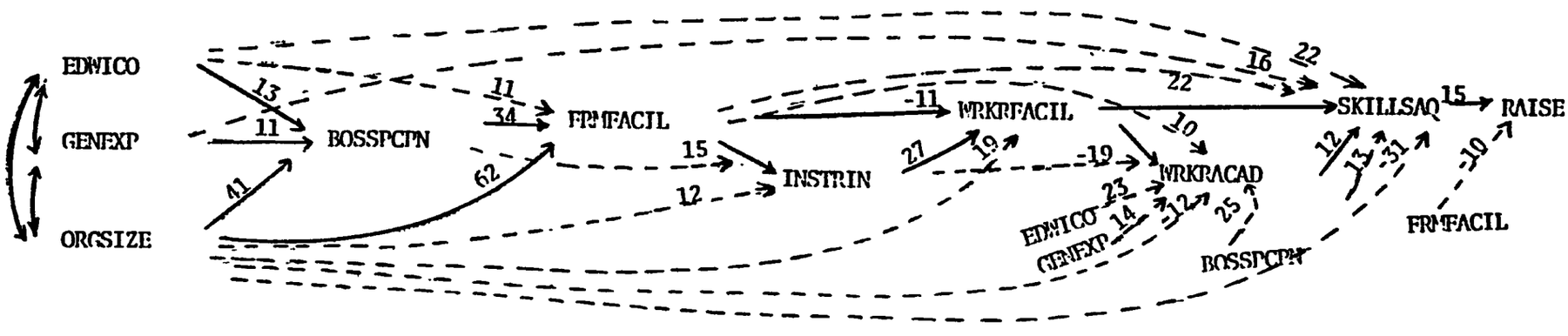
	WKRFACIL		WRKRACAD		SKILLSAQ		RAISE	
	r	path	r	path	r	path	r	path
EDWICO	-035	-052	235	228	223	221	042	036
GENEXP	-066	-066	073	143	122	163	076	037
ORGSIZE	154	189	037	-118	-074	-308	-153	-092
BOSSPCPN	081	043	264	250	215	134	002	034
FRMFACIL	079	-109	173	096	121	222	-108	-100
INSTRIN	286	267	-186	-187	047	089	-007	-006
WKRFACIL			-117	-055	-068	-041	032	077
WRKRACAD					238	124	114	087
SKILLSAQ							181	151
R^2		106		184		184		069

Figure I.14

Original Structure of General Path Model - SKILSEMI

(Worker and Firm Variables Combined)

(Solid lines = hypothesized paths; dotted lines = obtained paths)



R^2	182	704	027	106	184	184	069

Table I.64

Regression Analysis Using All Variables
in Path Model, RAISE or Dependent Variables
(Worker and Firm Variables Combined)
SKILSEMI

Dependent Variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B
EDWICO	0.042	0.001	0.035	0.017
GENEXP	0.076	0.002	0.031	0.003
ORGSIZE	-0.153	0.015	-0.098	-0.065
SECMOD	-0.090	0.001	-0.016	-0.041
BOSSPCPN	0.002	0.000	0.035	0.009
FRMFACIL	-0.108	0.010	-0.093	-0.027
INSTRIN	-0.007	0.000	-0.006	-0.015
WKRFACIL	0.032	0.002	0.077	0.102
WRKREXP	0.014	0.000	0.023	0.057
WRKRACAD	0.114	0.010	0.085	0.185
SKILLSAQ	0.181	0.027	0.148	0.054

$R^2 = 0.0696$

Constant = 0.6160

Table I.68

Regression Analysis Using All Variables
in Path Model, RAISE, or Dependent Variables UNSKIL
(Worker and Firm Variables Combined)

Dependent Variable: RAISE

Variable	Simple r	Contribution to R^2	Beta	B
EDWICO	0.056	-0.000	-0.002	-0.000
GENEXP	0.045	0.001	0.027	0.002
ORGSIZE	0.037	0.002	0.059	0.034
SECMOD	0.121	0.020	0.162	0.338
BOSSPCPN	0.095	0.004	0.041	0.009
FRMFACIL	0.010	-0.002	-0.166	-0.042
INSTRIN	0.057	0.003	0.058	0.120
WKRFACIL	0.077	0.004	0.047	0.049
WRKREXP	-0.004	0.000	-0.058	-0.117
WRKRACAD	0.092	0.010	0.106	0.212
SKILLSAQ	0.150	0.027	0.177	0.050

R^2 = 0.0686

Constant = 0.4295

is most commonly reported by better educated and more experienced workers, in small firms, where non-company personnel provide training. The learning measure could reflect expectations of educated persons that they will learn especially when they are singled out for special training programs given by people from outside the firm. Learning is not systematically associated with participation in the company's training program, whether that is academic or experiential in nature.

Participation in academic training programs, for all occupational categories, is most common for those who already have higher levels of education and experience. Those who believe that level of education attainment is a good indicator of ability to learn will find this relationship "relevant". But if education is expected to reflect prior learning, it would seem reasonable to argue that productivity of workers could be raised more by giving training to those not previously educated than to those with high levels of attainment. This seems especially the case where the content of formal education has little relevance for productivity in employment as must be the case in El Salvador with skilled, semi-skilled and unskilled occupations. Either education and experience dispose individuals to make themselves available for training, or employers use education as a certification of the "trainability" of their employees through "academically" oriented programs (i.e., those that provide some instruction in the classroom).

Salary differentials based on education are sometimes justified in terms of the higher productivity of better-educated workers. If RAISE is a reasonable measure of the employer's assessment of a worker's productivity (or increments in it), then it might be reasonable to expect to find a

relationship between education and RAISE. For this particular data the size of that relationship is constrained by the fact that only one-third of the workers received raises; education's relationship with productivity could be better explained by an examination of an earning stream rather than increments at one point in time. Furthermore, by dividing the sample into four occupational categories we have reduced the variance of the education measure to the extent that education and occupational category are associated. The education-RAISE correlation is highest (0.17) for the PROFMGMT group, which has the largest variance for the EDWICO variable. Education has an insignificant path with RAISE for all four occupational categories, but a significant path with SKILLSAQ. We interpret this to mean that formal education has no direct effects on this measure of productivity, but (if all the assumptions about the SKILLSAQ variable are merited) does contribute to increased learning and therefore indirectly contributes to productivity gains.

The finding that general worker participation in training programs (that use plant facilities) does not result in learning and is not related to increased productivity, could be taken as indicative of the lack of relevance of most in-house firm training programs. Participation in this training program is unrelated to education and experience (except for professional and managerial workers) and probably can be taken to mean that most of what is called "training" in firms in El Salvador is no more than supervision of the worker as he goes about his daily tasks, once having passed through a basic introduction to the job. As noted earlier, almost all of the "training" provided is on-the-job, probably meaning in most cases that whatever the worker learns he acquires

by himself with only a small input by the firm. Only for professional and managerial personnel is there a strong relationship between the firm's investment in training facilities and the level of worker participation in training.

In all cases, however, it is clear that firms develop training programs and invest in facilities based on the perception that workers need training, and in accordance with the size of their payroll. Thus, employers in large firms are most likely to see the need for training, except in the case of white collar workers.

APPENDIX A

Glossary of the Variables and their Acronyms in the Multivariate Analysis

Variable Acronym	Variable Precis	Page # of full Description
ANNAQ	Analytical skills workers acquired according to their reports	I-81
BOSSANA	Analytical skills workers required according to their employers' opinions	I-70
BOSSCLE	Clerical skills workers required according to their employers' opinions	I-70
BOSSOC	Social skills workers required according to their employers' opinions	I-70
BOSSPCPN	Employers' perceptions of workers training requirements	I-105, I-109
BOSSPER	Perception and dexterites skills workers acquired according to their reports	I-70
BOSSREL	Relationship skills workers required according to their employers' opinions	I-70
CLEAQ	Clerical skills workers reported having acquired	I-105
EDWICO	Years of (formal) education workers attained	I-71
FACILFIX	Instructional resources provided by firms (e.g., facilities, equipment)	I-70
FACILUSE	Instructional materials provided by firms (e.g., written materials)	I-70
FIRMACAD	Academic methods of instruction used by firms to train their personnel (e.g., courses, seminars)	I-70
FIRMEXP	Experiential methods of instruction used by firms to train their personnel (e.g., work experience, job rotation)	I-70
FRMFACIL	Firm investments in training facilities and equipment	I-81, I-105,I-10

Variable Acronym	Variable Precis	Page # of full Description
GENEXP	Workers total years of work experience	I-71
INOUT	Both company and non-company instructors	not discussed
INSTRIN	Company personnel who acted as instructors (e.g., general managers, technical personnel)	I-70, I-105
INSTROUT	Non-company instructors	I-70, I-105
ORGSIZE	Size of organizations, in numbers of workers	I-70
PERAQ	Perception and Dexterity Skills Workers Reported having acquired	I-81, I-105
RAISE	Salary increases workers received subsequent to the last training they received	I-71, I-109
RELAQ	Relationship skills workers reported having acquired	I-81
SECMOD	Modern sector of production	I-70, I-106
SEX	Workers sex	see Univariate
SKILLSAQ	Skills in general workers reported to have acquired during last training program	I-81, I-105, I-109
SOCAQ	Social skills workers reported having acquired	I-81
WRKRACAD	Academic methods of instruction workers experienced (e.g., course, seminars, conferences)	I-105, I-108, I-109
WRKREXP	Experiential methods of instruction workers experienced (e.g,, work experience, job rotation)	I-71, I-105
WRKRFACIL	Instructional resources and materials experienced by workers (e.g., facilities, equipment)	I-81, I-105, I-108, I-109
WRKRFIXED	Instructional resources workers experienced	I-81, I-105
WRKROUT	Both company and non-company instructors workers experienced during last training received	I-71, I-105
WRKRUSED	Instructional materials workers experienced (e.g., written materials)	I-81, I-105
PROFMGMT	Occupational group including Professionals and Managers	I-71
WHCOLLAR	Occupational Group including White Collar Workers	I-71
SKILSEMI	Occupational Group includes both Skilled and Semi-Skilled Workers	I-72
UNSKIL	Occupational Group including Unskilled Workers	I-72

II. Follow Up

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Appendix A. Glossary of Variable Acronyms

II. The Assessment of the Relevance of the Diversified Bachillerato

1.0 Introduction and Objectives of the Study

One of the major accomplishments of the 1967-1972 Educational Reform of El Salvador was the creation of a new form of secondary education. Prior to 1971 secondary education was divided into two three-year cycles. In addition to the basic cycle (grades 7, 8 and 9) that prepared students for the second cycle, the system offered terminal programs in commercial and secretarial skills, home economics, graphic arts, and teacher training for those scheduled to serve in rural areas. In the second cycle, or Bachillerato (grades 10, 11, and 12) students could study -- in addition to Sciences and Letters -- Arts, Industry, Agriculture, and Nursing.

There was considerable dissatisfaction with the existing programs on the grounds that they were academic and thought to be ill-adapted to the development needs of El Salvador. Unemployment among secondary school graduates was considered to be high, and perhaps as a result of this, too many of them sought to attend an already overcrowded national university. Economic planners talked of the need for persons trained at a sub-engineer level, who could serve as the communication link between the engineer and the skilled worker, and who could assume some positions of administrative responsibility. The development strategy (consistent with the then promising conditions offered by the Central American Common Market) called for industrial development, requiring in turn high school graduates trained in useful skills rather than the encyclopedic knowledge acquired at the traditional high school.

The Educational Reform took two steps to correct what were considered deficiencies in the secondary school program. The first cycle of secondary was made the third cycle of the new Basic Education Program. Compulsory education in El Salvador was to last nine instead of six years. Grades 10, 11 and 12 of the old secondary program were converted into a new Bachillerato, with ten separate programs. These were: The Academic bachillerato; industrial arts, commerce and administration; agriculture; teaching; health; navigation and fishing; hotel management; and vocational. Later the Academic Bachillerato was divided to provide for a specialization in Electricity, and another in Mechanics.

Students entered the new diversified bachillerato program for the first time in 1971, but in fairly reduced numbers as not all programs were operating at that time. A complete program was available in 1972, and the first graduates of that program entered society in 1974. The study described in this report was designed to evaluate the effectiveness of this new program in reaching the objectives set for it.

The new Bachillerato program had two main objectives: gainful employment, and preparation for advanced education. By national law, education in EEl Salvador is meant "to enable the individual to perform his job satisfactorily and to comprehend the value of labor as the principal source of human dignity and socio-economic development."[1] It was hoped that graduates of the new program would be hired by employers who were aware of the skills that the new graduates possessed and who were eager to put their productive abilities to work. The program contemplated that increased employment opportunities for graduates would reduce pressures on the university, especially from graduates of secondary school programs not specifically

[1] Memoria de Labores, 1975-1976, Ministerio de Educacion, Republica de El Salvador, 1976, p. 61.

linked to university-level programs. It was assumed that students (and their parents) would be aware of the market demand for graduates in specific programs, and that it would be possible to adjust enrollments to market demands on the basis of the experiences of previous graduates.

The data reported here were collected in a sample survey designed to evaluate the program in terms of outcomes experienced by the 1974 graduates. The designers of the survey had several purposes in mind:

a. To what extent do graduates obtain employment, or remain unemployed?

b. Are the salary levels of graduates higher than non-graduates?

c. Is employment in fields consistent with training given in the Bachillerato?

d. Do unemployed persons actively search for work?

e. What proportion of graduates go on to higher education?

f. Is there consistency between programs in higher education, and the program followed in the Bahillerato?

g. What are the personal and familial characteristics of persons who obtain employment, and who go on to higher education?

The survey also allowed graduates to express their satisfaction with particular aspects of the program they had followed. In addition to the survey, it was possible to collect information on the academic grades of the graduates, from their 8th through the 12th years, in all major subjects.

These data make possible the assessment of several aspects of the relevance of the Diversified Bachillerato program. First, it will be possible to assess relevance in terms of the relationship between program characteristics and outcomes and in the form of employment, attendance at an institution of higher education, or unemployment. Programs can be considered to be relevant when graduates attain the outcome category that is most consistent with the objectives of the program, for example, when persons

in job-preparation programs actually obtain employment. The salary of employed persons can be used as a proxy for job performance; that is, programs can be considered as relevant to the extent that knowledge of their characteristics is useful in predicting salary. For example, a strong relationship between grades obtained in a program, and salary would suggest that the criteria for evaluating school performance matched those used for evaluating work performance. If one assumes that grades measure learning in an academic program, then a positive relationship between grades and salary could be taken to mean that course content is relevant for job performance. If, on the other hand, personal attributes of the graduate were the only factors that relate significantly to salary, one would have evidence to suggest that the content of the diversified bachillerato programs makes no difference, i.e., that they are not relevant for job performance. If graduates of the program continue in higher education in areas that match their secondary school programs, then we could conclude that the secondary school training is relevant preparation for the university.

The following list summarizes the relevance questions to be asked using the data included in this report:

a. Do gratuates get work?

b. Can type of employment be predicted from experiences of graduates in the Bahillerato?

c. Is type of employment consistent with the program pursued?

d. Is work performance predictable from program experiences and academic success?

e. Is university attendance highest among graduates of university-preparatory programs?

f. Is university entrance predictable from program experiences and academic success?

g. Is university study consistent in content with the content of the Bachillerato program?

2.0 Methods of Collecting the Data

A. Sample Design

Students completing secondary education (Bachillerato) in 1974 (about 13,100) constituted the population for the study. A weighted sample of 770 students, representing all Bahcillerato specializations, was drawn from the list of students who signed up for the final examination in November 1974. Questionnaires were applied between November 1975 and January 1976, using addresses given at the time of the examination. In total 613 interviews were completed.

Table ompares the distribution of total enrollments by program with the distribution of interviews obtained. The column showing sample proportions reveals the sample weighting used to compensate for small programs that otherwise would have been underrepresented in the final sample.

The representativeness achieved for the whole sample is within acceptable limits to insure reliability in population estimates. As can be seen, Mathematics and Humanities, which are large and fairly homogeneous programs, were underrepresented in the sample, and small specialized vocational programs were over-sampled. As will be seen in the analysis, there are few large differences between graduates of the various programs in terms of demographic characteristics.

Table II-1

Sample Representativeness

PROGRAMS	Enrollments '75* N	%	Sample N	%	Sample Proportions n/N
Mathematics	17,329	47.7	86	14.0	0.005
Humanities	12,138	33.4	55	9.0	0.005
Commerce	2,186	6.0	99	16.2	0.005
Indust. Mechan.	1,105	3.0	68	11.1	0.062
Indust. Electr.	997	2.7	59	9.6	0.059
Agriculture	879	2.4	51	8.3	0.058
Inn-Keeping	295	0.8	31	5.1	0.105
Arts	205	0.6	32	5.2	0.156
Navigation	114	0.3	32	5.2	0.280
Teaching	620	1.7	30	4.9	0.048
Health	296	0.8	45	7.3	0.152
Vocational	144	0.4	25	4.1	0.174
TOTAL	36,308	100.0%	613	100.0%	0.017

* Does not include 55 students who had no defined specialization or program.

B. The Questionnaire

The questionnaire used in the follow-up survey of Bachillerato graduates was desinged by ODEPOR to collect information on six identifiable aspects:

a. Basic information on personal attributes (sex, age, marital status) and on socio-economic background (age, education, occupation and income of the head of the household, family size).

b. In-school experiences (institution and program attended, who paid for the studies, motivation for entering the program, student evaluation of the program).

c. Present activity or status (working, studying, working and studying, studying and looking for a job, just looking for a job, inactive).

d. Work related information (type of economic activity, occupational status, when became employed, salaries over time, method for finding a job, satisfaction with work).

e. Information on those studying (institution and career or program attended, who pays for studies, motivation).

f. Information on those looking for a job (how long, method used in the search, reasons for unemployment).

The questionnaire included 53* items and was administered by ODEPOR trained staff in field interviews. The questionnaire identifies those students who actually graduated (passed the final exam), but does not distinguish between those who passed the examination on their first attempt and those who failed in November and had to take a second examination.

Additional information on grades attained in different subjects in the 8th through the 12th year of schooling was collected from files at the Ministry of Education.

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*For some questions the number of responses is lower than the total number of cases because not all persons answered all questions.

3.0 Univariate Analysis

The description that follows is based on frequency tables obtained from the data on the surveyed population. Six broad groupings of variables have been selected for this analysis, and they rely upon the same groupings identified in the questionnaire used in the survey. All percentages presented are adjusted percentages accounting for missing values, that is, the figures express the percentages of those respondents who actually answered the particular item.

3.1 Personal Attributes and Socio-Economic Background

The population in the study is young, with 26 percent under 20 years of age, and nearly 70 percent between 20 and 25. Only 4 percent are over 25. The proportion of men is almost double that of women. About 90 percent are single.

Table II-2
Age, Sex, and Civil State of the Sampled Graduates

AGE:	f	%	SEX:	f	%	MARITAL STATUS:	f	%
∠20	160	26.2	Male	400	65.3	Single	549	90.4
20-25	426	69.7	Female	213	34.7	Married	44	7.3
>25	25	4.1				Accompanied	14	2.3
	611	100%		613	100%		607	100%

The average number of children in the family from which the graduates come is 5, and two fifths of them live in larger than average families. Most parents or guardians (heads of households) earn less than 400 colones per month, are literate (less than 2 percent are illiterate), and have attained various levels of education. However, the majority, 55.7 percent, did not complete elementary education. Roughly 10 percent completed bachillerato, and about 15 percent had access to post secondary education.

Table II-3

PARENT INCOME	f	%
<200¢ per month	140	29.4
201 - 400	200	42.0
401 - 600	62	13.0
>600	74	15.6
	476	100%

Table II-4

PARENT EDUCATION	f	%
Elementary complete	77	16.4
incomplete	262	55.7
Secondary complete	45	9.6
incomplete	14	3.0
Post secondary, non-college ed.		
complete	43	9.1
incomplete	11	2.3
Post secondary, college ed.		
complete	12	2.6
incomplete	6	1.3
	470	100%

Studies were mostly financed by the graduate's family (86.6 percent). Only 3.1 percent of the graduates received scholarship funds to pay for his or her studies, and 10.3 percent financed them with their own money.

Table II-5

SOURCE OF FINANCING	f	%
Family	531	86.6
Own money	63	10.3
Scholarship	19	3.1
	613	100%

3.2 In-School Experiences

The type of Bachillerato program attended varies, as shown in the following distribution:

Table II-6

PROGRAM ATTENDED	f	%
Academic (Mathematics & Humanities)	141	23.0
Commerce	99	16.2
Industrial	127	20.7
Agriculture	51	8.3
Hotel-keeping and Tourism	31	5.1
Arts	32	5.2
Navigation and Fishing	32	5.2
Teaching	30	4.9
Health	45	7.3
Vocational	25	4.1
	613	100%

Almost three out of every four graduates studied in a public school (73.6 percent) and most attended full-day programs (65.8 percent.) Twenty percent had morning classes, 5.6 percent attended school in the afternoon and 8.3 percent went to school in the evening (a figure close to the percentage of married students).

Self-motivation, or "vocation," accounted for 68 percent of the responses given when graduates were asked about the motive they had in mind when selecting their Bachillerato program. This and economic returns foreseen in their future careers, which accounted for 22.2 percent of the responses, are the most common reasons. Affordability, availability and family pressure or tradition accounted for the rest of the cases.

Table II-7

MOTIVATION	f	%
Self-motivation	405	68.0
Economic return	132	22.2
Affordability	29	4.9
Availability	17	2.9
Family Factors	12	2.0
	595	100%

Student dissatisfaction with the program attended was indicated by those subjects they considered most deficient. Independent of the program attended, Mathematics received the highest number of critical mentions (161) followed by Physics (158) and Chemistry (120). A second group of common subjects ranged from 97 mentions (English) to 22(Biology and Social Studies).

Table II-8

NUM CRIT (common subjects only)		%
Spanish	34	1.8
Social Studies	22	1.2
Mathematics	161	8.8
Physics	158	8.6
Biology	22	1.2
Chemistry	120	6.5
English	97	5.3
Aesthetic Ed.	33	1.8
N = 613 x3 = 1839		

About one third of the graduates experienced, as part of the curriculum of the program in which they were enrolled, some practical work in firms. This practice (or practicum) ranged from 1 to 3 months to more than a year.

Table II-9

PRACTICAL EXPERIENCE	f	%
Yes	194	31.7
No	418	63.3
	612	100%
Practice lasted:		
1 - 3 months	111	57.5
3 - 6 months	31	16.1
7 months - 1 year	19	9.8
more than 1 year	32	16.6
	193	100%

Some graduates worked for pay while studying (16%) and the jobs tended to be permanent (70 percent of the cases). On the average, they earned 173 colones per month, with monthly salaries ranging from less than 100 ¢ to more than 500 ¢ (S.D. = 56.69). The questionnaire did not determine whether the jobs were full-time, part-time or casual employment.

Table II-10

SALARIES WHEN STUDYING (estimated from interval mid-points)	f	%
¢ 80 per month	18	19.3
150	52	56.0
250	16	17.2
350	4	4.3
450	2	2.1
550	1	1.1
	93	100%

$\bar{x}$ = ¢173.01 per month

S.D. = 56.69; σ = 7.53

3.3 Present Activity

Graduates were asked their principal activity at the time of the survey. There were six possible answers to this question: working, studying, looking for a job, working and studying, studying and looking for a job, and inactive. The distribution of graduates across these categories is shown below:

Table II-11

STATUS	f	%
Working	225	36.7
Studying	140	22.8
Looking for a job	54	8.8
Working and studying	116	18.9
Studying and looking...	11	1.8
Inactive	67	10.9
	613	100%

Approximately one year after leaving school, two-thirds of the graduates were active in the labor force. Some 11 percent were inactive and nearly 23 percent were reported to be pursuing further studies. Although the questionnaire did not collect information about the inactive group, it provides some information about the group that is studying. (These data will be discussed later in a separate analysis). For the moment it seems important to notice that the sample includes 141 graduates from academic programs (Mathematics and Humanities), that is, 23 percent of the sampled graduates are, theoretically at least, expected to go on studying, assuming that these programs are clearly college-preparatory.

Of the 406 graduates in the labor force, 16 percent can be considered as unemployed one year after graduation, if one includes all those currently looking for work. The unemployment is 13.7 percent if one excludes from the labor force those studying and looking for work. Both figures are far above the overall national rates of unemployment reported in the Work Force study data analyzed in Part IV where we will return to discuss the significance of this high rate of unemployment.

3.4 Working Group Experience

For some graduates, employment seemed easy to find. Almost 50 percent of those at work reported they have been employed for more than 9 months prior to the time of the interviews. In contrast, 14 percent became employed in the recent past, that is, up to 3 months before the survey, which means they had been inactive or looking for work for at least 9 months. More than 35 percent spent 5 or more months before getting a job. Less than 4 percent have more than one job.

Table II-12

HOW LONG AT WORK	f	%	Cum. %
more than 9 months	162	47.5	47.5
8 - 9 months	59	17.3	64.8
6 - 7 months	53	15.5	80.3
4 - 5 months	19	5.6	85.9
2 - 3 months	29	8.5	94.4
less than 1 month	19	5.6	100.0
	341	100.%	

Information on salary received was collected for three time-points: January, May, and September, 1975. This means that for those who graduated in November, that salary is recorded two, five, and nine months after leaving the Bachillerato. As of January 1975 there were 151 graduates reporting a salary. On the average, they were earning 195.4 colones per month (S.D. = 26.86). (Again, the questionnaire did not distinguish between full and part-time employment). In May 1975 the number of employed graduates was 260, which represents an increase of 72.2 percent, and the average salary in this case was 211.6 colones per month. By September 1975 there were 312 graduates holding a job, an increase of 20 percent over the May figure and 106 over the January level. The average earnings for those employed in September was 234.3 colones per month (S.D. 24.86). This analysis considers unadjusted figures for the estimation of average salaries, that is, without consideration of inflation.

Table II-13

EMPLOYED GRADUATES AND SALARIES OVER TIME 1975	JAN	MAY	SEP
Number employed	151	260	312
Increment	100	172.2	206.6
Average Salary (¢ per mo.)	195.4	211.6	234.3
Increment	100	108.3	119.9
S.D.	26.86	19.64	24.86

A different analysis can be done to assess salary increments taking the average salary earned while a working student as the basis for comparison. Overall, there is a jump from 173 colones per month (earned when working while studying) to 234.3 colones per month in September 1975. That is, average salaries increased by 35.5 percent during the 10 months after graduation occurred.

Table II-14

SALARIES OVER TIME COMPARED WITH SALARY OF A WORKING STUDENT

Average salaries*		Increment
WWS**	173.0	100
January	195.4	112.9
May	211.6	122.3
September	234.3	135.4

*In colones per month
**When working while studying

With regard to the type of activity of the firms in which graduates are working, valid information was collected for 271 cases. Of these, 77 are working in community services, social services and/or in the public administration. Manufacturing industries employ 69 graduates. Sixty-two graduates are employed in wholesale or retail trade. Agriculture and fishing account for 37 employed graduates. These four broad categories of firm activity comprise 89 percent of the valid cases.

Men represent 68.3 percent of the working group and they constitute 94.6 percent of the graduates working in the Agriculture and Fishing sector; 69.6 percent of those in Manufacturing industries; 56.5 percent of those in Commerce; and 57.5 percent of those employed in the Services sector. This analysis, based upon the sector of the firm and not on occupations, shows that men and women have different kinds of employment opportunities (some sectors of the economy, expressed as types of firm activities, employ more men than women). The breakdown of variable FIRMACT by SEX shows a significant relationship between both variables (X^2 = 63.8; sig.: .000) and the multivariate analysis that follows this section will elaborate on this difference, providing information for men and women separately.

Most working graduates, 95 percent, are employees or salaried workers. Recommendations by other individuals was the principal method used to obtain a job. This occurs in 43.3 percent of the cases. Personal search and responding to employees' initiatives was the method for another 33.2 percent of the graduates, and about 12 percent found a job in open contest. Other non-specified methods were used by the remaining employed graduates.

Table II-15

TYPE OF ACTIVITY OF THE HIRING FIRM:		f	Cum f	%
1. AGRICULTURE, HUNTING AND FISHING	1. Agriculture	34		
	2. Fishing	3		
			37	13.7
2. MANUFACTURING INDUSTRY:	1. Food	8		
	2. Textile	24		
	3. Wood, furniture	2		
	4. Paper	3		
	5. Chemistry of oil, plastics rubber	11		
	6. Pottery, china	2		
	7. Metal Industry	4		
	8. Metal Manufacturing	14		
	9. Other manufactures	1		
			69	25.5
3. PUBLIC UTILITIES:	1. Electricity	5		
			5	1.8
4. CONSTRUCTION:	1. Construction	7		
			7	2.6
5. COMMERCE, HOTEL INDUSTRY:	1. Wholesale Commerce	59		
	2. Retail Commerce	3		
			62	22.9
6. TRANSPORTATION, WAREHOUSE AND COMMUNICATIONS:	1. Transportation, warehouses	11		
			11	4.0
7. FINANCING ESTABLISHMENTS, INSURANCE, REAL ESTATE SERVICES TO FIRMS:	1. Financing Firms	6		
	2. Real EState and services to firms	1		
			7	2.6
8. COMMUNITY SERVICES, SOCIAL SERVICES, PERSONAL SERVICES:	1. Public Administ. & Defense	26		
	2. Public Health Services	3		
	3. Social work - extension services	33		
	4. Entertainment and Recreation	2		
	5. House services	8		
	6. International organization	1		
			73	26.9
		271	271	100%

Table II-15a

Proportions of Male Graduates Working in Firms with Different Activities

Type of Activity of the Firm	Total f	Total %	Men f	Men Relative %
Agriculture and Fishing	37	13.7	35	94.6
Manufacturing Industries	69	25.5	48	69.6
Commerce	62	22.9	35	56.5
Services	73	26.9	42	57.5
Other	30	11.2	25	83.3
TOTAL	271	100.0%	185	68.3%

About 64 percent of the graduates holding a job are satisfied with it. For those not satisfied, low salaries are the main reason for their dissatisfaction, followed by the type of activity they have to perform in their work. These reasons account for 64 and 24 percent of the responses, respectively. Other reasons were also given such as the importance of the activity performed (9 percent), relationships with personnel (less than 2 percent), and treatment given by superiors (less than 1 percent.)

3.5 Information on Those Studying.

The group reporting "studying" as the principle activity at the moment of the survey is enrolled principally at the National University or at the Catholic University, the two universities in El Salvador. Some 80 percent of the graduates attend the National University. The Catholic University enrolls about 10 percent and a similar percentage is enrolled in other centers of post secondary education.

Table II-16

INSTITUTIONS ATTENDED BY THE STUDYING GROUP

	f	%
Universidad Nacional	204	80.6
Universidad Católica	25	9.9
Tecnológico Centroamericano	5	2.0
Escuela de Enfermería	2	.8
Escuela de Trabajo Social	1	.4
Escuela Militar	2	.8
Escuela de Agricultura	6	2.3
Hotel Escuela Cerro Verde	4	1.6
	253	99.99%

With the exception of Technical Engineering in Mechanics or Electricity, graduates of Bachillerato programs predominantly choose traditional careers. Architecture and Engineering, Medicine, Science and Humanities, Economics and Agronomy, plus the two technical engineering specialities enroll 83.3 percent of those graduates in continuing studies. The remaining graduates are distributed across nine other careers.

Table II-17

CAREERS PURSUED IN POST SECONDARY EDUCATION

	f	%
Architecture and Engineering	53	21.0
Medicine	43	17.1
Science and Humanities	25	9.9
Agronomy	19	7.5
Economics	19	7.5
Technical Engineering, Electricity	28	11.1
Technical Engineering, Mechanics	23	9.1
Technical Engineering, Civil and Construction	7	2.8
Law	13	5.2
Chemistry and Pharmacy	6	2.4
Nursing, Social Work, Education	16	6.3
Military, Agriculture, Hotel-keeping	4	1.6
	252	100%

The family is the source of financing for half of the studying graduates. The second most frequent source is the graduate himself. 36.6 percent stated that they finance their studies with their own money. Other less frequent sources are combinations of family support and own resources or scholarships, scholarships only, and loans.

For the 62.5 percent of the studying group, "vocation" was the principle motivation for enrolling in the program presently attended. The next mentioned reason was fitness between the Bachillerato program accomplished and the new program to attend 26.7 percent of the cases). Other reasons given were: satisfactory work conditions, economic return, social prestige and counseling by friends.

3.6 The Job Hunters

Data collected on the principal activity at the moment of the survey show 54 graduates who are engaged only in looking for a job, and 11 who are studying and also trying to become employed.

More than half of the 61 unemployed students answering the question, "Have you ever worked after graduation?" gave an affirmative answer (55.7 percent). Asked why they had stopped working, 10 indicated job termination as the reason; firing accounted for 9 cases; 7 graduates quit because of bad treatment from their superiors; 4 said that they quit because they wanted to progress; and 3 said that they left their occupations because their jobs did not correspond to the studies previously pursued.

More than one third of the (61) graduates in search of a job had been trying to get work for more than 10 months. Another 18 percent had been looking for 8 to 9 months. For more than 50 percent of the

Table II-18

FINANCING OF STUDIES	f	%
Family money	134	50.6
Own money	97	36.6
Family and own money	18	6.8
Family and scholarship	5	1.9
Scholarship	8	3.0
Loans	3	1.1
	265	100%

Table II-19

MOTIVATION FOR CONTINUING STUDIES	f	%
Vocation	162	62.5
Fitness with bachillerato	68	26.3
Economic return	11	4.2
Satisfactory work conditions	13	5.0
Counseling by friends	3	1.2
Social prestige	2	.8
	259	100%

graduates trying to get employed, the search had been unfruitful in a search period of at least 8 months.

Too much competition is blamed as the main reason for the unsuccessful search in 43.1 percent of the cases. The non-existence of jobs that fit with studies is the cause for 24.1 percent. Bad luck is the reason given for 22.4 percent. Low salaries and jobs requiring a move to another city (not in the capital)are said to be the reason for unemployment in equal proportions: 5.2 percent.

Different sources of information were used to look for work. They included newspapers, notices in firms, radio and television announcements, and recommendations of others.

Table II-20

TIME IN THE JOB SEARCH	f	%
Less than 1 month	7	11.5
2 - 3 months	15	24.6
4 - 5 months	4	6.6
6 - 7 months	2	3.3
8 - 9 months	11	18.0
10 and more months	22	36.0
	61	100%

Table II-21

SOURCES OF INFORMATION USED TO LOOK FOR WORK

Sources:	Yes	No	% Affirmative
Newspapers	27	23	54.0
Notices in firms	17	31	35.4
Radio, TV	3	43	6.5
Recommendations	43	9	82.6
All the above	13	40	24.5

4.0 Bivariate Analysis

Figure 1 presents a summary view of the analytical model used to assess the relevance of the diversified Bachillerato program. The figure can be read in the following way. First, the outcomes of the program can be assessed by comparison with estimations of national objectives and needs. The production of graduates in fields in which there are high levels of unemployment of high school graduates would be considered a non-relevant outcome.

The output of the Bahcillerato programs, as measured in this study by grades or marks is considered relevant if it predicts to outcomes. That output could be related in a systematic way to program experiences, but it is also possible to treat program experiences as another proxy for program outputs, and therefore to measure relevance in terms of the relationship between these experiences, and eventual outcomes. Specifically, those who find employment or who are studying (as compared to those who are just looking or inactive) should, if the Bachillerato programs are to be considered relevant, have higher grades, be more satisfied with the program, and have had a field practicum as part of their curriculum. Although it might be expected that students who work during their secondary school career probably have lower grades (because it can be assumed they have less time to study), that work experience will be considered relevant to their training if it is associated with employment and with high salaries.

The program in which a student is enrolled should be associated in a rational way with whether the program offers a practicum, and whether it provides students an opportunity for employment while studying. We would

also expect that there are some direct relationships between program characteristics and outcomes. For example, some programs are clearly university-preparatory in their orientation, while others are intended as work preparation. If these relationships hold then one could assert that the content of the programs is relevant. Given the government's objectives for the new Bachillerato program, one would expect to find that public schools most frequently offer work-preparatory programs, and provide opportunities for secondary school study for persons forced to work because of economic circumstances.

Finally, given national objectives to use education in order to achieve a more equitable distribution of educational opportunity, and eventually income, there should be no relationship between antecedent variables of the kind listed and the content of the Bachillerato program in which a student is enrolled, his experiences in that program, his grades, or the outcomes that follow graduation. That is, family background, age, sex, family size and similar variables are not relevant for school attendance, achievement, learning, and outcomes.

There is good reason to expect, of course, that both personal and familial antecedents will be related to school variables and later outcomes, as both this study and studies in other countries show the impact of social class on educational opportunity and achievement. But features of the diversified Bachillerato can be considered relevant if it can be shown that they are of equal or greater in importance, in accounting for outcomes, that are personal and familial antecedents.

In the bi-variate analysis that follows we present, in a sequence roughly corresponding to the analytical model in Figure 1, relationships between pairs of variables. In a following section we present the results of a multivariate analysis of relationships.

Figure II-1

ANALYTICAL MODEL FOR ASSESSMENT OF OUTCOMES

Antecedents	Content/ Structure	Process	Output	Outcomes
Personal Attributes Sex Age Civil State	Program in which enrolled Public/private school	**Program Experiences** Satisfaction with program Employment while studying Practicum in field	Grades	**Employment** Salary Satisfaction Fit
Family Background Parent Education Income Family size				**University** Fit
				Other Job search procedures

4.1 Status as a Function of Personal Attributes and Socio-Economic Background

A. Status and Personal Attributes

While SEX does not relate to STATUS in a significant manner, CIVSTATE does. Married graduates represent about 10 percent of the total sample (N = 606) and they are mainly found in the working category. That is of all those who are married, 58.6 per cent are working. This figure represents 15.4 percent of the total working group. They constitute only 2.9 percent of the studying group, yet they are 16.7 percent of the group just looking for work, 18.2 percent of the group who are studying and looking, and 4.4 percent of those combining study and work. Six percent of the inactive group are married. Proportionally, then, nearly 59 percent of the married graduates are working compared to 36.5 percent of the total in this category.

AGE proved to be related significantly to STATUS, and this variable was further used in combination with CIVSTATE in the analysis that follows.

AGE and CIVSTATE may be somewhat related and this may be reflected in our variable STATUS. In order to investigate this possible relationship, four combinations of AGE and CIVSTATE were produced for the analysis. The cut-off point to separate graduates between "younger" and "older" was 20 years of age. The new variable combining age and civil state was labelled LIFECYCLE. The combinations are younger single; younger married; older single; older married.

The analysis shows that there is a significant relationship between LIFECYCLE and STATUS and that older graduates are more likely to be working, whether they are married or not. Yet, older married graduates are even more likely to work than older singles (58.3 and 43.5 percent of the

Table II-22

Status and Civil State of Graduates

Status	Single f	Single %	Married f	Married %
Working	187	84.6	34	15.4
Studying	135	97.1	4	2.9
Looking	45	83.3	9	16.7
Study work	109	95.6	5	4.4
Study look	9	81.8	2	18.2
Inactive	63	94.0	4	6.0
TOTAL	548	(90.4%)	58	(9.6%)
N = 606; X^2 = 24.45; 5d.f; sig. .0002				

Table II-23

ANOVA Status with Age as the Criterion Variable

Source	Sum of Squares	D.F.	Mean Square	F
Between Groups	331.36	5	66.27	8.11*
Within Groups	4941.70	605	8.17	
TOTAL	5273.06	610		

* p = .05

respective categories). Younger married graduates in the working group constitute 60 percnet of this life cycle category, whereas older married graduates are 58.3 percent of their respective lifecycle category.

For the studying group, the following percentages were observed: younger single, 71 percent; younger married, less than 1 percent; older single, 26 percent; and older married, 2 percent.

B. Status and Socio-economic Background

Though PARINC is significantly related to the status of the graduate, the size of family (FAMSIZE) and the income per person in the family (PERCAPIN) are not.

4.2 Status in relation to In-school Experiences

STATUS is significantly related to the program attended by the graduate. For example, programs like Commerce, Arts, Teaching and Vocational have more than 50 percent of their graduates working, while the academic programs (Math and Humanities), Industrial Electricity, Hotel-Keeping and Health have less than 30 percent of their graduates in this status. Instead, these programs are more likely to produce graduates that go on studying. These findings suggest that there are programs more likely to lead to work while there are others more likely to lead to study.

No significant relationship was observed between the public/private support of the school attended and STATUS. Whether the graduate attended a private or a public secondary school to pursue his/her Bachillerato studies is not likely to determine his/her further status. Nevertheless, because it might be of interest to look at the proportions of graduates in the different categories of STATUS for each type of school we are including a table showing these figures.

Table II-24

Status and Lifestyle

Status	Young (< 20 yrs.) Single f	Young (< 20 yrs.) Single %	Young (< 20 yrs.) Married f	Young (< 20 yrs.) Married %	Old (> 20 yrs.) Single f	Old (> 20 yrs.) Single %	Old (> 20 yrs.) Married f	Old (> 20 yrs.) Married %
Working	82	26.6	6	60.0	104	43.5	28	58.3
Studying	99	32.1	1	10.0	36	15.1	3	6.3
Looking	18	5.8	1	10.0	27	11.3	8	16.7
Study work	63	20.5	0	0.0	46	19.2	5	10.4
Study look	5	1.6	1	10.0	4	1.7	1	2.1
Inactive	41	13.3	1	10.0	22	9.2	3	6.3
TOTAL	308	100.0%	10	100.0%	239	100.0%	48	100.0%

N = 605; X^2 = 62.77; 15 d.f.; sig. .0000

Table II-25

ANOVA for STATUS with PARING as Criterion Variable

Source	Sum of Squares	D.F.	Mean Square	F
Between Groups	* * * *	5	* * *	4.57*
Within Groups	* * * *	469	* * *	
TOTAL	* * * *	474		

* p = .05

Table II-26

Status According to Program Attended (BACIPROG)

STATUS	HUM		MATH		COMM		IMECH		IEEL		AG	
	f	%	f	%	f	%	f	%	f	%	f	%
Working	15	27.3	19	22.4	50	50.5	26	38.2	16	27.1	20	39.2
Studying	18	32.7	34	40.0	10	10.1	13	19.1	21	35.6	11	21.6
Looking	8	14.5	3	3.5	11	11.1	2	2.9	7	11.9	8	15.7
Study work	5	9.1	11	12.9	14	14.1	18	26.5	14	23.7	5	9.8
Study look	0	0.0	0	0.0	4	4.0	2	2.9	0	0.0	2	3.9
Inactive	9	16.4	18	21.2	10	10.1	7	10.3	1	1.7	5	9.8
TOTAL	55	100%	85	100%	99	100%	68	100%	59	100%	51	100%

N = 612; X^2 = 200.76

(continued)

Table II-26 (continued)

STATUS	HOTEL		ARTS		NAV		TEACH		HEALTH		VOC	
	f	%	f	%	f	%	f	%	f	%	f	%
Working	8	25.8	16	50.0	14	43.8	24	80.0	3	6.7	14	56.0
Studying	9	29.0	2	6.3	4	12.5	2	6.7	14	31.1	1	4.0
Looking	4	12.9	5	15.6	2	6.3	0	0.0	1	2.2	3	12.0
Study work	2	6.5	7	21.9	4	12.5	4	13.3	27	60.0	5	20.0
Study look	1	3.2	1	3.1	1	3.1	0	0.0	0	0.0	0	0.0
Inactive	7	22.6	1	3.1	7	21.9	0	0.0	0	0.0	2	8.0
TOTAL	31	100%	32	100%	32	100%	30	100%	45	100%	25	100%

N = 612; X^2 = 200.76

Table II-27

Status and Patronage of School (PRIV/PUB)

Sector of School	STATUS													
	Working		Studying		Looking		Study Work		Study Look		Inactive		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Private	59	26.2	45	32.6	11	20.8	24	20.7	3	27.3	18	26.9	160	26.2
Public	166	73.8	93	67.4	42	79.2	92	79.3	8	72.7	49	73.1	450	73.8
TOTAL	225	100%	138	100%	53	100%	116	100%	11	100%	67	100%	610	100%

A significant relationship was found between STATUS and having worked while studying (DIDWORK). That is, people who worked in their school-days are more likely to be working now. For instance, from the entire group who worked and studied (16 percent of the total valid sample; N=610), 63 percent are presently working. However, only 27 percent of the currently working group worked while in secondary school.

These findings are consistent with the data from the studying group. Less than 4 percent of the group combined work and study, or, to say it in different words, 96 percent of the currently studying group did not work while in Bahcillerato.

From the group currently combining work and study, 15 percent has work experience. These graduates represent 17.5 percent of the total number of graduates who worked in the past.

On the other hand, the inactive group confirms the observed relationship, in the sense that less than 10 percent of the graduates in this status worked while a student.

A. Status and Practicum

Whether the graduate had some kind of field experience or practicum as a component of the curriculum in high school (PRTCM) is significantly related to their present status. For the 194 graduates who had a practicum (31.8 percent of the valid sample), the breakdown by STATUS reads as follows: about 37 percent of those working had practice included in their program, as did 26.6 percent of those studying, 24.1 percent of those looking for a job, 37.1 percent of those who are studying and working, 36.4 percent of those studying and looking for a job, and 21 percent of those inactive. When we combine STATUS categories "working" and "studying and working" in order to observe how a practicum in high school relates to becoming employed

Table II-28

Status and Work Experience While Studying

STATUS	Did Work f	Did Work %	Did Not Work f	Did Not Work %
Working	61	27.1	164	72.9
Studying	5	3.6	134	96.4
Looking	5	9.3	49	90.7
Study work	17	14.8	98	85.2
Study look	3	27.3	8	72.7
Inactive	6	9.1	60	90.9
TOTAL	97	(15.9%)	513	(84.1%)
N = 611; X^2 = 42.12; 5 d.f.; sig: .0000				

Table II-29

Status and Field Practice (Practicum)

STATUS	Had Practicum f	Had Practicum %	Had No Practicum f	Had No Practicum %
Working	83	37.1	141	62.9
Studying	37	26.6	102	73.4
Looking	13	24.1	41	75.9
Study work	43	37.1	73	62.9
Study look	4	36.4	7	63.6
Inactive	14	20.9	53	79.1
TOTAL	194	(31.8%)	417	(68.2%)
N = 611; X^2 = 11.33; 5 d.f.; sig. .04				

as a graduate, the grouped categories add up to 55.7 percent of the total sample, or 340 graduates. When the length of the practicum was observed in relation to STATUS, it did not relate significantly to STATUS.

B. Status and Type of Program

Considering that among the different programs in which the Bachillerato students may enroll some are more likely to prepare for college entrance than others, BACHPROG can be regrouped to differentiate between programs with a high proportion of university attendees, and those with fewer graduates going on to study. Academic programs, meaning Mathematics and Humanities, and vocational programs in Industrial Mechanics, Industrial Electricity and Health are the five programs considered as college preparatory (COLLPREP). Graduates from these programs are more likely to be studying, while graduates from non-college preparatory programs are more likely to be working.

The separation of programs into two categories, college preparatory and non-college preparatory, permits an analysis of the relationship between the variables STATUS and PRACTICUM controlling for type of program attended (COLLPREP). In this case, the observed relationship became significant for all those who attended a program likely to lead to college, but did not prove significant for those who attended the other programs.

C. Marks and Status

Although not gathered as part of the survey, but from the files at the Ministry of Education, marks obtained by the graduates in Spanish and Mathematics in grades 8, 10 and 12 are used to investigate if status is somehow related to this indicator of school performance. However, the

Table II-30

Division of Bachellerato Programs into College Prep or Not, by Status

Status by Type of Program						
Status	TOTAL		College Prep		Non-College Prep	
	f	%	f	%	f	%
Working	225	36.8	79	35.1	146	64.9
Studying	139	22.7	100	71.9	39	28.1
Looking	54	8.8	21	38.9	33	61.1
Study work	116	19.0	75	64.7	41	35.3
Study look	11	1.8	2	18.2	9	81.8
Inactive	67	10.9	35	52.2	32	47.8
TOTAL	612	100%	312	51.0%	300	49.0%

X^2 = 63.7 with 5 d.f.; i sig. .0000

Table II-31

Status by Practicum Controlling for College Prep

STATUS	College Preparation				Non-College Preparatory			
	Had Practicum		Had No Practicum		Had Practicum		Had No Practicum	
	f	%	f	%	f	%	f	%
Working	16	23.5	63	25.8	67	53.2	78	45.1
Studying	22	32.4	78	32.0	15	11.9	24	13.9
Looking	1	1.5	20	8.2	12	9.5	21	12.1
Study work	28	41.2	47	19.3	15	11.9	26	15.0
Study look	0	0.0	2	0.8	4	3.2	5	2.9
Inactive	1	1.5	34	13.9	13	10.3	19	11.0
TOTAL	68	100%	244	100%	126	100%	173	100%
	X^2 = 22.23; 5 d.f.; sig..0005				X^2 = 2.22; 5 d.f.; sig. 0.81			

F-test performed separately for marks in both subjects for different school grades and in relation to status do not show any significant relationship between these variables. That is, the present status of graduates does not seem to be related to their prior school performance. This is true even for the last year of schooling and introduces the question whether school performance is taken into account for job or university entrance.

On the other hand, marks proved to be significantly related to the program attended, in some cases. This is the case for marks in Spanish in the 8th and 10th grade of schooling and for Mathematics in the 8th grade alone. Marks in either subject in the senior year of schooling did not prove to be significantly related to the Bachillerato program attended by the graduate.

4.3 The Working Group

B. Employability and Type of School Program

The length of time between graduation and employment is significantly related to the program graduates attended. This can be taken to mean that graduates from some programs find it easier to become employed than do those graduating from other programs.

One way of looking at this relationship is to estimate the "speed of employment" for each program. This can be calculated by associating the cumulative frequency of employed graduates from each program with a time scale. The data show that graduates from programs such as Agriculture, Vocational, Hotel-Keeping and both Industrial specialities were employed at a faster rate than were graduates from the six other

Table II-32

F-Values for School Marks in Relation to STATUS, BACIPROG, and WHENEMP

School Marks		STATUS	BACIPROG	WHENEMP
Spanish	8th grade	0.7286	2.9632*	2.5510
	10th grade	3.5648	4.8861*	2.3514
	12th grade	1.5773	1.4026	1.7706
Math	8th grade	0.9503	3.2956*	2.2985
	10th grade	2.7251	1.7633	2.2985
	12th grade	1.5384	1.6035	0.8151

* significant at 0.05.

programs when the respective cumulative frequencies were divided at 6.5 months (midpoint of the 6-7 months interval). In two months (8.5 months) some changes are observed, the most dramatic being Navigation, which ranked last before and now became the first one. This program is followed by Teaching, Agriculture, Arts, Vocational and the Industrial programs.

Another way to look at the data, in order to observe which programs are more likely to have their graduates employed sooner, is to look at the cumulative frequencies as proportions of graduates joining the work force at different times, making "more than 9 months" on the job the criterion for comparison (meaning full employment for each category of program). This procedure permits observations on changes in speed of employment occurring within each subset of graduates (programs). For instance, we may ask: "How long does it take for each program to have at least 30 percent of their graduates working? For graduates of the Hotel-Keeping program this percentage is achieved in 2-3 months, whereas 4-5 months are needed in the case of Math, Agriculture, and Vocational programs. Humanities, both Industrial programs and Health reach it in 6-7 months. Commerce, Arts, Navigation and Teaching make it in 7-8 months. A different perspective, analyzes the proportion of graduates from each program that have become employed by the end of the period.

In Table 35, we also calculate the proportion of graduates of the various programs that are unemployed, using as our definition of unemployment, actively looking for work. As can be seen, there are marked differences between the programs in terms of unemployment of graduates, suggesting that some programs are much more relevant than others.

Table II-33

COMPARATIVE SPEED OF EMPLOYMENT OF BACHILLERATO PROGRAMS
(Speed = Cumulative frequency/time)

Program	Rate at 6.5 mos.	Rank	Rate at 8.5 most.	Rank	Δ Speed
Mathematics	5.1	6	5.1	9	0.0
Humanities	4.6	7	4.7	10	+0.1
Commerce	4.3	9	4.4	12(Last)	+0.1
Ind. Mech.	5.9	4	6.7	6	+0.8
Ind. Elect.	5.6	5	6.7	6	+1.1
Agriculture	9.2	1(First)	8.0	3	-1.2
Hotel-Keeping	6.2	3	5.8	8	-0.4
Arts	4.0	9	7.2	4	+3.2
Navigation	0.8	12(Last)	8.5	1(First)	+7.7
Teaching	2.2	11	8.4	2	+6.2
Health	4.6	7	4.7	10	+0.1
Vocational	8.1	2	6.8	5	-1.3

Table II-34

PROPORTION OF EMPLOYED GRADUATES BY PROGRAM OVER TIME

MONEMP \ PROGRAM	HUM	MATH	COMM	I MECH	I ELEC	AG	HOTEL	ARTS	NAV	TEACH	HEALTH	VOC	CUM TOT
	(Frequency, Cumulative Frequency, Relative Percentage)												%
1 mo.	2 2 6.7	1 1 5.0	6 6 9.4	3 3 6.8	1 1 3.3	1 1 4.0	1 1 10.0	2 2 8.7	0 0 0	0 0 0	0 0 0	2 2 10.5	(19) 5.6
2 - 3 mos.	4 6 20.0	4 5 25.0	2 8 12.5	5 8 18.2	3 4 13.3	3 4 16.0	2 3 30.0	0 2 8.7	2 2 11.1	0 0 0	1 1 3.3	3 5 26.3	(48) 14.1
4 - 5 mos.	3 9 30.0	0 5 25.0	1 9 14.1	2 10 22.7	1 5 16.7	4 8 32.0	1 4 40.0	0 2 8.7	2 4 22.2	0 0 0	3 4 13.3	2 7 36.8	(67) 19.6
6 - 7 mos.	1 10 33.3	1 6 30.0	9 18 28.1	7 17 38.6	6 11 36.7	7 15 60.0	0 4 40.0	4 6 26.1	6 10 55.5	4 4 14.3	5 9 30.0	3 10 52.6	(120) 35.2
8 - 9 mos.	3 13 43.3	2 8 40.0	6 24 37.5	8 25 56.8	6 17 56.7	2 17 68.0	1 5 50.0	8 14 60.9	3 13 72.2	16 20 71.4	2 12 40.0	1 11 57.9	(179) 52.5
9 mos.	17 30 100	12 20 100	40 64 100	19 44 100	13 30 100	8 25 100	5 10 100	9 23 100	5 18 100	8 28 100	18 30 100	8 19 100	(341) 100

Table II-35

PROPORTION OF THE SAMPLED GRADUATES AT WORK TEN MONTHS AFTER GRADUATION

	HUM	MATH	COMM	I MECH	I ELEC	AG	HOTEL	ARTS	NAV	TEACH	HEALTH	VOC	TOTAL
IN THE SAMPLE N = 613	55	86	99	68	59	51	31	32	32	30	45	25	
% = 100	9.0	14.0	16.2	11.1	9.6	8.3	5.1	5.2	5.2	4.9	7.3	4.1	
AT WORK N = 341	20	30	64	44	30	25	10	23	18	28	30	19	
(Sept., 1975) % = 100	5.9	8.8	18.8	12.9	8.8	7.3	2.9	6.7	5.3	8.2	8.8	5.6	
WORKING/SAMPLE x 100	36.4	34.9	64.6	64.7	50.8	49.0	32.2	71.9	56.2	93.3	66.7	76.0	55.6
UNEMPLOYED LOOKING/ WORKING & LOOKING X 100	28.6	9.0	19.0	8.3	19.0	28.6	33.3	20.7	14.3	0	3.2	13.6	16.0

Our findings show that small programs, in terms of total enrollments (see Table 1), are more successful in placing their graduates in the labor force, though this assertion may be somewhat biased because of the under-representation affecting these programs in the sample. Programs like Teaching, Vocational, Arts and Health have more than two thirds of their graduates at work. The exception within the small programs is Hotel-Keeping, where less than one third of its graduates find employment. However, it is curious that Health shows 30 graduates at work and only 3 graduates on the overall sample reported to be working in Public Health Services. It may be possible that the remaining graduates from the Health program were absorbed into health-related occupations in the public sector, but only 26 graduates reported working in a public office (see Table 15 in univariate).

B. Salary and Type of Program

Does attending a specific program introduce a difference in salaries earned by the graduates? Our findings suggest that this is true only for salaries reported in May 1975. (See Table 36). That is there is no significant relationship between program attended and salary. soon after graduation (January, 1975 or 2 months after school leaving), nor is there a significant relationship 10 months after completion of bachillerato studies (September 1975).

No significant difference was found in terms of salary earned between those graduates merely working and those working and studying.

Table II-36

F-Values for Salary and BACHPROG

Salary	BACHPROG
JANSAL	1.1998
MAYSAL	2.5705*
SEPSAL	1.9659

* Significant at 0.05.

5.0 Multivariate Analysis of Educational Antecedents and Outcomes

A. Introductory Note

In this section we present the results of a multivariate analysis of the variables that are associated with educational outcomes. The purpose of the analysis is to explain as much as possible of the total variation students experienced in outcomes following graduation, and hence to increase our understanding of the relevance of the Diversified Bachillerato program.

There are of course several reasons why it may not be possible to explain a large proportion of that variation. First, it is possible that the measures employed are of relatively low reliability, that is, that "scores" on the variables are due in large measure to non-systematic factors that the analysis procedure cannot take into account. These could include vagueness of the questions (leading persons to interpret them in differing ways), vagueness or insensitivity of the multiple choice responses (leading the respondents to "code" similar responses in differing ways), lack of knowledge of the respondent about the subject of the question, mood swings, even errors in the mechanical preparation of the data. It is also possible that the variables used by the researcher to account for variation in educational outcomes are not those best suited for that purpose, in terms of capturing what it really is that "causes" the particular outcomes that occur. For example, in this particular survey no questions were asked about the formal relationships between

employers and those employed. It is possible that to some extent those who work for relatives get systematically higher (or lower) salaries than do those who work for strangers. We have no way, with this set of data, of answering questions like that and for that reason the total amount of variation that can be explained may not be high.

B. Choice of Variables

In conducting this analysis we included those variables that had the highest correlations with the dependent variable (the outcome measure) and variables that when included as antecedent to the particular outcome, could be considered logically as a possible determinant of the dependent variable. These variables were selected on the basis of the information generated in the bivariate analysis presented in the previous section.

The most useful outcome measure available in this study is the amount of salary received by working graduates in September 1975. Other possible measures are: salaries in January and May; job satisfaction; and time employed. As the bivariate analyses have indicated, the composition of persons receiving salaries changed significantly from January to September. In general it appears that those most in need of employment, and who often tended to be those already working while a Bachillerato student, are those who take employment in January and report a salary. Persons from higher income groups appear to take longer to enter the labor force, many only in September.

Because these persons enter with higher salaries than did those who entered in January and often enter with a higher salary than that received in September by persons who entered the labor force in January or May, we conclude that their delayed entrance into the labor force may not reflect difficulty in finding employment. Rather, it seems to reflect their ability (given parental support or other sources of income) to wait for a position whose prerequisites and rewards meet the graduate's requirements. If this supposition of ours is correct, then salary in January or May and time employed would not make satisfactory variables to assess educational outcomes. The measure of Job Satisfaction included in the questionnaire is not particularly sensitive. Its highest correlation (0.19) is with September Salary, and correlations with other variables are so small as to be insignificant. We concluded that the use of the Job Satisfaction variable as an educational outcome measure would not yield any additional understanding of the relevance of the Bachillerato.

C. Definition of Variables

Table II-37 presents the list of variables finally included in the multivariate analysis, along with the means and standard deviations of men and women on each variable. The decision to conduct separate analyses for men and for women was based principally on the significant differences between men and women, in terms of the sectors in which they worked, shown earlier in the bivariate analysis. Table II-37 shows differences between male and female graduates with respect to parent income and salary in September, but those differences have a different

TABLE II-37

Means and Standard Deviations for Men and Women

on Variables Included in Multivariate Analysis

Variable Name	Men (N=130) Mean	Men (N=130) S.D.	Women (N=55) Mean	Women (N=55) S.D.
1. PARINC	350.0	280.6	550.9	487.8
2. PARED	5.5	3.8	6.9	4.7
3. FAMSIZE	5.1	2.4	5.0	2.4
4. AGE	20.7	1.7	20.1	1.3
5. CIVSTATE (S/M)	1.04	0.19	1.04	0.33
6. DIDWORK (Y/N)	1.91	0.29	1.93	0.26
7. WHENEMP	4.8	1.2	4.9	1.4
8. PROGRAM	4.5	2.1	5.0	3.1
9. PRIVPUB	1.82	0.39	1.67	0.47
10. PRACTICM	1.58	0.90	1.55	1.00
11. MATH12	6.5	1.4	6.4	1.5
12. SPAN12	6.9	1.3	6.9	1.4
13. NUMCRIT	2.5	1.7	2.1	1.8
14. SEPSAL	247.7	88.8	193.2	81.4

explanation.

Family background was considered a critical variable to take into consideration in the assessment of the relevance of Bachillerato programs for salaries once employed. Other studies in El Salvador and elsewhere have shown that social class is important in accounting for educational experiences, and therefore is an important determinant of the outcomes of educational attainment. That is, other research tends to show that the relationship of educational attainment with outcomes such as employment and income is significantly influenced by social class.

In this study, however, only those graduates still living at home were asked about their parents' income and education levels. Most of the married students, and many of those who did not marry but did work during their Bachillerato, no longer live with their parents. Information on their social class origins is therefore not available.[2] Of the 399 men included in the sample, only 311 (78%) reported their parents' income and only 303 reported their parents' education level. Of the 214 women in the sample, only 164 (77%) reported their parents' income and 166 reported education. Of those two groups, only a proportion also were employed after graduation, as described earlier. The analysis to be reported was conducted using only those graduates from whom information was available on all of the

[2] Furthermore, it is likely that many of the 157 (of 770) graduates not interviewed could not be found because they had moved away from home, away from the address given in November 1974.

variables listed in Table II-37.

This may account, in part, for the apparent difference in social class background of men and women reported in Table II-37. The variable CIVSTATE indicates that only 4 percent of each group (still living at home) were married at the time of the interview, as compared to 10 percent of the men and 7 percent of the women in the whole sample. Men who work report lower family incomes (PARINC) than do those not employed, but the difference (¢ 350 per month as compared to ¢ 367) is not significant. Women who work, on the other hand, come from families with higher monthly incomes (¢ 551) than those who do not work. (The monthly family income for all women in the sample is ¢ 425.) The findings suggest that poor families are less likely to educate women through the Bachillerato than they are to educate their sons, and that women from higher-income families are more likely to be active in the labor force, perhaps because their social status makes it easier for them to find employment. This is consistent with findings presented before, showing that personal recommendations are the most used means to obtain a job.

Similar but smaller differences are found with respect to level of parents' education (PARED). Working men (still living at home) come from families where the head of the household has an average of 5.5 years of education, while women come from families where the head of the household has 6.9 years of education. There are no differences in family size (FAMSIZE) between the two groups and men and women are approximately equal in age.

The mean of the DIDWORK variable indicates the number of

persons who were employed while studying in the Bachillerato program. Altogether 17 percent of the men and 14 percent of the women worked, but those proportions are lower for the group under consideration for reasons stated above. WHENEMP indicates the number of months a person had been working after graduation. Those who worked during the Bachillerato and continued working after graduation received the maximum figure (a function of when the interview was conducted) while those unemployed received a 0. Only employed persons are included in this analysis. An average of 5 months employment means that the average Bachillerato graduate required 7 months to find his or her job.

PROGRAM refers to the extent to which graduates of the program in which the graduate was enrolled went on to the university.[3] Persons in the Humanities program, for example, received a score of 3.8 on this variable, while those in Arts received a score of 2.8. The PRIVPUB variable reflects whether the school in which the graduate received his Bachillerato training was sponsored by the government or by a private organization. Some 18 percent of the men and 33 percent of the women were enrolled in private schools. For this group of graduates living with their families, 42 percent of the men and 45 percent of the women experienced a field practicum as part of their Bachillerato program. PRACTICM is an ordinal variable with four categories: none; up to three months; three to six months; over six months. MATH12 and SPAN12 refer to the grades received

[3]All graduates who worked, regardless of program, are included in this analysis.

Mathematics and Spanish in the 12th grade. NUMCRIT is a count of affirmative answers to questions asking whether particular parts of the Bachillerato program were deficient. SEPSAL is a measure of salary in September 1975.

5.1 Correlations and Regression Analysis

Table II-38presents the correlation coefficients among the variables included in this analysis for both men and for women. Many of the relationships have already been covered in the bivariate section of this paper. There are the expected (moderately high) correlations between parental income and education, and family size. Graduates older than the mean are more likely to come from low-income and low-education families (and recall that this group does not include those who have already left home, an even older group), which is a comment on the difficulties that working class children have in completing school at the expected age. For men there is no relationship between entrance into the labor market and family social class, but women from wealthier families are more likely to have obtained employment soon after graduation. This suggests that employment for women may be dependent on familiar connections, more than is the case for men. Upper class women are more likely to have graduated from a private Bachillerato, than are men. These and other differences will be explored in the path analysis that follows.

The first 13 variables were combined in a regression equation to account for variance in SEPSAL. Tables II-39 and II-40 present the results of that analysis for men and for women.

In this analysis the path model and subsequent test was performed prior to the actual regression analysis. Variables were selected into the path model (to be described) on the basis of a conceptual

TABLE II-38

CORRELATION MATRIX FOR GRADUATES LIVING AT HOME

Men in Lower Section, Women in Upper Section

Variables	Variable Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PARINC		31	-05	-22	-04	-06	27	-08	-36	05	09	00	-14	01
2. PARED	45		-22	-23	07	-26	-06	-01	-17	-16	-05	-14	03	05
3. FAMSIZE	-09	-24		04	16	03	06	-11	-05	03	00	25	12	-12
4. AGE	-15	04	-03		07	-03	-02	01	20	08	-26	-11	05	11
5. CIVSTATE	-15	-07	-07	20		-18	21	-08	08	00	-03	04	31	15
6. DIDWORK	-10	07	-23	-07	06		-17	-07	10	08	-01	-01	-10	16
7. WHENEMP	01	02	-04	14	00	01		-08	-02	28	21	20	09	-06
8. PROGRAM	10	20	01	-08	-11	05	15		23	14	-13	-39	21	20
9. PRIVPUB	-20	-11	-02	14	10	-08	08	-06		15	-17	-08	-01	03
10. PRACTICM	-01	01	16	21	27	00	-08	07	17		-08	-01	-13	24
11. MATH12	15	03	-01	-05	-18	09	-04	09	07	08		61	-15	-05
12. SPAN12	-01	-02	05	01	-20	-05	07	-05	06	-04	67		-03	-34
13. NUMCRIT	10	04	15	-05	-11	-09	12	07	07	09	-06	04		10
14. SEPSAL	22	15	07	12	10	-01	10	10	-05	21	03	03	-09	

TABLE II-39

Regression of SEPSAL on selected variables
Men (N = 130)

Dependent Variable: SEPSAL

Variable	Simple r	Contribution to R^2	Beta	B
PARINC	.222	.050	.226	0.071
PARED	.154	.006	.039	0.922
FAMSIZE	.031	.000	-.008	0.458
AGE	.121	.011	.087	4.474
CIVSTATE	.096	.005	.055	25.479
DIDWORK	-.008	.000	-.006	-1.836
WHENEMP	.102	.011	.106	7.622
PROGRAM	.100	.006	.060	2.534
PRIVPUB	-.046	.002	-.042	-9.647
PRACTICM	.207	.041	.197	19.347
MATH12	.033	.000	-.005	-0.313
SPAN12	-.054	.000	-.008	-0.578
NUMCRIT	-.093	.012	-.130	-6.759

R^2 = .144 Constant = 61.640

TABLE II-40

Regression of SEPSAL on selected variables
Women (N = 55)

Dependent Variable: SEPSAL

Variable	Simple	Contribution to R^2	Beta	B
PARINC	.009	.000	.050	0.008
PARED	.049	.001	.015	0.258
FAMSIZE	-.122	.008	-.064	-2.141
AGE	.113	.014	.123	7.434
CIVSTATE	.147	.026	.175	43.012
DIDWORK	-.045	.002	-.049	-15.126
WHENEMP	-.059	.012	-.210	-12.434
PROGRAM	.204	.005	.022	0.592
PRIVPUB	.025	-.001	-.039	-6.730
PRACTICM	.241	.082	.341	27.863
MATH12	-.045	-.014	.318	16.713
SPAN12	-.280	.011	-.397	-22.753
NUMCRIT	.098	.014	.139	6.454

R^2 = .259 Constant = 95.118

framework and their simple correlations with SEPSAL. Only after the model was run was the regression analysis done to test the adequacy of the path solution. If one takes the results of the regression analysis as providing an estimate of the maximum amount of variance that can be explained in the dependent variable, then a comparison of the path results with the regression results can be used as an indicator of the adequacy of the path solution.

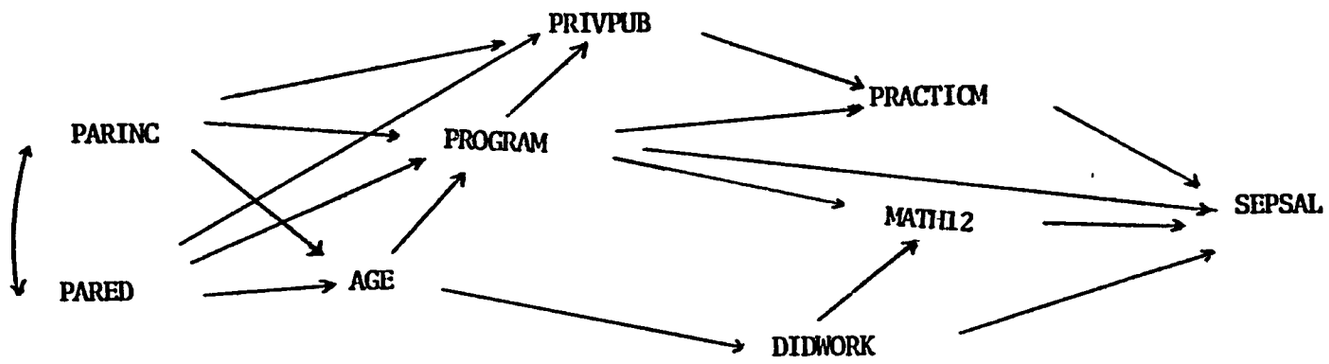
5.2 The General Path Model

Figure II-2 presents the general path model used to analyze these data. This model assumes that there are no direct (i.e., causal) relationships between SEPSAL and any other variables other than those directly related to the content of programs and the experiences of students. The model provides a test of the relevance of the content and process of the Bachillerato programs, by testing whether there are direct relationships between the other variables and SEPSAL. For example, finding that the correlation of 0.22 between PARINC and SEPSAL for men is mediated entirely by the association of PARINC with PROGRAM, MATH12 and DIDWORK would support a statement that Bachillerato experiences are relevant. A finding that this PARINC-SEPSAL correlation is not mediated would, on the other hand argue against the relevance of the Bachillerato program. A correlation is considered to be mediated if the path coefficient between two variables is much smaller than the simple correlation coefficient.

The model implies here that salary after graduation is determined by having had high grades in Mathematics, by having worked prior to graduation, and by having taken courses with field experience during

Figure II.2

General Path Model Used in Multivariate Analysis of Bachillerato Followup



the bachillerato. Grades in Mathematics are likely to vary from program to program, and also to be influenced by whether one works during school. Practical field experiences during the Bachillerato are more likely in some programs than others, and more likely in public than in private schools. Private schools offer different kinds of programs (especially with regard to their preparation for the university) than do public shcools; high social class families seek to send their children to the university and, therefore, high social class families are more likely to enroll their children in private than in public schools. We have already commented on the expected and obtained relationship between age and social class.

Many other factors influence the salary paid to recent graduates from secondary school programs. Salaries are known to vary considerably across sectors of the economy, across occupations within sectors and to be influenced by the size of the firm and its particular production or distribution technology. There are also a number of other aspects of a student's secondary school program that could influence the salary received subsequently in a labor market. Other studies show that salaries are highly influenced by personal relationships and social class factors not well-measured here, and hence the variables in the model may not account for a large portion of the variance in SEPSAL. The size of the simple correlations in themselves indicate that a multivariate analysis would explain only a small portion of the variance in SEPSAL. The multiple regression coefficients presented in Tables II-39 and II-40 show that using 13 variables it was possible to account for only 14 percent of the variance in SEPSAL for men, and 26 percent

of the variance in SEPSAL for women. Even so, the comparison of the relative usefulness of program-related variables, as compared with personal and family background variables, can allow some conclusions about the relevance of several features of the Bachillerato program.

A. Results for Men

Figure II-3 and Table II-41present the simple correlations and path coefficients for the general path model for the sample of men. Using 8 variables it is possible to account for 11 percent of the variance in SEPSAL. The most important predictors are PARINC, PRACTICM, and AGE. Grades in Mathematics and previous work experience are unrelated to salaries for Bachillerato graduates. Salaries are not directly determined by whether a student graduated from public or private Bachillerato, or whether the program in which he studied has a high proportion of students going on to the university. But where and what one studies is determined (partially) by social class, as are grades in Mathematics.

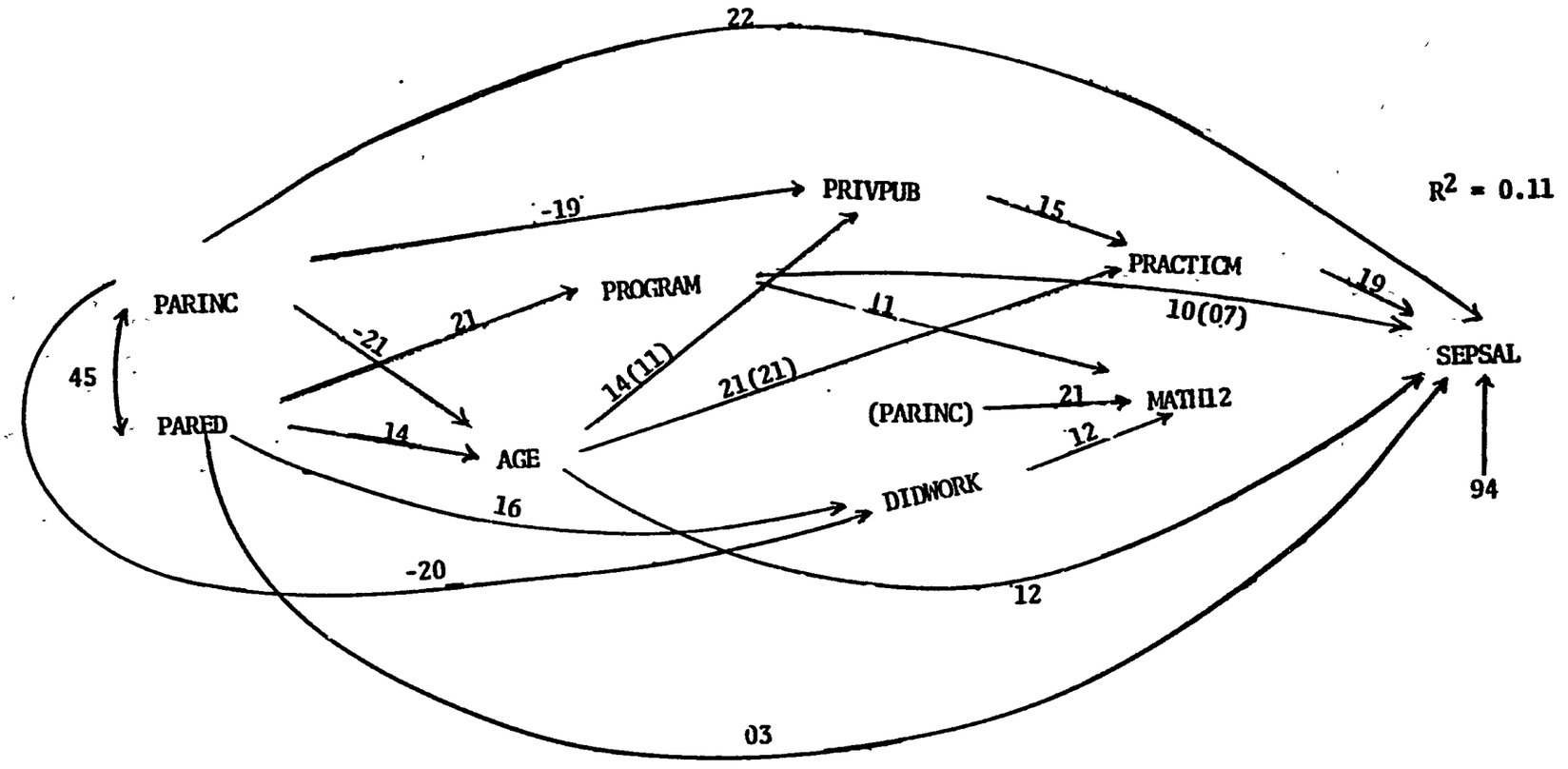
The results suggest that, using salaries after graduation as a criterion measure, how much one learns in the Bachillerato (using marks as a formal evaluation of how much a student learns) is not relevant. On the other hand, field experiences are relevant from the perspective of the labor market.

Several substitutions have been made in the variables included in the path analysis, using the results of the regression analysis to select the most effective set of variables. Those results are presented in Figure II-4 and Table II-42.

Figure II.3

Significant Path Coefficients* for

General Path Model - Men



*only coefficients of 0.10 and larger are presented

Table II-41

Zero-Order Correlations (r), Path Coefficients and R^2
General Model - Men

	PARED		AGE		PROGRAM		PRIVPUB		DIDWORK		PRACTICUM		MATH12		SEPSAL	
	r	path	r	path	r	path	r	path	r	path	r	path	r	path	r	path
PARINC	451		-145	-206	095	-015	-202	-187	-100	-204	-011	043	151	210	222	217
PARED			043	136	203	214	-106	-015	074	155	014	-020	028	-080	154	029
AGE					-081	-092	141	106	-068	-090	211	208	-046	-027	121	124
PROGRAM							-055	-022	045	020	073	091	092	081	100	068
PRIVPUB									-083	-094	172	152	066	107	-046	043
DIDWORK											-002	020	091	121	-008	015
PRACTICUM													084	068	207	187
MATH12															033	-015
R^2			036		049		063		047		082		062		114	

Figure II.4

Significant Path Coefficients for

Best Path Model - Men

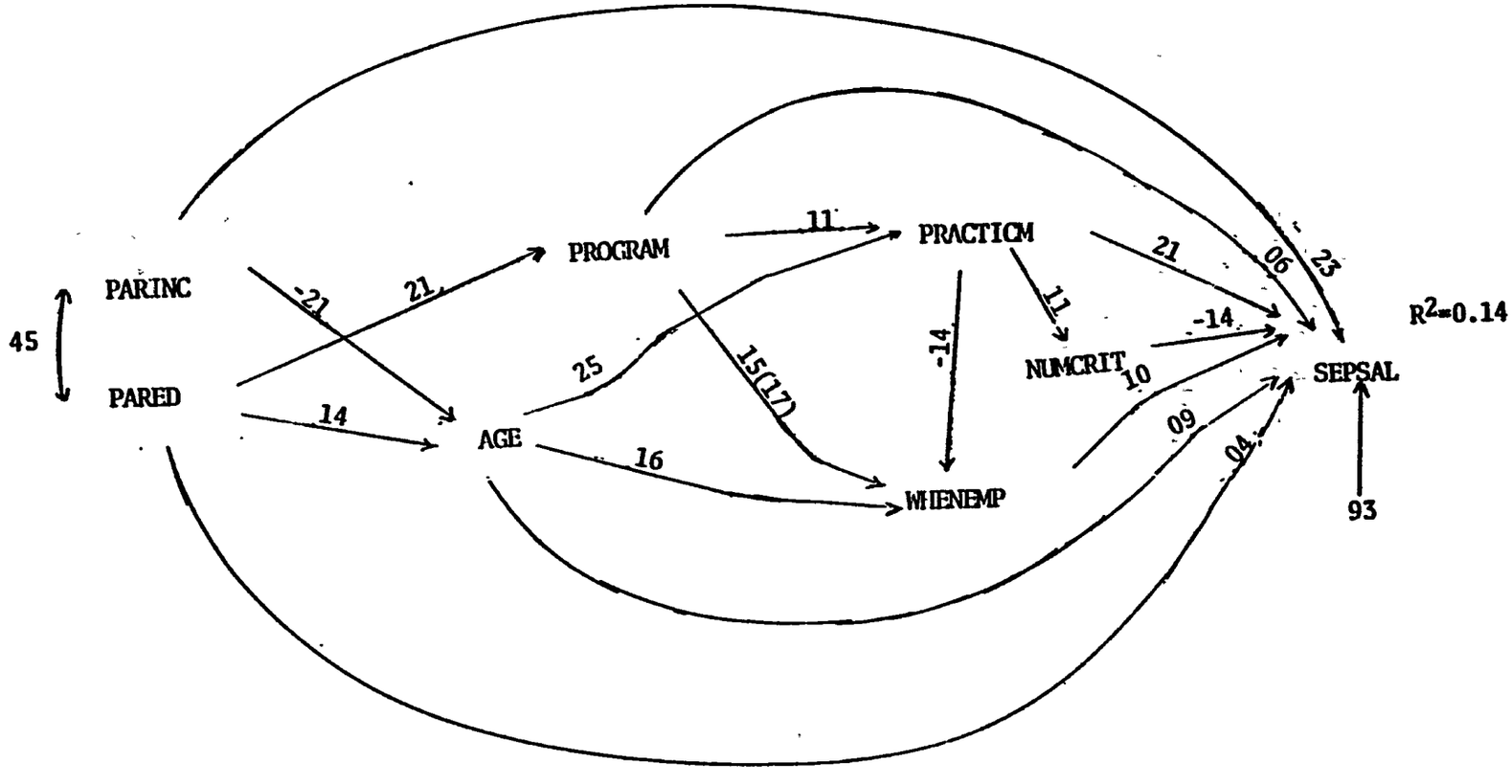


Table II-42

Zero-Order Correlations (r), Path Coefficients and R^2
Best Model - Men

	PARED		AGE		PROGRAM		WHENEMP		PRACTICUM		NUMCRIT		SEPSAL	
	r	path	r	path	r	path	r	path	r	path	r	path	r	path
PARINC	451		-145	-206	095	-015	007	030	-011	020	096	085	222	228
PARED			043	136	203	214	020	-035	014	-030	041	-004	154	036
AGE					-081	-092	143	162	211	249	-053	-072	121	091
PROGRAM							150	167	073	112	069	035	100	057
WHENEMP									-082	-141	071	084	102	105
PRACTICUM											085	105	207	206
NUMCRIT													-093	-141
R^2			036		049		048		080		029		139	

With 6 variables it is possible to explain almost as much of the variance of SEPSAL as explained with 13 variables. The number of months employed (WHENEMP) is substituted for DIDWORK as perhaps a better measure of motivation. NUMCRIT is used as an evaluation of the quality of the program experienced by the student. In general, the results are similar to those shown in the previous figure. Graduates with higher salaries in September are more likely to have come from a high income family, to have taken courses with field practice, to think that their program was well-run, and to have taken employment soon after graduation. It is possible that the NUMCRIT variable in this case is really a reaction to experiences after graduation, as the only relationship it has with other variables is with PRACTCM, and it is contrary to expectations. We would not have expected that students who had a field experience would be more critical of their program.

Overall the results of these analyses for men could be interpreted to suggest that much of the content and structure of the Bachillerato program is not relevant from the perspective of the labor market, that is, that employers do not offer higher wages to students on the basis of their academic performance, nor on the basis of the kind of school that they attended, or the program that they pursued. Employers apparently <u>are</u> interested in graduates who come to them with some practical field experience. It could be argued that some or many of the field practice placements in Bachillerato result in later employment, and therefore that PRACTICM is not a good measure of program attributes. But

the lack of a relationship between PRACTICM and DIDWORK, and the negative relationship between PRACTICM and WHENEMP suggests that this is not the case, that on the contrary, those who took programs with a field component take longer to find employment.

B. Results for Women

Results for the group of women are different. Figure II-5 and Table II-43 present the simple correlations and path coefficients for the general path model. The model is not particularly adequate in that the R^2 is only 0.11, while the regression equation provides an R^2 of 0.26. Salaries of women graduates in September 1975 are principally a function of having had a field experience in the Bachillerato and having attended a program with a high proportion of students going on to the university. Older women, and those whose parents have higher levels of education are likely to have high salaries. The relationship between attendance at a private versus a public school and social class is not mediated through the kind of program that women choose or have chosen for them. That is, while upper class families are mole likely to send their sons to university-preparatory Bachillerato programs, that is not true for women; but upper class families are more likely to send their girls to private schools than to send their boys.

It is possible to substitute other variables into the path model and come up with a more effective prediction of SEPSAL.

Figure II.5

Significant Path Coefficients for

General Path Model - Women

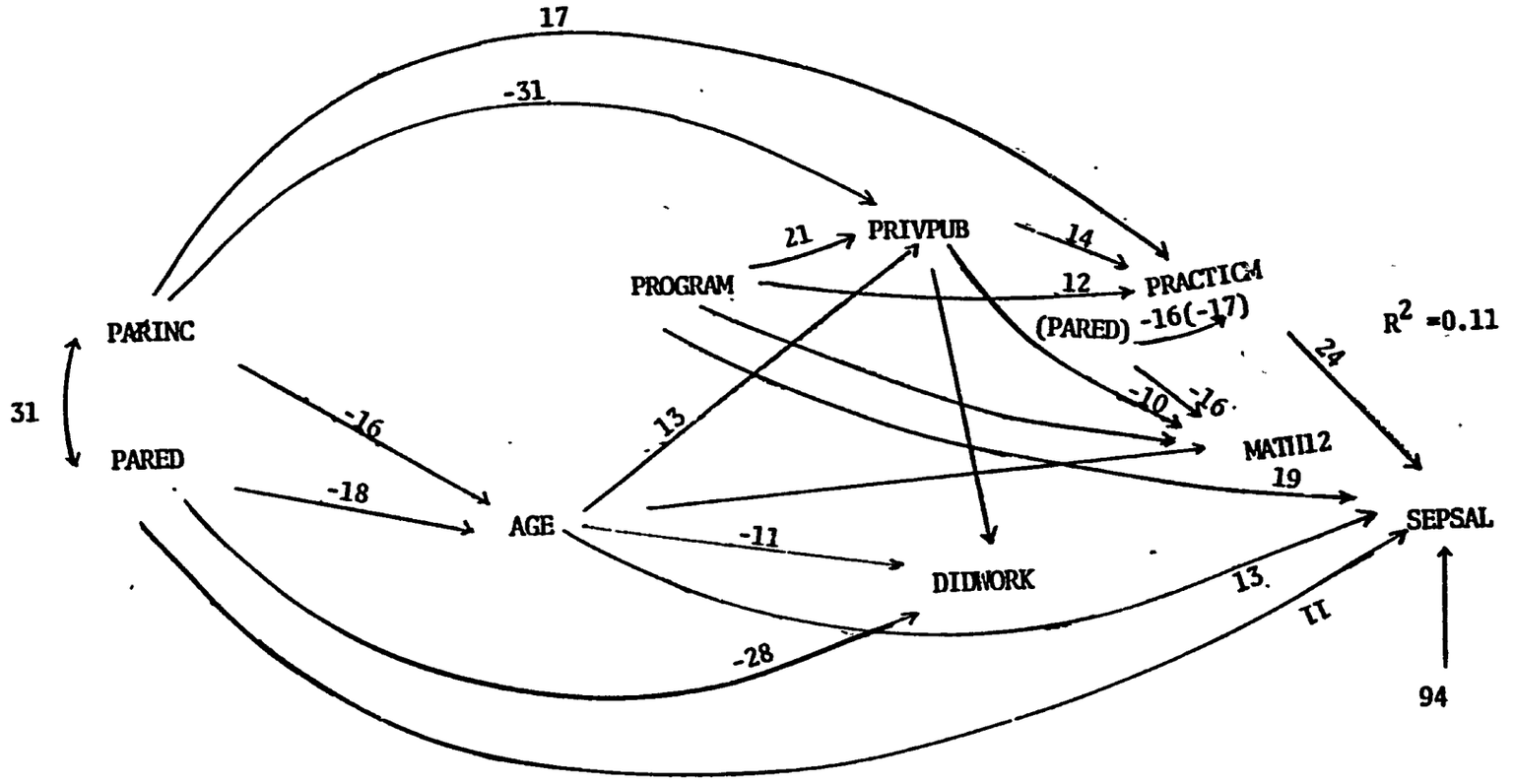


Table II-43

Zero-Order Correlations (r), Path Coefficients and R^2
General Model - Women

	PARED	AGE		PROGRAM		PRIVPUB		DIDWORK		PRACTICUM		MATH12		SEPSAL	
PARINC	307	-219	-163	-083	-089	-363	-308	-057	039	047	173	088	035	009	-017
PARED		-232	-182	-011	015	-165	-010	-263	-282	-156	-168	-048	-157	049	112
AGE				013	-003	203	133	-030	-108	079	036	-256	-261	113	133
PROGRAM						226	205	-066	-090	139	116	-129	-098	204	186
PRIVPUB								103	113	150	138	-172	-097	025	-061
DIDWORK										084	044	-008	-047	-045	-014
PRACTICUM												-080	-053	241	235
MATH12														-045	028
R^2		078		007		197		093		082		111		113	

This is shown in Figure II-6 and Table II-44. With 6 variables it is possible to account for 20 percent of the variance in SEPSAL, as compared to 26 percent with 13 variables. Once again, WHENEMP is substituted for DIDWORK. CIVSTATE replaces AGE, and SPAN12 replaces MATH12. Salaries in September are highest for those women bachillerato graduates who had courses with a field component, who obtained low grades in Spanish, who are married, who obtained employment recently, and who come from smaller families. The data suggest that those women who choose programs with a field component are more likely to keep that employment, and to trade performance in school (i.e., grades) for the benefits of employment. This could be true, for example, of girls who take commercial courses that involve some field experience, who do not compete with other girls planning to continue on to the university, but who continue to work in the firm in which they were placed. Married girls more frequently are in this category.

If this is an accurate description of what takes place, the conclusion would be that the type of Bachillerato is not, in terms of employment and salary, highly important, but that graduation from the Bachillerato does provide women with access to the labor market. Viewed from the perspective of the employer, the diversified Bachillerato represents a pool of available female labor from which he can draw those persons whose ability and motivation and possibly applied skills has been demonstrated through a relatively low-cost, low-risk trial period (the practical field experience).

Figure II.6

Significant Path Coefficients for

Best Path Model - Women

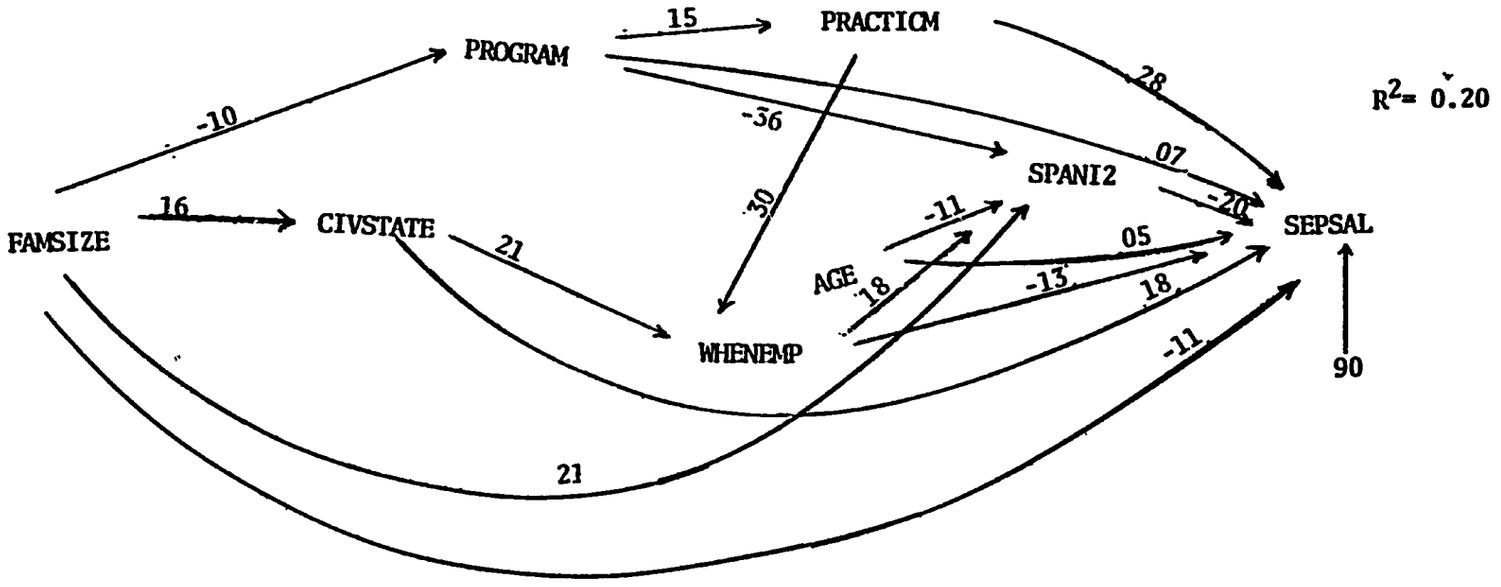


Table II-44

Zero-Order Correlations (r), Path Coefficients and R^2
Best Model - Women

	AGE		CIVSTATE		PROGRAM		WHENEMP		PRACTICUM		SPAN12		NUMCRIT		SEPSAL	
	r	path	r	path	r	path	r	path	r	path	r	path	r	path	r	path
FAMSIZE	040		161	159	-105	-096	061	027	031	036	247	210	122	097	-122	-107
AGE			074	068	013	[illegible]	-015	-031	079	085	-112	-111	048	039	113	053
CIVSTATE					-075	-061	210	207	-005	-069	044	-047	309	291	147	178
PROGRAM							-034	-016	139	146	-388	-362	206	277	204	068
WHENEMP									279	299	196	180	090	083	-059	-133
PRACTICUM											-005	-003	-131	-197	241	278
SPAN12													-034	024	-280	-198
NUMCRIT															098	080
R^2			031		015		046		112		238		193		197	

6.0 The Degree of Fit Between Bachillerato Studies and University Programs

Previous sections of this report have focused on the relevance of the Bachillerato program for employment. In this section we consider its relevance for post-secondary education. Our intent is to answer the question, "Is there a fit between what graduates studied in the Bachillerato, and what they were studying in the university at the time of the Followup Survey?"

The analysis is constrained because we have no information on whether the content of the study plans of Bachillerato courses was consistent with what students are required to know in order to master university-level subjects, nor do wo have information on student performance in the university that might indicate how well they were prepared. We can only compare titles of programs.

There is a certain, unmeasured amount of communality between Bachillerato programs. All, for example, have courses in Spanish and in mathematics, science or other subjects required for success in any university program. We would expect, therefore, that there would be a certain amount of substitutability of one Bachillerato program for another, in terms of preparation for the university. We would not have to find a perfect match between secondary and higher education programs in order to conclude that the former is relevant for the latter. On the other hand, we cannot specify just how good a fit is necessary to conclude that the Bachillerato is relevant.

Table 45 presents the data. The number of categories for Bachillerato programs has been reduced to eight, as some of the programs had very small

TABLE II-45 University Program Attended as a Function of Bachillerato Program

UNIVERSITY PROGRAM

BACHILLERATO PROGRAM	TOTAL GRADS		Technological Eng'g		Arch & Eng'g		Sci & Hum Chemistry Pharmacy		Medicine Nursing		Economics		Agronomy		Law		Others*		TOTAL HIGHER EDUCATION	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Industrial	127	20.7	37	55.2	21	31.3	1	1.5	2	3.0	2	3.0	1	1.5	2	3.0	1	1.5	67	26.6
Academic	141	23.0	12	19.0	15	23.8	15	23.8	8	12.7	3	4.8	3	4.8	4	6.3	2	3.2	63	25.0
Health	45	7.3	2	5.0	2	5.0	2	5.0	31	77.5	0	0	4	10.0	0	0	1	2.5	40	15.9
Commerce & Admin.	99	16.2	4	4.0	4	16.0	3	12.0	1	4.0	12	48.0	0	0.0	4	16	0	0.0	25	9.9
Agriculture	51	8.3	0	0	1	6.7	0	0.0	0	0.0	0	0.0	10	66.7	0	0	4	26.7	15	5.9
Innkeeping	31	5.1	2	18.2	1	9.1	2	18.2	0	0.0	2	18.2	0	0.0	1	9.1	3	27.3	11	4.4
Teaching	30	4.9	1	16.7	1	16.7	0	0.0	1	16.7	0	0.0	0	0.0	1	16.7	2	33.3	6	2.4
Others*	89	14.5	5	20.0	8	32.0	4	16.0	2	8.0	0	0.0	5	2.0	1	4	0	0.0	25	9.9
	613	100%	58	23.0	53	21.0	31	12.3	45	17.9	19	7.5	19	7.5	13	5.1	13	5.1	252	100%

*Includes Arts, Navigation and Fishing, Vocational.

**Includes Military, Teaching, Hotel and Physical Culture

numbers of students going on to the university. We included all the Bachillerato programs for which there are specific post-secondary programs of study irrespective of whether large numbers of graduates actually enrolled in them. Less than 3 percent of the graduates of Bachillerato teaching programs went on to the university, for example, but we have included them because there is a post-secondary program that they could have attended. We also have reduced the number of categories of university programs, combining those that seem to be closest in content to each other.

The two sets of programs have been arranged in Table 45 in the sequence that corresponds to our notion of consistency from secondary to higher education. If the Bachillerato programs are highly relevant for study in the university, the percentages along the diagonal of the table should be large, or at least larger than those above or below the diagonal.

In general this appears to be the case. The first comparison is for students graduating from the Industrial Mechanical and Industrial Electrical programs. More than half of the graduates enrolled in programs in engineering or technology. Another 31 percent enrolled in the School of Architecture and Engineering. We could conclude that Bachillerato training is highly relevant in terms of preparation of technological and engineering university students.

The category "academic" is broad, and accordingly we do not find the neat correspondence there as for the technical graduates. Graduates from the Humanities and Mathematics programs in the Diversified Bachillerato are spread across the major programs in the universities. It is hard to argue that this distribution supports or refutes a claim for relevance.

Bachillerato programs in Health are clearly specific "preparation" for Schools of Medicine and Schools of Nursing at the post-secondary level. Almost 78 per cent of the Health graduates who go on to higher education enroll in either Medicine of Nursing (almost all in Medicine).

Programs in Commerce and Administration might be expected to send their graduates to either Law or Economics, and 64 percent of the Bachillerato graduates (who go on) enroll in those programs. On the other hand, one could call attention to the fact that 20 percent enroll in technical and engineering programs, for which it could be assumed that Commerce and Administration is not relevant preparation. Two-thirds of the graduates of the Bachillerato Agriculture programs who go on to the university enroll in programs in Agriculture or Agronomy. But one-fourth enroll in a university-level program in Hotel Management. University-attending graduates of the Inn-Keeping program on the other hand enroll in a number of other programs for which their training at the Bachillerato level would not seem to be relevant. From their titles one would not expect the programs in Arts, Navigation and Fishing, and Vocational, to be relevant for any of the higher education programs, but almost 30 percent do go on to the university, and they enroll in about the same kinds of programs as do graduates from the Humanities and Mathematics programs.

Overall, the results present a mixed picture of the relevance of the Bachillerato programs as preparation for the university. Furthermore, there is an alternative explanation. The relationships found could be the result of structural factors, rather than a contribution of learning in the Bachillerato to entrance into the university. It is likely that some of the programs have established relationships with one or more faculties in the universities, and regularly send their graduates to those programs. It is also possible that less-qualified students in any program who are determined to attend the university head for those university programs in which enrollment is easiest.

Is learning in the Bachillerato specifically relevant for selection/entrance

into a given university program? The measure of learning available in this study is that of grades or marks awarded by teachers. If these can be assumed to be based on the amount of learning or knowledge of the student in the subject matter of his Bachillerato program, and if university programs select or receive students according to the fitness of that learning for the university-level program, then we should expect to find a relationship between marks or grades, Bachillerato program, and university program. If the selection process of the university is based on relevant factors, then average grades should be highest for those graduates selected into university programs that match their Bachillerato program.

Table 46 and 47 present the results of an analysis designed to assess relevance in this way. The dependent variable in the tables is average grades, in Spanish and in Mathematics, in the 12th grade of Bachillerato. For purposes of the presentation, the categories of programs have been compressed a bit further, as footnoted in Table 46. There are only modest differences between programs, in terms of grades. In some cases the mean grade is higher where the Bachillerato graduates are enrolled in a university program that "fits", but this pattern is not consistent, and the differences are small given the amount of variation. Furthermore, there is not much difference between the grades of those enrolled in university programs for which the Bachillerato may have been relevant, and the grades of those who did not attend the university. On the basis of these results one should conclude that evaluations of learning or knowledge in the Bachillerato are not used by universities in selecting students. Sticking with the assumption that grades mean something, this would indicate that learning or knowledge in the Bachillerato is not relevant for university admission, or that the content of Bachillerato programs is not considered relevant for success in the university.

Table II-46

Average Grades in SPAN 12 for Graduates
According to University Program

BACHILLERATO PROGRAM**		UNIVERSITY PROGRAM* Technical	Arch Eng'g	Sci Hum	Health	Econ Law	Others	Not Enrolled
Industrial	$\bar{X}$	7.15	7.45	6.75	7.33	7.67	6.0	6.93
	SD	.94	1.00	.50	.58	.58		.87
	N	41	20	4	3	3	1	80
Academic	$\bar{X}$	6.75	7.2	7.00	7.00	7.33	7.20	7.02
	SD	1.14	.86	1.09	1.41	1.21	1.30	1.02
	N	12	19	16	6	6	5	90
Health	$\bar{X}$		6.50	6.50	6.58		5.75	6.20
	SD		.71	.71	.92		.96	.45
	N		2	2	31		4	5
Commerce Admin	$\bar{X}$	7.00	7.00	6.20	6.00	7.22	7.33	6.74
	SD	1.00	1.83	.45		.94	.58	1.08
	N	3	4	5	1	18	3	91
Others	$\bar{X}$	8.00	7.50	7.33	8.00	7.50	7.33	7.03
	SD		1.00	.58	2.83	.71	.72	.96
	N	1	4	3	2	2	15	68

*Technical includes all technological engineering programs and military studies (2 cases). Arch Eng'g and Health remain the same. The Sci Hum category now includes Social Work (1 case).

**Navigation and Fishing is included in the Industrial group as its pattern for university attendance is very similar. Innkeeping is included with Commerce for the same reason.

Table II-47

Average Grades in MATH 12 for Graduates
According to University Program

UNIVERSITY PROGRAM

BACHILLERATO PROGRAM		Technical	Arch Eng	Sci Hum	Health	Econ Law	Others	NOT ENROLLED
Industrial	$\bar{X}$	6.88	7.10	6.50	6.67	7.33	6.00	6.33
	SD	1.23	1.25	.58	.58	1.53		.97
	N	41	20	4	3	3	1	80
Academic	$\bar{X}$	6.67	7.00	6.25	6.67	6.50	5.80	6.64
	SD	1.07	1.20	1.07	1.21	1.38	.84	1.36
	N	12	19	16	6	6	5	90
Health	$\bar{X}$		6.50	6.00	6.68		6.50	6.80
	SD		2.12	1.41	1.08		.58	1.48
	N		2	2	31		4	5
Commerce Admin	$\bar{X}$	7.67	7.00	5.60	5.00	6.50	6.67	6.10
	SD	1.16	2.31	.55		1.43	.58	.98
	N	3	4	5	1	18	3	91
Others	$\bar{X}$	8.00	7.75	6.33	8.00	7.00	6.67	6.35
	SD		1.50	.58	2.83	1.41	1.35	1.06
	N	1	4	3	2	2	15	68

On the basis of these data, then, we cannot affirm that a link between study in the Bachillerato and university study demonstrates that Bachillerato preparation is relevant for the university. It is just as likely that selection into programs in the university is a result of tradition, special relationships or other non-relevant factors not included in this study.

Appendix A

Glossary of the Variables and Their Acronyms

Variable Acronym	Variable Precis
AGE	
BACHPROG, PROGRAM, PROG	Bachillerato: program attended by the graduate
CIVSTATE	Civil state of the graduate
COLLPREP	Program more likely to lead to college than to work
DIDWORK	The graduate worked while studying Bachillerato
FAMSIZE	Size of the graduate's family
FIRMACT	Activity of the firm in which the graduate is working
LIFECYCLE	Combination of AGE and CIVSTATE
MATHI2	School - marks in Mathematics in Grade 12.
PARED	Parent education
PARINC	Parent income
PERCAPIN	Parent income/size of the family = per capita income
PRACTICUM, PRTCM	Field experience as part of the Bachillerato program
PRIV/PUB	Sector of the school attended
PROGRAM, PROG	See BACHPROG
SEX	
SEPSAL	Salary earned in September 1975
SPAN12	School - marks in Spanish in Grade 12
STATUS	Principal present activity of the graduate

III. Towards Relevance in Non-School Education in El Salvador: An Analysis of Audience Demand and Learning Sources

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III

TOWARDS RELEVANCE IN NON-SCHOOL EDUCATION IN EL SALVADOR: AN ANALYSIS OF AUDIENCE DEMAND AND LEARNING SOURCES

1.0 Introduction

The introduction to this set of studies stated that relevance in education can mean many things. It can refer to the "fit" between individual learning needs and educational program offerings, between educational program outcomes and socio-economic development goals, between educational program outcomes and educational goals, between job performance requirements and educational program outcomes, and between educational program outcomes and educational program content. This paper is concerned with the first of these relationships, i.e., the "fit" between expressed individual learning needs and what education activities are made available to the population. In addition, it is concerned with expressed individual preferences for where or through what medium one learns and the organizational delivery mechanisms through which education is made available.

Another distinguishing characteristic of this study is its concern with non-school or out-of-school education. These terms refer to the same activity sometimes called nonformal education and defined as:

> Any organized, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning

> to particular subgroups in the population, adults as well as children. Thus defined, nonformal education includes, for example, agricultural extension and farmer training programs, adult literacy programs, occupational skill training given outside the formal system, youth clubs with substantial educational purposes, and various community programs of instruction in health, nutrition, family planning, cooperatives, and the like. (Coombs and and Ahmed, 1974, p.8)

Non-school education is not a new educational activity, in fact it is the origianl form of education practiced in many forms throughout the history of civilization. What is new about non-school education is that whereas previously it was comprised of independent, disparate educational activities with limited objectives and planning, there is now interest in centralized planning and allocation of resources to non-school education. This has resulted in attempts to centralize, within the education sector, the analysis and planning of many forms of non-school education. One obstacle to this is that other ministries and sectors such as agriculture, health, and labor often see these non-school education activities as falling under their jurisdiction. No easy solution to this problem has been found but discussion of these issues is currently taking place and attempts at initiating coordination across ministries have been experimented with in several countries. Regardless of whether all activities called non-school education come under the jurisdiction of a Ministry of Education there is certainly a need to consider the availability and impact of these educational activities as a part of any education sector analysis. They are a part of the overall educational activities in a society and contribute to socio and economic development.

Given the diffuse and decentralized manner in which non-school education has been carried out in the past, it has not benefited from the develop-

ment of educational planning and analysis techniques to the same extent as has formal schooling. As a consequence there currently exists a great lack of planning information and techniques for non-school education. One kind of information important to planning non-school education is determining for specific audiences their expressed "learning" or educational needs and their preferences for how and where to learn. This paper is an attempt to explore these issues and provide information about them that might be useful to future planning of non-school education in El Salvador.

In the summer of 1974 ODEPOR (The Office of Planning of the Ministry of Education) in cooperation with the Board of Secondary and Higher Education conducted a survey (called the Audiencia Survey) of the general adult population in El Salvador to determine their current knowledge and desire for more information about eight general content areas. They also asked general questions (not specific to each of the eight topics) about access to, and preference for learning through, certain media and agencies. Following the data collection, the government did a descriptive analysis of the data broken out by selected demographic factors. The study described in this paper is a further analysis of this data, to determine specifically what factors influence current knowledge and desire for more information, and the way these factors influence how and where Salvadoreans want to learn.

2.0 Purpose and Design of Survey

The Audiencia Survey was one of a number of special surveys conducted by ODEPOR in the course of its educational sector analysis. The intent of these surveys was to collect large quantities of data about all facets of the El Salvador Educational System. Provisional documents (working papers) were published to initiate discussion, criticism and suggestions. These

working papers were also intended to serve as a foundation for future analyses.

Working papers Nos. 1 and 5 describe the Audiencia Survey. They include a description of the procedures and instruments used, and a description of the responses (frequencies) to most questions in the survey, broken out by residence, age, sex, education and sometimes employment/occupation.

Underlying the survey is the belief on the part of Salvadorean educational officials that an essential function of education is the development of the abilities of citizens and, thereby, the furtherance of socio-economic development and a reasonable quality of life. Furthermore they feel that the higher the level of education a society has, the higher the level of development it can reach. The consequences of higher levels of education attained are assumed to be that the country is better prepared to take care of necessities and utilize its natural resources.

The Audiencia Survey was conducted to determine the interests of the adult population in non-school educational services, particularly those services which could be provided through the use of mass media and existing community agencies. By determining educational needs and preferred modes of learning it was thought possible to strengthen and expand policies and programs that could increase people's educational attainment through the use of existing non-school delivery systems. Furthermore, it was expected that such data could subsequently be used as the basis for preparing new and improved educational programs that were consistent with the expressed needs of the population. The programs could be distributed through the most appropriate and highly utilized education/communications media and agencies.

2.1 Content

As stated in the previous section, one of the purposes of the survey was to obtain data on the amount of information received by different population groups and the interest these groups had in receiving more information about a variety of topics. The eight topics surveyed were:

a. Diseases and Illnesses
b. Preventive Medicine and Public Health
c. Foods and Nutrition
d. Agriculture
e. Work and Training (Jobs)
f. Home Economics
g. Education
h. Recreation

A second purpose of the survey was to evaluate the availability and utilization of a variety of education/communications channels in El Salvador. This included both the mass media and various community agencies and services. For planning purposes it was important not only to know the availability of media and agencies but also which were the preferred media and agencies for receiving information. Included in the mass media were television, radio, newspapers and magazines, movies and live theater, postal services, and telephone. Agencies and services considered to function as channels of education/communications were libraries, local civil and military authorities, government offices in the local community, cooperatives, loud speaker vehicles, agricultural extension agents, community developers and social workers, health facilities, Houses of Culture, adult education consultation centers, and clubs and organizations.

2.2 Methods: Definitions of Variables and How They Are Measured

A. Definitions of Classification Variables

Age - Number of years completed on the day interviewed (scored as under 30 or over 30)

Sex - Male or female

Residence Zone - Respondent's residence or address:

urban - domicile of survey participant is in a politically defined and recognized city or town

rural - domicile of survey particiapnt is in a politically defined and recognized canton *

Literacy - Is a person able to read and write (Yes/No)

Educational Level - Cycle or academic level of schooling completed (Primary 1-3, Primary 4-6, Basic Plan, some Secondary, Secondary completed, some University, University completed, other)

Occupation - The employment activity, paid or not, in which the respondent is currently engaged; or in which, if not currently working, was previously engaged.

Household Possessions - Number of following possessions found in the home of the respondent: plumbing, electricity, potable water, refrigerator, vehicle

Not all the data collected on these variables were utilized in the initial analysis (working paper #1) of the Audiencia Survey. There is no analysis of literacy. Occupation is analyzed only to the extent that people are employed or unemployed. And, although information was collected on household possessions, it too was not included for analysis in this first phase of study.

B. Definitions of Substantive Variables

a. The eight content areas about which detailed questions were asked regarding "current knowledge" and desire for more information" are defined below. Responses to questions in each area were measured by the indicators - - "much", "little", "none."

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* canton - a rural administrative unit roughly equivalent to an American township.

Health - Common illnesses and diseases--dental, eye, gastrointestinal, veneral, respitory, malaria, and children's diseases

Preventive Medicine and Public Health - Sanitation, mosquito control, birth and pregnancy control, immunizations and first aid

Foods and Nutrition - Nutritive value of dairy products and the function of vitamins, proteins, fats and carbohydrates within the body

Agriculture - Methods and techniques that can improve production of crops and animals, and marketing

Work and Training - Availability of employment, requirements for employment, occupations (skilled craftsmen, mechanical and electrical repair, service sector, and tourist sector)

Home Economics - Daily activities of the home (food preparation, childcare, serving, weights and measures)

Education and Culture - Educational programs, courses and media, history and culture of El Salvador and Latin America

Recreation - Activities through which people gain rest, diversion, and physical and mental health, including both participative and spectator sports

The information was collected in the following form.

TOPICS *	How Much Are You Currently Informed About: "much" "little" "none"	How Much Would You Like to Receive Information about: "much" "little" "none"
Health (7 questions)		
Preventive Medicine (6 questions)		
Foods & Nutrition (2 questions)		
Agriculture (17 questions)		
Work & Training (16 questions)		
Home Economics (6 questions)		
Education & Culture (20 questions)		
Recreation (14 questions)		
Total = 88 Questions		

b. The information about various available delivery systems in El Salvador was collected in a different form. First, the questions were not related to each topic area but were asked, in general, about media and agency access and preference. For the eight items related to television, radio, printed periodicals and organizational memberships,

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* Each of the eight content areas had multiple questions about it on the questionnaire. The number of questions in each content area is indicated in parentheses following the topic label.

respondents answered "yes" or "no" to indicate whether they had access to the media or membership in the group. For the remaining fifteen education/communications channels and agencies they could answer with "no opinion" as well as "yes" or "no." The media and agencies covered were:

a. Media

Television - Possession of a television set or ready access to one

Radio - Possession of a radio or ready access to one

Newspapers & Magazines - Possession of newspapers or magazines or the possibility of going to a place to read them

Movies or Live Theater - Existence of an accessible site in which films are shown or live theatrical productions are given

Postal Services - Availability of services for sending and receiving mail

Telephone - Availability of a telephone in the house or community

b. Agencies

Library - Existence of a library to which the respondent has ready access

Local Authorities - Ease of access to local civil and military authorities

Government Offices - Existence of government offices in the community of the person interviewed to which the respondent has access

School - Availability of a school in the community to which the respondent's family has access

Cooperative - Existence of a cooperative one can join

Loudspeaker Vehicles - Presence in community of vehicles to spread messages, either advertising, or motivational, by public address loudspeakers

Agricultural Extension Agents - Presence of agricultural extension agents that visit the community

Community Developers or Social Workers - Presence of community development workers or social workers in the community

Hospital, Health Center or Health Unit - Existence in the community of centers that provide services for the prevention and cure of illnesses

House of Culture - Existence of a center that develops socio-cultural activities coordinated by the Ministry of Education

FOCCO - Existence of projects of FOCCO (Government cooperative community development program) in respondent's community

Consultation Center for Adult Education - Existence of an Adult Education Center in the community

Membership in the Following Associations:

Church or Religious Organization
Club or Social Organization
School Organization

In addition to indicating the availability of each medium or agency, respondents were requested to indicate separately for media and agencies, their first two preferences for the means of receiving information.

2.3 Sample Design

The population from which the sample was drawn was first stratified according to whether an individual resided in an urban or rural area. The population was then limited to those above the age of fifteen, and divided into 15 - 30 year olds and those over 30. The population was further divided according to sex and according to whether the interviewee was employed or unemployed. From these categories quota samples were drawn so that there

were roughly equal numbers of men and women. An attempt was made to select potential interviewees from all the general occupation groups, including the unemployed.

A total of 7,244 persons in the 14 departments of El Salvador were surveyed. Of these 3,735 (51.5%) were male and 3,510 (48.5%) were female. 5,312 (73.3%) of the people surveyed resided in urban areas. Of those 2,644 were males (50%) and 2,668 (50%) were females. 1,934 (26.7%) rural dwellers were surveyed. 1,090 (56.4%) of them were male and 842 (43.6%) were female(For a breakdown of the sample by each classification see Appendix E).

SAMPLE SIZE BY RESIDENCE AND SEX

Sex / Residence	Total	Male	Female
Urban	5,312 (73.3%)	2,644	2,668
Rural	1,932 (26.7%)	1,090	842
Total	7,244 (100%)	3,734 (51.5%)	3,510 (48.5%)

2.4 Field Work

The survey was carried out jointly by ODEPOR and the Board of Secondary and Higher Education. The actual survey process was conducted by students in their final year of academic secondary school (bachillerato). They were supervised by their teachers and the directors of the schools. The analysis was done by personnel of the statistics department of ODEPOR with technical assistance from AID and people on loan from the United States Census Bureau.

Students were supervised by their teachers who in turn were supervised by their school directors. The school directors were responsible to supervisors from the Board of Secondary and Higher Education. Everyone was ultimately responsible to ODEPOR.

3.0 Original Analyses and Results

A description of the original analysis and its results are available in Working Document #1 on the Audiencia. In this document each question in the survey is analyzed and frequencies presented for each category of response. No analyses of statistical significance were calculated. Each question pertaining to current knowledge and desire for more information was analyzed according to residence, sex and education. No analyses were done for these questions by age and employment status. Access variables were analyzed according to residence, sex, education and age but not employment status. Preferred media and agency questions were analyzed according to education and age, but not residence, sex or employment status.

One can see from this description that, the original analyses were very basic, descriptive and selective. While that is certainly the kind of analysis with which to begin, there is much more that can be done in analyzing this information and interpreting its significance for educational relevance. Some additional analyses which seem important to do are:

a. To determine which classification variables, or set of variables make a statistically significant difference in respondents expressed "current knowledge" and "desire for more information."

b. To determine what relation, if any, exists between "current knowledge" and "desire for more information."

c. To determine which classification variables, or set of variables, make a statistically significant difference

in respondent's access to educational/communications media and agencies, and preference for learning by means of particular media or agencies.

d. To compare the profile of classification factors influencing "desire for more information" with the profile describing access to and preference for media and agencies Where comparison shows agreement this result can be used as a policy and planning guideline for deciding by what educational/communication media or agency to best deliver an educational program on a selected topic to a particular audience.

The remainder of this paper presents these analyses and results.

4.0 Current Analysis

A. General Objectives

In building upon the results reported in Working Document #1 of the Audiencia Survey, this current study will attempt to:

a. simplify the analysis of the data by reducing the number of variables to be analyzed. This will be done by consolidating the 88 variables measuring "current knowledge" and "desire for more information" for the eight content areas, into indexes representing similar groups of variables (e.g., one composite index for all questions in a particular content area);

b. extend the analysis of the effects of classification variables by simultaenously examining the effects of the same set of classification factors on each content index to determine their independent effects as well as their interaction (interrelated effects);

c. extend the analysis of the data to identify those factors that best predict "desire for more information" and access to and preference for learning sources, and compare the two sets of predictors for similarities and differences;

d. assess the reliability and validity of all analyses by calculating statistical tests of significance;

e. expand the usefulness of the study by assessing the implications of the analysis results and conclusions for policy making and planning of non-school education.

B. Specific Questions To Be Answered

In order to reach these objectives, the data will be analyzed according to the following research questions:

a. What is the underlying set of content dimensions being measured by the 88 questions on "current knowledge" and "desire for more information"?

b. What is the current level of "knowledge" and "desire for more information" for each of these content dimensions?

c. Is there a difference in "current knowledge" and "desire for more information" within each content dimension according to geographical residence, sex or gender, age, whether or not employed, and level of schooling attained?

d. Is "current knowledge" related to "desire for more information" for each content dimension?

e. Through what sources do people learn and prefer to learn?

i. What media and agencies do respondents have access to and which classification factors differentiate the rates of access?

ii. Through what media and agencies do respondents prefer to receive information and what classification factors differentiate preferences?

iii. Does access predict media and agency preference?

As can be seen from the above questions, this analysis is more interested in what factors account for "desire for more information" and learning preference than what is the frequency of demand and mode of learning for different subgroups of the population.

4.1 Analysis Design

A. Operational Definition of Variables

a. Classification of Variables

For this analysis it was decided to use geographical residence, gender, age, educational level and whether or not employed as classification or predivtor variables. Literacy was not used since it was thought it did not add substantial explanatory power over educational level attained, and perhaps had even less expalantion, given that 89% of the opoulation surveyed said they could read and write. This seems an unreliably high percentage, given that 27% of the sample is rural and 30% of the sample had no education or had only completed the third level of primary school. Number of household possessions also was not used because it is difficult to determine what this variable represents; particularly since it is only scored

as the total absolute number of possessions in the home with no distinction between type of possession (e.g., vehicle and refrigerator weighted equally). Furthermore, education and employment are probably better indicators of socio-economic status than number of possessions.

The five classification and predictor variables used were, operationally defined as follows:

Geographical Residence

1 = urban
2 = rural

Gender or Sex

1 = male
2 = female

Age

1 = under 30
2 = 30 +

Educational Level Attained

0 = no education completed
1 = primary 3 or 6 completed
2 = Basic Plan completed
3 = some or all of secondary or university completed

Currently Employed for Pay

1 = yes
2 = no

b. Substantive Variables

"Current knowledge" (hereafter called knowledge) variables and "desire for more information" (hereafter called demand) variables were each measured on equivalent scales for each of the 88 content questions. This scale was:

For Knowledge Questions	For Demand Questions
1 = much	1 = much
2 = little	2 = little
3 = none	3 = none

Before reducing the 88 variables to a smaller subset, 14 questions (#66 - #79 on the original questionnaire) were eliminated from the Education and Culture category. The reason was these questions did not measure the content of education and communication programs, but rather the extent to which the respondent possessed knowledge and demanded more information about specific delivery mechanisms (e.g., educational T.V., radio schools, music and art courses, etc.). Therefore, there were 74 content variables to be reduced to a smaller subset.

In order to reduce the 74 knowledge and demand questions to a reasonable number suitable for statistical manipulation, the 74 questions were factor analyzed (see Appendix 1 for explanation of this technique) separately for each of the eight content areas, and separately for knowledge and demand. The factor analysis was intended to reduce the 74 variables to a subset of simlar variables within each topic area measuring some common underlying dimension. For example, 6 of the 17 questions about agriculture refer to crop production and if supported by the factor analysis could be treated as a separate group of questions all measuring the same underlying dimension. Furthermore, a single index score could be claculated by taking the overall mean for the six variables.

One complication is that in order to compare knowledge and demand scores the same groupings would have to be made for the 74 knowledge items as for the 74 demand items. This means a similar factor solution must be obtained for the two separate factor analyses of knowledge and demand questions. Fortunately, this was the case and the following 15 indexes were created from the factor analysis for both the knowledge and demand variables (for a complete description of the factor analysis solution see Appendix A):

1. Diseases and illnesses
2. Preventive medicine and public health
3. Foods and Nutrition
4. Agriculture I - crop production
5. Agriculture II - livestock production
6. Agriculture III - support services
7. Jobs I - general availability and requirements
8. Jobs II - skilled craftsmen
9. Jobs III - repair
10. Jobs IV - service sector
11. Jobs V - tourist sector
12. Home Economics
13. Education and culture
14. Recreation I - participative sports
15. Recreation II - spectator sports

For a complete list of the questions included in each index, also see Appendix A.

Scores for each index have the same range of values as for each original question, i.e., 1-3. Since they are mean scores, however, decimal fraction scores are possible.

Access variables were defined as on the original questionnaire; "yes" or "no" for each of the 22 media or agencies, plus no opinion for 14 of these options. The 14 questions transferred from the education and culture category of the

content variables were scored the same as all knowledge and demand variables (much, little, none).

Preference for receiving information through specific Media and Agencies was defined as the frequency with which each alternative was indicated to be the most preferred mode of learning.

The 22 options for media and agencies were the same for access and preference, and were:

Media

1. Television
2. Radio
3. Newspapers
4. Magazines
5. Movies or theater
6. Mail
7. Telephone

Agencies

8. Library
9. Church or religious organization
10. Club or social organization
11. Local authorities
12. Government offices
13. School
14. Cooperative
15. Public address trucks
16. Agricultural extension agents
17. Community developers and social workers
18. FOCCO
19. Hospital, health center, health unit or health post
20. School organization
21. House of culture
22. Consultation center for adult education

B. Statistical Analyses

Statistical techniques used to analyze the above variables to provide answers to the research questions were:

a. Contingency tables and Chi-square for determining first the frequency of response to each response category for a question,

and the second the relation of classification variables to categorically define substantive variables, such as the access and preference questions.

b. Pearson product-moment correlations to determine the relation between "current knowledge" and "desire for more information" for each of the 15 content indexes.

c. Analysis-of-variance to determine the overall independent and interacting effects of the 5 classification variables.

d. Multiple Classification Analysis to determine the relative contribution of each classification factor to the variance in each of the 30 indexes.

C. Limitations and Constraints on the Analysis

In general, the data collected by means of the Audiencia Survey appears to be fairly reliable and useful. However, there are some limitations and constraints on its accuracy, generalizability and utility. First, even though a fairly large sample of 7,000 plus was drawn no statistical or logical estimate was made of the precision and representativeness of the sample. While the use of stratification factors and random selection procedures likely improved the quality of the sample, no one can be sure of the accuracy of the sample without some computation of standard error estimates or comparison of the sample to population norms.

Second, while it was useful to collect information about access to and preference for media and agencies, the failure to relate this information to specific content areas limits the explanatory power and usefulness of the access and preference information. Certainly access to and preference for media and agencies varies according to the content or subject matter of educational programs.

Third, "current knowledge" and "desire for more information" are not the best indicators of learning need or intent to participate in an educational activity. Learning need is also determined by dissatisfaction with one's current status or situation, inability to solve a problem,motivation to accomplish a task or reach a goal, etc. A complete measure of learning need would have to assess these other factors.

Finally, planning of new programs in response to audience demand also requires some indication of intent to participate and conditions influencing this intent. Therefore, this analysis of "current knowledge" and "desire for more information" is only a partial analysis of learning need and intent to participate in educational activities.

In spite of these deficiencies the current analysis was felt to be worthwhile given the paucity of existing information about audience learning needs and modes of learning, and the comprehensiveness and quality of the information in the Audiencia Survey. Furthermore, the possibility of comparing present and future educational offerings in El Salvador to audience demands in order to assess educational relevance makes the analysis worth doing.

5.0 Results and Discussion

Results are presented in this section according to each of the research questions presented on page 13. No attempt is made to draw conclusions about the results, which is the task of the final chapter.

Instead results are described in narrative and tabular form and their meaning discussed. Results for question 4.B.a were presented in the previous section in describing the construction of the fifteen knowledge and demand indexes. Therefore we begin with the second question.

Question 4.B.b What is the Current Level of Knowledge and "Desire for More Information" for Each of the 15 Content Dimensions?

Table III.1 presents the data on current knowledge and demand in terms of mean scores for each of the fifteen indexes. In general, respondents felt they had "little" to "no" knowledge of the fifteen content areas (overall mean of 2.351); but their demand for information was fairly high (overall mean of 1.677). Knowledge was greatest about foods and nutrition, preventive medicine, home economics and recreation - participative sports; and least about jobs (all categories). Interestingly, demand for information was greatest for foods and nutrition, preventive medicine and diseases and illnesses, and least for recreation-spectator sports, and all job categories except general information. It would appear from this result that higher levels of knowledge beget higher demand for information. Of course, it is important to remember that there was some demand for information about all topics. None of the overall means for demand indexes were greater than 2.02; in other words there was at least "little" demand for all kinds of information and never "no" demand.

Question 4.B.c Is There a Difference in "Current Knowledge" and "Desire for Information" for Each of the Content Indexes According to the Classification Variables?

Table III.2 presents a summary of the Analysis of Variance results for the fifteen knowledge indexes (the complete Analysis of Variance tables are

Table III.1 Means and Standard Deviations and Ns for 15 Indexes of Current Knowledge and Demand for More Information (Scale: 1 = much, 2 - little, 3 = none)

Indexes	Knowledge Questions			Demand Questions		
	Mean	Standard Deviation	N	Mean *	Standard Deviation	N
1. Diseases and Illnesses	2.142	.476	7074	1.352	.470	6974
2. Preventive Medicine	2.000	.483	7111	1.330	.437	6990
3. Foods and Nutrition	1.940	.615	7189	1.301	.500	7003
4. Ag- Crop Production	2.288	.605	7108	1.595	.668	7010
5. Ag-Livestock Production	2.376	.573	7131	1.688	.687	7042
6. Ag-Support Services	2.411	.494	7096	1.635	.636	6951
7. Jobs - General	2.433	.505	7131	1.587	.630	7009
8. Jobs - Skilled	2.612	.477	7150	1.973	.749	7055
9. Jobs - Repair	2.783	.426	7152	1.966	.816	7075
10. Jobs - Service	2.669	.359	7092	1.958	.658	6954
11. Jobs - Tourist	2.736	.400	7117	1.968	.705	7011
12. Home Economics	2.078	.525	7102	1.585	.571	6952
13. Education and Culture	2.317	.565	7135	1.563	.642	7060
14. Recreation - Participative	2.102	.495	7024	1.637	.546	6845
15. Recreation - Spectator	2.375	.491	7085	2.024	.660	6906
Overall Mean	2.351			1.677		

* While demand scales were scored 4-6 they are presented here on a 1-3 scale for base of comparison

presented in Appendix B). Given the large number of higher-order interactions the main effect differences are not a complete explanation. However, given the difficulty of interpreting and utilizing higher-order interactions, and the subsequent use of Multiple Classification Analysis to assess the interrelationship between these classification variables, the interpretations of the Analysis of Variance was limited to main effects. An examination of main effects results in Table III.2 reveals that being employed makes no difference in knowledge about any of the indexes other than general information about job availability and requirements. In this instance employed respondents had greater knowledge. Residence makes a difference in knowledge for all fifteen indexes as did sex and level of education reached. Urban residents knew more about health and nutrition, jobs, education and culture, home economics and recreation. Rural residents knew more about agriculture matters only.

Males knew more about females about agriculture, jobs (except service sector) education and culture, and recreation. Females knew more than males about health and nutrition, home economics, and service sector jobs.

Almost without exception, the higher the level of education completed the greater the knowledge on each of the fifteen indexes.

Age results were mixed. No significant differences were obtained for general information about jobs, repair jobs, tourist jobs, education and culture and participative recreational sports. Some significant differences were found: the under 30 age group had more knowledge only of recreational spectator sports; those 30 and over knew more about all other remaining topics.

Table III.2 Summary of Analysis of Variance for Classification Variables by 15 Knowledge Indexes (Numerical Entries in Main Effects Columns are Means for Significant Effects)

Indexes	Main Effects (1) Residence	(2) Age	(3) Sex	(4) Employed	(5)* Education	Significant Interactions	Grand Mean
1. Diseases & Illnesses	U = 2.12 R = 2.19	≤30 = 2.20 >30 = 2.09	M = 2.10 F = 2.12	NS	O = 2.38 P = 2.24 B = 2.03 S+ = 1.91	(2x3) (1x2x3x5)	2.14
2. Preventive Medicine	U = 1.97 R = 2.09	≤30 = 2.00 >30 = 1.94	M = 2.04 F = 1.96	NS	O = 2.24 P = 2.08 B = 1.89 S+ = 1.80	(1x5) (2x3) (2x3x5) (1x2x3x5)	2.00
3. Foods & Nutrition	U = 1.91 R = 2.03	≤30 = 1.99 >30 = 1.90	M = 1.98 F = 1.90	NS	O = 2.37 P = 2.06 B = 1.77 S+ = 1.61	(1x5) (2x3) (2x3x5)	1.94
4. Ag-Crop Production	U = 2.38 R = 2.03	≤30 = 2.36 >30 = 2.24	M = 2.10 F = 2.50	NS	O = 2.36 P = 2.30 B = 2.28 S+ = 2.24	(1x4) (1x5) (3x4)	2.29
5. Ag-Livestock Production	U = 2.46 R = 2.16	≤30 = 2.41 >30 = 2.36	M = 2.32 F = 2.45	NS	NS	(1x5) (1x2x3) (1x2x3x5)	2.38
6. Ag-Support Services	U = 2.46 R = 2.26	≤30 = 2.45 >30 = 2.38	M = 2.29 F = 2.54	NS	O = 2.53 P = 2.43 B = 2.38 S+ = 2.32	(3x4) (1x2x3) (1x2x3x5) (1x2x3x4x5)	2.41
7. Jobs - General	U = 2.40 R = 2.50	NS	M = 2.37 F = 2.50	Y = 2.40 N = 2.48	O = 2.64 P = 2.52 B = 2.35 S+ = 2.20	(1x5) (1x2x3x5)	2.43
8. Jobs - Skilled	U = 2.57 R = 2.72	≤30 = 2.63 >30 = 2.59	M = 2.41 F = 2.82	NS	O = 2.69 P = 2.59 B = 2.61 S+ = 2.61	(1x5) (3x5) (1x3x5) (1x2x3x4)	2.61
9. Jobs - Repair	U = 2.75 R = 2.86	NS	M = 2.67 F = 2.90	NS	O = 2.87 P = 2.82 B = 2.74 S+ = 2.68	(1x3) (1x5) (2x5) (3x4) (3x5) (2x3x5)	2.78
10. Jobs - Service	U = 2.66 R = 2.70	≤30 = 2.68 >30 = 2.66	M = 2.73 F = 2.60	NS	O = 2.77 P = 2.66 B = 2.63 S+ = 2.64	(1x5) (3x5) (1x2x3x5) (1x2x4x5)	2.67
11. Jobs - Tourist	U = 2.73 R = 2.77	NS	M = 2.72 F = 2.77	NS	O = 2.86 P = 2.79 B = 2.69 S+ = 2.63	(2x3x5) (1x2x4x5)	2.74
12. Home Economics	U = 2.05 R = 2.15	≤30 = 2.13 >30 = 2.04	M = 2.38 F = 1.76	NS	O = 2.31 P = 2.11 B = 2.0 S+ = 1.97	(1x3) (2x3) (2x5) (3x5) (4x5) (1x2x3x4x5)	2.08
13. Education & Culture	U = 2.28 R = 2.40	NS	M = 2.26 F = 2.36	NS	O = 2.75 P = 2.45 B = 2.12 S+ = 1.95	(3x5) (1x2x3x4x5)	2.32
14. Recreation - Participative	U = 2.05 R = 2.23	NS	M = 2.06 F = 2.14	NS	O = 2.43 P = 2.19 B = 1.95 S+ = 1.87	(1x5) (2x3) (2x4) (1x2x5) (2x3x5) (1x2x3x5) (1x2x3x4x5)	2.10
15. Recreation - Spectator	U = 2.33 R = 2.47	≤30 = 2.34 >30 = 2.39	M = 2.24 F = 2.51	NS	O = 2.60 P = 2.46 B = 2.25 S+ = 2.16	(1x3) (1x5) (2x4) (1x2x3x4) (1x2x4x5) (1x2x3x4x5)	2.37

NS = Not Significant at .05 level

* O = No education or primary not completed
P = Primary 3 or 6 completed
B = Basic Plan
S+ = Some or all of secondary or college completed

A further analysis called Multiple Classification Analysis was done to determine the total amount of variance in each index explained by the five classification variables, and the relative contribution of each variable to the explanation. The results in Table III.3 show that 7 variables have less than 15% of their total variance explained by these five classification variables. This is probably too small a percentage to justify further analysis.

Of the remaining eight indexes, Education, Home Economics, and Recreation have the greatest proportion of their variance accounted for by the five variables. In every instance except home economics, educational attainment explains most of the variance. Male/female status is related to demand for information for home economics and sports. For agricultural crop production and skilled jobs sex is the predominant explanatory variable although residence is also significant in explaining crop production responses. Education accounts for a majority of the variance in the two remaining indexes, those measuring foods and nutrition, and general information about jobs.

Table III.4 presents the results of the Analysis of Variance for the fifteen demand variables (the complete Analysis of Variance tables are presented in Appendix B). Again given the large number of higher-order interactions the main effects differences are incomplete explanations, but still useful for purposes of this analysis.

An examination of Table III.4 reveals that employment makes no difference in response except for demand for job information, specifically, general information, skilled craftsmen, and repair jobs. In these three instances, being employed results in greater demand.

Table III.3 Multiple Classification Analysis Results for Predicting 15 Knowledge Indexes from 5 Classification Variables

Indexes	Multiple R	R^2*	Beta Weights				
			Residence	Age	Sex	Employment	Education
1. Diseases and Illnesses	.359	.129	.07	.12	.04	.02	.34
2. Preventive Medicine	.343	.117	.11	.10	.08	.00	.30
3. Foods and Nutrition	.412	.170	.08	.07	.07	.02	.39
4. Ag-Crop Production	.447	.200	.26	.10	.33	.00	.06
5. Ag-Livestock Production	.274	.075	.23	.05	.11	.02	.02
6. Ag-Support Services	.332	.110	.18	.08	.25	.01	.12
7. Jobs - General	.401	.161	.09	.01	.13	.08	.29
8. Jobs - Skilled	.462	.214	.13	.04	.43	.02	.06
9. Jobs - Repair	.370	.137	.11	.02	.28	.00	.16
10. Jobs - Service	.224	.050	.04	.03	.19	.02	.11
11. Jobs - Tourist	.233	.054	.05	.00	.06	.02	.19
12. Home Economics	.616	.379	.08	.09	.59	.00	.19
13. Education and Culture	.515	.266	.09	.00	.09	.01	.46
14. Recreation - Participative	.463	.214	.16	.02	.08	.01	.36
15. Recreation - Spectator	.496	.246	.13	.05	.28	.02	.30

* R^2 = % of Variance explained

Table III.4 Summary of Analysis of Variance for Classification Variables by 15 Demand Indexes (Numerical Entries in Main Effects Columns are Means for Significant Effects)

Indexes	Main Effects (1) Residence	(2) Age	(3) Sex	(4) Employed	(5)* Education	Significant Interactions	Grand Mean
1. Diseases & Illnesses	NS	NS	NS	NS	O = 1.41 P = 1.37 B = 1.29 S+ = 1.29	(2x3)(2x5)(1x2x4)	1.35
2. Preventive Medicine	NS	≤30 = 1.30 >30 = 1.33	M = 1.34 F = 1.30	NS	O = 1.39 P = 1.33 B = 1.27 S+ = 1.30	(2x3)(1x3x5)	1.33
3. Foods & Nutrition	NS	NS	NS	NS	O = 1.35 P = 1.30 B = 1.24 S+ = 1.29	NONE	1.30
4. Ag-Crop Production	U = 1.66 R = 1.39	NS	M = 1.44 F = 1.75	NS	O = 1.65 P = 1.61 B = 1.55 S+ = 1.55	(3x4)(3x5)(2x3x5)	1.59
5. Ag-Livestock Production	U = 1.75 R = 1.51	NS	M = 1.60 F = 1.79	NS	NS	(1x3)	1.69
6. Ag-Support Services	U = 1.69 R = 1.45	NS	M = 1.51 F = 1.76	NS	O = 1.67 P = 1.66 B = 1.58 S+ = 1.58	(1x3)	1.63
7. Jobs - General	NS	≤30 = 1.52 >30 = 1.62	M = 1.51 F = 1.66	Y = 1.56 N = 1.61	O = 1.72 P = 1.63 B = 1.48 S+ = 1.47	(1x3)(3x5)(1x2x3x4)	1.58
8. Jobs - Skilled	U = 1.97 R = 1.92	NS	M = 1.66 F = 2.29	Y = 1.95 N = 1.99	O = 2.0 P = 1.95 B = 1.92 S+ = 1.98	(1x3)(1x5)(3x5)(4x5)	1.97
9. Jobs - Repair	NS	≤30 = 1.91 >30 = 1.98	M = 1.65 F = 2.28	Y = 1.93 N = 1.98	O = 2.12 P = 2.02 B = 1.83 S+ = 1.80	(1x3)(3x5)	1.96
10. Jobs - Service	U = 1.98 R = 1.88	NS	M = 2.01 F = 1.89	NS	O = 2.05 P = 1.94 B = 1.89 S+ = 1.97	(1x5)(2x3)(2x5)(1x3x4)	1.95
11. Jobs - Tourist	NS	≤30 = 1.92 >30 = 1.99	M = 1.92 F = 2.0	NS	O = 2.15 P = 2.02 B = 1.85 S+ = 1.84	(1x3x5)	1.97
12. Home Economics	NS	≤30 = 1.56 >30 = 1.60	M = 1.84 F = 1.30	NS	O = 1.64 P = 1.58 B = 1.53 S+ = 1.58	(1x5)(2x3)(1x2x4)(1x2x3x4x5)	1.58
[illegible]ation & [illegible]ture	NS	≤30 = 1.53 >30 = 1.57	M = 1.50 F = 1.60	NS	O = 1.86 P = 1.61 B = 1.41 S+ = 1.39	(2x3)(3x5)(1x3x5)(1x2x4x5)	1.56
14. Recreation - Participative	U = 1.62 R = 1.67	≤30 = 1.58 >30 = 1.67	M = 1.61 F = 1.65	NS	O = 1.88 P = 1.69 B = 1.49 S+ = 1.49	(1x2x3)	1.64
15. Recreation - Spectator	NS	≤30 = 1.95 >30 = 2.05	M = 1.86 F = 2.18	Y = 2.0 N = 2.04	O = 2.22 P = 2.08 B = 1.87 S+ = 1.87	(1x3)(3x5)(4x5)(1x3x5)	2.02

NS = Not Significant at .05 level

* O = No education or primary not completed
P = Primary 3 or 6 completed
B = Basic Plan
S+ = Some or all of secondary or college completed

Residence and age yield mixed results. No significant differences for residence are found for health and nutrition, jobs - general, jobs - repair, jobs - tourist, home economics, education and spectator recreational sports. Of the remaining six indexes rural residents demanded greater information for all but participative recreational sports.

In the case of age nonsignificant results were found for diseases, foods and nutrition, agriculture, skilled jobs and service jobs. For all of the remaining eight indexes the under 30 age group was found to desire more information.

Almost all of the analyses by sex and education classifications were significant, the exceptions being disease and foods/nutrition for sex, and livestock production for education. In the case of sex differences, females are found to desire more information than males about preventive medicine, home economics and service jobs. For all other indexes males demanded more information than females. In all instances more education resulted in greater demand for information.

Again for this data, Multiple Classification Analysis was done to determine the total amount of variance explained in each index by the five classification variables, and their relative contribution to this explanation. The results are presented in Table III.5

Only three indexes have more than 15% of their variation in response explained by the five classification variables. These indexes are skilled jobs, repair jobs and home economics. In all three instances the predominant explanatory variable is sex, with education

Table III.5 Multiple Classification Analysis Results for Predicting 15 Demand Indexes from 5 Classification Variables

Indexes	Multiple R	R^2*	Beta Weights				
			Residence	Age	Sex	Employment	Education
1. Diseases and Illnesses	.092	.008	.02	.02	.01	.03	.09
2. Preventive Medicine	.094	.009	.03	.03	.04	.02	.08
3. Foods and Nutrition	.076	.006	.01	.03	.02	.02	.06
4. Ag-Crop Production	.292	.086	.18	.00	.23	.00	.05
5. Ag-Livestock Production	.212	.045	.15	.01	.14	.00	.03
6. Ag-Support Services	.265	.070	.17	.01	.20	.00	.06
7. Jobs - General	.238	.056	.02	.08	.12	.04	.14
8. Jobs - Skilled	.437	.191	.03	.01	.43	.03	.03
9. Jobs - Repair	.442	.196	.02	.05	.39	.03	.14
10. Jobs - Service	.112	.013	.06	.01	.09	.03	.06
11. Jobs - Tourist	.189	.036	.00	.05	.06	.02	.15
12. Home Economics	.472	.223	.02	.03	.47	.01	.05
13. Education and Culture	.261	.068	.02	.03	.07	.02	.22
14. Recreation - Participative	.286	.082	.03	.08	.03	.02	.23
15. Recreation - Spectator	.351	.123	.02	.07	.24	.03	.19

* R^2 = % Variance explained

also being significant in explaining demand for information on jobs in repair.

In summary, while it appears that all classification variables with the exception of employment make a difference in both current knowledge and demand for information, these factors do not explain a major part of the variance in any index. Furthermore, those indexes in which a significant amount of variance is accounted for are predominantly explained by variations in sex and education. The results are that higher educational attainment results in more knowledge and higher demand, males have greater knowledge about all indexes except home economics where female demand is greater, and males demand more information about jobs.

Question 4.B.d Is "Current Knowledge" related to "Desire for more Information" for each Content Dimension?

Table III.6 presents simple correlations of each knowledge index with its corresponding demand index. None of the correlations are exceptionally high, the highest (.54) only accounting for 29% of the shared variance between the two comparable indexes. However, all of the correlations are statistically significant at the .001 level even though this is not surprising given the very large sample. If we take .30 as a rough cut-off for a meaningful correlation then all indexes except the three on health and nutrition have "meaningful" relations. All relationships are positive with more knowledge leading to greater demand for information.

Table III.6 Simple (zero-order) Correlation of Each Knowledge Index with Each Demand Index

Index	Correlation
1. Illnesses/Diseases	:15
2. Preventive Medicine	.10
3. Food/Nutrition	.03
4. Ag-Crop Production	.36
5. Ag-Livestock Production	.32
6. Ag-Support Services	.37
7. Jobs - General	.30
8. Jobs - Skilled	.44
9. Jobs - Repair	.34
10. Jobs - Service	.34
11. Jobs - Tourist	.30
12. Home Economics	.48
13. Education/Culture	.39
14. Recreation - Participative	.43
15. Recreation - Spectator	.54

Question 4.B.e Through What Sources do People Learn and Prefer to Learn?

i. What Media and Agencies do Respondents have Access to and which Classification Factors Differentiate Rates of Access?

Table III.7 presents data in terms of the percentage of respondents indicating they do or do not have access to a particular media or agency. The analysis reveals that over three-fourths of the respondents have access to radio, newspapers and mail. The highest proportion being 95% with access to radios. Over 50% of the population has access to the remaining media, namely, telephone, T.V., magazines and newspapers, in that order.

In terms of agency access, three-fourths or more of the respondents had access to schools (92%), public address cars (89%) and hospital/health units (75%). One-half to three-quarters of the respondents indicated access to local authorities, government offices, community developers, FOCCO and agricultural extension agents. The remaining seven agencies were available to less than one-half of the respondents with school organizations (21%) and social organizations (24%) being least accessible.

Table III.8 presents a summary of the effects of the five classification factors on access. Residence and education have the most pronounced effects consistently across the 22 learning resources. For all sources except "religious organizations" a higher percentage of urban respondents report the sources as being more accessible. In like manner, for all sources except "reli-

Table III.7 Percentage of Respondents With or Without Access to Particular Media or Agencies (Total N = 7248)

Access Variable	Have Access	Do Not Have Access	No Response
Media			
1. Radio	95%	4%	1%
2. Newspapers	78%	21%	1%
3. Mail	78%	20%	2%
4. Telephone	71%	26%	3%
5. T.V.	71%	27%	2%
6. Magazines	61%	38%	1%
7. Movies/Theater	54%	42%	4%
Agencies			
1. Schools	92%	6%	2%
2. Public Address Cars	89%	9%	2%
3. Hospital, Health Unit	75%	24%	1%
4. Local Authorities	74%	25%	1%
5. Government Offices	72%	25%	3%
6. Community Developers	57%	32%	11%
7. FOCCO	57%	32%	11%
8. Ag Extension	54%	35%	11%
9. Library	48%	47%	5%
10. Religious Organization	45%	54%	1%
11. Adult Education Center	37%	53%	10%
12. Cooperative	32%	57%	11%
13. House of Culture	25%	65%	10%
14. Social Organizations	24%	75%	1%
15. School Organizations	21%	78%	1%

Table III.8 Summary of Effects of 5 Classification Factors on Access (Numerical Entries in Classification Variables Columns Indicate Percentage of Respondents Having Access When Difference in Percentages is Significant and at least 10 Points)

Access Variables	Classification Factors: Urban	Sex	Age	Employed	Education
Media					
1. Television	U = 84% R = 43%	NS	NS	Y = 77% N = 65%	O = 42% P = 66% B = 85% S+ = 92%
2. Radio	NS	NS	NS	NS	NS
3. Newspapers	U = 88% R = 54%	NS	NS	NS	O = 39% P = 76% B = 92% S+ = 94%
4. Magazines	U = 71% R = 36%	NS	≤30 = 69% >30 = 56%	Y = 66% N = 54%	O = 22% P = 54% B = 78% S+ = 85%
5. Movies, Theater	U = 68% R = 18%	NS	≤30 = 61% >30 = 30%	Y = 60% N = 44%	O = 28% P = 50% B = 67% S+ = 69%
6. Mail	U = 95% R = 35%	NS	NS	Y = 83% N = 71%	O = 49% P = 75% B = 90% S+ = 93%
7. Telephone	U = 85% R = 36%	NS	NS	Y = 76% N = 65%	O = 43% P = 65% B = 81% S+ = 84%
Agencies					
1. Library	U = 61% R = 13%	NS	≤30 = 55% >30 = 43%	Y = 53% N = 40%	O = 21% P = 42% B = 63% S+ = 65%
2. Religious Organization	U = 42% R = 55%	NS	NS	NS	O = 56% P = 48% B = 40% S+ = 37%
3. Social Organization	NS	M = 32% F = 16%	NS	Y = 28% N = 18%	O = 10% P = 18% B = 30% S+ = 41%
4. Local Authorities	U = 77% R = 66%	NS	NS	NS	NS
5. Government Offices	U = 87% R = 33%	NS	NS	Y = 77% N = 66%	O = 51% P = 71% B = 82% S+ = 82%
6. Schools	NS	NS	NS	NS	O = 84% P = 93% B = 95% S+ = 95%
7. Cooperatives	U = 36% R = 20%	NS	NS	NS	O = 22% P = 30% B = 35% S+ = 38%
8. Public Address Cars	U = 96% R = 73%	NS	NS	NS	O = 73% P = 89% B = 94% S+ = 95%
9. Ag Extension	NS	NS	NS	NS	NS
10. Community Developers	U = 64% R = 40%	NS	NS	NS	O = 42% P = 55% B = 65% S+ = 67%
11. FOCCO	U = 62% R = 47%	NS	NS	NS	O = 45% P = 61% B = 61% S+ = 56%
12. Hospital, Health Unit	U = 90% R = 35%	NS	NS	Y = 79% N = 68%	O = 51% P = 71% B = 84% S+ = 87%
13. School Organization	NS	NS	NS	NS	O = 12% P = 18% B = 26% S+ = 30%
14. House of Culture	U = 32% R = 7%	NS	NS	NS	O = 12% P = 22% B = 30% S+ = 35%
15. Adult Education Center	U = 45% R = 15%	NS	NS	NS	O = 21% P = 34% B = 44% S+ = 42%

NS = Not Statistically Significant or Difference in Percentage not at least 10 Points

O = No Education or Primary 3 not completed
P = Primary 3 or 6 completed
B = Basic Plan
S+ = Some or All of Secondary or college completed

gious organizations" the more educated the respondent, the higher percentage reporting a source as accessible. There is undoubtedly an overlap between the residence and education variable since the more educated are more likely to live in urban areas, and both variables are partial surrogates for SES. Sex made no difference in access to any source except social organizations, where more males than females reported having access. Age made a difference in access to magazines, library and movie/theaters. The former two can perhaps be explained by higher rates of literacy for males. Employment differences were always in favor of the employed reporting higher rates of access. The sources for which employment makes a difference are those that could easily be explained in terms of urban residence, higher education, and higher SES factors resulting from having a job (e.g., having a television, telephone, being literate, etc.).

ii. Through What Media and Agencies did Respondents Prefer to Receive Information, and Which Classification Factors Differentiate Preferences?

Table III.9 indicates in rank order the respondents first preferences for the media or agencies for which they would like to receive information. For media, T.V. and radio are the first choice of 81.1% of the respondents. For agencies, libraries, religious organizations and local authorities are the first preference of 64.5% of the respondents. Table III.10 combines and rank orders media and agencies for those sources which are the first preference of at least 10% of the respondents. The results

Table III.9 Number and Percentage of Respondents Indicating Through which Particular Media or Agencies they First Prefer to Receive Information

Learning Source	Number	%
Media		
1. T.V.	3197	44.1
2. Radio	2736	37.7
3. Newspapers	560	7.7
4. Magazines	358	4.9
5. Mail	262	3.6
6. Movies, Theater	37	.5
7. Telephone	30	.5
No Response	68	1.0
Agencies		
1. Library	2135	29.5
2. Religious Organizations	1594	22.0
3. Local Authorities	942	13.0
4. Government Offices	650	9.0
5. Social Organizations	622	8.6
6. Cooperatives	509	7.0
7. Ag Extension	215	3.0
8. FOCCO	121	1.7
9. Community Developers	104	1.4
10. Public Address Cars	69	1.0
11. School Organizations	70	1.0
12. Hospital, Health Unit	48	.7
13. House of Culture	44	.6
14. Adult Education Center	21	.3
15. Schools	0	0.0

Table III.10 Rank Order of Media and Agency Sources Chosen as Most Preferred by at least 10% of Respondents

earning Source	Number	%
1. T.V.	3196	44.1
2. Radio	2736	37.7
3. Library	2135	29.5
4. Religious Organization	1594	22.0
5. Local Authorities	942	13.0

in preference order rank (from most to least preferred) are T.V., radio, library, religious organizations and local authorities. A significant missing learning resource in the list is schools which were not ranked as a first preferred learning resource by even one respondent.

Table III.11 summarizes the effects of the five classification variables on first preferred medium and agency for those learning sources preferred by at least 10% of the respondents in a particular subcategory of a classification variable (e.g., employed - yes). The detailed tables from which Table III.11 is drawn are presented in Appendix C. All of the classification factors except sex appear to make a difference in rank order preference. Urban residents give T.V., library and radio as their top three choices; while rural residents give radio, church and T.V. The higher urban preference for T.V. and libraries is probably a function of higher SES and educational attainment. Certainly T.V. is not as accessible in rural areas (see Table III.8) but is still more preferred than local authorities, libraries and cooperatives. Also, church has a high preference in rural areas as one might expect, and radio is most preferred.

The main difference between respondents 30 years of age or less and those over 30 is the greater preference for libraries in the younger group. This could be the result of higher rates of literacy in younger groups of the population.

Differences according to employment status are mainly reflected in a higher preference ranking for television and libraries.

Table III.11 Rank Order Comparison of Learning Sources Preferred by At Least 10% of Respondents in a Particular Sub-category According to 5 Classification Variables

Residence		Sex		Age		Employed		Education	
Urban	Rural	M	F	≤30	>30	Yes	No	Primary or less	Secondary or more
1.TV	1.Radio	1.TV	1.TV	1.TV	1.TV	1.TV	1.Radio	1.Radio	1.TV
2.Library	2.Church	2.Radio	2.Radio	2.Library	2.Radio	2.Radio	2.TV	2.TV	2.Library
3.Radio	3.TV	3.Library	3.Church	3.Radio	3.Library	3.Library	3.Church	3.Church	3.Radio
4.Church	4.Local Authorities	4.Church	4.Library	4.Church	4.Church	4.Church	4.Library.	4.Library	4.Social Club
	5.Library	5.Local Authorities	5.Local Authorities	5.Local Authorities	5.Local Authorities	5.Local Authorities	5.Local Authorities	5.Local Authorities	5.Local Authorities
	6.Coopera-tives								6.Church

Again this may be related to higher education and income among those having jobs.

If a respondent has completed primary education or less, radio is the first preference, church is third and libraries fourth; but for those with secondary or higher levels of education attainment, television and libraries are the first and second preference, and church is sixth.

iii. Does Access Predict Medium and Agency Preference?

A review of the cross-tabulation of access and first preference for each corresponding medium and agency reveals that the two are significantly related for television, magazines, religious organizations, social organizations, movies/theaters, libraries, house of culture and adult education centers. For the remaining 14 learning sources access does not appear to have any relation to preference. Radio, newspapers, mail and telephone may not have a significant relation to access because 70% or more of the population reported having access to each of these media. Similarly, all of the agencies for which a significant relation was found between access and preference were those accessible to 45% or less of the population. Therefore, access may be related to preference mainly when access is limited, or in other words, people prefer to recieve information through sources not readily available to them. This does not apply to T.V. and magazines, however, which may have an overriding popular appeal. Another possibl. explanation is that access is also

an indication of knowledge about the resource, and when knowledge is low, preference must also be low.

APPENDICES

A. Factor Analysis Solution for Knowledge and Demand Questions

B. Analysis of Variance of Effects of Classification Variables on 15 Knowledge and Demand Indexes

C. Contingency Tables of Classification Variables by First Preferred Medium and Agency

D. Description of Sample in Terms of Five Classification Variables

APPENDIX A

Factor Analysis Solution For Knowledge And Demand Questions

An SPSS computer package program was used to factor analyze the 74 content questions. A varimax rotation was applied to the principal components solution when more than one factor emerged. Each of the eight original groups of questions was factor analyzed separately yielding the weights and factors (indexes) presented below in separate columns for knowledge (K) and demand (D) questions. Multiple factors for one content area (e.g., Agriculture) means more than one factor emerged. Unity weights were used in constructing the indexes to avoid the problem of different weights for knowledge and demand questions.

Appendix A

Index 1. Diseases and Illnesses

K	D	
.57	.69	Q#12-Dental Diseases
.63	.76	Q#13-Malaria
.57	.71	Q#14-Venereal Diseases
.71	.80	Q#15 - Respiratory Diseases
.70	.77	Q#16-Gastro-Intestinal Diseases
.61	.73	Q#17-Children's Diseases
.58	.72	Q#18-Eye Illnesses

Index 2. Preventive Medicine and Public Health

K	D	
.66	.74	Q#19-Contaminated Water
.75	.79	Q#20-Garbage & Trash
.73	.76	Q#21-Mosquitos & Insects
.50	.59	Q#22-Pregnancy & Birth Control
.58	.70	Q#23-Immunizations
.50	.63	Q#24-First Aid

* **Index 3. Foods and Nutrition**

Q#25-Role of Vitamins, Fats, etc.
Q#26-Nutritive Value of Foods

** **Index 4. Agriculture - Crop Production**

K	D	
.72	.81	Q#27-Soils
.65	.84	Q#28-Irrigation and Drainage
.70	.85	Q#29-Crop Rotation
.62	.83	Q#30-Fertilizers
.68	.86	Q#31-Planting and Harvesting
.63	.85	Q#32-Plowing

* No factor analysis done for Foods and Nutrition since only two questions; both questions used in index.

** Index 5. Agriculture-- Livestock Production

K	D	
.54	.70	Q#33-Poultry Raising
.70	.83	Q#34-Cattle Raising
.65	.81	Q#35-Raising Horses
.72	.77	Q#36-Raising Pigs

** Index 6. Agriculture - Support Services

K	D	
.58	.76	Q#37-Transport to Market
.59	.73	Q#38-Sale of Products
.57	.79	Q#39-Organizing Cooperatives
.55	.83	Q#40-Agricultural Extension
.44	.79	Q#41-Machines and Tools
.47	.78	Q#42-Spraying and Insect Control
.55	.75	Q#43-Credit

Index 7. Jobs - General Availability and Requirements

K	D	
.45	.63	Q#44-Work Available
.66	.76	Q#45-Job Requirements
.67	.77	Q#46-Available Government Employment
.69	.78	Q#47-Available Private Employment

Index 8. Jobs - Skilled Craftsmen

K	D	
.71	.76	Q#48-Carpentry
.60	.81	Q#49-Plumbing
.39	.77	Q#50-Electricity
.75	.78	Q#51-Masonry

Index 9. Jobs - Repair

K	D	
.59	.74	Q#52-Auto Mechanics
.67	.70	Q#53-Radio and T.V. Repair

Index 10. Jobs - Service Sector

K	D	
.54	.67	Q#54-Gardening
.50	.69	Q#55-Hairdressing
.61	.81	Q#56-Baking
.34	.57	Q#57-Shoemaking
.50	.59	Q#58-Nursing
.50	.66	Q#59-Tailoring, Dressmaking

Index 11. Jobs - Tourist Sector

K	D	
.58	.64	Q#80-Tourist Business
.61	.61	Q#81-Hotel Business
.49	.54	Q#82-Boating and Fishing

Index 12. Home Economics

K	D	
.25	.44	Q#60-Weights and Measures
.76	.80	Q#61-Menu Planning
.80	.82	Q#62-Cooking
.64	.68	Q#63-Sewing and Embroidery
.74	.76	Q#64-Food Preservation
.69	.70	Q#65-Care of Young Children

** All agriculture questions were loaded on one factor for demand questions. Weights given are those for same factor.

Index 13. Education and Culture

K	D	
.76	.78	Q#83-El Salvador History and Culture
.75	.74	Q#84-Latin America History and Culture
.57	.60	Q#85-Community Values and Culture

Index 14. Recreation - Participative Sports

K	D	
.46	.53	Q#86-Games, Hobbies
.52	.62	Q#87-Children's Games
.47	.57	Q#88-Adult Games
.37	.48	Q#95-Swimming
.68	.72	Q#96-Recreation Centers
.68	.73	Q#98-Travel
.63	.71	Q#99-Tourist Sites

Index 15. Recreation - Spectator Sports

K	D	
.41	.71	Q#89-Soccer
.74	.73	Q#90-Basketball
.70	.76	Q#91-Volleyball
.62	.67	Q#92-Baseball, Softball
.27	.80	Q#93-Boxing
.18	.73	Q#94-Wrestling
.07	.35	Q#97-Circuses

APPENDIX B

Analysis of Variance of Effects of Classification Variables on 15 Knowledge and Demand Indexes

An analysis of variance (AOV) was conducted to determine the independent effects of each of the five classification factors on each of the 15 knowledge and demand indexes. In addition, the AOV provides an overall test of the significance of the effects. The AOV for each of the 30 indexes are presented in the following tables.

Table B.1 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Diseases and Illnesses

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF F
MAIN EFFECTS			181.321	7	25.903	133.453	0.00
URBAN			5.158	1	5.158	26.573	0.00
AGE			18.660	1	18.660	96.135	0.00
SEX			2.237	1	2.237	11.524	0.00
EMPLOYED			0.490	1	0.490	2.525	0.11
EDUC			127.553	3	42.518	219.053	0.00
2-WAY INTERACTIONS			5.052	18	0.281	1.446	0.1
URBAN	AGE		0.008	1	0.008	0.040	0.84
URBAN	SEX		0.049	1	0.049	0.252	0.61
URBAN	EMPLOYED		0.127	1	0.127	0.653	0.41
URBAN	EDUC		1.219	3	0.406	2.094	0.09
AGE	SEX		1.445	1	1.445	7.443	0.00
AGE	EMPLOYED		0.006	1	0.006	0.033	0.85
AGE	EDUC		0.813	3	0.271	1.397	0.24
SEX	EMPLOYED		0.604	1	0.604	3.114	0.07
SEX	EDUC		0.229	3	0.076	0.393	0.75
EMPLOYED	EDUC		0.250	3	0.083	0.429	0.73
3-WAY INTERACTIONS			5.626	22	0.256	1.318	0.14
URBAN	AGE	SEX	0.104	1	0.104	0.537	0.46
URBAN	AGE	EMPLOYED	0.051	1	0.051	0.261	0.61
URBAN	AGE	EDUC	1.040	3	0.347	1.787	0.14
URBAN	SEX	EMPLOYED	0.554	1	0.554	2.856	0.09
URBAN	SEX	EDUC	0.710	3	0.237	1.219	0.30
URBAN	EMPLOYED	EDUC	0.100	3	0.033	0.172	0.91
AGE	SEX	EMPLOYED	0.014	1	0.014	0.071	0.79
AGE	SEX	EDUC	0.636	3	0.212	1.093	0.35
AGE	EMPLOYED	EDUC	0.643	3	0.214	1.105	0.34
SEX	EMPLOYED	EDUC	1.261	3	0.420	2.166	0.09
4-WAY INTERACTIONS			6.269	13	0.482	2.485	0.00
URBAN	AGE EMPLOYED	SEX	0.178	1	0.178	0.918	0.33
URBAN	AGE EDUC	SEX	4.291	3	1.430	7.369	0.00
URBAN	AGE EDUC	EMPLOYED	0.537	3	0.179	0.922	0.42
URBAN	SEX	EMPLOYED	0.028	3	0.009	0.047	0.98
AGE	SEX EDUC	EMPLOYED	0.468	3	0.156	0.803	0.49
5-WAY INTERACTIONS			1.175	3	0.392	2.018	0.10
URBAN	AGE EMPLOYED	SEX EDUC	1.175	3	0.392	2.018	0.10
EXPLAINED			199.444	63	3.166	16.310	0.0
RESIDUAL			1210.591	6237	0.194		
TOTAL			1410.036	6300	0.224		

Table B.2 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Preventive Medicine

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			171.759	7	24.537	120.410	0.0
URBAN			13.601	1	13.601	66.745	0.000
AGE			14.590	1	14.590	71.598	0.000
SEX			8.291	1	8.291	40.686	0.000
EMPLOYED			0.013	1	0.013	0.063	0.80[illegible]
EDUC			100.630	3	33.543	164.607	0.000
2-WAY INTERACTIONS			11.031	18	0.613	3.007	0.000
URBAN	AGE		0.147	1	0.147	0.720	0.39[illegible]
URBAN	SEX		0.044	1	0.044	0.217	0.641
URBAN	EMPLOYED		0.231	1	0.231	1.133	0.28[illegible]
URBAN	EDUC		2.509	3	0.836	4.104	0.00[illegible]
AGE	SEX		1.837	1	1.837	9.013	0.00[illegible]
AGE	EMPLOYED		0.077	1	0.077	0.377	0.53[illegible]
AGE	EDUC		0.911	3	0.304	1.489	0.21[illegible]
SEX	EMPLOYED		2.482	1	2.482	12.178	0.000
SEX	EDUC		0.950	3	0.317	1.554	0.19[illegible]
EMPLOYED	EDUC		0.171	3	0.057	0.279	0.84[illegible]
3-WAY INTERACTIONS			5.167	22	0.235	1.153	0.28[illegible]
URBAN	AGE	SEX	0.150	1	0.150	0.738	0.39[illegible]
URBAN	AGE	EMPLOYED	0.073	1	0.073	0.358	0.54[illegible]
URBAN	AGE	EDUC	0.648	3	0.216	1.059	0.36[illegible]
URBAN	SEX	EMPLOYED	0.235	1	0.235	1.152	0.28[illegible]
URBAN	SEX	EDUC	0.595	3	0.198	0.973	0.40[illegible]
URBAN	EMPLOYED	EDUC	0.174	3	0.058	0.285	0.83[illegible]
AGE	SEX	EMPLOYED	0.438	1	0.438	2.148	0.14[illegible]
AGE	SEX	EDUC	1.633	3	0.544	2.672	0.04[illegible]
AGE	EMPLOYED	EDUC	0.152	3	0.051	0.249	0.86[illegible]
SEX	EMPLOYED	EDUC	1.005	3	0.335	1.644	0.17[illegible]
4-WAY INTERACTIONS			3.428	13	0.264	1.294	0.20[illegible]
URBAN	AGE EMPLOYED	SEX	0.180	1	0.180	0.882	0.34[illegible]
URBAN	AGE EDUC	SEX	1.684	3	0.561	2.755	0.041
URBAN	AGE EDUC	EMPLOYED	0.220	3	0.073	0.360	0.78[illegible]
URBAN	SEX EDUC	EMPLOYED	0.042	3	0.014	0.069	0.97[illegible]
AGE	SEX EDUC	EMPLOYED	1.638	3	0.546	2.680	0.04[illegible]
5-WAY INTERACTIONS			0.621	3	0.207	1.016	0.38[illegible]
URBAN	AGE EMPLOYED	SEX EDUC	0.621	3	0.207	1.016	0.38[illegible]
EXPLAINED			192.007	63	3.048	14.956	0.0
RESIDUAL			1270.964	6237	0.204		
TOTAL			1462.971	6300	0.232		

Table B.3 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Foods and Nutrition

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIG. OF
MAIN EFFECTS			402.643	7	57.520	185.326	0.0
URBAN			13.046	1	13.046	42.032	0.0
AGE			9.724	1	9.724	31.330	0.0
SEX			9.039	1	9.039	29.123	0.0
EMPLOYED			0.467	1	0.467	1.505	0.2
EDUC			281.202	3	93.734	302.004	0.0
2-WAY INTERACTIONS			17.416	18	0.968	3.117	0.0
URBAN	AGE		0.184	1	0.184	0.592	0.4
URBAN	SEX		0.735	1	0.735	2.368	0.1
URBAN	EMPLOYED		0.247	1	0.247	0.794	0.4
URBAN	EDUC		5.540	3	1.847	5.949	0.0
AGE	SEX		2.931	1	2.931	9.443	0.0
AGE	EMPLOYED		0.020	1	0.020	0.065	0.7
AGE	EDUC		0.675	3	0.225	0.724	0.5
SEX	EMPLOYED		2.929	1	2.929	9.438	0.0
SEX	EDUC		2.092	3	0.697	2.246	0.0
EMPLOYED	EDUC		0.274	3	0.091	0.295	0.8
3-WAY INTERACTIONS			8.264	22	0.376	1.210	0.2
URBAN	AGE	SEX	0.073	1	0.073	0.234	0.6
URBAN	AGE	EMPLOYED	0.398	1	0.398	1.282	0.2
URBAN	AGE	EDUC	0.046	3	0.015	0.049	0.9
URBAN	SEX	EMPLOYED	0.532	1	0.532	1.713	0.1
URBAN	SEX	EDUC	1.839	3	0.613	1.975	0.1
URBAN	EMPLOYED	EDUC	2.269	3	0.756	2.437	0.0
AGE	SEX	EMPLOYED	0.042	1	0.042	0.134	0.7
AGE	SEX	EDUC	2.691	3	0.897	2.890	0.0
AGE	EMPLOYED	EDUC	0.956	3	0.319	1.027	0.3
SEX	EMPLOYED	EDUC	1.504	3	0.501	1.615	0.1
4-WAY INTERACTIONS			3.961	13	0.305	0.982	0.4
URBAN	AGE EMPLOYED	SEX	0.393	1	0.393	1.267	0.2
URBAN	AGE EDUC	SEX	0.836	3	0.279	0.898	0.4
URBAN	AGE EDUC	EMPLOYED	0.715	3	0.238	0.768	0.51
URBAN	SEX	EMPLOYED	0.160	3	0.053	0.172	0.91
AGE	SEX EDUC	EMPLOYED	1.075	3	0.358	1.155	0.3
5-WAY INTERACTIONS			0.081	3	0.027	0.087	0.9
URBAN	AGE EMPLOYED	SEX EDUC	0.081	3	0.027	0.087	0.9
EXPLAINED			432.366	63	6.863	22.112	0.0
RESIDUAL			1935.798	6237	0.310		
TOTAL			2368.164	6300	0.376		

Table B.4 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Agriculture - Crop Production

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS			460.903	7	65.843	227.740	0.00
URBAN			122.163	1	122.163	422.540	0.00
AGE			20.619	1	20.619	71.318	0.00
SEX			223.247	1	223.247	772.169	0.00
EMPLOYED			0.000	1	0.000	0.000	0.99
EDUC			5.656	3	1.885	6.521	0.00
2-WAY INTERACTIONS			21.220	18	1.179	4.078	0.00
URBAN	AGE		0.193	1	0.193	0.667	0.41
URBAN	SEX		0.896	1	0.896	3.100	0.07
URBAN	EMPLOYED		1.519	1	1.519	5.254	0.02
URBAN	EDUC		4.771	3	1.590	5.501	0.00
AGE	SEX		0.663	1	0.663	2.294	0.13
AGE	EMPLOYED		0.185	1	0.185	0.638	0.42
AGE	EDUC		1.849	3	0.616	2.131	0.0
SEX	EMPLOYED		2.669	1	2.669	9.230	0.00
SEX	EDUC		1.025	3	0.342	1.181	0.31
EMPLOYED	EDUC		0.037	3	0.012	0.042	0.9
3-WAY INTERACTIONS			7.997	22	0.364	1.257	0.1
URBAN	AGE	SEX	2.868	1	2.868	9.921	0.00
URBAN	AGE	EMPLOYED	0.000	1	0.000	0.000	0.9
URBAN	AGE	EDUC	1.517	3	0.506	1.749	0.15
URBAN	SEX	EMPLOYED	0.015	1	0.015	0.052	0.81
URBAN	SEX	EDUC	0.447	3	0.149	0.516	0.67
URBAN	EMPLOYED	EDUC	1.026	3	0.342	1.183	0.31
AGE	SEX	EMPLOYED	0.076	1	0.076	0.263	0.6
AGE	SEX	EDUC	1.829	3	0.610	2.109	0.0
AGE	EMPLOYED	EDUC	0.647	3	0.216	0.745	0.5
SEX	EMPLOYED	EDUC	0.011	3	0.004	0.013	0.9
4-WAY INTERACTIONS			6.562	13	0.505	1.746	0.04
URBAN	AGE EMPLOYED	SEX	0.004	1	0.004	0.015	0.9
URBAN	AGE EDUC	SEX	1.970	3	0.657	2.271	0.07
URBAN	AGE EDUC	EMPLOYED	1.309	3	0.436	1.509	0.21
URBAN	SEX	EMPLOYED	1.151	3	0.384	1.327	0.2
AGE	SEX EDUC	EMPLOYED	2.704	3	0.901	3.117	0.0
5-WAY INTERACTIONS			2.177	3	0.726	2.510	0.0
URBAN	AGE EMPLOYED	SEX EDUC	2.177	3	0.726	2.510	0.0
EXPLAINED			498.859	63	7.918	27.388	0.0
RESIDUAL			1803.218	6237	0.289		
TOTAL			2302.076	6300	0.365		

Table B.5 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Agriculture-Livestock Production

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS			155.447	7	22.207	73.109	0.0
URBAN			86.574	1	86.574	285.017	0.00
AGE			4.722	1	4.722	15.545	0.00
SEX			21.638	1	21.638	71.235	0.00
EMPLOYED			0.435	1	0.435	1.431	0.23
EDUC.			0.509	3	0.170	0.558	0.64
2-WAY INTERACTIONS			9.025	18	0.501	1.651	0.04
URBAN	AGE		0.061	1	0.061	0.201	0.65
URBAN	SEX		0.205	1	0.205	0.674	0.41
URBAN	EMPLOYED		0.102	1	0.102	0.335	0.56
URBAN	EDUC		3.392	3	1.131	3.722	0.01
AGE	SEX		0.569	1	0.569	1.873	0.17
AGE	EMPLOYED		0.720	1	0.720	2.371	0.12
AGE	EDUC		1.344	3	0.448	1.475	0.21
SEX	EMPLOYED		0.849	1	0.849	2.795	0.09
SEX	EDUC		0.631	3	0.210	0.693	0.55
EMPLOYED	EDUC		0.974	3	0.325	1.068	0.36
3-WAY INTERACTIONS			5.560	22	0.253	0.832	0.68
URBAN	AGE	SEX	1.958	1	1.958	6.447	0.01
URBAN	AGE	EMPLOYED	0.064	1	0.064	0.212	0.64
URBAN	AGE	EDUC	1.171	3	0.390	1.286	0.27
URBAN	SEX	EMPLOYED	0.525	1	0.525	1.728	0.18
URBAN	SEX	EDUC	0.284	3	0.095	0.312	0.81
URBAN	EMPLOYED	EDUC	1.147	3	0.382	1.259	0.28
AGE	SEX	EMPLOYED	0.020	1	0.020	0.066	0.79
AGE	SEX	EDUC	0.609	3	0.203	0.668	0.57
AGE	EMPLOYED	EDUC	0.146	3	0.049	0.161	0.92
SEX	EMPLOYED	EDUC	0.228	3	0.076	0.250	0.86
4-WAY INTERACTIONS			8.473	13	0.652	2.146	0.01
URBAN	AGE EMPLOYED	SEX	1.069	1	1.069	3.519	0.06
URBAN	AGE EDUC	SEX	2.757	3	0.919	3.026	0.02
URBAN	AGE EDUC	EMPLOYED	1.412	3	0.471	1.550	0.19
URBAN	SEX	EMPLOYED	0.696	3	0.232	0.764	0.51
AGE	SEX EDUC	EMPLOYED	1.355	3	0.452	1.487	0.21
5-WAY INTERACTIONS			0.504	3	0.168	0.553	0.64
URBAN	AGE EMPLOYED	SEX EDUC	0.504	3	0.168	0.553	0.64
EXPLAINED			179.010	63	2.841	9.354	0.0
RESIDUAL			1894.490	6237	0.304		
TOTAL			2073.500	6300	0.329		

Table B.6 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Agriculture-Support Services

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF
MAIN EFFECTS			170.596	7	24.371	113.197	0.0
URBAN			40.619	1	40.619	188.668	0.0
AGE			9.120	1	9.120	42.360	0.0
SEX			82.260	1	82.260	382.077	0.0
EMPLOYED			0.060	1	0.060	0.278	0.5
EDUC			18.971	3	6.324	29.372	0.0
2-WAY INTERACTIONS			9.042	18	0.502	2.333	0.0
URBAN	AGE		0.015	1	0.015	0.069	0.7
URBAN	SEX		0.693	1	0.693	3.221	0.0
URBAN	EMPLOYED		0.836	1	0.836	3.884	0.0
URBAN	EDUC		1.579	3	0.526	2.444	0.0
AGE	SEX		0.475	1	0.475	2.204	0.1
AGE	EMPLOYED		0.000	1	0.000	0.002	0.9
AGE	EDUC		1.710	3	0.570	2.647	0.0
SEX	EMPLOYED		0.914	1	0.914	4.247	0.0
SEX	EDUC		0.471	3	0.157	0.729	0.5
EMPLOYED	EDUC		1.040	3	0.347	1.609	0.1
3-WAY INTERACTIONS			5.350	22	0.243	1.130	0.3
URBAN	AGE	SEX	1.754	1	1.754	8.147	0.0
URBAN	AGE	EMPLOYED	0.120	1	0.120	0.558	0.4
URBAN	AGE	EDUC	1.458	3	0.486	2.257	0.0
URBAN	SEX	EMPLOYED	0.004	1	0.004	0.016	0.8
URBAN	SEX	EDUC	0.291	3	0.097	0.450	0.7
URBAN	EMPLOYED	EDUC	0.480	3	0.160	0.743	0.5
AGE	SEX	EMPLOYED	0.453	1	0.453	2.103	0.1
AGE	SEX	EDUC	1.435	3	0.478	2.221	0.0
AGE	EMPLOYED	EDUC	0.078	3	0.026	0.121	0.9
SEX	EMPLOYED	EDUC	0.175	3	0.058	0.272	0.8
4-WAY INTERACTIONS			9.413	13	0.724	3.363	0.0
URBAN	AGE EMPLOYED	SEX	1.486	1	1.486	6.904	0.0
URBAN	AGE EDUC	SEX	3.867	3	1.289	5.987	0.0
URBAN	AGE EDUC	EMPLOYED	1.643	3	0.548	2.543	0.0
URBAN	SEX EDUC	EMPLOYED	0.983	3	0.328	1.521	0.2
AGE	SEX EDUC	EMPLOYED	0.621	3	0.207	0.961	0.41
5-WAY INTERACTIONS			2.421	3	0.807	3.748	0.0
URBAN	AGE EMPLOYED	SEX EDUC	2.421	3	0.807	3.748	0.0
EXPLAINED			196.822	63	3.124	14.511	0.0
RESIDUAL			1354.860	6293	0.215		
TOTAL			1551.682	6356	0.244		

Table B.7 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Jobs - General

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS							
URBAN			260.756	7	37.251	174.614	0.00
AGE			9.705	1	9.705	45.492	0.00
SEX			0.258	1	0.258	1.209	0.2
EMPLOYED			23.685	1	23.685	111.022	0.00
EDUC			8.075	1	8.075	37.850	0.00
			112.433	3	37.478	175.677	0.00
2-WAY INTERACTIONS							
URBAN	AGE		5.672	18	0.315	1.477	0.0
URBAN	SEX		0.021	1	0.021	0.100	0.7
URBAN	EMPLOYED		0.305	1	0.305	1.432	0.2
URBAN	EDUC		0.081	1	0.081	0.380	0.5
AGE	SEX		3.195	3	1.065	4.992	0.00
AGE	EMPLOYED		0.136	1	0.136	0.636	0.4
AGE	EDUC		0.003	1	0.003	0.016	0.8
SEX	EMPLOYED		0.102	3	0.034	0.159	0.9
SEX	EDUC		0.328	1	0.328	1.539	0.21
EMPLOYED	EDUC		1.340	3	0.447	2.094	0.0
			0.808	3	0.269	1.262	0.2
3-WAY INTERACTIONS							
URBAN	AGE	SEX	3.874	22	0.176	0.825	0.6
URBAN	AGE	EMPLOYED	0.009	1	0.009	0.043	0.8
URBAN	AGE	EDUC	0.004	1	0.004	0.018	0.8
URBAN	SEX	EMPLOYED	1.067	3	0.356	1.667	0.17
URBAN	SEX	EDUC	0.010	1	0.010	0.045	0.8
URBAN	EMPLOYED	EDUC	0.139	3	0.046	0.218	0.8
AGE	SEX	EMPLOYED	0.351	3	0.117	0.548	0.64
AGE	SEX	EDUC	0.244	1	0.244	1.145	0.2
AGE	EMPLOYED	EDUC	0.549	3	0.183	0.858	0.4
SEX	EMPLOYED	EDUC	1.119	3	0.373	1.748	0.15
			0.852	3	0.284	1.332	0.2
4-WAY INTERACTIONS							
URBAN	AGE	SEX	5.089	13	0.391	1.835	0.0
	EMPLOYED		0.805	1	0.805	3.773	0.05
URBAN	AGE	SEX					
	EDUC		2.308	3	0.769	3.606	0.01
URBAN	AGE	EMPLOYED	0.520	3	0.173	0.813	0.48
	EDUC						
URBAN	SEX	EMPLOYED	0.502	3	0.167	0.784	0.50
AGE	SEX	EMPLOYED	0.285	3	0.095	0.445	0.72
	EDUC						
5-WAY INTERACTIONS							
URBAN	AGE	SEX	0.059	3	0.020	0.093	0.96
	EMPLOYED	EDUC	0.059	3	0.020	0.093	0.96
EXPLAINED			275.449	63	4.372	20.495	0.0
RESIDUAL			1342.501	6293	0.213		
TOTAL			1617.951	6356	0.255		

Table B.8 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Jobs - Skilled

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS			306.000	7	43.714	251.734	0.0
URBAN			20.562	1	20.562	118.406	0.00
AGE			2.097	1	2.097	12.074	0.00
SEX			233.432	1	233.432	1344.251	0.00
EMPLOYED			0.592	1	0.592	3.408	0.06
EDUC			4.883	3	1.628	9.374	0.00
2-WAY INTERACTIONS			26.463	18	1.470	8.466	0.00
URBAN	AGE		0.120	1	0.120	0.693	0.40
URBAN	SEX		10.837	1	10.837	62.405	0.00
URBAN	EMPLOYED		0.005	1	0.005	0.031	0.86
URBAN	EDUC		3.815	3	1.272	7.322	0.00
AGE	SEX		0.373	1	0.373	2.151	0.14
AGE	EMPLOYED		0.217	1	0.217	1.248	0.26
AGE	EDUC		0.304	3	0.101	0.583	0.62
SEX	EMPLOYED		0.544	1	0.544	3.133	0.07
SEX	EDUC		1.953	3	0.651	3.749	0.01
EMPLOYED	EDUC		0.578	3	0.193	1.110	0.34
3-WAY INTERACTIONS			4.610	22	0.210	1.207	0.2
URBAN	AGE	SEX	0.169	1	0.169	0.972	0.3
URBAN	AGE	EMPLOYED	0.003	1	0.003	0.017	0.8
URBAN	AGE	EDUC	0.171	3	0.057	0.328	0.8
URBAN	SEX	EMPLOYED	0.389	1	0.389	2.242	0.1
URBAN	SEX	EDUC	1.399	3	0.466	2.686	0.04
URBAN	EMPLOYED	EDUC	0.452	3	0.151	0.868	0.45
AGE	SEX	EMPLOYED	0.012	1	0.012	0.071	0.7
AGE	SEX	EDUC	0.049	3	0.016	0.095	0.9
AGE	EMPLOYED	EDUC	0.416	3	0.139	0.798	0.49
SEX	EMPLOYED	EDUC	0.260	3	0.087	0.499	0.6
4-WAY INTERACTIONS			2.869	13	0.221	1.271	0.2
URBAN	AGE EMPLOYED	SEX	0.918	1	0.918	5.286	0.0
URBAN	AGE EDUC	SEX	0.996	3	0.332	1.912	0.12
URBAN	AGE EDUC	EMPLOYED	0.188	3	0.063	0.361	0.78
URBAN	SEX EDUC	EMPLOYED	0.484	3	0.161	0.929	0.4
AGE	SEX EDUC	EMPLOYED	0.131	3	0.044	0.251	0.86
5-WAY INTERACTIONS			0.158	3	0.053	0.303	0.82
URBAN	AGE EMPLOYED	SEX EDUC	0.158	3	0.053	0.303	0.82
EXPLAINED			340.100	63	5.398	31.087	0.0
RESIDUAL			1092.794	6293	0.174		
TOTAL			1432.894	6356	0.225		

Table B.9 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Jobs - Repair

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF
MAIN EFFECTS			153.836	7	21.977	146.915	0.0
URBAN			11.322	1	11.322	75.686	0.00
AGE			0.253	1	0.253	1.690	0.19
SEX			78.508	1	78.508	524.834	0.00
EMPLOYED			0.001	1	0.001	0.004	0.95
EDUC			21.936	3	7.312	48.882	0.00
2-WAY INTERACTIONS			25.189	18	1.399	9.355	0.00
URBAN	AGE		0.012	1	0.012	0.077	0.78
URBAN	SEX		3.270	1	3.270	21.861	0.00
URBAN	EMPLOYED		0.312	1	0.312	2.085	0.14
URBAN	EDUC		1.467	3	0.489	3.268	0.02
AGE	SEX		0.000	1	0.000	0.001	0.97
AGE	EMPLOYED		0.301	1	0.301	2.011	0.15
AGE	EDUC		1.396	3	0.465	3.110	0.02
SEX	EMPLOYED		2.287	1	2.287	15.290	0.00
SEX	EDUC		4.009	3	1.336	8.933	0.00
EMPLOYED	EDUC		0.056	3	0.019	0.125	0.94
3-WAY INTERACTIONS			2.950	22	0.134	0.896	0.60
URBAN	AGE	SEX	0.062	1	0.062	0.414	0.52
URBAN	AGE	EMPLOYED	0.010	1	0.010	0.066	0.79
URBAN	AGE	EDUC	0.208	3	0.069	0.465	0.70
URBAN	SEX	EMPLOYED	0.020	1	0.020	0.130	0.71
URBAN	SEX	EDUC	0.373	3	0.124	0.831	0.47
URBAN	EMPLOYED	EDUC	0.308	3	0.103	0.686	0.56
AGE	SEX	EMPLOYED	0.084	1	0.084	0.561	0.45
AGE	SEX	EDUC	1.293	3	0.431	2.881	0.03
AGE	EMPLOYED	EDUC	0.196	3	0.065	0.436	0.72
SEX	EMPLOYED	EDUC	0.145	3	0.048	0.322	0.80
4-WAY INTERACTIONS			1.126	13	0.087	0.579	0.87
URBAN	AGE	SEX EMPLOYED	0.021	1	0.021	0.142	0.70
URBAN	AGE	SEX EDUC	0.465	3	0.155	1.035	0.37
URBAN	AGE	EMPLOYED EDUC	0.007	3	0.002	0.016	0.99
URBAN	SEX	EMPLOYED	0.426	3	0.142	0.949	0.41
AGE	SEX	EMPLOYED EDUC	0.114	3	0.038	0.254	0.85
5-WAY INTERACTIONS			0.132	3	0.044	0.295	0.82
URBAN	AGE	SEX EMPLOYED EDUC	0.132	3	0.044	0.295	0.82
EXPLAINED			183.234	63	2.908	19.443	0.0
RESIDUAL			941.353	6293	0.150		
TOTAL			1124.586	6356	0.177		

Table B.10 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Jobs - Service

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF
MAIN EFFECTS			40.702	7	5.815	48.273	0.0
URBAN			1.204	1	1.204	9.996	0.0
AGE			0.566	1	0.566	4.701	0.0
SEX			24.495	1	24.495	203.360	0.0
EMPLOYED			0.213	1	0.213	1.765	0.1
EDUC			7.671	3	2.557	21.229	0.0
2-WAY INTERACTIONS			5.396	18	0.300	2.489	0.0
URBAN	AGE		0.022	1	0.022	0.185	0.6
URBAN	SEX		0.162	1	0.162	1.341	0.2
URBAN	EMPLOYED		0.160	1	0.160	1.332	0.2
URBAN	EDUC		0.986	3	0.329	2.728	0.0
AGE	SEX		0.007	1	0.007	0.060	0.8
AGE	EMPLOYED		0.020	1	0.020	0.168	0.6
AGE	EDUC		0.249	3	0.083	0.688	0.5
SEX	EMPLOYED		0.211	1	0.211	1.751	0.1
SEX	EDUC		2.561	3	0.854	7.087	0.0
EMPLOYED	EDUC		0.519	3	0.173	1.436	0.2
3-WAY INTERACTIONS			3.401	22	0.155	1.283	0.1
URBAN	AGE	SEX	0.288	1	0.288	2.390	0.1
URBAN	AGE	EMPLOYED	0.129	1	0.129	1.069	0.3
URBAN	AGE	EDUC	0.689	3	0.230	1.907	0.1
URBAN	SEX	EMPLOYED	0.050	1	0.050	0.411	0.5
URBAN	SEX	EDUC	0.248	3	0.083	0.687	0.5
URBAN	EMPLOYED	EDUC	0.509	3	0.170	1.409	0.2
AGE	SEX	EMPLOYED	0.107	1	0.107	0.891	0.3
AGE	SEX	EDUC	0.404	3	0.135	1.118	0.34
AGE	EMPLOYED	EDUC	0.127	3	0.042	0.351	0.7
SEX	EMPLOYED	EDUC	0.358	3	0.119	0.991	0.3
4-WAY INTERACTIONS			5.855	13	0.450	3.739	0.0
URBAN	AGE EMPLOYED	SEX	0.190	1	0.190	1.577	0.2
URBAN	AGE EDUC	SEX	1.957	3	0.652	5.417	0.0
URBAN	AGE EDUC	EMPLOYED	1.018	3	0.339	2.817	0.0
URBAN	SEX EDUC	EMPLOYED	0.754	3	0.251	2.098	0.1
AGE	SEX EDUC	EMPLOYED	0.849	3	0.283	2.348	0.07
5-WAY INTERACTIONS			0.884	3	0.295	2.447	0.0
URBAN	AGE EMPLOYED	SEX EDUC	0.884	3	0.295	2.447	0.0
EXPLAINED			56.239	63	0.893	7.411	0.0
RESIDUAL			758.010	6293	0.120		
TOTAL			814.249	6356	0.128		

Table B.11 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge: Jobs - Tourist

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI CF
MAIN EFFECTS			53.834	7	7.691	51.075	0.00
URBAN			1.912	1	1.912	12.698	0.00
AGE			0.002	1	0.002	0.013	0.90
SEX			3.406	1	3.406	22.619	0.00
EMPLOYED			0.339	1	0.339	2.252	0.13
EDUC			28.376	3	9.459	62.817	0.00
2-WAY INTERACTIONS			3.289	18	0.183	1.213	0.24
URBAN	AGE		0.075	1	0.075	0.498	0.48
URBAN	SEX		0.035	1	0.035	0.233	0.62
URBAN	EMPLOYED		0.188	1	0.188	1.250	0.26
URBAN	EDUC		1.122	3	0.374	2.484	0.05
AGE	SEX		0.002	1	0.002	0.016	0.90
AGE	EMPLOYED		0.302	1	0.302	2.008	0.15
AGE	EDUC		0.228	3	0.076	0.505	0.67
SEX	EMPLOYED		0.038	1	0.038	0.250	0.61
SEX	EDUC		0.519	3	0.173	1.149	0.32
EMPLOYED	EDUC		0.566	3	0.189	1.253	0.28
3-WAY INTERACTIONS			4.004	22	0.182	1.209	0.22
URBAN	AGE	SEX	0.093	1	0.093	0.618	0.43
URBAN	AGE	EMPLOYED	0.300	1	0.300	1.996	0.15
URBAN	AGE	EDUC	0.506	3	0.169	1.121	0.33
URBAN	SEX	EMPLOYED	0.078	1	0.078	0.519	0.47
URBAN	SEX	EDUC	0.190	3	0.063	0.420	0.73
URBAN	EMPLOYED	EDUC	0.095	3	0.032	0.211	0.88
AGE	SEX	EMPLOYED	0.090	1	0.090	0.600	0.43
AGE	SEX	EDUC	1.292	3	0.431	2.859	0.03
AGE	EMPLOYED	EDUC	0.961	3	0.320	2.127	0.09
SEX	EMPLOYED	EDUC	0.861	3	0.287	1.907	0.12
4-WAY INTERACTIONS			3.719	13	0.286	1.900	0.02
URBAN	AGE EMPLOYED	SEX	0.064	1	0.064	0.427	0.51
URBAN	AGE EDUC	SEX	0.986	3	0.329	2.183	0.08
URBAN	AGE EDUC	EMPLOYED	1.550	3	0.517	3.432	0.01
URBAN	SEX	EMPLOYED	0.706	3	0.235	1.564	0.19
AGE	SEX EDUC	EMPLOYED	0.635	3	0.212	1.405	0.23
5-WAY INTERACTIONS			0.646	3	0.215	1.429	0.23
URBAN	AGE EMPLOYED	SEX EDUC	0.646	3	0.215	1.429	0.23
EXPLAINED			65.492	63	1.040	6.904	0.0
RESIDUAL			924.832	6142	0.151		
TOTAL			990.325	6205	0.160		

Table B.12 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge, - Home Economics

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI CF
MAIN EFFECTS			646.886	7	92.412	550.673	0.00
URBAN			9.694	1	9.694	57.766	0.00
AGE			11.535	1	11.535	68.735	0.00
SEX			518.520	1	518.520	3089.790	0.00
EMPLOYED			0.003	1	0.003	0.017	0.59
EDUC			46.116	3	15.372	91.599	0.00
2-WAY INTERACTIONS			19.563	18	1.087	6.476	0.00
URBAN	AGE		0.283	1	0.283	1.686	0.19
URBAN	SEX		1.779	1	1.779	10.599	0.001
URBAN	EMPLOYED		0.011	1	0.011	0.066	0.79
URBAN	EDUC		1.084	3	0.361	2.154	0.09
AGE	SEX		0.959	1	0.959	5.715	0.01
AGE	EMPLOYED		0.600	1	0.600	3.578	0.05
AGE	EDUC		1.599	3	0.532	3.175	0.02
SEX	EMPLOYED		0.591	1	0.591	3.522	0.06
SEX	EDUC		7.599	3	2.533	15.093	0.00
EMPLOYED	EDUC		1.345	3	0.448	2.672	0.04
3-WAY INTERACTIONS			3.599	22	0.164	0.975	0.49
URBAN	AGE	SEX	0.328	1	0.328	1.952	0.16
URBAN	AGE	EMPLOYED	0.404	1	0.404	2.408	0.12
URBAN	AGE	EDUC	0.291	3	0.097	0.578	0.63
URBAN	SEX	EMPLOYED	0.029	1	0.029	0.171	0.67
URBAN	SEX	EDUC	0.040	3	0.013	0.079	0.97
URBAN	EMPLOYED	EDUC	0.277	3	0.092	0.551	0.64
AGE	SEX	EMPLOYED	0.506	1	0.506	3.015	0.08
AGE	SEX	EDUC	1.561	3	0.520	3.101	0.02
AGE	EMPLOYED	EDUC	0.561	3	0.187	1.113	0.34
SEX	EMPLOYED	EDUC	0.215	3	0.072	0.426	0.73
4-WAY INTERACTIONS			3.777	13	0.291	1.731	0.04
URBAN	AGE	SEX	0.160	1	0.160	0.956	0.32
	EMPLOYED						
URBAN	AGE	SEX	1.248	3	0.416	2.478	0.059
	EDUC						
URBAN	AGE	EMPLOYED	0.059	3	0.020	0.117	0.950
	EDUC						
URBAN	SEX	EMPLOYED	1.290	3	0.430	2.562	0.053
AGE	SEX	EMPLOYED	0.572	3	0.191	1.137	0.33
	EDUC						
5-WAY INTERACTIONS			1.497	3	0.499	2.973	0.030
URBAN	AGE	SEX	1.497	3	0.499	2.973	0.030
	EMPLOYED	EDUC					
EXPLAINED			675.323	63	10.719	63.876	0.0
RESIDUAL			1030.733	6142	0.168		
TOTAL			1706.056	6205	0.275		

Table B.13 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Education and Culture

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			525.412	7	75.059	321.803	0.000
URBAN			13.329	1	13.329	57.146	0.000
AGE			0.006	1	0.006	0.026	0.872
SEX			14.832	1	14.832	63.592	0.000
EMPLOYED			0.099	1	0.099	0.426	0.514
EDUC			323.928	3	107.976	462.929	0.000
2-WAY INTERACTIONS			10.031	18	0.557	2.389	0.001
URBAN	AGE		0.419	1	0.419	1.795	0.180
URBAN	SEX		0.385	1	0.385	1.651	0.199
URBAN	EMPLOYED		0.203	1	0.203	0.870	0.351
URBAN	EDUC		1.789	3	0.596	2.556	0.053
AGE	SEX		0.936	1	0.936	4.011	0.045
AGE	EMPLOYED		0.407	1	0.407	1.745	0.187
AGE	EDUC		0.727	3	0.242	1.039	0.374
SEX	EMPLOYED		0.033	1	0.033	0.141	0.707
SEX	EDUC		5.134	3	1.711	7.337	0.000
EMPLOYED	EDUC		0.614	3	0.205	0.878	0.452
3-WAY INTERACTIONS			3.374	22	0.153	0.657	0.884
URBAN	AGE	SEX	0.595	1	0.595	2.551	0.110
URBAN	AGE	EMPLOYED	0.009	1	0.009	0.038	0.845
URBAN	AGE	EDUC	1.098	3	0.366	1.569	0.195
URBAN	SEX	EMPLOYED	0.025	1	0.025	0.108	0.742
URBAN	SEX	EDUC	0.093	3	0.031	0.133	0.940
URBAN	EMPLOYED	EDUC	0.329	3	0.110	0.470	0.703
AGE	SEX	EMPLOYED	0.209	1	0.209	0.897	0.344
AGE	SEX	EDUC	0.087	3	0.029	0.124	0.946
AGE	EMPLOYED	EDUC	0.350	3	0.117	0.503	0.681
SEX	EMPLOYED	EDUC	0.161	3	0.054	0.229	0.876
4-WAY INTERACTIONS			2.766	13	0.213	0.912	0.539
URBAN	AGE	SEX	0.213	1	0.213	0.914	0.339
	EMPLOYED						
URBAN	AGE	SEX	1.082	3	0.361	1.546	0.200
	EDUC						
URBAN	AGE	EMPLOYED	0.694	3	0.231	0.992	0.395
	EDUC						
URBAN	SEX	EMPLOYED	0.084	3	0.028	0.120	0.949
AGE	SEX	EMPLOYED	0.659	3	0.220	0.941	0.420
	EDUC						
5-WAY INTERACTIONS			3.119	3	1.040	4.457	0.004
URBAN	AGE	SEX	3.119	3	1.040	4.457	0.004
	EMPLOYED	EDUC					
EXPLAINED			544.703	63	8.646	37.069	0.0
RESIDUAL			1432.591	6142	0.233		
TOTAL			1977.294	6205	0.319		

Table B.14 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Recreation - Participative

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF
MAIN EFFECTS			323.681	7	46.240	243.644	0.0
URBAN			30.155	1	30.155	158.889	0.000
AGE			0.648	1	0.648	3.416	0.065
SEX			9.399	1	9.399	49.523	0.000
EMPLOYED			0.130	1	0.130	0.685	0.408
EDUC			150.583	3	50.194	264.478	0.000
2-WAY INTERACTIONS			6.646	18	0.369	1.946	0.010
URBAN	AGE		0.000	1	0.000	0.000	0.990
URBAN	SEX		0.237	1	0.237	1.249	0.264
URBAN	EMPLOYED		0.076	1	0.076	0.402	0.526
URBAN	EDUC		2.060	3	0.687	3.618	0.013
AGE	SEX		0.792	1	0.792	4.171	0.041
AGE	EMPLOYED		0.914	1	0.914	4.816	0.028
AGE	EDUC		0.595	3	0.198	1.046	0.371
SEX	EMPLOYED		0.068	1	0.068	0.360	0.549
SEX	EDUC		1.332	3	0.444	2.339	0.071
EMPLOYED	EDUC		0.780	3	0.260	1.370	0.250
3-WAY INTERACTIONS			5.401	22	0.245	1.294	0.161
URBAN	AGE	SEX	0.533	1	0.533	2.810	0.094
URBAN	AGE	EMPLOYED	0.053	1	0.053	0.278	0.598
URBAN	AGE	EDUC	1.601	3	0.534	2.812	0.039
URBAN	SEX	EMPLOYED	0.452	1	0.452	2.381	0.123
URBAN	SEX	EDUC	0.036	3	0.012	0.063	0.979
URBAN	EMPLOYED	EDUC	0.128	3	0.043	0.224	0.880
AGE	SEX	EMPLOYED	0.000	1	0.000	0.000	0.990
AGE	SEX	EDUC	2.040	3	0.680	3.583	0.013
AGE	EMPLOYED	EDUC	0.302	3	0.101	0.531	0.661
SEX	EMPLOYED	EDUC	0.349	3	0.116	0.613	0.606
4-WAY INTERACTIONS			5.604	13	0.431	2.271	0.006
URBAN	AGE EMPLOYED	SEX	0.467	1	0.467	2.462	0.117
URBAN	AGE EDUC	SEX	1.707	3	0.569	2.999	0.029
URBAN	AGE EDUC	EMPLOYED	1.037	3	0.346	1.821	0.141
URBAN	SEX	EMPLOYED	0.751	3	0.250	1.320	0.266
AGE	SEX EDUC	EMPLOYED	0.727	3	0.242	1.277	0.280
5-WAY INTERACTIONS			2.840	3	0.947	4.987	0.002
URBAN	AGE EMPLOYED	SEX EDUC	2.840	3	0.947	4.988	0.002
EXPLAINED			344.172	63	5.463	28.785	0.0
RESIDUAL			1165.666	6142	0.190		
TOTAL			1509.838	6205	0.243		

Table B.15 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Knowledge - Recreation - Spectator

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS			366.963	7	52.423	292.564	0.00
URBAN			19.053	1	19.053	106.332	0.00
AGE			3.827	1	3.827	21.355	0.00
SEX			103.055	1	103.055	575.128	0.00
EMPLOYED			0.333	1	0.333	1.860	0.17
EDUC			109.597	3	36.532	203.880	0.00
2-WAY INTERACTIONS			11.855	18	0.659	3.676	0.00
URBAN	AGE		0.037	1	0.037	0.204	0.65
URBAN	SEX		3.516	1	3.516	19.622	0.00
URBAN	EMPLOYED		0.316	1	0.316	1.761	0.18
URBAN	EDUC		1.635	3	0.545	3.042	0.02
AGE	SEX		0.184	1	0.184	1.026	0.31
AGE	EMPLOYED		0.699	1	0.699	3.904	0.04
AGE	EDUC		0.691	3	0.230	1.285	0.27
SEX	EMPLOYED		0.065	1	0.065	0.363	0.54
SEX	EDUC		0.524	3	0.175	0.975	0.40
EMPLOYED	EDUC		1.224	3	0.408	2.277	0.07
3-WAY INTERACTIONS			4.415	22	0.201	1.120	0.31
URBAN	AGE	SEX	0.079	1	0.079	0.443	0.50
URBAN	AGE	EMPLOYED	0.045	1	0.045	0.252	0.61
URBAN	AGE	EDUC	1.279	3	0.426	2.379	0.06
URBAN	SEX	EMPLOYED	0.353	1	0.353	1.970	0.16
URBAN	SEX	EDUC	0.100	3	0.033	0.187	0.90
URBAN	EMPLOYED	EDUC	0.237	3	0.079	0.441	0.72
AGE	SEX	EMPLOYED	0.007	1	0.007	0.039	0.84
AGE	SEX	EDUC	0.754	3	0.251	1.403	0.24
AGE	EMPLOYED	EDUC	0.607	3	0.202	1.129	0.33
SEX	EMPLOYED	EDUC	0.412	3	0.137	0.766	0.51
4-WAY INTERACTIONS			5.851	13	0.450	2.512	0.00
URBAN	AGE	SEX	1.031	1	1.031	5.751	0.01
	EMPLOYED						
URBAN	AGE	SEX	1.030	3	0.343	1.916	0.12
	EDUC						
URBAN	AGE	EMPLOYED	2.376	3	0.792	4.420	0.00
	EDUC						
URBAN	SEX	EMPLOYED	0.386	3	0.129	0.719	0.54
	EDUC						
AGE	SEX	EMPLOYED	1.543	3	0.514	2.870	0.03
	EDUC						
5-WAY INTERACTIONS			2.872	3	0.957	5.343	0.001
URBAN	AGE	SEX	2.872	3	0.957	5.343	0.001
	EMPLOYED	EDUC					
EXPLAINED			391.957	63	6.222	34.721	0.0
RESIDUAL			1100.559	6142	0.179		
TOTAL			1492.516	6205	0.241		

Table B.16 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Diseases and Illnesses

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			10.918	7	1.560	7.262	0.000
URBAN			0.538	1	0.538	2.504	0.114
AGE			0.487	1	0.487	2.269	0.132
SEX			0.106	1	0.106	0.495	0.482
EMPLOYED			0.719	1	0.719	3.350	0.067
EDUC			8.264	3	2.755	12.826	0.000
2-WAY INTERACTIONS			6.248	18	0.347	1.616	0.048
URBAN	AGE		0.044	1	0.044	0.205	0.651
URBAN	SEX		0.013	1	0.013	0.059	0.809
URBAN	EMPLOYED		0.034	1	0.034	0.159	0.690
URBAN	EDUC		0.609	3	0.203	0.946	0.417
AGE	SEX		1.049	1	1.049	4.884	0.027
AGE	EMPLOYED		0.502	1	0.502	2.338	0.126
AGE	EDUC		2.230	3	0.743	3.461	0.015
SEX	EMPLOYED		0.055	1	0.055	0.255	0.61[illegible]
SEX	EDUC		0.438	3	0.146	0.679	0.56[illegible]
EMPLOYED	EDUC		0.527	3	0.176	0.818	0.484
3-WAY INTERACTIONS			4.940	22	0.225	1.046	0.40[illegible]
URBAN	AGE	SEX	0.011	1	0.011	0.051	0.82[illegible]
URBAN	AGE	EMPLOYED	0.893	1	0.893	4.159	0.041
URBAN	AGE	EDUC	0.067	3	0.022	0.104	0.95[illegible]
URBAN	SEX	EMPLOYED	0.229	1	0.229	1.068	0.30[illegible]
URBAN	SEX	EDUC	1.110	3	0.370	1.723	0.160
URBAN	EMPLOYED	EDUC	0.154	3	0.051	0.239	0.86[illegible]
AGE	SEX	EMPLOYED	0.391	1	0.391	1.821	0.17[illegible]
AGE	SEX	EDUC	0.670	3	0.223	1.040	0.374
AGE	EMPLOYED	EDUC	0.103	3	0.034	0.159	0.92[illegible]
SEX	EMPLOYED	EDUC	0.499	3	0.166	0.774	0.50[illegible]
4-WAY INTERACTIONS			2.932	13	0.226	1.050	0.39[illegible]
URBAN	AGE	SEX	0.001	1	0.001	0.006	0.940
URBAN	AGE EMPLOYED	SEX	0.726	3	0.242	1.127	0.337
URBAN	AGE EDUC	EMPLOYED	0.177	3	0.059	0.275	0.844
URBAN	SEX EDUC	EMPLOYED	0.646	3	0.215	1.002	0.391
AGE	SEX EDUC	EMPLOYED	0.851	3	0.284	1.321	0.26[illegible]
5-WAY INTERACTIONS			1.044	3	0.348	1.620	0.18[illegible]
URBAN	AGE EMPLOYED	SEX EDUC	1.044	3	0.348	1.620	0.18[illegible]
EXPLAINED			26.082	63	0.414	1.928	0.00[illegible]
RESIDUAL			1273.857	5931	0.215		
TOTAL			1299.939	5994	0.217		

Table B.17 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Preventive Medicine

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
AIN EFFECTS			9.839	7	1.406	7.610	0.000
URBAN			0.599	1	0.599	3.245	0.072
AGE			0.969	1	0.969	5.245	0.022
SEX			1.521	1	1.521	8.237	0.004
EMPLOYED			0.278	1	0.278	1.506	0.220
EDUC			5.421	3	1.807	9.783	0.000
-WAY INTERACTIONS			6.270	18	0.348	1.886	0.013
URBAN	AGE		0.005	1	0.005	0.026	0.873
URBAN	SEX		0.000	1	0.000	0.002	0.961
URBAN	EMPLOYED		0.000	1	0.000	0.000	0.998
URBAN	EDUC		0.802	3	0.267	1.446	0.227
AGE	SEX		1.159	1	1.159	6.274	0.012
AGE	EMPLOYED		0.201	1	0.201	1.087	0.297
AGE	EDUC		1.715	3	0.572	3.096	0.026
SEX	EMPLOYED		0.031	1	0.031	0.170	0.680
SEX	EDUC		0.908	3	0.303	1.638	0.178
EMPLOYED	EDUC		0.115	3	0.038	0.207	0.892
-WAY INTERACTIONS			5.512	22	0.251	1.356	0.123
URBAN	AGE	SEX	0.022	1	0.022	0.119	0.730
URBAN	AGE	EMPLOYED	0.561	1	0.561	3.036	0.082
URBAN	AGE	EDUC	0.070	3	0.023	0.126	0.945
URBAN	SEX	EMPLOYED	0.366	1	0.366	1.979	0.160
URBAN	SEX	EDUC	1.961	3	0.654	3.540	0.014
URBAN	EMPLOYED	EDUC	0.759	3	0.253	1.369	0.250
AGE	SEX	EMPLOYED	0.667	1	0.667	3.611	0.057
AGE	SEX	EDUC	0.664	3	0.221	1.199	0.309
AGE	EMPLOYED	EDUC	0.620	3	0.207	1.118	0.340
SEX	EMPLOYED	EDUC	0.420	3	0.140	0.759	0.517
-WAY INTERACTIONS			3.321	13	0.255	1.383	0.159
URBAN	AGE	SEX	0.246	1	0.246	1.330	0.249
	EMPLOYED						
URBAN	AGE	SEX	0.657	3	0.219	1.185	0.314
	EDUC						
URBAN	AGE	EMPLOYED	1.068	3	0.356	1.927	0.123
	EDUC						
URBAN	SEX	EMPLOYED	0.240	3	0.080	0.433	0.730
AGE	SEX	EMPLOYED	1.114	3	0.371	2.010	0.110
	EDUC						
-WAY INTERACTIONS			0.654	3	0.218	1.181	0.315
URBAN	AGE	SEX	0.654	3	0.219	1.181	0.315
	EMPLOYED	EDUC					
XPLAINED			25.596	63	0.406	2.200	0.000
ESIDUAL			1095.561	5931	0.185		
OTAL			1121.157	5994	0.187		

Table B.18 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Foods and Nutrition

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			8.581	7	1.226	4.976	0.000
URBAN			0.141	1	0.141	0.571	0.450
AGE			0.879	1	0.879	3.568	0.059
SEX			0.551	1	0.551	2.238	0.135
EMPLOYED			0.655	1	0.655	2.660	0.103
EDUC			4.211	3	1.404	5.698	0.001
2-WAY INTERACTIONS			5.881	18	0.327	1.326	0.160
URBAN	AGE		0.100	1	0.100	0.408	0.523
URBAN	SEX		0.234	1	0.234	0.948	0.330
URBAN	EMPLOYED		0.020	1	0.020	0.079	0.778
URBAN	EDUC		1.363	3	0.454	1.845	0.137
AGE	SEX		0.261	1	0.261	1.060	0.303
AGE	EMPLOYED		0.003	1	0.003	0.013	0.909
AGE	EDUC		1.792	3	0.597	2.425	0.064
SEX	EMPLOYED		0.207	1	0.207	0.839	0.360
SEX	EDUC		0.614	3	0.205	0.831	0.476
EMPLOYED	EDUC		0.198	3	0.066	0.268	0.849
3-WAY INTERACTIONS			4.906	22	0.223	0.905	0.589
URBAN	AGE	SEX	0.249	1	0.249	1.010	0.315
URBAN	AGE	EMPLOYED	0.298	1	0.298	1.209	0.272
URBAN	AGE	EDUC	0.332	3	0.111	0.450	0.717
URBAN	SEX	EMPLOYED	0.215	1	0.215	0.871	0.351
URBAN	SEX	EDUC	1.003	3	0.334	1.357	0.254
URBAN	EMPLOYED	EDUC	0.465	3	0.155	0.630	0.596
AGE	SEX	EMPLOYED	0.009	1	0.009	0.038	0.845
AGE	SEX	EDUC	0.754	3	0.251	1.020	0.383
AGE	EMPLOYED	EDUC	0.625	3	0.208	0.846	0.469
SEX	EMPLOYED	EDUC	0.361	3	0.120	0.489	0.690
4-WAY INTERACTIONS			3.449	13	0.265	1.077	0.374
URBAN	AGE	SEX	0.173	1	0.173	0.704	0.401
	EMPLOYED						
URBAN	AGE	SEX	1.176	3	0.392	1.592	0.189
	EDUC						
URBAN	AGE	EMPLOYED	1.684	3	0.561	2.278	0.078
	EDUC						
URBAN	SEX	EMPLOYED	0.228	3	0.076	0.309	0.819
AGE	SEX	EMPLOYED	0.195	3	0.065	0.264	0.852
	EDUC						
5-WAY INTERACTIONS			1.107	3	0.369	1.498	0.213
URBAN	AGE	SEX	1.107	3	0.369	1.498	0.213
	EMPLOYED	EDUC					
EXPLAINED			23.923	63	0.380	1.541	0.004
RESIDUAL			1461.069	5931	0.246		
TOTAL			1484.992	5994	0.248		

Table B.19 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Agriculture-Crop Production

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS			227.142	7	32.449	80.216	0.0
URBAN			66.506	1	66.506	164.407	0.0
AGE			0.049	1	0.049	0.120	0.7
SEX			119.517	1	119.517	295.453	0.00
EMPLOYED			0.002	1	0.002	0.005	0.94
EDUC			4.896	3	1.632	4.034	0.0
2-WAY INTERACTIONS			13.406	18	0.745	1.841	0.0
URBAN	AGE		0.083	1	0.083	0.206	0.6
URBAN	SEX		1.014	1	1.014	2.506	0.11
URBAN	EMPLOYED		0.590	1	0.590	1.458	0.23
URBAN	EDUC		1.542	3	0.514	1.271	0.2
AGE	SEX		0.544	1	0.544	1.345	0.24
AGE	EMPLOYED		0.212	1	0.212	0.525	0.46
AGE	EDUC		0.707	3	0.236	0.583	0.6
SEX	EMPLOYED		2.961	1	2.961	7.321	0.00
SEX	EDUC		4.120	3	1.373	3.395	0.01
EMPLOYED	EDUC		0.952	3	0.317	0.785	0.50
3-WAY INTERACTIONS			9.537	22	0.433	1.072	0.3
URBAN	AGE	SEX	0.109	1	0.109	0.269	0.60
URBAN	AGE	EMPLOYED	0.008	1	0.008	0.019	0.89
URBAN	AGE	EDUC	1.178	3	0.393	0.971	0.4
URBAN	SEX	EMPLOYED	0.059	1	0.059	0.146	0.70
URBAN	SEX	EDUC	1.691	3	0.564	1.394	0.2
URBAN	EMPLOYED	EDUC	1.194	3	0.398	0.984	0.39
AGE	SEX	EMPLOYED	0.019	1	0.019	0.046	0.8
AGE	SEX	EDUC	3.393	3	1.131	2.796	0.03
AGE	EMPLOYED	EDUC	1.933	3	0.644	1.593	0.18
SEX	EMPLOYED	EDUC	0.461	3	0.154	0.380	0.76
4-WAY INTERACTIONS			3.870	13	0.298	0.736	0.72
URBAN	AGE	SEX	0.119	1	0.119	0.294	0.58
	EMPLOYED						
URBAN	AGE	SEX	0.755	3	0.252	0.622	0.60
	EDUC						
URBAN	AGE	EMPLOYED	0.640	3	0.213	0.528	0.66
	EDUC						
URBAN	SEX	EMPLOYED	1.358	3	0.453	1.119	0.34
AGE	SEX	EMPLOYED	1.433	3	0.478	1.181	0.31
	EDUC						
5-WAY INTERACTIONS			1.903	3	0.634	1.568	0.19
URBAN	AGE	SEX	1.903	3	0.634	1.568	0.19
	EMPLOYED	EDUC					
EXPLAINED			255.858	63	4.061	10.040	0.0
RESIDUAL			2399.206	5931	0.405		
TOTAL			2655.064	5994	0.443		

Table B.20 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Agriculture-Livestock Production

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI DF
MAIN EFFECTS			126.261	7	18.037	40.056	0.00
URBAN			52.953	1	52.953	117.594	0.00
AGE			0.165	1	0.165	0.366	0.54
SEX			49.102	1	49.102	109.041	0.00
EMPLOYED			0.048	1	0.048	0.106	0.74
EDUC			2.369	3	0.790	1.754	0.1
2-WAY INTERACTIONS			9.814	18	0.545	1.211	0.2
URBAN	AGE		0.133	1	0.133	0.295	0.5
URBAN	SEX		2.513	1	2.513	5.580	0.01
URBAN	EMPLOYED		1.204	1	1.204	2.674	0.10
URBAN	EDUC		2.832	3	0.944	2.096	0.0
AGE	SEX		0.088	1	0.088	0.195	0.6
AGE	EMPLOYED		0.185	1	0.185	0.411	0.5
AGE	EDUC		0.606	3	0.202	0.448	0.7
SEX	EMPLOYED		1.688	1	1.688	3.748	0.0
SEX	EDUC		1.801	3	0.600	1.333	0.2
EMPLOYED	EDUC		0.842	3	0.281	0.623	0.6
3-WAY INTERACTIONS			9.575	22	0.435	0.967	0.5
URBAN	AGE	SEX	0.592	1	0.592	1.315	0.2
URBAN	AGE	EMPLOYED	0.594	1	0.594	1.320	0.2
URBAN	AGE	EDUC	1.285	3	0.428	0.952	0.4
URBAN	SEX	EMPLOYED	0.000	1	0.000	0.000	0.9
URBAN	SEX	EDUC	0.874	3	0.291	0.647	0.5
URBAN	EMPLOYED	EDUC	1.368	3	0.456	1.012	0.3
AGE	SEX	EMPLOYED	0.153	1	0.153	0.341	0.5
AGE	SEX	EDUC	1.216	3	0.405	0.900	0.4
AGE	EMPLOYED	EDUC	1.103	3	0.368	0.816	0.4
SEX	EMPLOYED	EDUC	1.499	3	0.500	1.110	0.3
4-WAY INTERACTIONS			4.385	13	0.337	0.749	0.71
URBAN	AGE	SEX	0.943	1	0.943	2.095	0.14
	EMPLOYED						
URBAN	AGE	SEX	0.454	3	0.151	0.336	0.79
	EDUC						
URBAN	AGE	EMPLOYED	0.465	3	0.155	0.344	0.79
	EDUC						
URBAN	SEX	EMPLOYED	1.375	3	0.458	1.018	0.38
AGE	SEX	EMPLOYED	1.052	3	0.351	0.779	0.5
	EDUC						
5-WAY INTERACTIONS			1.081	3	0.360	0.800	0.4
URBAN	AGE	SEX	1.081	3	0.360	0.800	0.4
	EMPLOYED	EDUC					
EXPLAINED			151.115	63	2.399	5.327	0.0
RESIDUAL			2670.746	5931	0.450		
TOTAL			2821.862	5994	0.471		

Table B.21 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Agriculture-Support Services

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF
MAIN EFFECTS			171.891	7	24.556	65.936	0.0
URBAN			54.339	1	54.339	145.910	0.0
AGE			0.252	1	0.252	0.676	0.4
SEX			85.156	1	85.156	228.659	0.0
EMPLOYED			0.006	1	0.006	0.017	0.8
EDUC			6.913	3	2.304	6.187	0.0
2-WAY INTERACTIONS			8.265	18	0.459	1.233	0.2
URBAN	AGE		0.411	1	0.411	1.104	0.2
URBAN	SEX		1.469	1	1.469	3.944	0.0
URBAN	EMPLOYED		0.425	1	0.425	1.141	0.2
URBAN	EDUC		0.708	3	0.236	0.634	0.5
AGE	SEX		0.778	1	0.778	2.088	0.1
AGE	EMPLOYED		0.025	1	0.025	0.066	0.7
AGE	EDUC		1.408	3	0.469	1.260	0.2
SEX	EMPLOYED		1.394	1	1.394	3.744	0.0
SEX	EDUC		0.729	3	0.243	0.653	0.5
EMPLOYED	EDUC		1.813	3	0.604	1.622	0.1
3-WAY INTERACTIONS			10.633	22	0.483	1.298	0.1
URBAN	AGE	SEX	0.879	1	0.879	2.360	0.1
URBAN	AGE	EMPLOYED	1.086	1	1.086	2.917	0.0
URBAN	AGE	EDUC	1.236	3	0.412	1.107	0.3
URBAN	SEX	EMPLOYED	0.098	1	0.098	0.263	0.6
URBAN	SEX	EDUC	1.866	3	0.622	1.671	0.1
URBAN	EMPLOYED	EDUC	1.200	3	0.400	1.074	0.3
AGE	SEX	EMPLOYED	0.144	1	0.144	0.387	0.5
AGE	SEX	EDUC	1.097	3	0.366	0.981	0.4
AGE	EMPLOYED	EDUC	0.921	3	0.307	0.825	0.4
SEX	EMPLOYED	EDUC	1.494	3	0.498	1.337	0.2
4-WAY INTERACTIONS			3.116	13	0.240	0.644	0.8
URBAN	AGE	SEX	0.713	1	0.713	1.915	0.1
	EMPLOYED						
URBAN	AGE	SEX	1.439	3	0.480	1.288	0.2
	EDUC						
URBAN	AGE	EMPLOYED	0.837	3	0.279	0.749	0.5
	EDUC						
URBAN	SEX	EMPLOYED	0.407	3	0.136	0.364	0.7
AGE	SEX	EMPLOYED	0.580	3	0.193	0.519	0.6
	EDUC						
5-WAY INTERACTIONS			2.439	3	0.813	2.183	0.0
URBAN	AGE	SEX	2.439	3	0.813	2.183	0.0
	EMPLOYED	EDUC					
EXPLAINED			196.344	63	3.117	8.368	0.0
RESIDUAL			2242.696	6022	0.372		
TOTAL			2439.040	6085	0.401		

Table B.22 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Jobs - General

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			134.233	7	19.176	52.111	0.00
URBAN			0.696	1	0.696	1.890	0.16
AGE			14.163	1	14.163	38.498	0.00
SEX			28.440	1	28.440	77.286	0.00
EMPLOYED			3.169	1	3.169	8.613	0.00
EDUC			35.550	3	11.850	32.202	0.00
2-WAY INTERACTIONS			12.237	18	0.680	1.847	0.01
URBAN	AGE		0.025	1	0.025	0.067	0.79
URBAN	SEX		1.849	1	1.849	5.025	0.02
URBAN	EMPLOYED		0.085	1	0.085	0.232	0.631
URBAN	EDUC		0.166	3	0.055	0.151	0.92
AGE	SEX		0.893	1	0.893	2.428	0.11
AGE	EMPLOYED		0.615	1	0.615	1.671	0.19
AGE	EDUC		2.174	3	0.725	1.969	0.11
SEX	EMPLOYED		1.095	1	1.095	2.975	0.08
SEX	EDUC		3.506	3	1.169	3.176	0.02
EMPLOYED	EDUC		2.100	3	0.700	1.903	0.12
3-WAY INTERACTIONS			7.111	22	0.323	0.878	0.62
URBAN	AGE	SEX	0.001	1	0.001	0.003	0.95
URBAN	AGE	EMPLOYED	0.303	1	0.303	0.824	0.36
URBAN	AGE	EDUC	0.095	3	0.032	0.086	0.96
URBAN	SEX	EMPLOYED	0.004	1	0.004	0.010	0.91
URBAN	SEX	EDUC	1.018	3	0.339	0.922	0.42
URBAN	EMPLOYED	EDUC	0.502	3	0.167	0.455	0.71
AGE	SEX	EMPLOYED	1.290	1	1.290	3.505	0.06
AGE	SEX	EDUC	1.651	3	0.550	1.496	0.21
AGE	EMPLOYED	EDUC	1.265	3	0.422	1.146	0.32
SEX	EMPLOYED	EDUC	0.109	3	0.036	0.099	0.961
4-WAY INTERACTIONS			6.637	13	0.511	1.387	0.15
URBAN	AGE EMPLOYED	SEX	2.919	1	2.919	7.931	0.00
URBAN	AGE EDUC	SEX	2.817	3	0.939	2.552	0.05
URBAN	AGE EDUC	EMPLOYED	0.605	3	0.202	0.548	0.64
URBAN	SEX EDUC	EMPLOYED	0.801	3	0.267	0.725	0.53
AGE	SEX EDUC	EMPLOYED	1.075	3	0.358	0.973	0.40
5-WAY INTERACTIONS			0.701	3	0.234	0.635	0.59
URBAN	AGE EMPLOYED	SEX EDUC	0.701	3	0.234	0.635	0.59
EXPLAINED			169.919	63	2.554	6.941	0.0
RESIDUAL			2215.997	6022	0.368		
TOTAL			2376.916	6085	0.391		

Table B.23 Analysis of Variance of Effects of Residence, Sex, Age, Employment and Education on Demand - Jobs - Skilled

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNI OF
MAIN EFFECTS			652.231	7	93.176	205.586	0.0
URBAN			2.730	1	2.730	6.023	0.01
AGE			0.214	1	0.214	0.472	0.49
SEX			540.009	1	540.009	1191.491	0.00
EMPLOYED			1.839	1	1.839	4.058	0.04
EDUC			3.365	3	1.122	2.475	0.06
2-WAY INTERACTIONS			24.744	18	1.375	3.033	0.00
URBAN	AGE		0.005	1	0.005	0.012	0.91
URBAN	SEX		3.307	1	3.307	7.296	0.00
URBAN	EMPLOYED		0.614	1	0.614	1.356	0.24
URBAN	EDUC		4.154	3	1.385	3.055	0.02
AGE	SEX		1.237	1	1.237	2.730	0.09
AGE	EMPLOYED		0.638	1	0.638	1.407	0.23
AGE	EDUC		2.273	3	0.758	1.671	0.17
SEX	EMPLOYED		0.674	1	0.674	1.487	0.22
SEX	EDUC		15.493	3	5.164	11.395	0.00
EMPLOYED	EDUC		3.669	3	1.223	2.698	0.04
3-WAY INTERACTIONS			8.849	22	0.402	0.887	0.61
URBAN	AGE	SEX	0.090	1	0.090	0.199	0.65
URBAN	AGE	EMPLOYED	0.152	1	0.152	0.336	0.56
URBAN	AGE	EDUC	0.838	3	0.279	0.616	0.60
URBAN	SEX	EMPLOYED	0.936	1	0.936	2.066	0.15
URBAN	SEX	EDUC	2.418	3	0.806	1.779	0.14
URBAN	EMPLOYED	EDUC	1.335	3	0.445	0.982	0.40
AGE	SEX	EMPLOYED	0.010	1	0.010	0.022	0.88
AGE	SEX	EDUC	1.430	3	0.477	1.052	0.36
AGE	EMPLOYED	EDUC	1.030	3	0.343	0.758	0.51
SEX	EMPLOYED	EDUC	0.478	3	0.159	0.351	0.78
4-WAY INTERACTIONS			5.022	13	0.386	0.852	0.60
URBAN	AGE EMPLOYED	SEX	0.270	1	0.270	0.596	0.44
URBAN	AGE EDUC	SEX	1.926	3	0.642	1.417	0.23
URBAN	AGE EDUC	EMPLOYED	1.656	3	0.552	1.218	0.30
URBAN	SEX	EMPLOYED	0.651	3	0.217	0.478	0.69
AGE	SEX EDUC	EMPLOYED	0.944	3	0.315	0.694	0.55
5-WAY INTERACTIONS			0.326	3	0.109	0.240	0.86
URBAN	AGE EMPLOYED	SEX EDUC	0.326	3	0.109	0.240	0.86
EXPLAINED			691.172	63	10.971	24.207	0.0
RESIDUAL			2729.299	6022	0.453		
TOTAL			3420.471	6085	0.562		

Table B.24 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Jobs - Repair

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF
MAIN EFFECTS			792.719	7	113.246	212.177	0.0
URBAN			1.026	1	1.026	1.921	0.1
AGE			8.421	1	8.421	15.778	0.0
SEX			536.969	1	536.969	1006.066	0.0
EMPLOYED			2.787	1	2.787	5.222	0.0
EDUC			60.756	3	20.252	37.944	0.0
2-WAY INTERACTIONS			23.361	18	1.298	2.432	0.0
URBAN	AGE		0.060	1	0.060	0.113	0.7
URBAN	SEX		5.058	1	5.058	9.477	0.0
URBAN	EMPLOYED		0.007	1	0.007	0.013	0.9
URBAN	EDUC		2.314	3	0.771	1.445	0.2
AGE	SEX		1.767	1	1.767	3.311	0.0
AGE	EMPLOYED		0.075	1	0.075	0.140	0.7
AGE	EDUC		0.831	3	0.277	0.519	0.6
SEX	EMPLOYED		0.043	1	0.043	0.081	0.7
SEX	EDUC		7.075	3	2.358	4.418	0.0
EMPLOYED	EDUC		3.052	3	1.017	1.906	0.1
3-WAY INTERACTIONS			12.224	22	0.556	1.041	0.4
URBAN	AGE	SEX	0.005	1	0.005	0.010	0.9
URBAN	AGE	EMPLOYED	0.269	1	0.268	0.501	0.4
URBAN	AGE	EDUC	2.571	3	0.857	1.606	0.1
URBAN	SEX	EMPLOYED	0.023	1	0.023	0.044	0.8
URBAN	SEX	EDUC	3.119	3	1.040	1.948	0.1
URBAN	EMPLOYED	EDUC	2.327	3	0.776	1.453	0.2
AGE	SEX	EMPLOYED	0.002	1	0.002	0.003	0.9
AGE	SEX	EDUC	1.002	3	0.334	0.626	0.5
AGE	EMPLOYED	EDUC	0.737	3	0.246	0.460	0.7
SEX	EMPLOYED	EDUC	2.184	3	0.728	1.364	0.2
4-WAY INTERACTIONS			4.694	13	0.361	0.677	0.7
URBAN	AGE EMPLOYED	SEX	0.533	1	0.533	0.999	0.3
URBAN	AGE EDUC	SEX	0.861	3	0.287	0.537	0.6
URBAN	AGE EDUC	EMPLOYED	1.470	3	0.490	0.918	0.4
URBAN	SEX	EMPLOYED	0.948	3	0.316	0.592	0.6
AGE	SEX EDUC	EMPLOYED	0.313	3	0.104	0.195	0.9
5-WAY INTERACTIONS			1.604	3	0.535	1.002	0.3
URBAN	AGE EMPLOYED	SEX EDUC	1.604	3	0.535	1.002	0.3
EXPLAINED			834.602	63	13.248	24.821	0.0
RESIDUAL			3214.126	6022	0.534		
TOTAL			4048.728	6085	0.665		

Table B.25 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Jobs - Service

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF
MAIN EFFECTS			33.321	7	4.760	11.207	0.[illegible]
URBAN			8.669	1	8.669	20.410	0.[illegible]
AGE			0.328	1	0.328	0.771	0.[illegible]
SEX			18.513	1	18.513	43.587	0.[illegible]
EMPLOYED			1.479	1	1.479	3.483	0.0[illegible]
EDUC			9.600	3	3.200	7.534	0.0[illegible]
2-WAY INTERACTIONS			26.357	18	1.464	3.447	0.0[illegible]
URBAN	AGE		0.426	1	0.426	1.003	0.[illegible]
URBAN	SEX		0.355	1	0.355	0.837	0.[illegible]
URBAN	EMPLOYED		0.237	1	0.237	0.558	0.4[illegible]
URBAN	EDUC		3.326	3	1.109	2.610	0.0[illegible]
AGE	SEX		2.550	1	2.550	6.003	0.0[illegible]
AGE	EMPLOYED		0.077	1	0.077	0.180	0.[illegible]
AGE	EDUC		3.623	3	1.208	2.843	0.0[illegible]
SEX	EMPLOYED		0.591	1	0.591	1.391	0.[illegible]
SEX	EDUC		9.526	3	3.175	7.476	0.0[illegible]
EMPLOYED	EDUC		0.619	3	0.206	0.486	0.[illegible]
3-WAY INTERACTIONS			10.173	22	0.462	1.089	0.[illegible]
URBAN	AGE	SEX	0.011	1	0.011	0.027	0.8[illegible]
URBAN	AGE	EMPLOYED	0.055	1	0.055	0.130	0.7[illegible]
URBAN	AGE	EDUC	1.298	3	0.433	1.019	0.[illegible]
URBAN	SEX	EMPLOYED	1.737	1	1.737	4.089	0.0[illegible]
URBAN	SEX	EDUC	3.070	3	1.023	2.410	0.0[illegible]
URBAN	EMPLOYED	EDUC	2.111	3	0.704	1.656	0.1[illegible]
AGE	SEX	EMPLOYED	0.001	1	0.001	0.002	0.9[illegible]
AGE	SEX	EDUC	1.167	3	0.389	0.916	0.4[illegible]
AGE	EMPLOYED	EDUC	0.573	3	0.191	0.449	0.7[illegible]
SEX	EMPLOYED	EDUC	0.731	3	0.244	0.573	0.6[illegible]
4-WAY INTERACTIONS			6.937	13	0.534	1.256	0.2[illegible]
URBAN	AGE	SEX	0.942	1	0.942	2.219	0.1[illegible]
	EMPLOYED						
URBAN	AGE	SEX	2.980	3	0.993	2.338	0.0[illegible]
	EDUC						
URBAN	AGE	EMPLOYED	0.894	3	0.298	0.702	0.5[illegible]
	EDUC						
URBAN	SEX	EMPLOYED	0.759	3	0.253	0.596	0.6[illegible]
AGE	SEX	EMPLOYED	0.604	3	0.201	0.474	0.7[illegible]
	EDUC						
5-WAY INTERACTIONS			1.661	3	0.554	1.304	0.2[illegible]
URBAN	AGE	SEX	1.661	3	0.554	1.304	0.2[illegible]
	EMPLOYED	EDUC					
EXPLAINED			78.449	63	1.245	2.932	0.0[illegible]
RESIDUAL			2557.794	6022	0.425		
TOTAL			2636.243	6085	0.433		

Table B.26 - Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand Jobs - Tourist

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF
MAIN EFFECTS							
URBAN			103.545	7	14.792	31.166	0.0
AGE			0.004	1	0.004	0.009	0.9
SEX			5.938	1	5.938	12.511	0.0
EMPLOYED			8.400	1	8.400	17.699	0.0
EDUC			1.003	1	1.003	2.113	0.1
			51.918	3	17.306	36.462	0.0
2-WAY INTERACTIONS							
URBAN	AGE		6.428	18	0.357	0.752	0.7
URBAN	SEX		1.775	1	1.775	3.741	0.0
URBAN	EMPLOYED		0.823	1	0.823	1.734	0.1
URBAN	EDUC		0.438	1	0.438	0.923	0.3
AGE	SEX		1.618	3	0.539	1.136	0.3
AGE	EMPLOYED		0.045	1	0.045	0.094	0.7
AGE	EDUC		0.772	1	0.772	1.626	0.2
SEX	EMPLOYED		0.404	3	0.135	0.284	0.8
SEX	EDUC		0.427	1	0.427	0.899	0.3
EMPLOYED	EDUC		2.080	3	0.693	1.460	0.2
			1.397	3	0.466	0.981	0.4
3-WAY INTERACTIONS							
URBAN	AGE	SEX	14.091	22	0.641	1.349	0.1
URBAN	AGE	EMPLOYED	0.424	1	0.424	0.894	0.3
URBAN	AGE	EDUC	0.019	1	0.019	0.040	0.8
URBAN	SEX	EMPLOYED	0.118	3	0.039	0.083	0.9
URBAN	SEX	EDUC	0.928	1	0.928	1.954	0.1
URBAN	EMPLOYED	EDUC	5.792	3	1.931	4.068	0.0
AGE	SEX	EMPLOYED	3.207	3	1.069	2.252	0.0
AGE	SEX	EDUC	0.595	1	0.595	1.255	0.2
AGE	EMPLOYED	EDUC	1.467	3	0.489	1.030	0.3
SEX	EMPLOYED	EDUC	0.617	3	0.206	0.433	0.7
			1.673	3	0.558	1.175	0.3
4-WAY INTERACTIONS							
URBAN	AGE	SEX	6.136	13	0.472	0.994	0.4
	EMPLOYED		1.104	1	1.104	2.325	0.1
URBAN	AGE	SEX					
	EDUC		0.755	3	0.252	0.530	0.6
URBAN	AGE	EMPLOYED					
	EDUC		3.486	3	1.162	2.448	0.0
URBAN	SEX	EMPLOYED					
			0.290	3	0.097	0.204	0.8
AGE	SEX	EMPLOYED					
	EDUC		1.388	3	0.463	0.975	0.4
5-WAY INTERACTIONS							
URBAN	AGE	SEX	0.550	3	0.183	0.386	0.7
	EMPLOYED	EDUC	0.550	3	0.183	0.386	0.7
EXPLAINED			130.750	63	2.075	4.373	0.0
RESIDUAL			2770.863	5838	0.475		
TOTAL			2901.612	5901	0.492		

Table B.27 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Home Economics

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF
MAIN EFFECTS							
URBAN			423.132	7	60.447	243.308	0.0
AGE			0.542	1	0.542	2.183	0.1
SEX			1.873	1	1.873	7.539	0.0
EMPLOYED			370.537	1	370.537	1491.454	0.0
EDUC			0.076	1	0.076	0.306	0.5
			3.881	3	1.294	5.208	0.0
2-WAY INTERACTIONS							
URBAN	AGE		9.524	18	0.529	2.130	0.0
URBAN	SEX		0.210	1	0.210	0.847	0.3
URBAN	EMPLOYED		0.238	1	0.238	0.957	0.3
URBAN	EDUC		0.138	1	0.138	0.557	0.4
AGE	SEX		2.813	3	0.938	3.775	0.0
AGE	EMPLOYED		2.326	1	2.326	9.363	0.0
AGE	EDUC		0.004	1	0.004	0.015	0.9
SEX	EMPLOYED		0.867	3	0.289	1.163	0.3
SEX	EDUC		0.070	1	0.070	0.280	0.5
EMPLOYED	EDUC		0.884	3	0.295	1.186	0.3
			1.192	3	0.397	1.600	0.1
3-WAY INTERACTIONS							
URBAN	AGE	SEX	7.079	22	0.322	1.295	0.1
URBAN	AGE	EMPLOYED	0.475	1	0.475	1.913	0.1
URBAN	AGE	EDUC	1.195	1	1.195	4.810	0.0
URBAN	SEX	EMPLOYED	1.245	3	0.415	1.671	0.1
URBAN	SEX	EDUC	0.252	1	0.252	1.014	0.3
URBAN	EMPLOYED	EDUC	1.921	3	0.640	2.578	0.0
AGE	SEX	EMPLOYED	0.590	3	0.197	0.791	0.4
AGE	SEX	EDUC	0.140	1	0.140	0.564	0.4
AGE	EMPLOYED	EDUC	0.833	3	0.278	1.118	0.3
SEX	EMPLOYED	EDUC	1.077	3	0.359	1.445	0.2
			1.284	3	0.428	1.723	0.1
4-WAY INTERACTIONS							
URBAN	AGE	SEX	3.458	13	0.266	1.071	0.3
	EMPLOYED		0.228	1	0.228	0.920	0.3
URBAN	AGE	SEX	1.615	3	0.538	2.167	0.0
	EDUC						
URBAN	AGE	EMPLOYED	0.155	3	0.052	0.208	0.8
	EDUC						
URBAN	SEX	EMPLOYED	0.751	3	0.250	1.008	0.3
AGE	SEX	EMPLOYED	0.218	3	0.073	0.292	0.8
	EDUC						
5-WAY INTERACTIONS							
URBAN	AGE	SEX	2.220	3	0.740	2.978	0.0
	EMPLOYED	EDUC	2.220	3	0.740	2.978	0.0
EXPLAINED			445.414	63	7.070	28.458	0.0
RESIDUAL			1450.393	5838	0.248		
TOTAL			1895.806	5901	0.321		

Table B.28 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Education and Culture

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF
MAIN EFFECTS			162.345	7	23.192	61.490	0.[illegible]
URBAN			0.692	1	0.692	1.836	0.[illegible]
AGE			1.662	1	1.662	4.406	0.[illegible]
SEX			11.368	1	11.368	30.141	0.[illegible]
EMPLOYED			0.468	1	0.468	1.241	0.[illegible]
EDUC			92.566	3	30.855	81.808	0.[illegible]
2-WAY INTERACTIONS			10.258	18	0.570	1.511	0.[illegible]
URBAN	AGE		0.003	1	0.003	0.007	0.[illegible]
URBAN	SEX		0.253	1	0.253	0.671	0.[illegible]
URBAN	EMPLOYED		0.025	1	0.025	0.067	0.[illegible]
URBAN	EDUC		0.470	3	0.157	0.415	0.[illegible]
AGE	SEX		1.537	1	1.537	4.075	0.[illegible]
AGE	EMPLOYED		0.422	1	0.422	1.119	0.[illegible]
AGE	EDUC		0.183	3	0.061	0.162	0.[illegible]
SEX	EMPLOYED		0.209	1	0.209	0.555	0.[illegible]
SEX	EDUC		3.869	3	1.290	3.419	0.[illegible]
EMPLOYED	EDUC		1.000	3	0.333	0.883	0.[illegible]
3-WAY INTERACTIONS			8.949	22	0.407	1.078	0.[illegible]
URBAN	AGE	SEX	2.790	1	2.790	7.398	0.[illegible]
URBAN	AGE	EMPLOYED	0.855	1	0.855	2.266	0.[illegible]
URBAN	AGE	EDUC	0.475	3	0.158	0.419	0.[illegible]
URBAN	SEX	EMPLOYED	0.209	1	0.209	0.554	0.[illegible]
URBAN	SEX	EDUC	3.110	3	1.037	2.749	0.[illegible]
URBAN	EMPLOYED	EDUC	0.391	3	0.130	0.345	0.[illegible]
AGE	SEX	EMPLOYED	0.053	1	0.053	0.141	0.[illegible]
AGE	SEX	EDUC	0.199	3	0.066	0.176	0.[illegible]
AGE	EMPLOYED	EDUC	0.320	3	0.107	0.283	0.[illegible]
SEX	EMPLOYED	EDUC	0.732	3	0.244	0.647	0.[illegible]
4-WAY INTERACTIONS			5.922	13	0.456	1.208	0.[illegible]
URBAN	AGE EMPLOYED	SEX	0.195	1	0.195	0.518	0.[illegible]
URBAN	AGE EDUC	SEX	0.634	3	0.211	0.560	0.[illegible]
URBAN	AGE EDUC	EMPLOYED	3.065	3	1.022	2.708	0.[illegible]
URBAN	SEX	EMPLOYED	1.513	3	0.504	1.337	0.[illegible]
AGE	SEX EDUC	EMPLOYED	0.475	3	0.158	0.420	0.[illegible]
5-WAY INTERACTIONS			1.035	3	0.345	0.914	0.[illegible]
URBAN	AGE EMPLOYED	SEX EDUC	1.035	3	0.345	0.914	0.[illegible]
EXPLAINED			188.508	63	2.992	7.933	0.0
RESIDUAL			2201.906	5838	0.377		
TOTAL			2390.414	5901	0.405		

Table B.29 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Recreation - Participative

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGN OF F
MAIN EFFECTS			142.753	7	20.393	75.155	0.0
URBAN			1.521	1	1.521	5.607	0.0
AGE			11.389	1	11.389	41.973	0.0
SEX			1.309	1	1.309	4.823	0.0
EMPLOYED			0.542	1	0.542	1.997	0.1
EDUC			71.152	3	23.717	87.405	0.0
2-WAY INTERACTIONS			5.974	18	0.332	1.223	0.2
URBAN	AGE		0.432	1	0.432	1.591	0.2
URBAN	SEX		0.509	1	0.509	1.877	0.1
URBAN	EMPLOYED		0.265	1	0.265	0.976	0.3
URBAN	EDUC		0.336	3	0.112	0.413	0.7
AGE	SEX		0.343	1	0.343	1.263	0.2
AGE	EMPLOYED		0.832	1	0.832	3.065	0.0
AGE	EDUC		0.606	3	0.202	0.744	0.5
SEX	EMPLOYED		0.178	1	0.178	0.656	0.4
SEX	EDUC		1.471	3	0.490	1.807	0.1
EMPLOYED	EDUC		1.739	3	0.580	2.136	0.0
3-WAY INTERACTIONS			7.235	22	0.329	1.212	0.2
URBAN	AGE	SEX	1.146	1	1.146	4.223	0.04
URBAN	AGE	EMPLOYED	0.058	1	0.058	0.214	0.64
URBAN	AGE	EDUC	1.023	3	0.341	1.257	0.28
URBAN	SEX	EMPLOYED	0.612	1	0.612	2.255	0.1
URBAN	SEX	EDUC	1.956	3	0.652	2.403	0.06
URBAN	EMPLOYED	EDUC	0.112	3	0.037	0.137	0.97
AGE	SEX	EMPLOYED	0.105	1	0.105	0.387	0.53
AGE	SEX	EDUC	1.802	3	0.601	2.213	0.08
AGE	EMPLOYED	EDUC	0.132	3	0.044	0.163	0.92
SEX	EMPLOYED	EDUC	0.685	3	0.228	0.841	0.47
4-WAY INTERACTIONS			3.579	13	0.275	1.014	0.43
URBAN	AGE EMPLOYED	SEX	0.009	1	0.009	0.033	0.85
URBAN	AGE EDUC	SEX	0.407	3	0.136	0.500	0.68
URBAN	AGE EDUC	EMPLOYED	1.326	3	0.442	1.629	0.18
URBAN	SEX	EMPLOYED	0.930	3	0.310	1.143	0.32
AGE	SEX EDUC	EMPLOYED	0.523	3	0.174	0.643	0.58
5-WAY INTERACTIONS			1.384	3	0.461	1.700	0.16
URBAN	AGE EMPLOYED	SEX EDUC	1.384	3	0.461	1.700	0.16
EXPLAINED			160.925	63	2.534	9.413	0.0
RESIDUAL			1584.145	5838	0.271		
TOTAL			1745.069	5901	0.296		

Table B.30 Analysis of Variance of Effects of Residence, Age, Sex, Employment and Education on Demand - Recreation - Spectator

SOURCE OF VARIATION			SUM OF SQUARES	DF	MEAN SQUARE	F	SIG OF
MAIN EFFECTS			315.594	7	45.085	119.910	0.0
URBAN			0.793	1	0.793	2.092	0.1
AGE			12.935	1	12.935	34.115	0.0
SEX			132.110	1	132.110	348.435	0.0
EMPLOYED			1.738	1	1.738	4.585	0.0
EDUC			69.645	3	23.215	61.229	0.0
2-WAY INTERACTIONS			14.323	18	0.796	2.099	0.0
URBAN	AGE		0.964	1	0.964	2.541	0.1
URBAN	SEX		4.688	1	4.688	12.365	0.0
URBAN	EMPLOYED		1.450	1	1.450	3.825	0.0
URBAN	EDUC		2.302	3	0.767	2.024	0.1
AGE	SEX		0.000	1	0.000	0.000	0.0
AGE	EMPLOYED		1.139	1	1.139	3.004	0.0
AGE	EDUC		1.658	3	0.553	1.457	0.2
SEX	EMPLOYED		0.545	1	0.545	1.438	0.2
SEX	EDUC		3.243	3	1.081	2.851	0.0
EMPLOYED	EDUC		3.374	3	1.125	2.966	0.0
3-WAY INTERACTIONS			8.073	22	0.367	0.968	0.5
URBAN	AGE	SEX	1.223	1	1.223	3.227	0.0
URBAN	AGE	EMPLOYED	0.009	1	0.009	0.025	0.8
URBAN	AGE	EDUC	0.740	3	0.247	0.650	0.5
URBAN	SEX	EMPLOYED	0.053	1	0.053	0.139	0.7
URBAN	SEX	EDUC	3.572	3	1.191	3.140	0.0
URBAN	EMPLOYED	EDUC	0.118	3	0.039	0.104	0.9
AGE	SEX	EMPLOYED	0.125	1	0.125	0.330	0.5
AGE	SEX	EDUC	0.268	3	0.089	0.235	0.8
AGE	EMPLOYED	EDUC	0.846	3	0.282	0.744	0.5
SEX	EMPLOYED	EDUC	0.129	3	0.043	0.113	0.9
4-WAY INTERACTIONS			5.619	13	0.432	1.140	0.3
URBAN	AGE EMPLOYED	SEX	0.781	1	0.781	2.060	0.1
URBAN	AGE EDUC	SEX	1.774	3	0.591	1.563	0.1
URBAN	AGE EDUC	EMPLOYED	1.622	3	0.541	1.426	0.2
URBAN	SEX	EMPLOYED	0.446	3	0.149	0.392	0.7
AGE	SEX EDUC	EMPLOYED	0.313	3	0.104	0.275	0.8
5-WAY INTERACTIONS			2.128	3	0.709	1.871	0.1
URBAN	AGE EMPLOYED	SEX EDUC	2.128	3	0.709	1.871	0.1
EXPLAINED			345.736	63	5.488	14.474	0.0
RESIDUAL			2213.494	5838	0.379		
TOTAL			2559.230	5901	0.434		

APPENDIX C

Cross - Tabulations of 5 Classification Factors With First Preferred Media and Agencies

Cross-tabulation of classification factors with first preferred media and agencies were done to determine if each classification factor made a significant difference in preference. For discussion in the report (Table III.11) ranks were constructed for each classification sub-category of those media and agencies (combined) preferred first by at least 10% of the sample. Ranks were then compared across sub-categories of each classification factor. The raw data frequencies and percentages from which the ranks were drawn are presented in the following tables.

Table C.1 Frequencies and Percentages for Cross-Tabulations of Residence with first Preferred Media and Agencies

MEDIA	URBAN		RURAL	
	N=5256	%	N=1912	%
1. Television	2604	49	590	30
2. Radio	1605	30	1125	58
3. Newspapers	466	9	91	5
4. Magazines	319	6	39	2
5. Movies/Theater	30	.5	7	.5
6. Mail	208	4	54	3
7. Telephone	24	.5	6	.5
AGENCIES	**N=5230**	**%**	**N=1902**	**%**
8. Library	1850	35	280	15
9. Church	897	17	693	36
10. Social Club	497	9	128	7
11. Local Authorities	651	12	289	15
12. Government Offices	504	9	146	8
13. Cooperatives	318	6	190	10
14. Public Address Vans	37	.5	32	2
15. Ag Extension Agent	175	3	40	2
16. Community Developer	44	1	60	3
17. FOCCO	109	2	12	.5
18.. Health Center	38	1	10	.5
19. School Organization	54	1	16	.5
20. Houses of Culture	42	1	2	0
21. Adult Education Center	17	.5	4	0
22. Schools	0	0	0	0

Table C.2 Frequencies and Percentages for Cross-Tabulations of Sex with First Preferred Media and Agencies

MEDIA	MALE		FEMALE	
	N=3699	%	N=3474	%
1. Television	1591	43	1605	46
2. Radio	1420	38	1314	38
3. Newspapers	314	8	1314	38
4. Magazines	216	6	141	4
5. Movies/Theater	20	.5	17	.5
6. Mail	128	4	134	4
7. Telephone	10	.5	20	.5
AGENCIES	N=3678	%	N=3459	%
8. Library	1225	33	907	26
9. Church	639	17	954	27
10. Social Club	348	9	273	8
11. Local Authorities	518	14	422	12
12. Government Offices	340	9	310	9
13. Cooperatives	238	6	271	8
14. Public Address Vans	52	1	17	.5
15. Ag Extension Agents	97	3	118	3
16. Community Developer	76	2	28	1
17. FOCCO	53	1	68	2
18. Health Center	25	1	23	1
19. School Organization	29	1	41	1
20. Houses of Culture	28	1	16	.5
21. Adult Education Center	10	.5	11	.5
22. Schools	0	0	0	0

Table C.3 Frequencies and Percentages for Cross-Tabulation of Age with First Preferred Media and Agencies

MEDIA	≤ 30		> 30	
	N=3058	%	N=4072	%
1. Television	1398	46	1781	44
2. Radio	1976	35	1635	40
3. Newspapers	272	9	286	7
4. Magazines	173	6	182	5
5. Movies/Theater	18	.5	17	.5
6. Mail	114	4	148	4
7. Telephone	7	.5	23	.5
AGENCIES	N=3050	%	N=4045	%
8. Library	1092	36	1029	25
9. Church	502	16	1084	27
10. Social Club	289	9	326	8
11. Local Authorities	374	12	558	14
12. Government Offices	279	9	364	9
13. Cooperatives	223	7	284	7
14. Public Address Vans	27	1	42	1
15. Ag Extension Agents	97	3	118	3
16. Community Developers	31	1	73	2
17. FOCCO	60	2	61	2
18. Health Center	18	.5	30	1
19. School Organization	30	1	39	1
20. Houses of Culture	18	.5	26	1
21. Adult Education Center	10	.5	11	.5
22. Schools	0	0	0	0

Table C.4 Frequencies and Percentages for Cross-Tabulation of Employed with First Preferred Media and Agencies

EDIA	EMPLOYED		UNEMPLOYED	
	N=4520	%	N=2369	%
. Television	2058	45	1000	42
. Radio	1591	35	1035	44
. Newspapers	391	9	151	6
. Magazines	267	6	83	4
. Movies/Theater	27	.5	8	.5
. Mail	167	4	82	4
. Telephone	19	.5	10	.5
ENCIES	N=4501	%	N=2352	%
. Library	1494	33	561	24
. Church	839	19	687	30
. Social Club	401	9	185	8
. Local Authorities	595	13	298	13
. Government Offices	428	9	194	8
. Cooperatives	310	7	192	8
. Public Address Vans	49	1	18	1
. Ag Extension Agents	118	3	88	4
. Community Developers	65	1	36	1.5
. FOCCO	79	2	39	2
. Health Center	29	.5	18	1
. School Organization	50	1	17	1
. Houses of Culture	31	1	11	.5
. Adult Education Center	13	.5	8	.5
. Schools	0	0	0	0

Table C.5 Frequencies and Percentages for Cross-Tabulation of Education with First Preferred Media and Agencies

MEDIA	NONE		PRIMARY		BASIC		SECONDARY +	
	N=712	%	N=3558	%	N=1097	%	N=1631	%
1. Television	258	36	1392	39	559	51	904	55
2. Radio	396	56	1621	46	304	28	349	21
3. Newspapers	31	4	269	8	107	9	136	8
4. Magazines	6	1	119	3	66	6	161	9
5. Movies/Theater	6	1	13	.5	3	.5	15	1
6. Mail	12	2	133	4	51	5	59	4
7. Telephone	3	.5	11	.5	7	.5	7	.5
AGENCIES	N=712	%	N=3545	%	N=1083	%	N=1622	%
8. Library	77	11	872	25	429	40	702	43
9. Church	322	45	954	27	134	12	143	9
10. Social Club	30	4	250	7	106	9	217	13
11. Local Authorities	95	13	530	15	135	12	165	10
12. Government Offices	46	7	313	9	115	11	159	10
13. Cooperatives	69	9	289	8	66	6	72	4
14. Public Address Vans	10	1	35	1	7	.5	15	1
15. Ag Extension Agents	20	3	117	3	28	3	44	3
16. Community Developer	17	2	58	2	9	1	19	1
17. FOCCO	8	1	45	1	23	2	41	3
18. Health Center	8	1	20	1	7	.5	12	.5
19. School Organization	6	1	35	1	10	1	17	1
20. Houses of Culture	1	0	15	.5	13	1	13	1
21. Adult Education Center	3	.5	12	.5	1	0	3	.5
22. Schools	0	0	0	0	0	0	0	0

APPENDIX D

Description of Sample in Terms of Five Classification Factors

(Note: Discrepancy in totals and full sample N=7244 due to missing data)

		N	%
I:	Residence		
	A. Urban	5305	73%
	B. Rural	1931	27%
	Total	7236	
II.	Sex		
	A. Male	3734	51.5%
	B. Female	3506	48.5%
	Total	7240	
III.	Age		
	A. 30 and under	3083	42.8%
	B. Over 30	4114	57.2%
	Total	7197	
IV.	Employed		
	A. Yes	4565	65.6%
	B. No	2387	34.4%
	Total	6952	
V.	Education		
	A. No Education	725	10.3%
	B. Primary 3 or 6 Completed	3592	50.9%
	C. Basic completed	1101	15.5%
	D. Some or all Secondary completed	1644	23.3%
	Total	7062	

IV. The Work-Force Study: A General Assessment of Relevance

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IV. Relevance

1.0 The Coverage of General Relevance Assessments

The Introduction to this report noted that the Work-Force Study and the Household Study analyzed the general relevance relationship of education (crudely measured by level of attainment) to economic outcomes (crudely measured by average earnings and income). The assumption underlying these studies and the analysis to follow is: if education is relevant, in this case effective for enhancing economic performance, then the relationship should be revealed by analysis results which demonstrate that more education goes with higher economic performance and less education with lower economic performance. To accept this version of the effect of education on economic outcomes requires that the analyst accept these propositions:

1. Educational attainment can be measured by the number of grades of school completed, i.e. the highest grade of school attained by members of households sampled.

2. Educational attainment so measured can serve as a measure of the learning that results from formal schooling.

3. The learning that results from formal schooling serves to enhance economic performance i.e. production and productivity.

4. Enhanced economic performance results in increased earnings (Marginal wages equal marginal product).

5. The relationship between increase in schooling and increase in earnings (as averaged and traced between the several stages noted above) can be reflected in the form of a simple mathematical function of the kind that underlies least squares, regression and path analysis (see Appendix 1).

Acceptance of most, if not all, of the five propositions, is the basis for the major research activity carried on by human capital theorists and analysts in the economics of education over the past decade. This includes work on the education production function, rate of return, and some approaches to manpower requirements studies and cost-benefit analysis. The work of Bowles, Levin , Coleman, Jencks and the International Education Achievement Studies typify this approach to the analysis of education and its relevance to economic performance. The simplism of the approach has been criticized, (Bowles and Gintis, Bowles and Levin, Leucke and McGinn, Davis, Hudson and Lewis). Yet, if the bold sweep of the underlying assumption is admitted and kept constantly in the mind of the analyst, the method, though simple, has considerable heuristic advantage for explaining and analyzing a limited span of educational relevance relationships .

If we hark back to Schema I in the Introductory section, most economics of education studies cover the span of relationships from Stage IV (Education and Training Results)measured by educational attainment or educational achievement to Stage VI (Work Performance Outcome) measured in earnings differences, but without explicit attention to Stage V (Work Performance Indicating Learning).

In Schema I the relevance of education to economic and social outcomes was defined as a series of relationships between education, learning, work performance and economic and social outcomes. The statistical models and methods appropriate for analyzing these relationships are based on simple correlation (relationships between education and other variables considered one at a time), and multiple regression and correlation (relationship of

education and other variables considered as a set of independent variables) to a single dependent variable, e.g. earnings. This is a simple model of relationships assessed in the Household study where Education* and a set of other independent variables are used to explain variation in Income (earnings). The square of the multiple correlation coefficient is interpreted as the percent of variance explained in the dependent variable Income by the set of independent variables. (CF Statistical Appendix 1). Stated more starkly the analysis reveals how much of the differences in earnings can be attributed to differences in education.

In the Work Force Study two sets of statistical analyses are performed: 1. a Descriptive and Bi-variate Analysis, and 2. a Multivariate Analysis. The multivariate analysis begins with a linear regression model, and then develops theoretical models in the form of path models, which reflect the relationships of education to economic and social outcomes. The path model shows direct and indirect relationships (relationships of education and earnings as affected by other variables such as Sex, Birthplace and Occupation). When Education is included as a prior variable to Earnings in the path model the analyst is testing how education affects earnings--the relevance of education to earnings.

2.0 Relevance of Education and Earnings as Shown in the Household Study

Data from the Household Study provide a simple illustration of the basic correlation and regression analysis used to assess the relationship of education and economic outcomes. The data base is limited to analysis of six variables on heads of households with children who were tested in the national achievement examination: 1. Income (this is almost

* When some words are capitalized they are being refered to as variables rather than general concepts, e.g. Education, Income...

entirely the earnings of the head of household in the past month); 2. Age; 3. Sex; 4. Education (highest grade in school successfully completed); 5. Literacy (the enumerator judges whether the head of household can read or write, usually by asking him); 6. Residence (Rural/Urban). In simplest form the model consisted of analyzing the relationship among the six variables, as shown in the correlation matrix of Table IV-1 and then performing a regression analysis in which Income is the dependent variable and the other five variables are treated as independent variables. The simple correlations among the six variables are shown in Table IV-1.

At the level of simple correlations the most noteworthy features of the data are: a. Education is the variable most highly correlated with Income, which foreshadows a strong relationship in the regression model to follow, wherein Education will be one of the independent variables and Income will be the dependent variable. The next strongest relationship with Income is Residence which reflects rural disadvantage, the fact that urban residence goes with higher earnings. Literacy is correlated with Income because it is highly, though far from perfectly, related to Education. This lack of perfect relationship reveals the weakness of the subjective measure of Literacy, and the imperfection of the measure of Education. Age is negatively, though weakly, related to Income, Education, Literacy and Residence. This reflects a cluster of disadvantages for older, largely rural people who have less education and lower earnings. SEX (Female/Male) has a slight relationship (-.13) with RESIDENCE (R/U). There are more female heads of households in urban, rather than rural areas, and because there is a general bias in favor of urban residents this washes out any relationship between female education and earnings. Education, as noted goes strongly with Income (.49) and with Literacy, and shows the relationship

Table IV.1 : Correlation Matrix for Household Questionnaire

	INCOME	AGE	SEX	EDUC	LITERACY	RESIDENCE
INCOME	1.00000	-0.01098	0.08823	0.49130	0.15201	0.17238
AGE	-0.01098	1.00000	0.07937	-0.15087	-0.12286	-0.06114
SEX	0.08823	0.07937	1.00000	0.04544	0.04938	-0.12633
EDUC	0.49130	-0.15087	0.04544	1.00000	0.50078	0.39667
LITERACY	0.15201	-0.12286	0.04938	0.50078	1.00000	0.26178
RESIDENCE	0.17238	-0.06114	-0.12633	0.39667	0.26178	1.00000

with Urban residence (.39) and age (-.15) which reflects past generational and locational inequality in provision of educational services in El Salvador.

Table IV.2 shows the first regression run with Income as the dependent variable and a set of independent variables -- Education, Literacy, Sex, Age, and Residence. The multiple correlation, with Education entered into the analysis and the other variables held constant, is .49 with Income as the dependent variable. Interpreting the square of the multiple correlation coefficient as percent of variance explained, about a quarter of the variation (increase) in earnings is attributable to variation (increased attainment) in education. Even with crude measures and a simplistic model, there is a fairly strong indication that education is relevant, i.e. is related to, economic performance measured by earnings. It is also apparent in Table IV.2 that the succeeding variables in this multiple regression array, Literacy, Sex, Age, and Residence add little to the variance explained in Income, Education is the variable most strongly related to Income.

Inasmuch as the results of Table IV.2 may have been influended by the order in which the variables were allowed to enter the regression equation it is moderately interesting to change this order, as in Table IV.3 where all except Education are forced to enter first in a stepwise regression, and then Education is allowed to enter the analysis.

With the four variables entered (Residence, Age, Sex and Literacy) five percent of the variance in Income is attributable to the four combined. When Education is allowed to enter last, the percent of variance explained jumps to 26, indicating that the order of entering of education affects the matter only slightly and Education is far and away the most powerful variable to affect economic performance, given the limited

Table IV-2 Summary Table for the Step-Wise Regression of Income on Selected Variables

DEPENDENT VARIABLE.. INCOME

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
EDUC	0.49130	0.24137	0.24137	0.49130	232.39363	0.56096
LITERACY	0.50316	0.25317	0.01180	0.15201	-154.97795	-0.12388
SEX	0.50792	0.25798	0.00481	0.08823	86.39021	0.06384
AGE	0.51057	0.26068	0.00270	-0.01098	2.92322	0.05297
RESIDENCE	0.51060	0.26072	0.00003	0.17238	-7.02679	-0.00640
(CONSTANT)					-326.77535	

Table IV-3

Summary Table for the Regression of Income on Selected Variables, with Education Entered Last

DEPENDENT VARIABLE.. INCOME

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
RESIDENCE	0.17238	0.02971	0.02971	0.17238	-7.02679	-0.00640
AGE	0.17238	0.02972	0.00000	-0.01098	2.92322	0.05297
SEX	0.20515	0.04209	0.01237	0.08823	86.39021	0.06384
LITERACY	0.22879	0.05234	0.01026	0.15201	-154.97795	-0.12388
EDUC	0.51060	0.26072	0.20837	0.49130	232.39363	0.56096
(CONSTANT)					-326.77535	

set of variables analyzed in the Household data base. The Household data base is mainly of use in presenting the basic model which will be used in the analysis of the Work-Force data base.

3.1 Relevance of Education to Economic and Social Outcome Variables in the Work Force Study

The Work-Force Study provides a data base which is far more adequate for studying the relevance of education to economic and social outcomes in El Salvador. To study the main clusters of relevance relationships four data files were created from the 33,000 individual records of the data base:

1. The Economically Active File--A data-file of those identified as "economically active" by the questionnaire (i.e. working or seeking work), N=10, 526..

From the Economically Active File, two Sub-Files were created:

2. Heads of Household (Economically Active, Male or Female, head of Household) -- N=5,036.

3. Working Dependents (Economically Active, not Head, usually working children living at home) -- N=2,873.

4. Women's File (Females 12 years or older) From the general data base a Women's File was created. N=11,440

The four files were used to test a variety of relevance relationships of education, both to economic and social outcomes:

A. The relationship of educational attainment to economic performance, measured by earnings:

a. This relationship was analyzed for the economically active population of File 1.

b. The relationship was also analyzed for Heads of Household in the Economically Active Population of File 2.

c. The relationship was also analyzed for Working Dependents of File 3.

B. The relationship of educational attainment to economic performance as this is influenced by generational differences. The effect of the socio-economic status of heads of household on the relationship of education and earnings of Working Dependents was assessed. Here the object was to study the effects, if any, of education in El Salvador in overcoming, or failing to overcome, social and economic disadvantage in households. Hence the relevance of education to social equity was assessed, insofar as this was measured by the variables analyzed.

C. The relationship of educational attainment (and other variables e.g. working status) to fertility and child bearing, as measured by four variables:

a. Fecundity 1 (number of live births per year of fertility)

b, Fecundity 2 (Children per year since first live birth);

c. Proportion of Children Surviving;

d. Woman's age when first child born.

D. The relevance of education for overcoming other demographic and social characteristics, rural/urban birthplace, residence and migration, sex differences in access to education, occupations and earnings; and age and generational differences in access to education, occupations, and earnings

E. The relationships among Education, Earnings and other variables to socio economic status as measured by the variable Life Style (an index of household possession and amenities).

Broadly described the study sought to assess the relationship of educational attainment to economic outcomes, economic and social equity, and fertility, and to assess the effects of other variables (Age, Residence) on the education and outcome relationships.

3.2 The Relevance of Education to Economic and Social Outcomes For the Economically Active Population of El Salvador

The relevance of education to economic and social outcomes for the economically active population of El Salvador will be broadly characterized by analyzing the data of the work force study in two stages. The first stage sets out certain descriptive properties of the variables in the four data files created. A limited number of bi-variate analyses of variables is also presented in the next section. In a concluding section a multi-variate analysis of relationships will be offered, beginning with a simple regression analysis of the type already illustrated in the Household Study, and ending with a set of path models and analyses.

Univariate and Bivariate Description of the Economically Active Population

3.3. Univariate Description

Demographic, education and employment characteristics of the economically active population are shown in Table IV-4. This table serves to define in broad terms the sample of respondents in the Work Force Survey used for the analysis in this section of the Report. The economically active population is predominantly male (68%), younger than 35 years of age, and reside in urban areas of Salvador (59%). Two thirds have had less than six years of schooling, the distribution of educational attainment being quite skewed, with large numbers of people having little or no formal education and a few people having a lot (6% with 12 or more years).

Approximately 40 percent of the economically active population is employed in some agricultural capacity, some as agricultural owners (12% of the total), and many more are in the large category of workers whose principal occupation is labeled as laborer or peddler. The distribution of occupations also shows that 16 percent of the economically active population is employed as professionals, a figure somewhat misleading because of the aggregate nature of the data as received. On the data tape, occupational codes of individual workers were at the two-digit level, meaning that many lower status occupations could not be differentiated from the higher status ones with the same two digit code. For example, it was not possible to differentiate doctors from any of a variety of medical technicians.

Table IV-4

Selected Frequency Distributions for the Economically Active Population

Variable Category and Name	Code Label	Distributions		
		Absolute Freq.	Adjusted Freq. (Pct)	Cum Freq. (Pct)
I. Demographic	1. Male	7155	68.0	68.0
1. SEX (sex)	2. Female	3371	32.0	100.0
	Missing	0	----	
	Total	10,526	100.0	
2. AGE (age)	1. 10-14	497	4.7	4.7
	2. 15-24	2937	27.9	32.6
	3. 25-34	2404	22.8	55.6
	4. 35-54	3348	31.8	87.3
	5. 55+	1339	12.7	100.0
	Missing	1	----	
	Total	10,526	100.0	
3. RESIDNCE (Residence)	1. Urban	6213	59.0	59.0
	2. Rural	4313	41.0	100.0
	Missing	0	0	-----
	Total	10,526	100.0	
4. BORN (where born)	1. Inner City	1169	11.2	11.2
	2. City	3072	29.4	40.6
	3. Town	1751	16.8	57.4
	4. Country	4456	42.6	100.0
	Missing	78	----	
	Total	10,526	100.0	

Table IV-4 (continued)

Variable Category and Name	Code Label	Distributions		
		Absolute Freq.	Adjusted Freq. (Pct).	Cum Freq. (Pct).
II. Education				
1. YRSEDUC (educational attainment in years)	1. 0, 1	4054	38.5	38.5
	2. 2-5	3105	29.5	68.0
	3. 6-8	1964	18.7	86.7
	4. 9-11	781	7.4	94.1
	5. 12-14	504	4.8	98.9
	6. 15+	118	1.1	100.0
	Missing	0	---	
	Total	10,526	100.0	
III. Employment				
1. OCCUPATN (principal occupation)	1. Laborer, peddler	4463	42.8	42.8
	2. Ag owner	1252	12.0	54.8
	3. Operative	1766	16.9	71.7
	4. Skilled, semi-skilled	946	9.1	80.8
	5. White collar	331	3.2	84.0
	6. Professional	1680	16.1	100.0
	Missing	88	----	
	Total	10,526	100.0	
2. EARNINGS (usual monthly wage, in colones)	1. 10-50	1832	23.0	23.0
	2. 60-80	1195	15.0	38.0
	3. 90-120	1768	22.2	60.2
	4. 120-200	1554	19.5	79.7
	5. 210-300	776	9.7	89.5
	6. 310-400	329	4.1	93.6
	7. 410-1000	389	4.9	98.5
	8. 1010-2000	84	1.1	99.5
	9. 2010+	36	0.5	100.0
	Missing	2563	----	
	Total	10,526	100.0	

Table IV-4 (continued)

Variable Category and Name	Code Label	Absolute Freq.	Adjusted Freq. (Pct).	Cum Freq. (Pct.)
3. INDUSTRY (principal industry)	Agriculture	4298	41.2	41.2
	Mining	14	0.1	41.3
	Mfg, software	993	9.5	50.8
	Metals, other	175	1.7	52.5
	Utilities	40	0.4	52.9
	Construction	464	4.4	57.3
	Wholesale	488	4.7	62.0
	Retail	1021	9.8	71.8
	Hotel	580	5.6	77.4
	Transport	283	2.7	80.1
	Financial	65	0.6	80.7
	Pub. Admin.	427	4.1	84.8
	Pub. Soc. Serv.	486	4.7	89.5
	Commercial Serv	24	0.2	89.7
	Personal Serv.	1071	10.3	100.0
	International	6	0.1	100.0
	Missing	97	----	
	Total	10526	100.0	
4. EMPLSTAT (employment status)	0. Unemployed	244	2.3	2.3
	1. Part-time	1066	10.1	12.4
	2. Full-time	9216	87.6	100.0
	Missing	0	----	
	Total	10526	100.0	
IV. Other				
1. LIFESTYL (style of life index)	0. Low	769	7.3	7.3
	1.	1519	14.4	21.7
	2.	2552	24.2	46.0
	3.	1925	18.3	64.3
	4.	780	7.4	71.7
	5.	462	4.4	76.1
	6.	578	5.5	81.6
	7.	652	6.2	87.8
	8.	596	5.7	93.4
	9. High	693	6.3	100.0
	Missing	0	----	
	Total	10526	100.0	

Nearly nine out of every 10 people who are economically active are employed full-time. The data from this survey also shows that only 2.3% of the population is unemployed, a figure which may underestimate unemployment, for reasons discussed elsewhere in the report. Earnings of the economically active are also highly skewed, with 20 percent earning less than 50 colones a month, 60 percent earning less than 120 colones/month, and only one percent earning 1000 or more colones per month.

Table IV-5 in more abbreviated form than Table IV-4 shows the same kind of information for each of the other three sub-files created from the Work Force data set. Differences of note generally reflect self-evident characteristics--heads of households,for example, are older and earn more on average than working dependents.

3.4. Bivariate Analysis and Comparisons Among Variables

In order to investigate the relationships that may exist among demographic, education, and employment variables it is necessary to move beyond the univariate stage. Of primary concern is the relationship of education to Economic Outcomes. This can be investigated at a macro-level using the data available in the Work Force Survey, the major variables being those described in the previous section. In Table IV-6 the relationship of central concern is between educational attainment and earnings. The table shows a very strong relationship--those with more years of formal schooling earn more. For example, 54 percent of those with one or fewer years of education earn less than 80 colones per month; only 1.7 percent earn more than 400 colones per month. For workers with more education, the figures are reversed. Only 1.9 percent of those individuals with 12-14 years of schooling earn less than 80 colones per

Table IV-5

Measures of Central Tendency and Dispersion

for Selected Variables, by Data File

Variable Category and Name	File Name					
	Heads of Household		Working Dependents		Women	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
I. Demographic						
1. SEX (sex)	1.1	0.4	1.3	0.4	---	---
2. AGE (age)	42.9	14.0	21.9	8.1	26.2	10.7
3. RESIDNCE (urban/rural residence)	1.4	0.5	1.5	0.5	1.4	0.5
4. BORN (where born)	3.0	1.0	3.0	1.1	3.0	1.1
II. Education						
1. YRSEDUC educational attainment in years	3.2	3.9	3.9	3.8	3.5	3.6
2. YRSEDUCP (educational attainment of head of household	---	---	1.6	2.7	---	---
III. Employment						
1. OCCUPATN (principal occupation	2.8	1.8	2.2	1.6	---	---
2. OCCUPATP (occupation of head of household)	---	---	2.6	1.7	---	---
3 EARNINGS (usual monthly wages in tens of colones)	19.0	43.9	12.1	20.3	---	---

Table IV-5 (continued)

	File Name					
	Heads of Household		Working Dependents		Women	
	Mean	Std. Dev.	Mean	Std.Dev.	Mean	Std.Dev.
4. EARNINGSP (usual monthly wage of head of household in tens of colones.	---	---	14.5	39.8	---	---
IV. Other						
1. LIFESTYL (style of life index	3.2	2.4	2.8	2.2	3.4	2.6
2. FECUND1 (children per year of fertility)	---	---	---	---	0.1	0.1
3. PCSURVIV (proportion of children surviving	---	---	---	---	0.9	0.2
4. AGEBIRTH (age at first birth)	---	---	---	---	19.6	3.9

Table IV-6

YEARS OF EDUCATION BY EARNINGS

	ROW PCT COL PCT	EARNINGS (in colones)									
		10-50 1	60-80 2	90-120 3	120-200 4	210-300 5	310-400 6	410-1000 7	1010-2000 8	2010+ 9	ROW TOTAL
YRSEDUC 0, 1	1	33.0 48.7	21.1 47.7	30.0 45.9	10.4 18.1	3.0 10.6	0.8 6.4	1.5 10.5	0.1 2.4	0.1 5.6	2702 33.9
2-5	2	26.7 34.6	17.1 34.0	25.3 34.0	20.4 31.3	6.9 21.3	1.4 10.3	1.6 9.8	0.4 10.7	0.1 8.3	2377 29.9
6-8	3	16.2 14.2	11.8 16.0	18.0 16.5	32.0 33.2	14.2 29.5	4.1 20.1	2.8 11.8	0.7 14.3	0.2 8.3	1615 20.3
9-11	4	5.7 2.1	3.6 2.1	8.0 3.1	27.5 12.2	24.1 21.4	12.5 26.1	15.7 27.8	1.6 13.1	1.4 27.8	690 8.7
12-14	5	1.3 0.3	0.6 0.3	1.7 0.5	16.8 5.0	28.5 17.0	24.0 33.7	22.7 27.0	3.2 17.9	1.1 13.9	463 5.8
15+	6	0.0 0.0	0.0 0.0	0.9 0.1	2.6 0.2	1.7 0.3	9.5 3.3	44.0 13.1	30.2 41.7	11.2 36.1	116 1.5
	COLUMN TOTAL	1832 23.0	1195 15.0	1768 22.2	1554 19.5	776 9.7	329 4.1	389 4.9	84 1.1	36 0.5	7963 100.0

month, while 27 percent earn 400 or more colones. For this table the gamma value, a measure of the degree of association between two variables (see Appendix 1), is 0.51. A value of 0.51 indicates that those individuals with high levels of educational attainment are much more likely, on average, to receive high monthly earnings than those with little formal schooling.

A full range of bivariate relationships were explored using tables similar to Table IV.6. These results can be summarized in a table or matrix of gamma values. This matrix is shown as Table IV-7 and is useful for several purposes. The overall relationship between educational attainment and earnings, as we have just seen, is .51. We might begin to ask whether that relationship varies among various demographic groups, according to whether people are male or female, young or old, or reside in urban or rural settings. Looking at the strengths of the measures of association between these demographic variables and years of education as shown in Table IV-7, we see that both sex and age are only moderately related to educational attainment. Breaking the economically active population into two age groups, those less than 25 and those 25 years or older, and then computing separate tables of educational attainment by earnings for each age group yields gamma values that are quite similar (0.47 for those less than 25 years of age and 0.57 for those older than 25). The relationship improves for older workers as their earnings become more varied over time. The relationship by sex group were investigated using the Head of Household sub-file, again with the same results.

However, it can be noted in Table IV-7 that the relationship between the demographic variables BORN (where born) or RESIDNCE (urban/rural)

Table IV-7

Measures of Association (Gamma Values) for Selected Variables, Economically Active File

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	SEX	---	---	---	---	.173	.311	.334	.190	-.352	.418
(2)	AGE		----	---	---	.115	.396	.123	.022	.299	.137
(3)	BORN				---	-.533	-.407	.076	-.082	-.303	-.477
(4)	RESIDNCE					-.675	-.575	.180	-.175	-.332	-.770
(5)	YRSEDUC					---	.408	-.043	.002	.508	.522
(6)	OCCUPATN						---	-.176	-.093	.345	.367
(7)	EMPLSTAT							---	---	.347	-.007
(8)	HRSWK								---	-.017	.178
(9)	EARNINGS									---	.294
(10)	LIFESTYL										---

and years of education is quite substantial, and in a negative direction. This indicates a strong tendency for those who were born or presently reside in rural regions of Salvador to have received fewer years of schooling than those who were born or presently reside in the urban areas of the country. To investigate the possibility that the relationship between educational attainment and earnings differs according to geographic factors, separate tables were computed by residence (urban/rural). And indeed the relationship changes according to residence -- the strength of the relationship is 0.55 in urban areas, nearly the same as for the economically active population as a whole. But in rural areas, the relationship is considerably weaker, this time being 0.26, reflecting the fact that earnings vary less in rural regions than they do in urban regions and that the amount of formal schooling received by rural residents is less important for predicting what variation in earnings does exist.

Table IV-7 can also be used to give a first indication of the interesting relationships that might reveal themselves in a multivariate analysis involving more than two variables, as in regression or path analyses. We should expect a multivariate analysis that includes the geographic variables RESIDNCE or BORN to show several strong relationships because of all the relationships summarized in Table IV-7, those involving geographic variables are the strongest. For example, those currently residing in rural areas, in addition to being less educated, also earn considerably less and live in housing conditions with fewer amenities.

Additionally, in an analysis in which we were trying to explain the variation in earnings, we might expect that educational attainment would be the best predictor of earnings, based on the gamma values shown in Table IV-7. Beyond that, though, there are a number of other variables that could be important, with gamma values of about +.30 these being sex, age, occupation, and residence. How they interrelate in a more complex model attempting to explain variations in earnings is uncertain from the bivariate results. To adequately explore these kinds of issues and put the variables in a more theoretical framework, it is necessary to move beyond the bivariate stage and begin to investigate the multivariate relationships.

3.5.0. Multivariate Analysis of Education and Economic and Social Outcomes

The first simple model analyzing the relationship of education and economic outcomes in the economically active population is cast in the same form as the analysis of the Household survey data. The work force data is based on a larger and more carefully designed sample of national households, and for the Economically Active Population the sample size is reduced a bit, after missing cases on some variables are omitted. The sample is probably more adequate for rural and urban poor, inasmuch as the Household sample was drawn from parents who had children in the schools and this would tend to bias it slightly toward urban and more economically favored households. A larger number of variables is also included in the analysis of the economically active population.

3.5.1. Relationship of Education to Earnings and Life-Style in Economically Active Data Base

Table IV-8 shows the zero-order correlations among variables analyzed in the economically active file.* Table 8 shows essentially the same pattern as Table 1, but there are some differences worth noting, apart from the obvious fact that variables are slightly different and there are more of them incorporated into the analysis:

a. The relationship of Education to Earnings is lower, .37 for the work force,compared to the .49 found for the parents of school children.

b. Educational attainment (measured the same in both surveys) is most strongly related to Life Style (not measured in the Household survey), the simple correlation being .54. Life Style measures household possessions, and in one sense acquired wealth.

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*In interpreting the signs of coefficients refer to Table IV-4.

Table IV-8

Correlation Matrix for Selected Variables for Economically Active

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) YRSEDUC	1.000	0.371	0.541	0.410	0.085	-0.435	-0.466	-0.227	-0.043	0.315	0.359
(2) EARNINGS		1.000	0.003	0.208	-0.072	-0.168	-0.186	0.039	0.019	0.522	0.926
(3) LIFESTYL			1.000	0.333	0.300	-0.537	-0.407	0.009	0.190	0.485	0.308
(4) OCCUPATN				1.000	0.260	-0.373	-0.332	0.107	-0.052	0.094	0.189
(5) SEX					1.000	-0.272	-0.161	-0.093	1.159	0.164	-0.058
(6) RESIDNCE						1.000	0.604	0.031	-0.108	-0.237	-0.163
(7) BORN							1.000	0.038	-0.036	-0.196	-0.171
(8) AGE								1.000	-0.028	-0.059	0.048
(9) HRSWK									1.000	0.172	0.033
(10) FAMINC										1.000	0.563
(11) INCOME											1.000

c. The relationships of age, rural birthplace, and residence to educational attainment show up strongly, and reveal the obvious lack of access to education for past generations and for past and present generations from rural areas. The relationship of Education to Age is -.23, to(rural)Birthplace -.47 and to(rural)Residence -.44.

d. Educational attainment not surprisingly goes with Occupation, which is an occupation status measure where occupations are arranged hierarchically with laborer/farm worker in the lowest category and professional/managerial in the highest. The occupational categories clearly have education level built-in.

e. Educational attainment goes slightly higher with Income (which includes other income as well as earnings) than it does with Earnings alone. Other income includes rents and retirements benefits and investment income, but there was little of it reported in the survey.

The simple correlations show that there is far from a simple relationship between educational attainment and economic outcomes, although there is a strong relationship. The following analysis attempts to get at other influences on this relationship, particularly influences of age, sex, rural status and class as revealed by parental status of workers.

Table IV-9 shows the simple regression model with Education as an independent variable along with Sex, Occupation and Birthplace and Residence, and Earnings as the dependent variable. Education has the strongest relationship, although not so strong as previously, and now accounts for about 14 percent of the variance in Earnings. When Sex and Occupation and rural status variables are included only about 16 percent of the variance is attributable to the total set of independents.

Table IV-9

Summary Table for the Regression of Earnings on Selected Variables, for Economically Active

DEPENDENT VARIABLE: EARNINGS USUAL MONTHLY WAGE

VARIABLE		SUMMARY TABLE					
		MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
YRSEDUC	YEARS OF EDUCATION	0.37102	0.13766	0.13766	0.37102	2.935079	0.32963
SEX		0.38542	0.14855	0.01090	-0.07233	-9.867922	-0.13237
OCCUPATN	PRINCIPAL OCCUPATION	0.39571	0.15658	0.00803	0.20801	1.805444	0.09656
RESIDNCE		0.39623	0.15700	0.00041	-0.16868	-1.362720	-0.01881
BORN	WHERE BORN	0.39631	0.15706	0.00006	-0.186111	-0.3396064	-0.01035
(CONSTANT)						15.74580	

Table IV-10

Summary Table for the Regression of LIFESTYL on Selected Variables, for Economically Active

DEPENDENT VARIABLE.. LIFESTYL STYLE OF LIFE INDEX

VARIABLE		SUMMARY TABLE					
		MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
YRSEDUC	YEARS OF EDUCATION	0.54165	0.29338	0.29338	0.54165	0.2256949	0.33671
RESIDNCE		0.63699	0.40576	0.11238	-0.53769	-1.702629	0.31224
SEX		0.66018	0.43583	0.03007	0.30052	1.103415	0.19662
EARNINGS	USUAL MONTHLY WAGE	0.67215	0.45179	0.01596	0.30094	0.1032865D-01	0.13720
BORN	WHERE BORN	0.67216	0.45180	0.00002	-0.40751	-0.1330839D-01	0.00539
OCCUPATN	PRINCIPAL OCCUPATION	0.67217	0.45181	0.00001	0.33330	-0.4331358D-02	0.00308
(CONSTANT)						3.529650	

Table IV-11

Summary Table for the Regression of OCCUPATN on Selected Variables, for Economically Active

DEPENDENT VARIABLE.. OCCUPATN PRINCIPAL OCCUPATION

VARIABLE		SUMMARY TABLE					
		MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
YRSEDUC	YEARS OF EDUCATION	0.41078	0.16874	0.16874	0.41078	0.1404487	0.29494
SEX		0.46875	0.21972	0.05098	0.26063	0.7250407	0.18186
RESIDNCE		0.49615	0.24616	0.02644	-0.37345	-0.5817864	-0.15018
BORN	WHERE BORN	0.49943	0.24943	0.00327	-0.33261	-0.1313567	-0.07487
(CONSTANT)						2.507478	

Table IV-10 shows that when Life Style (possession or services) is the dependent variable Education has a much stronger relationship, in this case a multiple correlation of .54 which explains about 29 percent of the variance. Residence (urban/rural) adds a substantial increment to variance explained which now goes up to 40 percent, and Sex and Earnings add more to bring it up to 45 percent. Birthplace and Occupation tion add little more. The fact that birthplace has less influence than current residence provides some indication of geographical mobility having an effect on earnings.

Table IV-11 is included only because it shows that when Occupation is the dependent variable Sex has some moderate relationship, as does Birthplace and Residence. The fact that Sex is the second variable to enter the regression analysis of Table IV-11 is interesting because it indicates that females in the economically active population are in higher status occupations. This does not indicate any major economic advantage of women in El Salvador because there is a slight tendency for males to earn more despite the fact females are in higher occupations.

3.5.2. Summary Comment on Multiple Regression Analysis Applied in the Simplified Model

When analysis is applied in a simplified model relating Education and other variables to Earnings there is a fairly strong relationship, but by no means a straightforward demonstration of the relevance of education to economic outcomes. Many other variables are influencing the relationship, and to explore educational relevance more adequately there was an attempt to probe deeper into the work-force data. Sex, urban-rural status (Birthplace and current Residence), and Age are influencing the relationship.

Related to age are two important considerations: first, the extent to which there is generational difference in access to education and subsequent social and economic benefits, and second, the extent to which the status of older heads of households influences the education and earnings of younger students and workers. From a policy standpoint not much can be done to improve access to primary schools for older workers. Special adult programs may be the alternative. It is however significant for policy makers to assess the extent to which provision of education, or lack of provision, is affecting the access to education and subsequent economic and social benefits of younger workers. Hence, the consideration of relevance is broadened from assessing the effects of education in limited economic outcome terms to include analysis of the effects of education on economic and social equity.

To explore these broader relationships, and to probe deeper into the issue of relevance to economic outcomes, the Economically Active Population (EAP) was broken down into the two related data bases, Heads of Household and Working Dependents.

3.5.3. Relevance of Education to Economic and Social Outcomes of Heads of Household

The simple correlations among Education, Earnings and other variables for the Heads of Household were not very different from those for the entire economically active population. The Heads of Household sample was approximately 5000. The correlation of Education and Earnings was a bit higher (.43) for Heads of Households than for the entire EAP. Table IV-12 shows the summary table of the multiple regression analysis of Education and other independent variables with Earnings as a dependent variable.

Table IV-12

Summary Table of the Multiple Regression Analysis of Education and other Independent Variables with Earnings as a Dependent Variable

DEPENDENT VARIABLE.. EARNINGS

		SUMMARY TABLE					
VARIABLE		MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
YRSEDUC	YREARS OF EDUCATION	0.43325	0.18771	0.18771	0.43325	4.251467	0.38159
OCCUPATN	PRINCIPLE OCCUPATION	0.43639	0.19044	0.00273	0.23459	2.050169	0.08439
SEX		0.44276	0.19604	0.00560	-0.05202	-10.21676	-0.08341
BORN	WHERE BORN	0.44353	0.19672	0.00068	-0.22719	-1.195462	-0.02870
RESIDENCE		0.44354	0.19673	0.00001	-0.21252	-0.3056800	-0.00350
(CONSTANT)						14.97006	

Education now accounts for about 19 percent of the variance in Earnings. Occupation rises a bit and enters before Sex, and together the set accounts for about 20 percent of the variance in Earnings.

When the set is run against Life Style as a Dependent variable the multiple correlation/variance explained begin to show increase. The multiple correlation of education is now .62 with about 38 percent of the variance explained. When Residence, Occupation and Earnings are added to the set of independent variables the multiple correlation rises to .72 and somewhat over 50 percent of the variance is accounted for.

When the age range is reduced, as it is in the Heads of Household file, and respondents have a longer earning period, then the relationship of Education to Earnings is stronger. The relationship of Education to Life Style is even stronger.

Occupation and Residence are also strongly related. Table IV-13 indicates an interesting relationship of Residence when Occupation appears as a dependent variable. Residence has a stronger relationship to Occupation than Education does, which reflects the fact that most higher level occupations are in urban areas. However, since Birthplace does relate strongly to Residence, there is an influence of rural birth on access to Occupation and subsequent economic and social benefits. In the past the schools in El Salvador have not been highly successful in changing this. This relationship will be explored in later path analysis.

Table IB-13

Relationship of Residence When Occupation appears as a Dependent Variable.

DEPENDENT VARIABLE...	OCCUPATION PRINCIPAL OCCUPATION					
	SUMMARY TABLE					
VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
RESIDNCE	0.45525	0.20726	0.20726	-0.45525	-0.8242995	-0.22936
YRSEDUC YEARS OF EDUCATION	0.52203	0.27552	0.06526	0.43278	0.1410436	0.30756
SEX	0.58462	0.34178	0.06927	0.32521	1.357291	0.26920
BORN WHERE BORN	0.58585	0.34321	0.00143	-0.36894	-0.8432543D-01	-0.04918
(CONSTANT)					2.191429	

3.6.0. The Relationship of Education to Economic Outcomes Across Generations

The economically active population was split into a Heads of Household and Working Dependents file, and the files were used to match dependents with parents so that generational effects could be analyzed. Effects were studied by developing a set of path models which reflected the analysts' conceptualization of how Education related to Earnings and Life Style (Household possessions and services, and in some measure wealth) and how this relationship was affected by other variables which appeared to be important from the bivariate and regression analysis of the Economically Active Population. (Appendix 1 gives a brief explanation of path analysis.) The central characteristics of the techniques applied here were that it required the analysts to develop a model that would depict ordered relationships among variables and permit analysis of the direct and indirect effects among the variables so ordered by the model.

3.6.1. Heads of Household Model

Path Model IV-1 shows one such ordering of variables which traces the relationships of Education, Earnings and Life Style for Heads of Households. The relationships traced by the model are essentially that birthplace (urban/rural) and sex (male/female) affect access to education which in turn affects earnings and life style. The path coefficients (standardized regression coefficients) indicate that there is a significant direct path from birthplace to education (-.476), and education to earnings (.382), and a somewhat weaker path from earnings to life style (.168). The major path of education to economic outcomes, is direct and high but other variables and other paths are also significant.
One slight variant is the direct path from education to life style (.345) without mediation of earnings. The path analyst could develop

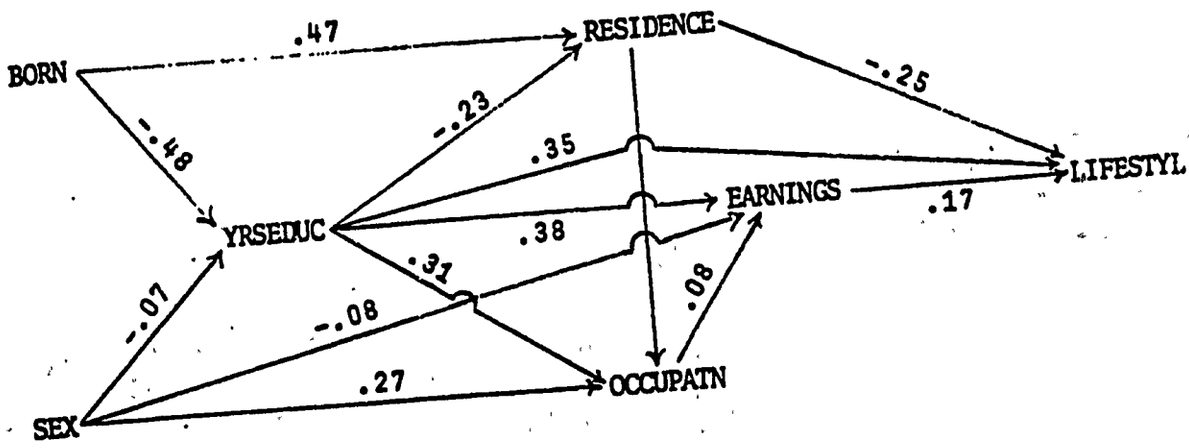
Direct Path Coefficients and(Zero-Order Correlations), N=4924

Model IV-1 Heads of Household

Independent Variable	Dependent Variable (1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) BORN	---	--- (-.15)	-.48 (-.47)	.47 (.60)	-.05 (-.37)	-.03 (-.23)	-.01* (-.43)
(2) SEX		---	-.07 (.00)	-.15 (-.22)	.27 (.33)	-.08 (-.05)	.02* (.12)
(3) YRSEDUC			---	-.23 (-.45)	.31 (.43)	.38 (.43)	.35 (.61)
(4) RESIDNCE				---	-.23 (-.46)	-.00* (-.21)	-.25 (-.53)
(5) OCCUPATN					---	.08 (.23)	.19 (.50)
(6) EARNINGS						---	.17 (.42)
(7) LIFESTYL							---
R^2			.22	.42	.34	.20	.51

*Not significant, t values less than 2.0

Selected Paths Displayed



an explanation that this reflects the cultural influence of education on household style or standard of living, i.e. that the choice of household possessions and services is influenced by education and culture as well as earnings. The path model shows the effects of sex on occupation (.269). This indicates certain greater access of women to professional occupations. From occupation there is only a small trace to earnings (.084). The path from sex to earnings is -.083, the negative path coefficient indicating a slight disadvantage for women. Taken together the paths may suggest that women have access to professions but they are lower level profession (sub professional or technical) which have lower earnings. There is a fairly substantial path from education to occupation (.308), but from there to earnings only the modest trace already described.

A different path is traced along the rural route from Birthplace to Residence (.470), and from Residence to Lifestyle (-.250). This indicates the effects of rural living style since many of the possessions and amenities of lifestyle are more prevalent in urban areas. The path from Education to(rural) Residence is -0.231. The model may well have mis-ordered the relationship, and in later analysis Residence will be put before Education, rather than modeled as a resultant. Model IV-1 hypothesizes that residence is affected by education, which indeed it is. Educated people do not return to live in rural areas, and this may be a negative effect in El Salvador and elsewhere. An alternative path model will assess the effect of residence on education, an effect demonstrated by much of the previous analysis. There is also an effect of rural Residence on Occupation (-.229) and then a weaker trace to Earnings.

For the Heads of Household Path Model IV-1 shows:

a) Education has some clear effects on earnings and life style, and hence suggests relevance of education for economic outcomes.

b) The effects of education on earnings are mediated by rural birth place and residence which affects access to education and occupation, but there is no significant effect of rural status on earnings.

c) People who are born in rural areas have substantially less access to education, and provision of school services has not mitigated this especially for older heads of household. People who still reside in rural areas have less education, partly because of less access to education and partly because people with more education do not return to rural areas.

d) There is a slight negative effect of sex in access of females to education, especially among older women who are heads of household.

e) The effects of sex on access to occupations is to enhance the chances of women entering professions, but these are generally the lower rungs of professions, and this access is not reflected in earnings by women. (Note that the relationship of occupation on earnings is surprisingly low. The breadth of the occupational categories and unreliable coding may account for this.

f) One task for educational development in El Salvador is to make the provision of education in rural areas more adequate, in order to accomplish both economic and social equity objectives.

g) Full effects of age are not apparent in this model because it is limited to analysis of the file of older workers who are heads of household. The effects of age and generational status are analyzed in other path models.

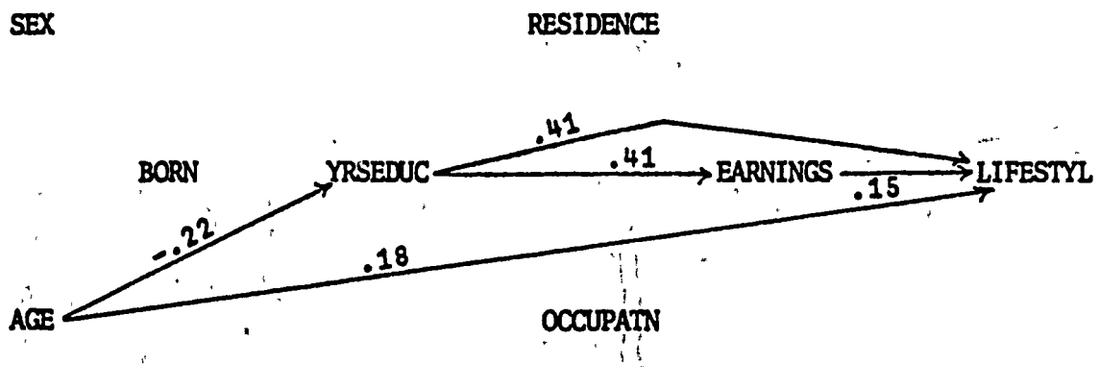
Path Model IV-2: Heads of Household

Direct Path Coefficients and (Zero-Ordered Correlations), N=4924

Independent Variables	Dependent Variables							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) AGE	--- ---	--- (.08)	.03 (.02)	-.22 (-.23)	-.06 (-.00)	.10 (.04)	.08 (-.02)	.18 (.09)
(2) SEX		--- ---	-.15 (-.15)	-.05 (-.00)	-.15 (-.22)	.27 (.33)	-.08 (-.05)	.01* (.12)
(3) BORN			--- ---	-.47 (-.47)	.46 (.60)	-.04 (-.37)	-.02* (-.23)	.00* (-.43)
(4) YRSEDUC				--- ---	-.25 (-.45)	.34 (.43)	.41 (.43)	.41 (.61)
(5) RESIDNCE					--- ---	-.22 (-.46)	.00* (-.21)	-.24 (-.53)
(6) OCCUPATN						--- ---	.07 (.23)	.16 (.50)
(7) EARNINGS							--- ---	.15 (.42)
(8) LIFESTYL								--- ---
R^2			.02	.27	.42	.35	.20	.54

*Not significant, t is less than 2.0

Selected Paths Displayed



Path Model IV-2, again for Heads of Household, shows that age, has direct effects on education (-.220). With age in the model the effects of education on earnings is slightly stronger (.408). From earnings to life style the paths are about the same as in Model 1 (.152). Including age in the model raises the direct path from education to lifestyle slightly to .413. There is a significant path from age directly to life style (.180). For older people more possessions are sought, acquired, and affordable. The rural relationships stay about the same. Path Model IV-2 suggests:

a) For older workers there has been limited access to education. This might suggest, when taken along with results of the analysis of the Audiencia data that provision of nonformal education to older workers would be warranted on both economic and social equity grounds.

b) El Salvador already has program alternatives for older drop-outs from formal schools, (Accelerated Programs and Weekend Schooling). These programs, with appropriate content, could be opened to larger numbers of older workers and offer both basic education and work-oriented training.

3.6.2 Relationship of Education to Economic and Social Outcomes Across Generations.

Path Model IV-3 was developed to show the relationship of education to economic outcomes across generations. The objective was to assess the effects of the socio-economic status of the household on the education and earnings of younger workers living at home.

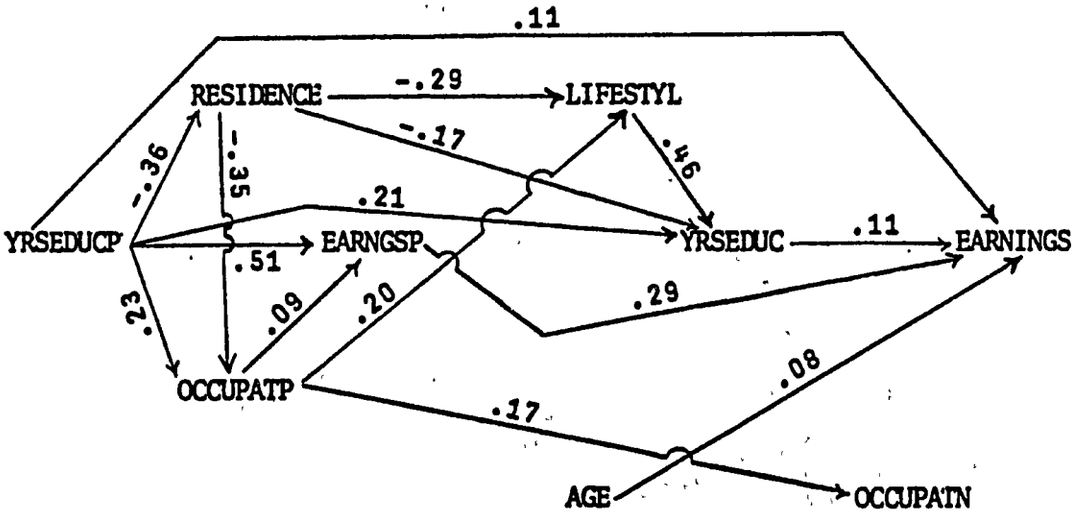
Path Model IV-3: Working Dependents

Direct Path Coefficients and (Zero-Order Correlations), N=1072

Independent Variables	Dependent Variables								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) AGE	--- ---	--- (.10)	--- (-.13)	--- (.22)	--- (.03)	--- (.26)	-.04* (.13)	.14 (.26)	.08 (.11)
(2) YRSEDUCP		--- ---	-.36 (-.36)	.23 (.36)	.51 (.53)	.43 (.64)	.21 (.59)	.07 (.39)	.11 (.34)
(3) RESIDNCE			--- ---	-.35 (-.43)	.05* (-.17)	-.29 (-.55)	-.17 (-.51)	-.14 (-.42)	.04* (-.12)
(4) OCCUPATP				--- ----	.09* (.25)	-.20 (.50)	.05* (.42)	-.1 (.43)	.01* (.16)
(5) EARNGSP					--- ---	.08 (.40)	.01* (.35)	-.01* (.22)	.29 (.39)
(6) LIFESTYL						--- ----	.46 (.71)	.12 (.51)	.06* (.30)
(7) YRSEDUC							--- ---	.21 (.49)	.11 (.28)
(8) OCCUPATN								--- ---	-.05* (.14)
(9) EARNINGS									---
R^2			.13	.23	.28	.57	.56	.36	.20

* Not significant, t is less than 2.0

Selected Paths Displayed



Conceptually, the generational models study the effect of parental status (education, urban/rural, occupation, earnings and lifestyle) on the education, occupation and earnings of Working Dependents (young workers living at home). In Model IV-3 there is an attempt to assess the effect of the younger worker's education on his earning, relative to the effects of the socio-economic status of parents on the younger worker's earnings. The sample reduced considerably from an N of 2800 to an N of 1072. Almost half (1100) of the original Working Dependents file were excluded because they had no earnings reported. Since by definition all in the Working Dependents file were economically active, the reduction reflects severe under-employment that is tantamount to unemployment because there are no earnings among these young workers.[1]

It should also be noted that younger workers have had too limited work experience and earnings trajectory for the full effects of education to be demonstrated on earnings.

In Path Model IV-3 the Heads of Household variables are to the left. The Working Dependent variables are to the right and assumed to be the resultants of household status and the working dependents own background. The final dependent variable is Earnings of the working dependent, since

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[1]Contrast this fact with an unemployment rate of 4.5 percent for the under 25 year old members of the Economically Active Population (Results from analysis of EAP file not shown in this report). The 4.5 percent unemployment gives a distorted picture of employment among young workers in El Salvador, partly because the classification is loose and invites misreporting in the survey, and partly because almost 50 percent of the under 24 year old group are peddlars and laborers who work sporadically on family farms, as farm hire labor, or in petty trade and services and had no earnings to report in the period of the survey. In any realistic sense of the term, many of them should have been classified "Unemployed".

lifestyle for the working dependent is presumed a condition of his household that has been created by the parent. The ordering of variables within the Parent and Working Dependent clusters of variables follows pretty much the scheme of the earlier two path models.

The model depicts the parent's education as the starting point, although from Model 1 we have seen that this path was strongly related to a prior condition, rural birthplace (-.476).

Beginning with parent education there is a strong direct effect on parent earning (.514), which attests to the relevance of education to economic outcomes for the older generation. From education there is a reasonably strong path to residence (-.358), and through residence(rural) to life-style (-.293) and to years of education of the working dependent (-.168). Parent residence and education have moderately strong paths to parent occupation (-.351 and .240). The path from parent occupation to earnings of working dependents is low (0.087), but from parent occupation to life style it is moderate (.204). There is a moderately high path across generations from parent occupation to working dependent occupation (.172).

For this analysis the significant paths are those which cross the generation to working dependent's education and earnings. The highest direct path into dependent's education is life style (.463). Note that this is life style primarily created by the parent and this is one indication of the lack of social mobility and access to education in El Salvador. The next highest path into dependent's education is from parent's education (.213). The effect of rural residence on dependent's education is shown by the path coefficient -.168). There is no significant direct path from parent's earnings to dependent's education. The original simple correlation of Parent's Earnings with Dependent's Education, relatively high at .35, disappears in the path analysis, since most of the effect is mediated through Life Style.

Lastly, there are the significant paths from household socio-economic status to dependent's earnings (.290). Compare this with the path from dependent's education to dependent's earnings (.112), and some qualifications on the relevance of education to earnings, within the younger worker generation, are necessary. The effects of socio-economic outcomes appears fairly clear. In fact the path from parent's education to dependent's earnings (.107) is almost equal to the path from the dependent's own education to his own earnings(.112). The only other path into the dependent's earning, and it is low is dependent's age (.081).

The results of the cross generational path analysis indicate:

a) The education of working dependents is most strongly affected by the life style of the household, primarily created by the parent. This suggests lack of social and economic equity in the access of younger people to education and subsequent benefits in El Salvador.

b) Access to education is also affected by rural residence of parents, for working dependents as it was for heads of household. Hence the provision of equity of access to education by geographical location has not yet been attained for recent generations.

c) The education of working dependents is also strongly affected by the education of parents, suggesting some lack of intergenerational mobility in securing access to education.

In summary the schools of El Salvador have some way to go in providing more equitable access to education for children from rural and poorer families.

As to the relevance of education to economic outcomes:

a) The earnings of working dependents are most strongly affected by the earnings of their parents. Measured on this basis the earnings of parents is more "relevant" for the earnings of young workers than their own education.

b) The education of working dependents does have a clear direct effect on their earnings. Again it should be noted that dependents have had no major portion of work life to stretch out their earnings in a more normal work life profile.

c) Rather surprising is the direct effect of parent education on dependent earnings, this being only minutely smaller than the path from the dependents own education.

In summary, though education is relevant to economic outcomes in El Salvador as elsewhere, the relationship is being strongly affected, and in some cases turned around, by the influence of socio-economic status of family class variables. Education does relate to earnings i.e. is relevant by the terms of this study, but this relevance is clearly affected by the influence of socio-economic status and class. One conclusion, though not a policy recommendation within the sector of education itself, is that the relevance of education to economic outcomes could be improved by reducing the constraining influence of class.

3.7.1 Relevance of Education to Fertility Outcomes

In this segment of the analysis there was an attempt to assess the relevance of education to fertility and infant care as this was reflected by the relationship of educational attainment to children born per year of fertile age (12 to 45) and to percent of children surviving per woman. The education variable is the usual crude measure of educational attainment and the fertility measures are equally aggregate and general. Path Model IV-4 traces the paths from birthplace and age through education and through other variables (residence, employment status, family income and life style) to the fertility measure called Fecundity 1 (children per year of fertility). In Path Model IV-5 life style is used as the final variable, after Fecundity 1. MModel IV-4 shows the effects of life style on fecundity and Model IV-5, fecundity on life style. The other variable relationships are more or less the same.

In Path Model IV-4 rural birthplace and age have the usual effects on access to education for women as for all members of the population. (The women's file with an N of 8,800 was constructed by taking all women over 12 years of age from the original data base of 33,000). The path from rural birthplace to education for women is -.479, and from age to education -.185, another indication of the effects of rural

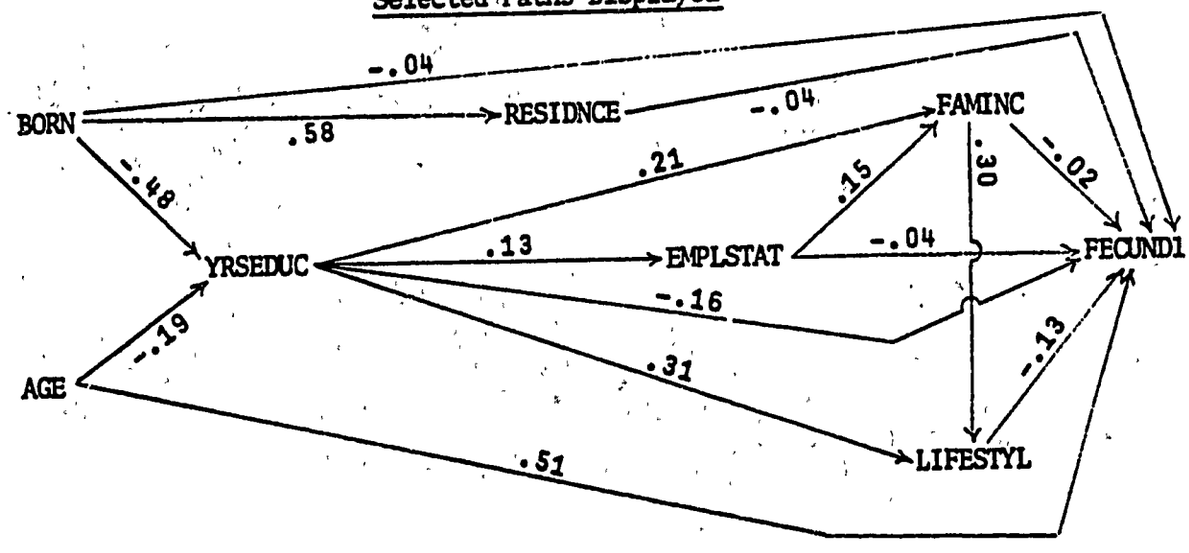
Path Model IV-4

Direct Path Coefficients and (Zero-Order Correlations), N=8540

Independent Variables	Dependent Variables							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) BORN	---	--- (.02)	-.48 (-.48)	.58 (.67)	.03* (-.21)	-.05 (-.24)	-.02 (-.47)	-.04 (.15)
(2) AGE		--- ---	-.19 (-.19)	-.06 (-.02)	.22 (.20)	.01* (.00)	.03 (-.01)	.51 (.53)
(3) YRSEDUC			--- ---	-.19 (-.45)	.13 (.19)	.21 (.30)	.31 (.56)	-.16 (-.34)
(4) RESIDNCE				--- ---	-.27 (-.32)	-.09 (-.26)	-.30 (-.57)	.04 (.17)
(5) EMPLSTAT					--- ---	.15 (.23)	.11 (.34)	-.04 (-.02)
(6) FAMINC						--- ---	.30 (.50)	-.02* (-.14)
(7) LIFESTYL							--- ---	-.13 (-.25)
(8) FECUND1								--- ---
R^2			---	.48	.15	.13	.54	.36

*Not significant, t is less than 2.0

Selected Paths Displayed



and generational deprivation on access to schooling. Age also has a large direct path to fecundity (.506), unsurprising because age is built into the fecundity measure, and many very young women have no children. Education does have a moderately high direct path to fecundity, showing the main effects of education on fertility (-.158). More education goes with lower fertility. Education also has a path through life style (.311) and from life style to fertility (-.126). Education also has a path through family income (.208) and then to life style (.303), and then to fertility as described. Family Income seemed a more appropriate variable than Earnings because large numbers of women had no earnings. Substantial numbers of women were employed, however, and there was a significant path from education to employment status (.126) and then to fertility. From employment status the direct path to fertility was low (-.038).

There may be some interest in the strength of the path from employment to fertility (-.038). This reflects the fact that many women, who work at poor paying and menial tasks still have high fertility. Employment does not affect fertility much for these women. Employment status does affect family income (.148), but there is only a low path from family income to fertility (-.019). Fertility does not appear to be much affected by income levels as measured in this study, and in El Salvador

there is probably high fertility across income classes, although this is influenced to some extent by life style.

The path from rural residence to fertility is interesting. The direct path from rural birthplace to fertility is low (-.040). The path from rural birthplace to current residence is (.584). Some rural women do migrate. From rural residence to fertility the path is also low (.042). In El Salvador fertility does not seem highly related to rural birthplace or rural residence except as these are affected by access to education and employment.

In summary the indications are:

a) Education has a moderately high effect on lowered fertility.

b) Education has a higher direct path to life style and then to lower fertility.

c) Rural birthplace has a strong effect on access to education for women.

d) Rural birthplace has a weak direct effect on fertility. About the same effect holds for rural residence. Neither rural birthplace nor rural residence goes with high fertility, which is somewhat in conflict with prevailing opinion.

e) Education has a moderate effect on employment of women, but employment has little direct effect on fertility. The effect comes through lifestyle.

f) If it were desirable policy in El Salvador to reduce fertility, and given the present high rate of natural increase (3.2%) this might be a reasonable goal apart from a direct campaign to improve family planning services, other less direct options might be:

i) Increase education for women, especially in rural areas

ii) Improve living conditions, especially in rural areas, and this is done by increasing employment, earnings and family income. Failing the possibility of abolishing poverty and its attendent conditions investment in education seems a reasonable though far from perfect option.

In Path Model IV-5, Life Style is the final dependent variable with Fecundity preceeding. The effects of prior variables on life style do not change markedly. There is a very slight drop in the direct path from education and family income to life style. The path from fertility to life style (-.088) is lower than the path from life style to fertility (-.126) in the previous model, although from this it would not be possible to argue that life style has more effect of fertility than fertility on life style. Rural Residence has a slightly higher effect on fertility in Path Model IV-5.

Path Model IV -5 shows an even higher direct path from education to fertility (-.197) when the relationship is not traced through life style. The same is so for employment (-.052). Hence, the conclusions from Path Model IV-5 would be about the same as those of Path Model IV-4 that the one social and economic variable which seems to affect fertility is educational attainment. This relevance of education to fertility is by no means so strongly demonstrated that educational development would be a major policy instrument for lowering fertility. The relationship is strong enough to show, however, that investment in education to provide greater access for rural and poor women would be a relevant policy for lowering fertility. Clearly other direct action in family planning would have to accompany the education policy.

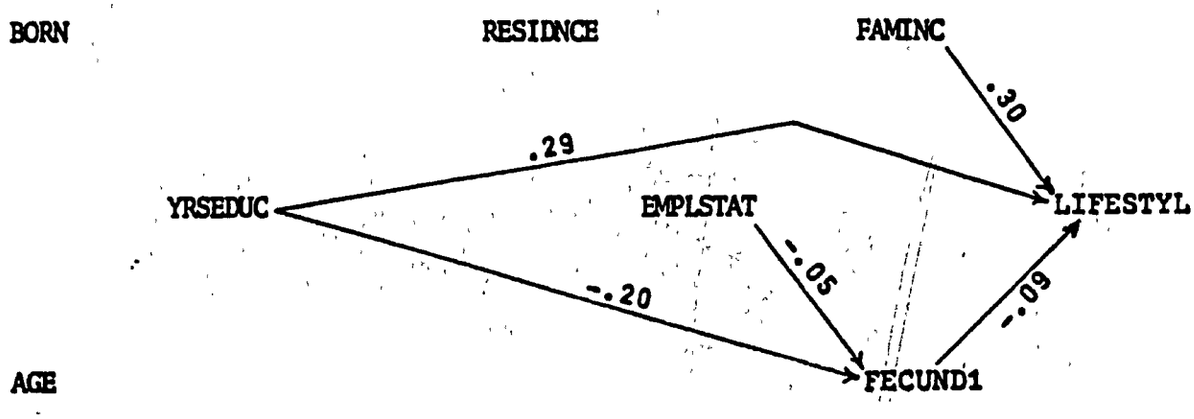
Path Model IV-5: Women

Direct Path Coefficients and (Zero-Ordered Correlations), N=8540

Independent Variables	Dependent Variables							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) BORN	--- ---	--- (.02)	-.48 (-.48)	.58 (.67)	.03* (-.21)	-.05 (-.24)	-.04 (-.47)	-.03 (.15)
(2) AGE		--- ---	-.19 (-.19)	-.06 (-.02)	.22 (.20)	.01* (.00)	.50 (-.01)	.07 (.53)
(3) YRSEDUC			--- ---	-.19 (-.45)	.13 (.19)	.21 (.30)	-.20 (.56)	.29 (-.34)
(4) RESIDNCE				--- ---	-.27 (-.32)	-.09 (-.26)	.08 (-.57)	-.29 (-.17)
(5) EMPLSTAT					--- ---	.15 (.23)	-.05 (.34)	.10 (-.02)
(6) FAMINC						--- ---	-.06 (.50)	.30 (-.14)
(7) FECUND1							--- ---	-.09 (-.25)
(8) LIFESTYL								--- ---
R^2				.48	.15	.13	.35	.55

*Not significant, t is less than 2.0

Selected Paths Displayed



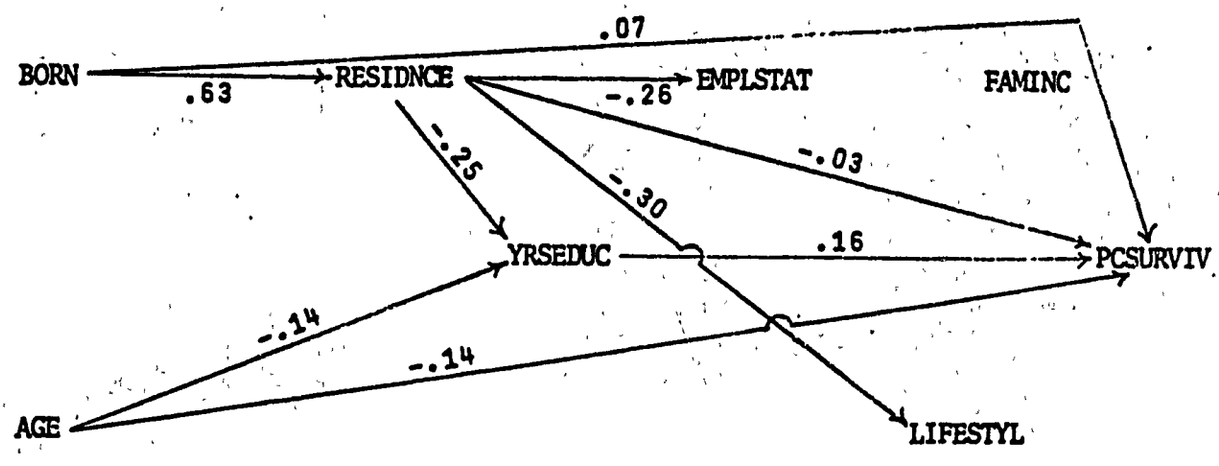
Path Model IV-6: Women

Direct Path Coefficients and (Zero-Order Correlations), N=4888

Independent Variables	Dependent Variables							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) BORN	--- ---	--- (-.02)	.63 (.63)	-.32 (-.47)	-.03* (-.28)	-.05 (-.24)	.00* (-.44)	.07 (-.04)
(2) AGE		--- ---	-.02 (-.03)	-.14 (-.12)	.08 (.06)	.06 (.05)	.08 (.07)	-.14 (-.15)
(3) RESIDENCE			--- ---	-.25 (-.44)	-.26 (-.37)	-.08 (-.26)	-.30 (-.55)	-.03* (-.08)
(4) YRSEDUC				--- ---	.18 (.30)	.21 (.30)	.33 (.57)	.16 (.18)
(5) EMPLSTAT					--- ----	.14 (.25)	.09 (.38)	-.01* (.04)
(6) FAMINC						--- ---	.31 (.51)	.02* (.07)
(7) LIFESTYL							--- ---	(.05) (.12)
(8) PCSURVIV								--- ---
R^2			.40	.27	.16	.13	.55	.06

*Not significant, t is less than 2.0

Selected Paths Displayed



3.7.2 Relevance of Education to Child Family Characteristics

Path Model IV-6 represents an attempt to assess the effects of education on a variable slightly different from the fertility variables. The final dependent variable was the percent of children born live who survived to the time of the survey. The rationale for developing this variable was that it measured some form of family health or child rearing factor. As Path Model IV-6 indicates the variable was too crude, or the measure imperfect, to reveal clear cut effects, but because the variable was different from the fecundity measures it seemed reasonable to report the results:

a) Education does have the strongest direct path to percent surviving (.155), but when included in the set of variables of Path Model-IV-6, education explains only 6 percent of the variance in percent surviving. This result suggests that the model does not get very close to specifying the set of variables which explain the percent of children surviving. Alternately, and more likely, the variable Percent Surviving is a poor one to measure in a survey. Given the traumas the question may provoke among women, infant death is probably under-reported and selectively reported. By contrast, if Life Style is taken as a dependent variable, the set of preceeding variables have a multiple R of.74 and 55 percent of the variance is explained. For women then the variable set explains their standard of living but not family health conditions insofar as Percent Surviving reflects this.

b) Age also has a high direct path, in this model a negative effect on percent surviving. This probably reflects another weakness in the measure. Small numbers of child deaths occuring for younger women with far fewer births has an inordinate effect. Age also shows a high direct negative path to education, which again reflects the inequality

of provision of education to past generations of females in El Salvador.

c. Neither birthplace nor residence, show high direct paths to percent surviving. The fairly high paths of residence to employment status (-.261) and to life style (-.295) show favorable effects for women residents of urban areas. The direct path from birthplace to residence is now higher than it was before (.630) when education was put as an intervening variable between birthplace and residence. The path from residence to education (-.246) is now higher than the path education to residence (-.185) in the previous models, indicating that the appropriate model is probably one which shows Residence affecting access to education, in this instance, the limited access for rural women.

In summary the final path model for women shows the same effects of age, sex, rural status on access to education, employment, income and possessions, and a moderate trace from education to percent of children surviving.

A final summary of the findings of the analysis of the Work Force data base will be included with the summaries from analysis of the other data bases at the end of this report.

PART THREE

APPENDIX I: STATISTICAL PROCEDURES

Appendix 1: Statistical Procedures

(A) Measures and Techniques Used in Work-Force, Followup, and Worker-Bosses Studies

1. Measures of association and tests of significance.

It is often useful to have a summary statistic that describes the relationship between two variables displayed in a cross tabulation. Such statistics are called measures of association and indicate how strongly, and in what direction, two variables are related.

There are numerous summary measures of association, but the one chosen for use here is the gamma-value. This is a statistic useful when the variables of concern are ordinal, that is, each variable is composed of separate categories and it is possible to rank-order the categories according to some criterion.

The value of gamma can be taken as the probability of correctly guessing the order on one variable once the ordering on the other is known. Suppose, for example, we have a table of values showing Residence by Earnings, with earnings categorized according to High and Low, and Residence by Urban and Rural. Further, suppose that the categories are coded such that Rural = 0 and Urban = 1 for Residence, and Low = 0 and High = 1 for Earnings. Then a gamma value of +0.6 means that there is a fairly strong relationship between place of residence and earnings received, with those residing in urban areas more likely to receive higher earnings that those residing in urban areas. More specifically, it means that if the place of residence is known and the earnings unknown, then one would be right 60% of the time if the earnings were guessed at in correspondence with the direction of the table results--low earnings with rural residence and

high earnings with urban residence. The values for gamma range from -1 (perfect negative association) through 0 (no association) to +1 (perfect positive association).

While a measure of association provides a summary of the strength of the relationship between two categorical variables, a test of significance is used to determine the probability that the observed relationship could have happened by chance. It provides an estimate of the probability that in a sample of a given size there could exist by chance a relationship as strong as the one actually observed.

The Chi-square is one such test of statistical significance. This involves computation of table (cell) entries as if no relationship existed between the variables. These expected values are then compared to the observed values. Large values of Chi-square are interpreted to mean some systematic relationship exists between the variables. A small value indicates that there is an absence of a relationship. The probability of obtaining a value of a Chi-square as large or larger than the one calculated from the sample, is used as a criterion for determining whether a systematic relationship does exist. A typical probability used as a criterion for statistical significance in a relationship is 0.05, meaning that for every 100 samples drawn there would be 5 in which a relationship of equal or greater strength than the observed relationship would occur when in fact there was no relationship between the variables in the whole population.

2. Multiple regression analysis

Multiple regression is a statistical technique used to analyze the relationship between a single dependent variable and a set of independent or predictor variables. Suppose, for example, that information has been collected on the earnings and educational attainment of a sample of individuals. It is reasonable to hypothesize that there is some relationship between the two variables, that in fact increased earnings is a function of increased education. The type or form of this functional relationship is not usually known, and a linear one is often chosen as a first approximation.

For the simple example dealt with here this has a ready geometrical interpretation. The data for earnings and educational attainment could be plotted on an ordinary two-dimensional graph. Choosing a linear functional form to represent the relationship between earnings and education is equivalent to passing a straight line through the collection of data points. The question of which straight line to choose is normally based on the so-called least-squares criterion, meaning that the line chosen will be the one that minimizes the sum of the squared vertical distances between the data points and the line.

The best fit line, the regression line, tells us something about the relationship between the dependent variable (Earnings = Y) and the independent variable (Education = X). Suppose the line is given as:

$$Y = a + bX, \text{ where}$$

b is the slope of the line and a is the intercept. The slope, b, is interpreted as the average amount of change in Y that occurs for a one unit change in X.

If b is estimated from a sample, the values of b would vary from sample to sample. It is possible to estimate the sampling variability of b, an estimate called the standard error of b. It is also possible to compute a summary statistic, called an F-statistic, to test the hypothesis that there in fact is no relationship between the variables (i.e., $b = 0$).

The accuracy of the regression line can be assessed by determining how scattered the data points are about the regression line. If points are scattered loosely about the line, there is little accuracy to the regression. If the data points cluster closely about the line, the regression is fairly accurate--the predicted earnings value and the actual earnings value for a given educational attainment are fairly close. The accuracy of a regression equation is estimated by computing a summary statistic called R-squared which indicates the proportion of variation in the dependent variable that is explained by the independent variable.

When more than one independent variable is used in a regression, most of the above discussion applies as well, except that there is no longer a simple geometrical interpretation when more than two independent variables are used. When one independent variable is used, regression results in fitting a straight line to a set of data points in two-dimensional space; when two independent variables are used regression fits a plane to a set of data points in 3-dimensional space. Here the simple, visual geometrical interpretation ends, but the concept is the same: when n independent variables are used, regression is the fitting of a hyper-plane to a set of data points in $(n + 1)$-dimensional space.

There are some other differences between simple and multiple regression that are also worth noting. Suppose the regression equation fitted to a set of data is:

$$Y = a + b_1X_1 + b_2X_2$$

The interpretation given to the slope coefficients is slightly different in this case than in the simple regression considered previously. Here b_1, the slope or regression coefficient of X_1, is interpreted as the expected change in Y for a one unit change in X_1 when the value of X_2 is held constant. From this comes the notion of "controlling for" or "holding constant" a variable. In describing a regression of earnings (Y) on educational attainment (X_1) and residence (X_2), it is thus possible to discuss the relationship of education to earnings when holding the effect of residence constant.

Values of the standard errors of the slope coefficients can be calculated, as can values for the significance of each coefficient (F-test), and the overall prediction accuracy (R-square). The remaining items to explain are the various terms found in the summary regression tables. R-SQUARE, as stated previously, is the amount of variation in the dependent variable that is accounted for by each of the independent variables. RSQ CHANGE is the amount of additional variation explained by including a given variable in the regression, above and beyond the amount explained by the previously included variables. MULTIPLE R, or the multiple correlation, is the square root of R-SQUARE, and is a measure of the simple correlation between the actual Y (dependent) values and the dependent values predicted by the regression equation. SIMPLE R is the correlation between each independent variable and the dependent variable; B values are the slope or regression coefficients; and BETA is the regression coefficient of each independandent variable when all variables have been standardized to have zero mean and unit variance. Beta values are particularly useful when two or more independent variables are measured in different units and

it is necessary to compare the relative effect on the dependent variable of each independent variable. As seen in the next section it is these standardized regression coefficients that are normally used in path analysis.

3. Path analysis

Path analysis is an extension of multiple regression that allows more flexibility for positing the causal ordering among variables. For a given set of variables, a presumed structure of cause and effect linkages may be specified, based upon substantive theory or on the basis of hypothesis and conjecture. For example, suppose we have information on three variables called Residence, Educational attainment, and Earnings, as found for a sample of individuals. A resasonable causal model would propose a set of linkages like the following:

1) earnings is a function of both the amount of education an individual has and the residence of the person (i.e., residence and education affect earnings);

2) the amount of education is a function of the access to school, that is, educational attainment is affected by the residence of the individual; and

3) the residence of an individual is affected by factors unknown or unmeasured in this sample of individuals.

This set of assumed causal orderings translates into a structural model, shown in Figure 1, and a set of accompanying equations which define the model. A model such as this is known as a path model. The direction of each arrow in the model shows the presumed causal relationship--X_1, for example, affects both X_2 and X_3. Note, too, that there is a difference in types of effects, some being <u>direct</u> and others being <u>indirect</u>. The effects of X_1 on X_2 are direct. There is also a direct effect between X_1

and X_3, but there is an additional indirect effect of X_1 on X_3 that is mediated by X_2. In other words X_1 indirectly affects X_3 because it directly affects X_2 which in turn directly affects X_3. The total causal effect of X_1 on X_3 is thus the sum of the direct and indirect effects.

As the equations accompanying Figure 1 would suggest, the causal effects are estimated using multiple regression. The path model shown in Figure 1 would require two regression: X_2 on X_1 and X_3 on X_1 and X_2. The beta coefficients from these regressions yield the direct path coefficients. For example, regressing educational attainment on residence (X_2 on X_1) will yield a beta value for the slope of the regression line. This beta value is the path coefficient P_{21}, The magnitude of indirect effects is found by successive multiplication of path coefficients along the indirect path. In the example above the indirect effect of X_1 on X_3 is given by $(P_{21})(P_{32})$. The total causal effect is the sum of direct and indirect effects and represents the accompanying change in the dependent variable for a one unit change in the independent variable when all extraneous variables are controlled for.

If, in the example, we let $P_{21} = .4$, $P_{31} = 0.2$, and $P_{32} = 0.5$, it is possible to illustrate the causal effects of the variables on each other. The effect on X_1 (residence) on X_2 (earnings) occurs only directly and thus the causal effect is just $P_{21} = 0.4$. Similarly the effect of X_2 on X_3 is direct only and is 0.5. But the effect of X_1 (residence) on X_3 (earnings) is a result of both direct and indirect effects:

$$\begin{aligned} \text{causal effect of } X_1 \text{ on } X_3 &= P_{31} + (P_{21})(P_{32}) \\ &= .2 + (.4)(.5) \\ &= .4 \end{aligned}$$

In other words a unit change in X_1 results in a 0.4 unit change in X_3,

Figure 1

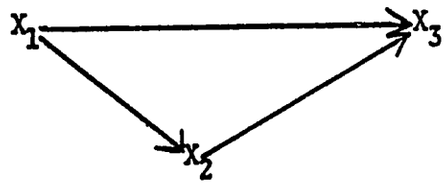
A Hypothetical Causal Model between Residence, Educational Attainment, and Earnings

Let X_1 = Residence

X_2 = Educational Attainment

X_3 = Earnings

The model corresponding to the set of causal linkages described in the text are:



This structural model is also defined by a series of equations:

X_1 is exogenous (unexplained in the model)

$X_2 = P_{21}X_1 + U$

$X_3 = P_{31}X_1 + P_{32}X_2 = V$

where U and V are error terms, the random component, in the respective equations.

partly occurring because X_1 affects X_3 directly and partly occurring because X_1 affects X_2 which in turn affects X_3.

Perhaps a word of warning should be sounded in finishing. A path model cannot be used to prove the existence of causal relationships. It rather is useful in testing the implications of a proposed causal structure which is imposed on the data. There are many models that could be imposed on the data, and the selected one does not imply that the world actually operates in the way modeled.

(B) Statistical Techniques Used in Conducting the Analyses of the Audiencia

1. Chi-Square

Given that most of the variables in the study are categorically defined or are binary variables and not scaled variables most of the analyses were done by frequency counts or enumeration of data within a category. When comparing the frequency distributions across two or more categories Chi-square can be used to determine the probability of the particular pattern of frequencies obtained occurring. It is interpreted like most statistics in terms of the "p" value where a $p = .05$ or less is considered statistically significant.

2. Factor Analysis

The questionnaire contained a series of questions within each topic area (agriculture, health, home economics, etc.) about a respondents current knowledge of an item and desire for more information about the item. Within a particular topical category the number of items ranged from 2 for Nutrition to 17 for Agriculture (Education and Culture had 20 items but all were not used since some are better used as measures of access to channels of information rather than knowledge of Education or Culture). An analysis that required examining each item within a topical category separately would not only be enormous but would also be very difficult to interpret. In order to simplify our task we wanted to group items into indexes measuring, at least, 2 or 3 major sub-dimensions of each topical area (e.g., Agriculture), and, if possible, developing one index for all items within a particular topical area. Factor Analysis is a statistical technique that permits the construction of such indexes on the basis of the actual empirical scores obtained for each item rather than on an a priori basis.

The requirements for doing a factor analysis are the same as those for calculating a correlation coefficient--that the variables be scaled and normally distributed. This relation between factor analysis and correlation exists because factor analysis is based on the correlation and least-squares regression models. Factors or indexes for grouping items are determined by first calculating the correlative relation between all variables to be grouped, and then extracting factors that reveal the underlying pattern of inter-correlation between variables. This is done by assuming one, or a series of, independent underlying dimension(s) or vector(s) to which all items in a particular category or grouping are correlated. The higher the correlation of all items with the underlying vector (or factor) the stronger or more predominant the factor. In some instances one factor will have significant correlations with all variables and therefore will be sufficient to "explain" the inter-correlation between all variables being factor analyzed. In other instances some variables may have very low correlations with one factor and high correlations with another independent factor (or underlying vector); in which case 2 or more factors may be required to explain the inter-correlation between all variables being factor analyzed. In any case the resultant solution is an empirical reduction of two or more variables into one variable, namely, the factor which can be treated as an index or proxy variable for all items making up the factor. The definition of the factor is determined logically by the researcher based upon an analysis of the variables making up the factor, their correlation with the factor, and their inter-correlation with each other. An index score for the factor can then be determined by either summing or averaging the scores for each respondent for all items making up a factor, or by weighting each item according to its correlation with the factor before summing or averaging across all items.

In the analysis of the Audiencia data we factor analyzed each of the sets of items making up a topical category and then constructed one or more indexes depending on the factor solution. For most topics this resulted in all items being grouped into one index, but for Agriculture, Jobs and Recreation several indexes were created. Once an index was identified the total score was calculated by taking the arithmetic mean of all items making up an index for each respondent. Unity weights were applied for all items.

3. Multivariate Analysis of Categorical Data

Because so many of the demographic, access and communication items in the Audiencia survey were categorical or binary variables it was not possible to use Multiple Regression techniques to determine their relation to "knowledge" or "desire for more information" within each topical category. Consequently, non-traditional techniques had to be used for these analyses. The first technique used was iterative cross-tabulations of each predictor variable (demographic, access, or communication) with the criterion variables (indexes of "knowledge" and "desire for more information" for each topical category). This was supplemented by crossing predictor variables with each other and then cross-tabulating these multi-variate classifications with the criterion variables. The problem with this approach is it increases the chance of obtaining a statistically significant result due to repeated tests (non-independent) of the same hypothesis; and does not permit the testing of all possible interactions. Some other techniques were therefore utilized that have recently been deveoped that simulate Multiple Regression Analysis for categorical data and overcome some of the weaknesses of the iterative cross-tabulation approach. These techniques are Multiple

Classification Analysis and Multivariate Nominal Scale Analysis; both developed by the Survey Research Center at the University of Michigan and available from them in published form under their respective titles. A more detailed explanation of these techniques will not be given here due to their rather technical quality. Suffice it to say that they are fairly straight-forward refinements of the iterative cross-tabulation approach that permit calculation of accurate levels of significance and permit examination of all possible interactions.

(C) Additional Statistical Procedures Used in the Following and Worker Bosses Analyses

1. Canonical correlations

Canonical correlation analysis shares many features with multiple regression analysis and factor analysis, so only a brief introduction will be provided. It, like regression and factor analyses, assumes that the relationships among variables are linear and that one aim of the analysis is to account for as much variation in certain variables as possible.

Regression analysis is particularly suited for use when there is a single dependent variable and several independent variables. When the number of variables, either dependent or independent, becomes large, it is often useful to reduce the number of variables to make meaningful interpretation possible. Factor analysis is the procedure often used for this data reduction. However, if there are two obvious sets of variables and the point of the research is to use one set of variables to account for as much variation in the second set as possible, canonical correlation analysis may be the desired procedure. A factor analysis would select factors on the basis of intercorrelations in each set of variables and maximize the

explained variance of those variables in that set alone. But in canonical correlation analysis, factors from each of the two sets are constructed in such a way that the correlation (and hence the explained variation between factors) is maximized. In other words, a factor, consisting of one or more variables from the first set of variables, will be selected such that it maximally correlates with a factor of one or more variables from the second set. This pair of factors is called a canonical variate. After finding the first pair of canonical variates, the procedure tries to identify a second, or additional, independent canonical variate that account for as much unexplained variation between the two sets of variables as possible.

The important types of information provided by a canonical correlation analysis are the canonical variates and the canonical correlations between them. Each canonical variate is composed of coefficients that reflect the importance of the original variables in the subset forming the variates. The amount of correlation between each corresponding pair of canonical variates is the canonical correlation between them, and its square is the amount of variance in one canonical variate accounted for by the other variate.

PART FOUR

A SUMMARY OF CONCLUSIONS

FROM FOUR STUDIES OF EDUCATIONAL RELEVANCE IN EL SALVADOR

I. Summary of Results from Worker-Employers Survey

The results of this study provide an opportunity to evaluate the relevance of training programs offered by public and private sector enterprises in El Salvador. Because this survey (as well as the others in this report on Relevance) was not designed specifically for the purposes of assessment of relevance, it is not possible to assess all the relationships described in the basic model, but the data do provide information not available in the other studies in the report, and provide insights into an important educational activity usually ignored in education sector assessments and analyses.

Training is offered by firms to increase the productivity of workers, and therefore may be planned by the firm in response to an assessment of the current abilities and skills of workers in light of the firm's position in the economy. Training can be accomplished both by creating training facilities within the firm as well as providing opportunities for workers to receive training in some institution that trains workers from more than one company. If training does result in learning, and learning in increased productivity, then it is reasonable to expect that one can demonstrate relationships between measures of perception of need for training, existence of training facilities and opportunities, participation in training, learning, and productivity. The major variables in the study were defined so as to permit a presentation and evaluation of those relationships.

Most firms included in this sample of Salvadorean enterprises provide some kind of training for their workers. About three-quarters of the companies either had a physical facility in the plant specifically intended for training or sent their workers outside. In most cases this facility may be no more than a room or area where training classes can take place, and for most firms "training" means no more than supervision of workers

as they learn to carry out new tasks.

A fairly large minority of firms, especially those in industry and those larger in size, are concerned enough about the training of their workers to establish what, on the basis of these data, seem to be training programs that are more than just supervised production. About one-fifth, for example, send workers outside the firm or bring in instructors from the outside. A number of workers receive training in classroom settings that involve taking time off from productive activities. Training is undoubtedly an important activity for many firms.

Variation in the extent of a firm's investment in training is explained almost completely by taking into account the size of the firm, and the perception by the employer that workers require training. No doubt there are economies' of scale that operate in the decision to invest in training facilities. The cost of training, especially if done within the firm, requires a minimal "lump" of capital that may not be justified with firms below a given size. Once size is taken into account, the product line of the firm seems irrelevant-- small industrial firms are no more likely to have training programs than small commercial firms.

There is an apparent paradox in the positive relationship between the education level of employees and the perceived need for training by the employer. We have concluded, but cannot support our contention, that firms probably hire persons with higher levels of education (within a given occupational category) when the technology of the firm is more sophisticated. Other studies have shown that employers regard workers with more education as more trainable (a result borne out in this study as well), and therefore would employ those already better educated in order to meet the technological challenge. Employers do not take the experience of their employees into account when determining need for

training. This could mean that each firm has a unique production technology, for which prior experience is irrelevant. Or it could be taken to mean that the primary function of training, for employers, is not development of mechanical production skills.

Employers believe that "social skills" are important, for all occupational groupings, and generally tend to de-emphasize the importance of analytical skills. The "social" skills included in this survey appear to be measures of motivation, of commitment to the firm and to production, rather than human relations skills. Relational skills are considered important by employers for professionals, managers and white collar employees, as one would expect, and perceptual and dexterity skills are considered important for skilled and unskilled workers. But for all groups, employers are most concerned about training that will result in more effort by the employee. If training programs were to be designed to meet employers' perceptions of what is required, they should include heavy emphasis on the development of motivation in workers, with lesser attention to specific technical/production skill training as conventionally defined.

As would be expected (if the primary function of training is development of attitudes toward work) the strongest relationship between types of training facilities and employer's perceptions, are between social skills and classroom training. This is especially the case for skilled and unskilled workers, and less true for professional and managerial occupational classification. As we have noted above, not all firms have classroom training facilities, and it is unlikely that available facilities could easily handle all workers in a large firm. The emphasis on acquisition of social skills must be limited to a fairly small set of firms concerned about worker morale as it affects work spirit and production.

Variations for worker participation in training programs are more difficult to account for than are variations in the existence of training facilities and opportunities. In part this may be the result of a statistical artifact--the description of firm training programs was obtained from 255 employers, but 1502 workers answered questions on participation, and there is bound to be more variation in the larger group. There may have been definitional problems in the identification of training programs for workers, especially as so much of the training is on-the-job.

It is apparent that many workers do not (feel that they) receive training, even though training facilities are present in the firm. Does this represent an under-utilization of installed capacity, is it a function of scheduling of training over a longer period of time than that covered by the survey, or can it be explained in terms of imprecision about what constitutes training? Unfortunately we cannot answer these questions definitively. We can, however, point out that the answer depends on which occupational group is being considered. There was a clear match for professional and managerial workers between employer and employee responses. In this case, non-participation in training would probably represent an underutilizaion of capacity. The same is true for the white collar group. There is an interesting anomaly in the findings, in that the best fit for professionals and managers is for the presence, and use, of fixed (installed) training facilities, while for white collar employees the best fit is for academic training, usually offered outside the firm. We would speculate that much of the training for professionals and managers is on technical equipment specific to the production process of the firm, and therefore contained within the firm. Training for clerical employees, on the other hand, probably meets the needs of a technology common to many firms, for which training can be provided anywhere.

There was fairly high consistency between facilities and experiences for skilled and semi-skilled workers, but almost none for the unskilled group. Most of the first category of workers are found in industrial firms; skill training emphasizes expendable materials, probably is on-line or in facilities that simulate the production process. Recall, however, that employers emphasize social attitudes as most important for this group of workers.

Formal education is the best single predictor of participation in training programs. If workers select themselves into training, then this relationship could be explained as a result of higher motivation among the better-educated. It is likely, however, that workers are selected for training, in which case the relationship could be explained on the basis offered earlier, that employers believe that persons with higher levels of education (within the same occupational category) are more trainable. For employers, then, the educational level of workers is relevant for participation in training programs.

Educational attainment is also relevant for learning, at least as reflected in the variable used in this analysis. Independent of its association with participation in training programs, formal education also is associated with reports of having learned through training.

There are several difficulties in the interpretation of the learning variable in terms of the relevance model. Most serious is that the direct relationship between reports of participation in training, and reports of learning, is at best modest. If participation does have effects, it is "explained" or mediated by other variables. In the particular explanatory model used in the analysis, participation was immediately prior to learning,

so that mediation by other variables in effect implies that zero-order relationships between training and learning (themselves not large) are a result of colinearity rather than direct effects. One can account for more of differences in learning by asking the employer questions about the firm's training program, than by asking the employee about what he or she actually experienced, suggesting that the "learning" measure may be getting at something other than actual changes in individual behavior.

What employers want employees to learn (which in turn accounts for the existence of training programs), is modestly related to what the workers report learning. All groups are higher on social and relational skills, and lowest on analytical skills, but the specific rankings are not totally consistent. Given the measurement problems in the data, however, these results could be taken to suggest that learning is relevant to perceived needs, and that employers can and do set up training programs that satisfy their objectives.

Furthermore, whatever else the learning measure might be, it is the variable with the highest relationship with subsequent raises, the proxy measure of productivity. Although only a relatively small proportion of the variation in amount of raises during the one year period can be accounted for by the variables in the study, it seems warranted to suggest that worker learning through training is a determinant of those salary increases.

Overall there is measurable coherence in the training system operating within firms in El Salvador. Firms do create training facilities and opportunities in response to conditions affecting the firm. Workers participate in these programs, and report learning. The learning is associated with increases in salary, or if you will, with increases in productivity.

The results of this survey suggest that government intervention to enhance the contribution of worker training to productivity should: 1) create or expand central training facilities to service small firms, where those firms have a production technology that does not require firm-specific skills and knowledge; 2) develop the capacity to provide training in highly specialized skills within firms using their equipment and facilities; 3) develop training materials that assist employers in raising the motivational level of employees. These recommendations are consistent with the conclusion that, from the perspective of employers in El Salvador, worker training is relevant for increased productivity.

II. Summary of the Relevance Findings of the Followup Survey

This review of the findings of this survey can begin with the seven questions posed in the Introduction (page II-3). Graduates of the diversified Bachillerato do, in the main, find employment. But their unemployment rates (over 14%) are high enough to conclude that one of the original objectives for the program, to reduce educated unemployment, has not been attained.

The results provide some help for the policy maker concerned with improving the employability of graduates. We were able to demonstrate stable, if small, relationships between aspects of the various programs within the Bachillerato, and employability and salaries once employed. Specifically, participation in programs with a practical field component is more likely to lead to employment, and higher salaries for men and for women. As we have discussed, this may be a function of actual learning through the field experience, or it may be a result of student contact with future employers. But in any event, it may be possible to increase employment and productivity by increasing the number of programs and courses with actual field experience.

We found few or no relationships between most of the other aspects of the Bachillerato program and employment and salaries, and therefore can not comment on their relevance. Most striking is the lack of relationship between marks or grades, and employment, salary or attendance at the university. If grades were an accurate reflection of learning, then we would have to conclude that the content learned by Bachillerato students has an undemonstrated relevance for employment or further study. It is likely that grades or marks are <u>not</u> valid or reliable reflections of learning. In that case, the policy receommendation would be to avoid the use of grades for decisions affecting students, and to urge a revamping of the student evaluation system.

The findings indicated that university attendance is highest among graduates of university-preparatory programs, but that it is not possible to predict university entrance with high precision from knowledge of program experiences and success. These findings are like those with regard to employment. That is, there are structural relationships between the Bachillerato and later outcomes, but we cannot identify the functional aspects of the programs that make a difference. One may wish to conclude that the structural relationships (e.g., of the kind that Health graduates all go to Medicine) are logical, even if it is not possible to identify the reasons why these relationships hold. For future improvement of the system, however, it will be important to understand the basis for that relationship.

A more critical stance would be that as none of the measurable and measured differences in programs account for much of the differences in outcomes, we should equalize programs achieving greater efficiency, and reducing overall costs. Table II.48 presents data on the costs of the various Bachillerato programs. Some programs cost four times as much per student per year as do other programs. If all programs are equivalent in their outcomes, it would seem reasonable to eliminate more expensive programs and institute a common (instead of Diversified) Bachillerato with operating costs similar to the currently cheapest program. It should be noted that there is no relationship between unit costs of the various Bachillerato programs, and their outcomes as measured in this study. That is, more expensive programs are not always more successful, either in terms of employment of graduates or in terms of enrollment in the university. A move toward efficiency would suggest elimination of expensive programs.

On the basis of the data collected for this study, we are not ready to recommend the abolition of the Diversified Bachillerato program. On the other hand, we can not support an argument that its relevance to the political, social and economic development of El Salvador has been demonstrated in any definitive fashion. It is possible that the program does in fact make a substantial contribution to the nation's welfare, but the nature and extent of that contribution is not revealed in the study presented in this report.

III

SUMMARY OF CONCLUSIONS FROM AUDIENCIA SURVEY

A. About Current Level Knowledge

1. Current knowledge is generally low for all fifteen content areas. The least is known about work and training - - what jobs are available, what are their requirements, and what are the characteristics of jobs requiring skilled craftsmen, of repair jobs, of jobs in the service or tourist sectors. The most is known about health and nutrition, home economics and recreation.

2. The likelihood of knowing little or nothing about jobs is higher if one is unemployed, a rural resident, female, 30 years or younger, and relatively uneducated. The exceptions to this are that females know more than males about service sector jobs. No differences were found for age groups in general information about jobs, and in specific information on repair and tourist sector jobs.

3. The five classification factors do not explain a significant amount of the variance in knowledge about diseases and illnesses, preventive medicine, livestock production, agricultural support services, repair jobs, service sector jobs and tourist sector jobs. Other factors not measured in the survey would have to be analyzed to account for the variance in knowledge of these content areas.

4. For those content areas in which the five classification factors explain a significant proportion of variance, education is the predominant explanatory variable, except in the case of home economics where sex explains the most variance. In other words, current knowledge about content areas can mostly be explained by higher levels of education attained, and by the other socio-economic attainments that accompany education. The fact that sex (female) explains more current knowledge about home economics is no surprise.

B. About Amount of Demand for Information

1. Demand for more information is greatest for health and nutrition, home economics, and recreation, but least for jobs. It is important to remember, however, that demand was fairly high for information about all content areas. There were no indexes about which respondents indicated no interest in obtaining more information.

2. Classification factors explain a significant amount of variance in only skilled and repair jobs, home economics and spectator sports; and one factor (sex) accounts for most of this explanation. The remainder of the variation in response for the fifteen content areas is not significantly explained by the five classification factors. For the four indexes in which sex is a significant explanatory variable, men show a greater demand for information about jobs and sports, and women for information about home economics.

C. About Relation of Current Knowledge to Demand

An a priori examination of current knowledge and demand by content areas suggests that the two variables are positively related. The three indexes in which current knowledge is highest (nutrition, home economics

and recreation) are the same three areas in which demand is greatest.

The correlation of the fifteen knowledge indexes with the fifteen demand indexes supports this finding for all indexes except health and nutrition. In fact, a significant positive correlation (above .30) is obtained for all other indexes.

Therefore, knowledge appears to beget a felt need for more knowledge, rather than the lack of knowledge resulting in greater demand for information. This is consistent with findings in studies of adult education in other countries where the greatest demand for continuing education is by people who already have substantial education.

D. About Access to Learning Sources

1. The media to which most of the population (75% or more) have access are radio, newspapers and mail, with 95% having access to radio.

2. None of the media are inaccessible to over 50% of the population.

3. The agencies to which most of the population (75% or more) have access are schools, public address vans and hospital/health units, with 92% having access to school. Libraries, religious organizations, adult education centers, cooperatives, House of Culture, social organizations and school organizations are inaccessible to over 50% of the population.

4. For all twenty-two learning resources, excluding religious organizations only, urban residents and higher educated persons have more access. ~~Not surprisingly~~ SIGNIFICANTLY, rural residents and relatively uneducated persons have greater access to religious organizations.

E. About Preferences for Learning Sources

1. People prefer to receive information from television, radio, libraries, religious organizations and local authorities, in that order of preference. T.V. and radio are preferred by 81.8% of the respondents interviewed.

2. Schools are never mentioned by any respondent as a first preferred source for receiving information, even though they are the agencies to which the greatest number of respondents (92%) report having access.

3. All classification factors except sex make a difference in learning source preference. If a respondent is rural, unemployed, and has primary level or less education, then radio, church and T.V. are their first three preferences, with radio always the first preference. However, if the respondent is urban, employed, and has a secondary level or higher education, then T.V., libraries and radio are the top three choices, with T.V. always first.

F. About Relation of Access to Learning Preference

Access is related to demand for only certain media and agencies, namely, television, magazines, religious organizations, social organizations, movies, libraries, Houses of Culture and adult education centers. This may be because lack of knowledge about a source precludes demand, or because a person is attracted by a source that is not accessible.

G. Implications for Non-School Education Policy and Planning

1. Given that prior knowledge hightens demand for more, and that this is affected by rural residence, unemployment and socio-economic status, if the goal of adult education programs is to reach the poor

rural majorities it is critical that educational programs about specific content areas be preceeded by information campaigns that heighten awareness about the topic and provide some basic facts useful to the recipients that will motivate demand for further information.

2. On the basis of the approach that educational programs should fill deficiencies in knowledge and skills, there is a need in El Salvador for non-school training and information programs dealing with work and job training. On the basis of the approach that education should respond to the expressed learning needs of the population, non-school education in El Salvador should give high priority to health and nutrition, home economics and recreational programs. The most practical solution is probably a combination of both approaches but policy makers should be aware that "demand", or "need" may be addressed differently, according to the assumptions and approaches which underly non-formal education programs.

3. Work and training programs responding to deficiencies in work knowledge and skills should be addressed to rural residents, 30 years or younger, females, and relatively uneducated persons.

4. Home economics and health/nutrition programs responding to expressed needs of the population should be addressed to those 30 years of age or younger, females and those with relatively more education. Recreational programs responding to expressed needs should be addressed to urban residents, 30 years of age or younger, males, employed, and those with relatively higher levels of education.

5. On the basis of a combined analysis of access to, and preference for, learning sources, if the audience to be reached by an educational activity is rural, unemployed and relatively uneducated, then radio and religious organizations, in that order, are the best learning sources. If the audience is urban, employed and relatively highly educated, then television, libraries, and radio, in that order, are the best learning sources.

6. While television is not widely accessible in rural areas it does have a lot of appeal as a learning source. Therefore, expansion of educational television in rural areas may be useful.

7. Last, but perhaps most interesting, schools are not perceived as a useful learning source in El Salvador for educational activities in the fifteen content areas covered by this study. Out-of-school educational delivery systems should therefore be more varied, highly developed, better planned and organized, and expanded to fit other kinds of settings. Though this conclusion would have to be studied more thoroughly than it was in this survey it does suggest that policy makers should examine the assumption that school settings are the most effective delivery sites for adult and continuing education, an assumption that seems logical based on the fact that schools are already there, and fairly widespread through the country. An alternative may be to change the perceptions of adults as to what formal schools are, and what their limitations are. Perhaps amplified service through schools may affect this change, but the unchallenged assumption that "schools are the place for all forms of education" requires examination.

In one sense then, given the adult perceptions of schools, schools may not be relevant for delivering all forms and all kinds of education to all men and women in El Salvador.

IV. Summary of Conclusions and Selected Policy and Program Implications from the Work-Force Study

A. Summary of Conclusions from the Analysis of the Household and Work Force Data Bases: Analytic Results

1. Education is relevant to economic outcomes in El Salvador if relevance is indicated by a strong relationship of educational attainment with occupation, earnings, income and life style (household possessions, services and amenities).

2. Education is also demonstrated as relevant to economic outcomes when relevance is indicated by the extent to which variation in educational attainment "explains" variation in occupation, earnings, income and possessions. Education is more strongly related to income and life style (possessions and in one sense wealth) than to earnings. The relationship of education to earnings is also higher for the more favored groups in the Household Study than the economically active population surveyed in the Work Force study. These relationships and others to be examined suggest the influence of socio-economic class status on the relationship of education to economic outcomes.

3. The relevance of education to economic outcomes is influenced by other social, economic, demographic and geographic conditions as these are reflected in the social class of households, the economic status of households, the age and sex of older and younger workers and the birthplace and residence of students and workers. Specifically:

a. Rural birthplace and rural residence have a strong negative relationship with education and occupational status, and these variables

influence earnings, income and possessions. The direct relationship of rural status on education, occupation, earnings, income and possessions is one of the most powerful indications of the effect other variables have on the relevance of education to economic outcomes.

b. Sex also has a strong relationship on access to education, occupation, earnings, income and possessions, although the relationship is less strong and direct than rural status. The relationship of sex to education suggests that females have slightly less access to education, and this is especially true for older, rural females. The relationship of sex to occupation is more complex, in that females appear to have slightly more access to professional occupations. This is influenced by greater access of younger and urban females to the professions, although the data indicate that this is access to the lower rungs of the professions. The influence of sex is also reflected in the fact that female status goes with slightly lower earnings, but slightly higher possessions, a status often attributable to earnings of husbands, or the effects of two earners in the home.

c. Age also has a distinctive relationship to education, occupation, earnings and income, although again the relationship is less powerful than rural status and more complicated. The relationship suggests that older workers in general have had less access to education. This is more marked for females and for rural females, but the relationship holds for all groups in the older age classes. Although older age goes with less education it does not go with lower status occupations and lower earnings, thus reflecting past deprivation for older groups in access for formal schooling, the effects of educational credentialing

in later years for younger workers with more education, and the effects of work experience on occupational mobility and increased earnings for older less educated workers. This again is influenced by rural and female status; advantages in earnings are largely for urban males.

The influence of other variables, particularly rural status, sex and age, demonstrated the necessity of going beyond analysis of simple relationships and explained variation, to study the direct effects of education on earnings and life style when the direct and indirect effects of other variables are assessed. This assessment was made by spliting the economically active population into older (Heads of Household) and younger (Working Dependent) worker files, developing path models to explain the influence of the other variables on the education/economic outcomes relationship, and analyzing the direct effects of education and other variables on earnings and life style through path analysis. This analysis revealed:

4. For older workers (Heads of Households) the direct effects of education on earnings is strong. The direct effect of education on occupation is strong, but the direct effect of occupation on earnings is not. The direct effect of education on life style is also strong. Hence the relevance of education to economic outcomes for older workers is strongly indicated, despite the influence of age, sex and rural birthplace and residence. Age, rural status and sex affect access to education and occupations and thence to earnings and lifestyle, but they do not change the fact that there is a strong direct effect of education on economic outcomes.

5. For younger workers (Working Dependents) the effects of education on earnings and life style are strongly influenced by intergenerational effects that come from the socio-economic status of parents and households. Younger workers' earnings are more directly affected by the earnings of their parents than by their own education. The effect of parents' education on dependents' earnings is almost as strong as the effect of the dependents' own education on their earnings.

6. For younger workers access to education is most strongly affected by the socio-economic status of the household, i.e. the life style and educational level of their parents, and by the urban residence of their parents.

HENCE, FOR YOUNGER WORKERS IN EL SALVADOR, THOUGH EDUCATION DOES AFFECT ECONOMIC OUTCOMES, THEIR ACCESS TO EDUCATION AND LATER ECONOMIC BENEFITS IS MORE POWERFULLY AFFECTED BY THE STATUS OF THE HOUSEHOLDS FROM WHICH THEY COME.

A file of women twelve years and older (Women's file) was created out of the Work Force Data Base, to study the effects of education on fertility and child survival.

7. Education did have a moderate direct effect on fertility, in that higher education went with lower fertility, and an indirect effect on fertility through life style. Education had the highest direct effect on fertility of any of the variables studied. Whether the woman was employed or resident in a rural area did not have a high direct effect on fertility, when compared to education; but rural background did affect access to education

8. Education did have the strongest effect of any variable on child survival, but all of the variables used, including education, did not

affect child survival greatly.

B. Policy Implications

1. Education, when measured by attainment of formal schooling in El Salvador, is relevant to economic outcomes in that it does enhance earnings and income. This holds generally, for younger and older workers, for makes and females and for urban and rural residents. The work force study does not assess whether or not increased earnings reflect more productive behavior of workers, and hence whether investment in education is a direct contributor to economic productivity and development.

2. The relevance of education is influenced by demographic, social, economic and geographic conditions, which presumably could be used to guide allocations policies and program development so as to improve the yield on the investment in both economic and social equity terms. Specifically:

a. Investment is warranted in programs and facilities to increase accessaand continuation opportunities in formal school programs covering grades 1-12 in rural areas. Educational attainment is still low for the general school age populations who would be attending the first three cycles of education (grades 1-9), and the effects on earnings and income are apparent. These implications have a direct relationship to findings in the studies of efficiency carried out in the general sector analysis.

b. Special efforts should be made to increase access for rural females in the regular age-groups corresponding to grades 1-9. Access for females has been improving in recent years although the effects appear mainly for urban females of higher socio-economic status. The analysis reveals open access for women with higher educational credentials to professional and upper level occupations, but this depends on educational background which is limited for rural and older females.

c. Special attention should be given to providing program alternatives for younger workers. Many have low educational attainment because of drop-out and repetition. Because of a need to participate in the work force (although with sporadic employment and uneven earnings as peddlars, farm laborers or workers on family farms) many of them could not attend regular primary grades. There should be a strong effort to increase initiatives already begun in El Salvador with Accelerated Programs (coverage of regular primary cycles in fewer years), weekend study (Saturday schools) and scattered nonformal programs outside of school. These programs could be expanded to contain more work oriented training in fields of study covered under the Audiencia survey. Work oriented content is insufficient however, and the basic education and equivalent credentials provided by the accelerated programs are essential for enhanced opportunity for further study, access to occupations and increased earnings.

d. Special attention is also necessary to provide alternative access to basic education for older workers. The need in part is for regular basic education programs as covered in the Accelerated and Weekend courses, but since many of these workers are already in occupations, the payoff would be less for formal schooling, equivalence, and credentials, and more for work-oriented training. The Audiencia survey suggests fields for coverage and the Worker/Employers results have a bearing on in-service and in-plant training returns. Policies, programs and subventions which encourage industries to increase in-service training, e.g. national apprenticeship programs, are indicated. It is necessary that the range of enterprises offering such training be expanded to cover middle and smaller sized firms. This suggests subventions, partial coverage

of costs, incentives. to hire and train, and direct training support through centers serving groups of smaller industries without resources to offer training in their own plants. Results which will help guide the formulation of policy and programatic details for such programs appear in other studies of the sector analysis. The Work Force and Household survey results bear mainly on the need for such policies and programs.

e. Specialized programs at the Bachiller level are also warranted but increased access provided by more flexible entry and exit is required if younger workers already out of formal schooling are to be served. The Follow-Up Study results bear more on this issue, indicating the fields and program arrangements that have greater effectiveness in preparing students for employment and earnings.

3. The relevance of education for economic outcomes is substantially affected by socio-economic inequalities. The economic and social equity issues which underlie the effects of household and class status on access to education, occupations, earnings and life style are not amenable to treatment within the limits of conventional education policies and programs. Movement toward equity, already apparent though limited in recent past developments in Salvadorean education, might be made a more explicit basis for the formulation of educational policies and programs to serve groups previously described. Resolution of the major problems lies in the broader field of political and social development to which the schools can contribute powerfully as the main results of the study suggest. The contribution has been limited because of economic, social,demographic and geographic factors covered in the analysis.

4. In El Salvador the effects of education on increased earnings and improved life style are clear and direct, but the effects of education in accomplishing economic, and social equity are far from demonstrated, and this fact should shape the development of policies and programs for human resource development through education.

5. The relevance of education for reduced fertility is a result which emerges clearly enough to indicate that investment in general education for reduced fertility is a reasonable policy. Direct activity in provision of family planning services probably has a greater effect but the study has no way of assessing this. It should be stated however that the effects of education ~~of~~ on fertility should not suggest that education is an alternative to other direct activity addressed to reduction of fertility. Education, especially population education, may help such programs. In fact education may be necessary accompaniment to most family planning programs. Education may also aid in promoting family health and reducing infant deaths; but though the study shows a direct relationship of education to higher percent of children surviving, the study and the variables chosen to model the situation simply do not cover the major factors which influence survival of infants and young children in El Salvador.