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Industrialization and National Integration: A Cross-Cultural Comparison of Brazil, Chile, and the United States

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INDUSTRIALIZATION AND NATIONAL INTEGRATION:
A CROSS-CULTURAL COMPARISON OF BRAZIL,
CHILE, AND THE UNITED STATES

by

Phyllis D. Knights

A Dissertation Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

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For their long-lasting influence, thanks are extended to extraordinary individuals whom it was good fortune indeed to have known:

VITA

The author, Phyllis Diane Knights, is the daughter of Browning Knights and Mary (Morel) Knights. She was born October 27, 1941, in Sandwich, Illinois.

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CHAPTER I

INTRODUCTION AND REVIEW OF RELATED LITERATURE

Statement of Problem

The Industrial Revolution is a great leveler. It knows nothing of differentiation by race and color. It can serve with equal efficiency democracy and communism. It can erase the disparity between the advanced and the backward (Dean, 1957).

Development is an economic, political, and social process in which industrialization and integration are included as sub-processes. In turn, industrialization is viewed here as a socio-economic process having far-ranging social and economic consequences.

Although industrialization is occurring in most nations, research findings in the social sciences as well as current events suggest that the above quotation is applicable only in terms of what industrialization could potentially generate. In recent times, the developing nations have presented demands to the United Nations for international development planning to reduce the "disparity between the advanced and the backward nations." At the same time, there is the recognition that past national and international planning has failed, as noted by Castel (1971:xiii-xvii) and ECLA (1972:3), largely because it has not occurred in the light of national system needs. The "leveling" role of industrialization therefore comes into question.

The research problem is to investigate the relationship between the levels of industrialization and national integration in Brazil, Chile, and the United States. The overall objective is to understand the process of national integration. Three specific objectives orient this research:

1. To contribute to efforts at specifying adequate social indicators
2. To contribute toward the construction of intermediate-level theory by focusing on the relationship between two sub-processes of development--national integration and industrialization
3. To test and revise an original analytic model developed for this research project

These objectives are related to three contemporary problems in the field of sociology: (1) the lack of an adequate theory of development which is partly due to (2) a failure to understand areas at an intermediate level which, in turn, is hampered by (3) the lack of empirical research and cross-cultural comparisons related to social indicators (Sheldon and Moore, 1968:9-12, 21-23; also see Gross, 1966) to determine whether or not they actually indicate what they are supposed to indicate. Potentially, this project can contribute to the solution of these problems by addressing itself to the following questions: Is national integration a concomitant of industrialization? Do these two variables interact or is one directionality to be assumed? If they interact, in what manner does this occur? If one causes the other, why and how? Are there variations between nations and, if so, what are the sources of variations?

Relationship of the Problem to Related Literature

Social indicators

In the presentation of the functions that a system of social indicators can fulfill, Zapf (1975:488-493; also see Wilcox et al., 1972: 1-49) summarizes the expansion of the social indicator movement from a function of national planning and program evaluation to five major functions: (1) the monitoring or measurement of social change, (2) evaluation of social policy, (3) social reporting on changes in social structure and/or system performance, (4) explanation of social change through the use of causal models, and (5) innovative social policy based on the fulfillment of the first four functions. The approach taken in this project is to explain the association and changes in the association between industrialization and national integration by developing a causal model and formulating theoretical propositions for use in future research.

One approach to constructing analytic models and systems of social indicators begins with general systems theory and leaves the development of social indicators for that time in the future when there is full understanding of the social system. Proponents of this position include Levin (1970), Gross (1966), and Attinger (1970). The opposite approach and the one taken in this study begins with an analytic model incorporating specific social statistics as social indicators for use in research that has as its objective the construction of intermediate-level theory to contribute towards the understanding of the social system and changes in it.

To the extent that an historical context is necessary in this

project, the author agrees with Gross (1966) that qualitative data fulfill as important a function as quantitative data in understanding the association between social indicators. Similarly, there is agreement with Gross (1966) and Bauer (1966:1-67) that a system of social indicators involves all social sciences, i.e., all types of data. The terms "social statistics" and "social indicators" in this report therefore include social, economic, and political data.

Zapf (1975:481, 489-491) notes that the adequacy of social statistics used as social indicators depends on their reliability and their validity as measures of social reality. The methodological problems encountered in this study, as in similar research, and their consequences serve to illustrate that there are two distinct sets of problems associated with the development and use of social indicators: (1) how to use existing data and (2) how to set up a system of comparative data for use now and in the future.

Development theory and research

Development is a process that can be comprehended only in historical context. However, the study of this process has been increasingly limited to contrasting the past experiences of developed and developing nations. These contrasts should be included in a model of development since they are important for understanding cross-cultural variations, changing characteristics of the system of international relations, and many of the problems faced by developing nations today.

From another perspective, however, the emphasis on contrasting past experiences has resulted in the polarization of social scientists' thinking. While the paucity of research pertaining to national inte-

gration makes this a more difficult topic to deal with, research in the general areas of change and development has tended to (a) fail in formulating generalizations and (b) falsify rather than support existing theory because this theory is based on: (1) the experiences of developed nations, (2) isolated case studies of developing nations or concerning developing nations but not based on empirical research, or (3) ideal types that cannot account for variations (as in recent functionalist or neo-evolutionary attempts). As one consequence, in the social sciences we now have a set of ex post facto "theories of developed nations" (such as demographic transition theory and most theories of economic growth) and a set of unconfirmed hypotheses or "quasi-theories of developing nations" (such as Pye's theory of political development and all efforts at theory pertaining to nation-building).

Efforts at theory construction in the area of change tend to be general theories as in the case of Parsons (1966), Ogburn's (1966) cultural lag, theories of history (cyclical and spiral theories in particular), conflict theory, or evolutionary, neo-evolutionary (functionalist attempts), and modernization theory. In contrast, development research is implicitly intermediate-level as it deals with such topics as the concomitants of industrialization, of urbanization, of economic growth, of the spread of mass media, or the impact of any of these processes on a specific aspect of social structure. Similarly, the literature on national integration tends to focus on specific types of integration, e.g., political, economic, religious, or social integration. However, a universally applicable framework for development research and planning does not exist or, as in the case of Chodak's (1973) work,

attempts at constructing such a framework have not been subjected to empirical analysis.

Given the existing state of development theory and research, it is suggested here that the most adequate approach to research is to gradually construct increasingly more general theories by seeking uniformities in intermediate-level areas. Empirical work is accumulating in this direction specifically in the contrasts that have been made between developed and developing nations. Some of the principal conclusions based on these contrasting experiences are:

1. Economic growth, urbanization, and industrialization are no longer closely related processes.
2. Occupationally, the tertiary (service) sector in developed nations grew after the expansion of the secondary sector whereas the reverse is true in developing nations today and is usually explained by a combination of factors such as over-population and over-urbanization. However, the researcher is limited by (a) the fact that "service sector" is a statistical category in government reports and (b) the more narrow definition of "service sector" in developing nations (usually referring to menial labor) which makes comparison difficult. Similarly, there is a difference among nations in the type of industrial labor force; i.e., a larger proportion of the industrial labor force is employed in extractive industries in developing nations than in developed nations.
3. The "push and pull" thesis suggests that the rural population was "pulled" to the cities to become part of the urban labor force when developed nations were industrializing while, in developing nations

today, people are "pushed out" of the countryside due to rural overpopulation.

4. Demographic transition theory is not applicable to developing nations (for criticism of the applicability of this theory to developed nations, see Drake, 1969).
5. Technology and entrepreneurship were internal in developed nations whereas they are now exogeneous forces of change contributing to the dependence and substitutability of developing nations' economies and indicative of the increasing importance of planning.
6. State intervention in capitalist-type economies in developing nations is occurring at earlier stages of capital investment than it did in Western developed nations.
7. The "birth of modern nations" in referring to developed nations is seen as different from the contemporary "nation-building" of developing nations; i.e., developing nations are attempting to establish by political means the socio-economic "prerequisites" (to political "stability") and political "stability" at the same time.
8. Mass media emerged during the later stages of industrialization in the developed nations whereas today the media are contributing toward a sense of relative deprivation and the creation of internal demands for automated products and improved socio-economic conditions prior to significant automation with the result that mass media indirectly contribute to the dependence and substitutability of developing economies and socio-political instability.

These conclusions not only contribute to the understanding of variations in the development process. They also point to the need for a central

concept that would permit generalizations in spite of the contrast in experiences. Functional linkage has been selected as this concept.

Functional Linkages and Integration

Functional linkages are defined as those ties established to fulfill national and international system needs, e.g., initiation of vocational programs to train unskilled labor in needed skills. The reasons for selecting functional linkage as the key concept are:

1. It is a concept that does not exclude cooperation, conflict, and competition as inherent in the social system and as sources of change.
2. The proponents (principally anthropologists) of the concept of convergence have been criticized for focusing on "functional integration." However, there is support for this position in that functional relations do exist (Moore, 1965:13-19).
3. Acknowledging the multilinear (Steward, 1955) nature of change, the study of any process is made more complicated by cross-cultural variations and influences. Similarly, the study of national integration has to be carried out in the context of the system of international relations if, in the study of industrialization and national integration, such phenomena are to be understood as, e.g., dependence, substitutability, and the range of problems that arise from nations being incorporated into the system of international relations prior to being nationally integrated. The concept of functional linkage facilitates the search for generalities while taking these complications into account and it is susceptible to

data analysis.

4. The need for research on national integration is accompanied by the difficulty of operationalizing the many qualitative definitions of integration and its sub-aspects, e.g., political integration.

However, national integration as both causal-functional and logico-meaningful in Sorokin's (1957) terms can be inferred from the existence of functional linkages.

One common thread running through sociological and related literature is the notion of increasing differentiation and interdependence both within and among societies. This can be discerned in Parsonian functionalism and, more directly related to interest in dynamics, it is evident in development theory, to some extent in theories of history, and to a certain degree it is a notion implicit in conflict theory (although this last type of theory contributes more by specifying that conflict--as a source of change--is inherent in the social system). In the body of literature that can be categorized as evolutionary or neo-evolutionary, this notion is found in the dichotomies that have been constructed whether they deal with larger systems (Redfield's folk vs. urban society, Bendix's feudalistic structures vs. nation-states, Hoselitz's ascription-diffuseness-particularism vs. achievement-specificity-universalism), communities (Tönnies' Gemeinschaft vs. Gesellschaft), roles (Smelser's multifunctional vs. more specialized role structures), authority (Weber's traditional vs. rational-legal authority), or interaction (Cooley's primary vs. secondary groups, Durkheim's mechanical vs. organic solidarity).

Industrialization is not only disruptive (as an initiator of

change and economic growth) by generating differentiation but it is also accompanied by integrative processes; i.e., it generates a situation requiring the expansion of functional linkages. The rise of internal demands--partly a consequence of industrialization--further contributes to the expansion of linkages. Given that industrialization is part of economic organization, if industrialization generates interdependence (and the implied functional linkages), then it is suggested here that economic linkages are the first to generate integration, i.e., planned cooperation to achieve shared economic goals. It is also suggested that the gradual establishment of political and finally social linkages within a nation will accelerate and expand the meaning of the process of integration; it becomes possible to speak of national integration and not only of economic and/or political integration.

National integration is defined here as a process of continual definition and redefinition of the lines along which a population is differentiated. It is assumed here that the definition of lines of differentiation within a nation is first based on ascribed characteristics (which will vary from nation to nation in some cases). One universal ascribed characteristic is ethnicity which is defined in this project as "national origin or ancestry." In addition, rural-urban differences have been found to decrease with development. While residence may be either ascribed or achieved, it is often an assumed characteristic, i.e., involving some voluntary choice. Both ethnicity and rural-urban residence were selected as control variables in this research project.

In order to be consistent with the underlying assumptions of the

data sources that this project utilizes, the term "nation" is used in the sense of administrative-political and geographic boundaries. Similarly, "provincial" is used to refer to sub-national administrative units with political and geographic boundaries (specifically states, provinces, and territories).

In specific terms related to this research project, national integration is therefore defined as a process which, due to the establishment of functional linkages generated by industrialization, consists in the redefinition of the lines along which a population within political-geographic boundaries is differentiated such that former differences based on ethnicity and/or rural-urban residence are weakened. It is suggested here that redefinition occurs on the basis of achievement (as former differences on the basis of ascribed characteristics weaken) and then on the basis of increasingly more specialized or narrowly defined roles.

The literature on integration within the social system emphasizes the integrative role of education, the state or political system, the legal system, and association structures such as interest groups. Even though functional linkages are established, e.g., through legislation, these linkages may latently support non-integration either because (1) they favor specific groups explicitly (e.g., tax incentives to multinational corporations may serve to discourage national entrepreneurship) or (2) due to lack of enforcement and/or lack of supportive mechanisms, certain sectors of the population do not utilize existing linkages.

The latent dysfunctionality of some functional linkages or the

lack of linkages may eventually contribute to integration in two ways: (1) it may be a source of conflict which can give rise to demands for integration or (2) non-integration can result in anomie which for Hoselitz (1960) and Hagen (1963) is one source of entrepreneurship and change.

There appear to be, therefore, two sides to participation as an aspect of integration: (1) the opportunity to develop a capacity to participate in collective activities in a similar sense as Weber's (Gerth and Mills, 1958) discussion of an individual's life chances and (2) actual participation. Functional linkages may be imposed and/or demanded and the establishment of functional linkages does not necessarily mean that they will be maintained, utilized, or supported. Finally, what appear as functional linkages for the larger social system (or for the system of international relations) may be dysfunctional for some groups within the system (or for some other nation within the system of international relations).

It is concluded that not only do indicators of economic, political, and social linkages need to be included but also: (1) ethnicity and rural-urban residence should be controlled as possible bases of differentiation and (2) since the fruits of industrialization might be reaped by non-national entrepreneurs or a favored group within the nation, some measure of the distribution of these benefits needs to be used (specifically average annual income by economic sector). A measure of social disorganization should be included since it is expected to accompany industrialization and, in addition, can be expected to exist among non-integrated groups; however, reliable data for indicators

frequently used as a reflection of social disorganization (e.g., homicide rates, suicides, divorce rates) are not available for all three nations included in this study.

In summary, the theoretical framework for this research project is based on four assumptions. Two of these are statements of (1) the feasibility of eventually building a universal theory of development and (2) the requisite of proceeding by first building intermediate-level theory. The remaining assumptions refer directly to building intermediate-level theory, asserting that the most adequate approach is (1) to begin with a key concept (functional linkage) and (2) to focus on two sub-processes of development by defining a not fully understood process (national integration) on the basis of functional linkage and investigating its relationship to a process (industrialization) that, it is suggested, generates functional linkages. By proceeding in this manner, a series of theoretical propositions will hopefully result and serve as a starting point for gradually building a theory of development.

CHAPTER II

ANALYTIC MODEL

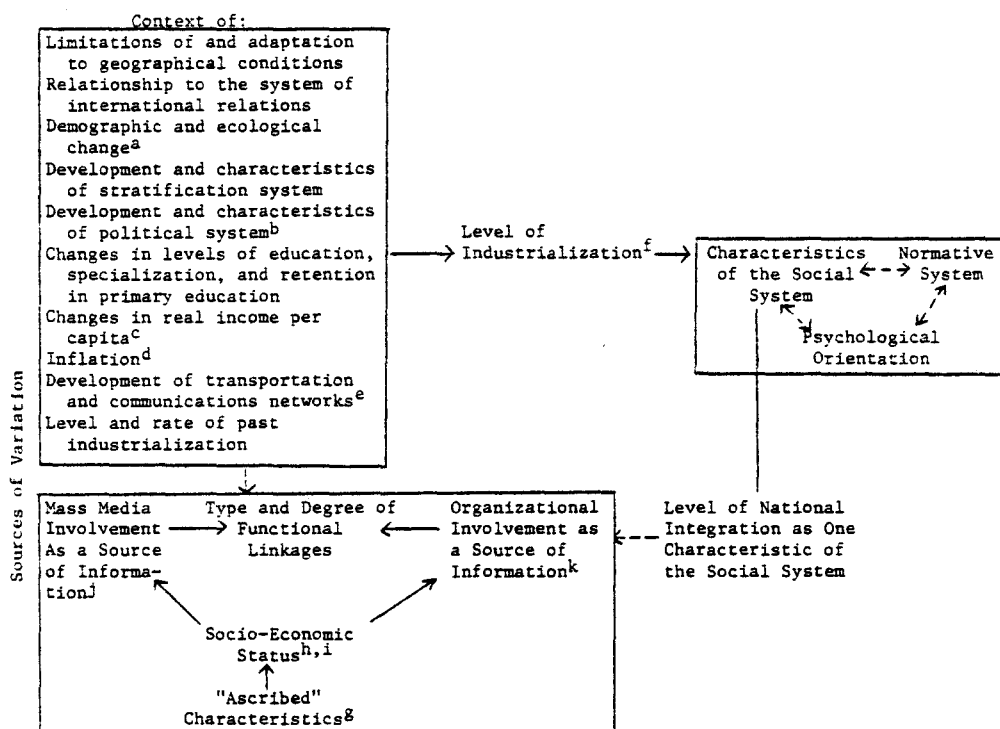
Analytic Model for Cross-Cultural Research on National Integration

The model shown in figure 1 was developed to illustrate the expected relationship among the variables selected for this project and the framework within which to conduct research on the relationship between industrialization and national integration. The context is shown as an influence on the level of industrialization and on the type and degree of functional linkages. The section on the type and level of functional linkages represents sources of internal demands contributing toward generating functional linkages which vary according to the level of national integration. The rest of the model depicts the research topic, i.e., the relationship between the level of industrialization and national integration as one characteristic of the social system. The general expectation is that only at relatively high levels of industrialization is it possible for a socially as well as economically and politically integrated system to emerge.

Operational Definitions of Variables

Three problems related to social indicators are (1) whether or not they indicate what they are assumed to indicate, (2) whether or not generalizations can be made concerning any single indicator among nations or from national to sub-national levels, and (3) whether or not

Fig. 1. Analytic model for cross-cultural research
on national integration*



*The variables in this model are interrelated; therefore, the unbroken lines indicate the path of interest in this research only and do not imply causality.

^aFertility, mortality, migration, urbanization, population distribution.

^bIncluding civil conflicts (e.g., riots), administrative divisions, percentage of registered voters who vote, and legislation related to economy and society.

^cBy economic sector (specifically agriculture, industry, commerce, and services in this study).

^dUsing the price index for wheat.

^eIncluding the growth of port facilities (location and tonnage).

^fPercentage of the labor force employed in industry and contributions of major economic sectors to the G.N.P.

^gEthnicity and rural-urban residence.

^hAverage annual income by economic sector.

ⁱIlliteracy rates.

^jRadios per capita.

^kPercentage of the economically-active population covered by social security; school enrollment; percentage of the voting-age population that is registered; access to marketing districts (ports).

acceptance of the notion of multilinearity means that different social indicators should be used in cross-cultural comparisons; e.g., today automation is by-passing the earlier stages of industrialization that occurred in developed nations but it does not necessarily reduce employment levels (ILO, 1972:223-243) although it may inhibit growth of the industrial labor force. As a consequence, the operationalization of industrialization and national integration takes the form of multi-dimensional definitions.

The Industrial-Economic Set of Functional Linkages

Since industrialization could be defined by the changing size of the industrial labor force or simply as a changing occupation structure, this process is operationally defined in two ways. In addition, it is expected in this project that the first functional linkages to be established are economic in nature. Therefore, communicative and other economic variables that tend to vary with, and have often been used as indicators for, industrialization are included in this set. The industrial-economic set of variables and their operational definitions follow.

Industrialization

Percentage of the labor force employed in industry. For this first operational definition of industrialization, Brazil, Chile, and the U.S. use different classifications of the major economic sectors. To assure that these classifications would coincide for this and related variables, it was necessary to define "industry" as including mining (including quarrying), manufacturing, construction, public

utilities, and communications (including transport and storage) and to tabulate the data accordingly.

Percentage contributions of the major economic sectors (agriculture, industry, commerce, services) to the G.N.P. This second indicator of industrialization was treated as four variables in the regression and partial correlation analysis of provincial data, representing the economic sectors of interest in this project. The specific operational definitions therefore become the percentage contribution to the G.N.P. of (1) industry (as already defined), (2) commerce (retail and wholesale trade, finance), (3) agriculture (value of agricultural products), and (4) services (receipts from personal services and related services as included in national censuses, e.g., hotels and motels, recreational, repair, and miscellaneous services). The G.N.P. as a national estimate is not broken down by provincial sectoral contributions. Each province's percentage share of national production in each sector was either available or easily calculated from available statistics for the three nations in the study. Based on the sectoral composition of the gross product, each province's percentage share of production in each sector was then transformed into a percentage of the total gross product.

Communications

Radios per capita. Radios per capita is the one variable from the industrial-economic set for which 1960 and 1970 provincial data were not consistently available for the three nations. It was left in the study, however, to see if any relationship might appear in cross-cultural comparison between the national level of radios per capita

and provincial variations in the socio-political variables. For each nation, radios per capita at the national level for 1960 and 1970 was assigned to each province. This procedure raises both methodological and theoretical questions; therefore, the findings are included in this report as tentative. They should be viewed with caution and within the context of not constituting a commonly used methodology.

Other economic linkages

Access to marketing districts (number of ports). The selection of the number of ports by province as the indicator of access to marketing districts includes both national and international marketing. The number of ports tabulated by province consists in all those listed in the official statistics of the three nations as having been used for coastwise and/or maritime shipping in 1958-1960 and 1968-1970.

Average annual income in the major economic sectors. Average annual income in the major economic sectors refers only to wage earners in this study. Income is expressed in U.S. dollars and, because of the extremely high inflation rates in Brazil and Chile, a constant rate of exchange was used in tabulating the data. These rates (representing the exchange rates for 1960) are CrN\$.09=US\$1 for Brazil and E⁰1.053=US\$1 for Chile for both 1960 and 1970. This indicator was also treated as four variables representing each of the sectors (agriculture, industry, commerce, services) of interest in this study and as defined above for the variable concerning the percentage contributions of the major economic sectors to the G.N.P.

The Socio-Political Set of Functional Linkages

Social linkages

Percentage of school enrollment (at primary, secondary, and college levels). In collecting the 1960 and 1970 provincial data for Brazil, Chile, and the U.S., the difficulty encountered was similar to that expressed by Vera (1963:288), i.e., to calculate the school-age population of developing nations; this difficulty in Latin America stems in part from the variation in the definition of "school-age" among nations and in part from a census breakdown by nation and/or province of age groups that is inadequate for the purposes of studying the school-age population. Data for the total school-age population at the provincial level were not consistently available for the three nations in this study. Therefore, a primary-school enrollment ratio was developed and used for the three nations so that findings would be comparable and cross-cultural analysis possible. This ratio is:

$$\frac{\text{province's primary-school enrollment} \\ \text{as a percentage of the nation's school-} \\ \text{age population aged 5-19}}{\text{province's percentage share} \\ \text{of total population}} \times 100$$

The age category of 5-19 in the ratio was selected after examining school enrollment figures by age distribution in Brazil and Chile; the minimum age represented was 5 and, although youth older than 19 were included in primary enrollment figures (the same is true for secondary enrollment) because of high repetition rates, it was decided that their numbers were too few to risk further distortion of the data. The

primary-school enrollment ratio therefore signifies each province's relative share of primary enrollment of the nation's school-age population in relation to its share of the total population. For the same reasons as in the case of primary education, a secondary-school enrollment ratio was developed:

$$\frac{\text{province's secondary-school enrollment} \\ \text{as a percentage of nation's school-age} \\ \text{population aged 10-19}}{\text{province's percentage share} \\ \text{of total population}} \times 100$$

The minimum age of 10 is used in the secondary-school ratio since data on enrollments in the three nations showed this to be the minimum age included in enrollment figures. The upper limit of age 19 was selected for the same reasons as in the primary-school enrollment ratio. The secondary-school enrollment ratio represents, therefore, each province's relative share of secondary enrollment of the nation's (secondary) school-age population in relation to its share of the total population.

The commonly used indicator of university enrollment per 100,000 population conceals, for the purposes of this study, and more likely than not underestimates actual access to university education (1) by not taking into account the population that has a university education but is not currently enrolled and (2) by including individuals of all educational levels (without distinction among these levels) in a single measure. Enrollment at different educational levels as a social indicator in this study focuses on the percentage of the population that is eligible by being actually enrolled in school. University enroll-

ments were therefore calculated as a percentage of total primary- and secondary-school enrollments (actual enrollments and not the ratios that were developed) in each province of the three nations. It is a measure of the relative access to, and importance assigned to, university education in relation to the actual size of pre-university educational participation (potential university students) in each province.

Illiteracy rates. These rates for Brazil and Chile refer to the population aged 15 years and over defined by the census as illiterate. Of the population aged 14 years and over in the U.S., 2.2 per cent were illiterate in 1959 and 1.0 per cent in 1969. With such a low rate, data for the 50 cases in 1960 and 1970 would not vary enough for regression and correlation analysis. Therefore, functional illiteracy rates (population 25 years of age and over with less than five years of schooling) were used for the U.S. with comparable rates unavailable in Brazil and Chile for this age group.

Percentage of the economically-active population covered by social security. The provincial data in this study refer only to the estimated percentage of the labor force covered by the main social security system in each nation.

Political linkages

Percentage of the voting-age population registered to vote. Inconsistencies in provincial data available on the voting-age population in Brazil, Chile, and the U.S. resulted in limiting the operational definition of this variable to the percentage of the eligible (literate) voting-age population registered to vote in election years which repre-

sents estimates in the three nations.

The Control Variables

The two controlled variables are ethnicity and rural-urban residence. Although controversy exists over the importance of ancestry in Brazil and Chile, discrimination has been documented especially in the case of blacks, mulattoes, Amerinds, and mestizos in Brazil; two groups in particular are treated as unassimilated--the Japanese and Amerinds. Similar controversy in Chile centers on whether or not it is a mestizo nation and whether or not discrimination based on ancestry exists; Amerinds are viewed as an unassimilated group. Therefore, ethnicity in this study is operationally defined by national ancestry, specifically percentage of the provincial population of non-European ancestry. The Brazilian census classifies individuals as branco (white or of European ancestry), prêto (black or of African ancestry), pardo (brown, usually of mixed ancestry), and amarelo (yellow or of Asian ancestry). Given the controversy over the importance of ancestry, the specific control variable here is the percentage of the provincial population that is of non-European ancestry which includes the prêto, pardo, and amarelo categories of the Brazilian census and the sum of "non-white" categories in the U.S. census. Chile's population of non-European ancestry includes Amerinds and mestizos.

Rural-urban residence is operationally defined as the percentage of the provincial population living in cities having a population of 20,000 or more. The Brazilian urban classification is by municípios and the Chilean by comunas of 20,000 or more which therefore include some rural population over which the "urban place" has jurisdiction.

CHAPTER III

RESEARCH DESIGN AND SELECTION OF CASES

Selection of Cases: Brazil, Chile, and the United States

Brazil, Chile, and the United States were selected as: (1) nations at different levels of industrialization within the same hemisphere; (2) nations representing former colonies of the major colonial powers in this hemisphere: England, Portugal, and Spain; and (3) nations among which functional linkages---e.g., in trade agreements, foreign aid, and participation in several hemispheric organizations---have existed since their struggles for independence.

Units of Analysis and Statistical Procedures

The units of analysis are provinces within the three nations. These provinces consist in Chilean provinces (N=25), Brazilian states and territories (N=25), and the states of the United States (N=50). So N's are 25, 25, 50, and 100 (for the combined cases in cross-cultural analysis) for the statistical tests. There is a combination of three levels of analysis--provincial, national, and international--but the focus is on the province as the basic unit. The research interest is to focus on (1) the co-variation of the two sets of variables within each province in contrast to the co-variation at the national level in each of the three nations and (2) the sources of provincial variation in contrast to variations at the national level and as possible explanations of the level of national integration in each of the three nations.

While the analysis focuses on making a time comparison using data for 1960 and 1970, descriptive statistics covering a longer span of time are included to describe the historical context of the research. These statistics are related to demographic and ecological change, changes in real income per capita, inflation (since inflation may consume any gains made), and the system of international relations (specifically dealing with trade relations). For the same purpose, general qualitative description is provided, e.g., in relation to geographical factors (particularly ecological barriers as well as type and abundance of natural resources), development of the political and stratification systems, and international relations.

The descriptive statistics are used to (1) trace changes in the selected variables, recognizing that rates of change in early stages of development accelerate and begin to taper off at later stages, and (2) to place a check on some variables that might carry a hidden bias; i.e., descriptive statistics on retention rates in primary education, location and tonnage of port facilities, and the percentage of registered voters who vote are included. In all cases, the qualitative and quantitative description contains possible sources of provincial and national variations. Given this descriptive context, data for 1960 and 1970 (or as close to these years as possible since some data are collected between census years, e.g., the agricultural census) are used to investigate the relative importance of each variable for each nation separately. Then, a causal analysis based on partial correlations is done.

In the regression analysis, the first criteria for selecting

industrial-economic variables for subsequent use in causal analysis were: (a) maintain the variables in the order in which they appear in the regression equation, (b) eliminate those which were excluded from the regression equation because of insufficient tolerance and F values, (c) exclude all variables entered at those steps in the expansion of the equation where the overall F test indicates the increase in Multiple R to be insignificant at the .05 level, and (d) exclude variables that contribute nothing (R^2 change = .000) or less than one per cent to explaining variation in the socio-political variable. Beta weights (chosen instead of unstandardized regression coefficients since the variables are expressed in different units) and the standard error of estimate are included in appendix C (tables 47-54) only for the reader's interest since the regression program is based on zero-order correlation matrices and primary interest is in first-order partials controlling for rural-urban residence.

The two control variables (rural-urban residence and ethnicity) were entered into the regression equation and, in some cases, were the only variables significantly correlated with elements of the socio-political set. Ethnicity was eliminated early in the study as a control variable because of inadequate data; in addition, problems appeared in relation to multicollinearity and to indicators that proved to be seriously inadequate. These problems made any attempt to proceed with a regression analysis based on first- and/or second-order correlation matrices impractical.

The scatterplots of residuals (standardized residuals plotted against standardized Y' values) were directly examined. No curve indi-

cative of a non-linear (e.g., curvilinear) relationship was discovered. In the correlation analysis, first-order partials controlling for rural-urban residence where $p < .05$ were examined. A partial of $\pm .400$ was arbitrarily defined as the weakest correlation to be retained in the study; industrial-economic variables were therefore defined as relatively unimportant and eliminated if the first-order partial was less than $\pm .400$. If, when controlled, the correlation between variables was reduced to less than $\pm .400$, this is noted in the discussion. Two-tailed significance tests were used.

After using the above criteria, multicollinearity became a problem in the two groups of industrial-economic variables that were each treated as four variables--percentage contributions of the major economic sectors to the G.N.P. and average annual income in the major economic sectors (see tables 38-41 in appendix C). When multicollinearity appeared in one of these groups, the decision in this project was to select the variable in that group which either (a) had no ties with other elements in the group or (b) had, of the tied elements, the strongest partial correlation with the socio-political variable involved. The selected variable(s) was then assumed to be an indicator of the same underlying phenomenon as those which were omitted. The fact that multicollinearity appeared as a problem should be taken into account when examining the beta weights in appendix C.

Finally, relationships among variables were determined to be direct, indirect, or both and after discussing each subfile, a causal analysis was done. On the basis of the research findings, generalizations are limited to the Western Hemisphere and the attempt is made to

construct intermediate theory.

Data Collection

Data utilized for correlation and regression analysis were collected from, or based on, Brazilian, Chilean, and U.S. census publications. Supplementary sources for descriptive (quantitative and qualitative) data consisted in statistical bulletins, case studies, and histories of the three nations. Sources used primarily for quantitative data collection are listed on pages 260-266. Sources consulted for geographical description and for the history of economic, political, and social development of the three nations are included on pages 249-260.

CHAPTER IV

THE CONTEXT: 1800-1970

As a context for the research findings, it will be helpful to provide a descriptive overview of some national and international events and trends. A brief introduction to Brazil, Chile, and the United States is followed by a review of the nineteenth and twentieth centuries. Particular emphasis is on shifts in functional linkages. A geographical description of the three nations can be found in appendix A. A discussion of functional linkages and lines of differentiation in the three nations in the sixteenth, seventeenth, and eighteenth centuries is provided in appendix B.

Introduction to Brazil, Chile, and the United States

Population

The population of Brazil increased from 17,318,556 in 1900 to 41,565,083 in 1940 and 93,204,379 in 1970; Chile's population was 3,220,531 in 1907, 5,023,539 in 1940, and 8,853,140 in 1970; and the U.S. population grew from 75,994,575 in 1900 to 131,669,275 in 1940 and 203,211,926 in 1970. Comparable densities/km.² in 1970 were 11.1 in Brazil, 11.7 in Chile, and 22.2 in the U.S.

Three basic factors contributing to the ethnic composition as well as population size of the three nations were the original Amerind population, the voluntary immigrants, and the involuntary immigrants (chiefly African slaves). The Amerind population has faced isolation

and/or extinction through wars (Chile, U.S.), slavery (Brazil, Chile), amalgamation, and the reservation system. Today it is estimated that they account for between .4 per cent and 1.5 per cent of Brazil's population, between 3.2 and 5 per cent of Chile's population, and .4 per cent of the U.S. population. African slaves were negligible in Chile but significant in Brazil and the United States; actual numbers of slaves cannot be compared since Brazil (Weil et al., 1975:81) destroyed all records when slavery was abolished in 1888.

Immigration has played an important role in Brazil and the U.S. not only in relation to ethnicity but in having an economic impact as a source of labor and as a significant factor in industrialization. About 4,800,000 immigrants entered Brazil from 1850 to 1950, 459,285 from 1954 to 1963, and 65,381 from 1964 to 1970; the nations of origin in terms of numbers of immigrants are in order of importance Portugal, Italy, Spain, Germany, Japan, and USSR (also prominent were Dutch, Polish, Lebanese, and Syrian immigrants). In the U.S., 45,533,116 immigrants entered from 1820 to 1971; in the twentieth century, the peak of 8,202,388 from 1900 to 1909 dropped to a low of 699,375 from 1930 to 1939 rising to 3,213,749 from 1960 to 1969. The nations of origin in order of importance are Germany, Italy, England, Ireland, Canada, USSR, and Mexico.

Immigration has never been as important in Chile; the foreign-born population numbered 19,669 in 1854, 134,324 in 1907, and 107,273 in 1940. In one of the peak periods between 1883 and 1901 only 36,000 Europeans entered Chile and by 1960-1966 the average number of immigrants was less than 1,000 a year. The nations contributing immigrants

listed in order of importance have been Spain, Germany, Italy, and, to a lesser degree, Switzerland, France, England, and Yugoslavia.

Contemporary Politico-Administrative Systems

At present (see appendix B for the history of the politico-administrative systems of the three nations), Brazil is technically a constitutional republic consisting in 21 states, 4 territories, and a federal district. The Constitution of 1967 remains in effect. Elections are indirect with the president elected by the national congress. The administrative divisions of states and territories (referred to as provinces in this study) are divided into districts with towns as seats. The states have unicameral legislatures while territories are administered by the federal government.

The Chilean government remains highly centralized. Political subdivisions are the 25 provinces divided into departments which are further divided into subdelegations and then districts. Administratively, the provinces are divided into comunas which coincide with political subdelegations; groups of comunas make up municipalities. Chile has no federal district. Elections (up to 1973) are direct with the president chosen by popular vote and the Constitution of 1925 remains in effect.

The U.S. consists in 50 states (referred to in this study as provinces) and a federal district under the Constitution of 1789 with a president elected by popular vote and the Electoral College. The states are governed by bicameral legislatures with the exception of Nebraska which has a single-chambered legislature. Politically and

administratively states are subdivided into counties, except for Louisiana (parishes) and Alaska (boroughs). The District of Columbia is under federal legislative administration.

The Impact of Plantation Systems

In the colonial era (see appendix B) of Brazil, Chile, and the U.S., the land had been left to private initiative, a policy resulting, on the one hand, in the rapid growth of agricultural production but also the poor utilization and abuse of the land, soil erosion, and waste of a basic natural resource. The consequences would affect agricultural production in the twentieth century. On the other hand, this policy permitted the emergence of plantation systems in Brazil, Chile, and the southern U.S.; the consequence from this perspective was a landed aristocracy dominating economic and political institutions characterized by paternalistic-dependent relationships, one of the greatest and most persistent obstacles to development in these regions.

From the time of the colonial era, economic linkages predominated nationally as well as internationally. The African slave, the Amerind, the indentured servant, and the mestizo were first viewed as important to plantation and commercial economic interests as manual laborers and as consumers. They were not, however, linked to the political system. In some instances, even economic linkages were severed; e.g., the end of Amerind enslavement came in Brazil once the Amerind was defined as "unproductive" and underlying the eventual acceptance of the abolition of African slavery by the landed aristocracy in Brazil was the notion that slaves were "non-producers" and "non-consumers," as noted by

DeKadt (1968:41-45; also see Toplin, 1969:640).

The political, or more accurately, politico-economic linkages originally belonged to the aristocracy, most of whom were European-born. Until they became upper-class members after independence, creoles in a sense were an "intermediate" group as, it can be suggested, were the Jewish and Middle Eastern immigrants in Brazil and Chile as well as other of the immigrant groups in the three nations whose importance, particularly in commerce (and in industry in the twentieth century), was recognized. The original Amerind inhabitants of Brazil, Chile, and the U.S. were perceived as the "conquered" and therefore the "isolated" be it in the Andes Mountains, Amazonian jungle, or on reservations.

As Hicks et al. (1970:394) note, wherever slavery has existed, manual labor is viewed with disdain. This notion has not completely disappeared in the U.S. but remains especially prevalent in twentieth-century Brazil and Chile where it inhibits governmental attempts to establish a system of vocational schools to meet national development needs. The manual laborer--black, Amerind, mestizo, or immigrant--of the nineteenth century continued to be isolated from political participation in part because of elitist-oriented educational systems that provided a rudimentary, if any, education where the right of suffrage carried with it a literacy requirement. In turn, the creation of a massive uneducated or poorly educated, unskilled labor force subsequently became an obstacle to industrialization in the nineteenth-century U.S. and twentieth-century Brazil and Chile.

Functional Linkages and Lines of Differentiation in the Nineteenth Century

Changes in Functional Linkages and the Redefinition of Lines of Differentiation in the International System

Impact of the Napoleonic Wars

Independence of Brazil. Following Napoleon's take-over of Portugal in 1807, the English took the regent João (who became João VI in 1816) and his family to Brazil. After liberating itself in 1820, Portugal protested against having its government located overseas; João returned to Portugal in 1821 leaving his son Pedro as prince-regent of Brazil. In 1821-1822, Portugal, opposed to free trade and the increasing autonomy in Brazil, moved to make it a dependent colony once again. Pedro was recalled to Portugal in 1822 but, with the support of Minas Gerais (especially the miners), he declared Brazil an independent empire.

Independence of Chile. When it was apparent that Napoleon had triumphed in Spain, a national government was established in Santiago (1810); the captain-general of Chile was deposed and a junta, elected by open cabildo, assumed authority in the name of Fernando VII. The Spanish reconquest (1814-1817) came to an end when San Martín's army defeated Spanish forces in Santiago in 1817. San Martín refused the post of Supreme Director which was then given to Bernardo O'Higgins and, in 1818, independence was declared; Spain did not recognize Chilean independence until 1844.

Awareness of economic interdependence. The interdependence of the European and U.S. economies became apparent by the effect in the U.S. of the Napoleonic Wars. They were the primary reason for the

Panic of 1819 (Hicks et al., 1970:394-395), the first of a series of typical U.S. depressions.

Emergence of Brazil, Chile, and the U.S. as world powers:
redefinitions as a consequence of war

Brazil, Chile, and the U.S. emerged as "world powers" in the nineteenth century basically as a consequence of wars. After attaining this status, they became characterized by a tendency to adopt expansionist policies followed by a period of isolationism or at least non-involvement in conflict. It was by winning the War of the Pacific (1879-1884) against Peru and Bolivia (and gaining one-third of its national territory today) that Chile became the dominant power of West Coast South America; following the War of the Pacific until 1929, Chile was isolationist.

It was because of expansionist motives that Brazil went to war with Argentina (1825-1828) and Paraguay (1865-1870). In spite of failure to expand its boundaries, these conflicts--in combination with a reversal of the expansionist policy that had prevailed 1840-1889--led to Brazil's growth of prestige in South America; it did not then become so much an isolationist nation as an advocate of arbitration and negotiation to avoid conflict.

For the U.S., the War of 1812 and the 1846-1848 war with Mexico in which Texas, New Mexico, and California were acquired were expansionist wars that marked more or less the beginning and end of Manifest Destiny. The U.S. was already alienated from European affairs by 1812; in the latter half of the century, attention turned to westward expansion and domestic reform with an isolationist foreign policy, as illus-

trated by the Monroe Doctrine. It became increasingly difficult to avoid world contacts by 1890. The U.S. had capital, agricultural, and manufacturing surpluses; other nations wanted U.S. agricultural products in particular. As the principal result, U.S. diplomacy began to operate in an ever-widening sphere. It was, however, by involvement in the Spanish-American War that the U.S. emerged as a world power at the close of the century.

Beginning of U.S. economic expansion overseas

By 1860, goods consumed within the U.S. were mainly of domestic origin. Surpluses (especially of capital, agriculture, and manufacturing) increased but by 1890, with both the population and national boundaries having reached the Pacific coast, the domestic market could no longer absorb these surpluses. For the economy to continue to expand, outlets were needed abroad. Substantial investments overseas had begun following the Civil War. The increase in world gold production and in the demand for U.S. agricultural products led to a period of prosperity for agriculture in the U.S. (1897-1901) but it was the Spanish-American War in particular that thrust the U.S. into overseas economic expansion.

Expansion of linkages in trade and foreign investment

In Brazil, foreign capital was invested mainly in the trade sector and the construction of public utilities until the twentieth century; the English continued to hold their dominant position as a trade partner, as builders of the Brazilian railway system, and until 1844 as having the power by treaty to limit Brazil in the imposing of tar-

iffs. Chile's international trade, aside from wheat exports to Peru, remained until 1880 predominantly with Western Europe. Europe also continued to dominate in U.S. exports and imports but Asia began to increase in importance as trade agreements were made with China (1844), Japan (1854), and Siam (present-day Thailand) in 1856. With Canada and South American nations also becoming trade partners, trade relations increased rapidly in the last decade of the nineteenth century. Foreign capital in the U.S. was important in transportation in particular.

Fluctuations in inter-American linkages

The U.S. fully comprehended Latin America's problems as colonies of foreign powers; during their wars of independence, the U.S. offered assistance (which was also requested, e.g., by the Carrera faction in Chile) and later served as a mediator in their disputes. In spite of these ties and the trade relations that had begun, hemispheric unity did not emerge in the nineteenth century.

Brazil's shift away from expansionism toward arbitration and negotiation had improved relations with other Latin American nations but Brazil remained relatively isolated from them throughout the nineteenth century. The U.S. had been the first nation to recognize (1824) Brazilian independence but Brazil's ties remained predominantly with Europe. Chile was already investing capital in Peru and Bolivia (in nitrates and guano) prior to the War of the Pacific (when Chile gained control over guano- and nitrate-producing areas); by the end of the century, Chile's relations with Latin America had improved but nineteenth-century relations with the U.S. worsened.

The alienation of the U.S. from European affairs and the Monroe

Doctrine came at a time when domestic concerns were emphasized. Therefore, when Latin American nations first attempted to strengthen relations with the U.S., they met with limited success as in the reluctance of the U.S. Congress to send delegates in response to Bolívar's invitation to the 1826 Panama Congress (organized to jointly demand that Spain recognize the independence of Spanish-American Nations). The 1846-1848 expansionist war with Mexico did not enhance the image of the U.S. in Latin America but relations had improved by 1889 when the first Pan American Congress met in Washington and the Pan American Union, an information bureau, was established. Then the U.S. became involved in the internal affairs of Chile by backing President Balmaceda in the 1891 Civil War against Chilean Congressional forces. Balmaceda's forces lost the war and Congressional forces remained antagonized because of the U.S. position. Shortly after, a lengthy dispute over an attack against U.S. sailors in Valparaíso resulted in anti-U.S. feeling throughout Latin America at the close of the nineteenth century.

Changes in Functional Linkages and Redefinition of Lines of Differentiation within National Systems

Divergent experiences in economic growth: basis of differences in the type of economic linkages

The functional linkages of Brazil, Chile, and the U.S. to the international system in the sixteenth and seventeenth centuries were defined on the basis of their status as dependencies. Although individual immigrants may have had different motives, economic linkages predominated and resulted in extractive, export economies to meet Europe's needs. Particularly in the nineteenth century the economies of the three nations diverged drastically in their characteristics. A

basic difference between these economies was that industrialization emerged in the U.S. on the basis of an already existing infrastructure; in contrast, it was left to governmental planning in the twentieth century to simultaneously attempt to industrialize and build an industrial infrastructure in Brazil and Chile. Although Brazil and Chile had emerged in the nineteenth century as world powers politically, their economies remained characteristically extractive and export-oriented.

Nineteenth-century economies of Brazil and Chile. Economic expansion was rapid from 1830 to 1900 in Chile (particularly 1841-1876) and in Brazil from 1850 to 1900 (especially after 1889). For Chile, the acquisition of the North as a consequence of the War of the Pacific signified wealth in nitrates; population expansion and settlement (mainly by immigrants) south of the Bío-Bío River would come to signify wealth in agricultural and forest resources. In large part, Chilean economic expansion was due to a shift from silver to coal production followed in the 1870s by a shift to nitrates. While the Chilean economy continued to rely on the mining sector, Brazil depended on coffee. The first substantial coffee exports were in 1818 with a coffee cycle well-established by the 1830s (beginning in Rio de Janeiro State); coffee became the major export until World War II although this cycle continues today. Adding to the importance of coffee was the continued shift away from sugar and cotton after the slave trade was abolished (1852). Contributing to the rapid economic growth after 1889 in Brazil was the expansion in trade, cattle raising, mining, agriculture, and forestry.

Industrialization of the United States. The industrialization of the U.S. passed through the following phases during the nineteenth

century:

1. The handicraft stage of colonial times continued up to 1810.
2. Gradual, although unsteady, growth occurred between 1810-1840 with manufacturing well-established--mainly in New England--by the end of the War of 1812. A series of factors began to operate concomitantly leading to a period of rapid growth: population growth (a source of labor and consumers of domestic production), development of a market economy, changes in technology (cotton gin, use of power machinery in textiles), new sources of energy (steam, anthracite coal), the transfer of capital from merchandizing to manufacturing, and the influx of foreign capital, especially in canals and railroads; in addition, the textile industry commonly had all operations under one management by the 1830s which was important to the subsequent development of corporate organization. As Fite and Reese (1973:142, 267) indicate, however, the most important economic factor prior to 1860 was the acquisition and settlement of the West which: provided more resources, markets, and exports; drew foreign capital; and encouraged transportation.
3. From 1840-1860 the shift away from agriculture to manufacturing began with rapid industrial and commercial development. Contributing (and interrelated) factors were: as a consequence of more machinery, the factory system (relatively unimportant before the 1840s) became well-established and labor productivity increased; as a consequence of the growing need for capital, the corporation emerged as the predominant form of business organization thus making a sharp distinction between labor and management; and, as a conse-

quence of improved transportation, domestic and foreign markets rapidly expanded. Manufacturing, however, was only beginning to be concentrated at strategic points and was still limited basically to using raw materials produced within the U.S. In all economic sectors specialization was under way in both production and trade while manufacturing was rapidly approaching self-sufficiency.

4. The Civil War period reflected both pre- and post-war regional differences. The concentration of industry in the North prior to the war contributed to the outcome of the Civil War and, because of the needs of the war, the shift from agriculture to manufacturing accelerated in this region. Industry in the South developed almost completely to meet wartime needs. In the North, the war brought prosperity; in the South, it brought ruin.
5. In the post-Civil War period, several trends emerged: (a) the growth of large-scale business and corporate organization; (b) the concentration of banking and finance in a few strategic centers such as Wall Street; (c) the mechanization, specialization, and commercialization of agriculture which impelled it into a less self-sufficient exchange economy; and (d) the replacement of steel for iron and the growing importance of industry over agriculture. Agriculture continued to predominate until 1890, the turning point for industry; by 1894, the U.S. was the world's leading manufacturing nation. The shift in manufacturing away from New England to the Middle Atlantic made the latter the most important manufacturing region; rapid progress was made in the North-Central Region but not in the South prior to 1880. It was, however, to be those

regions east of the Mississippi where manufacturing would still be concentrated in the next century.

Impact of changes in transportation and communications
on the expansion of functional linkages

The War of 1812 was a turning point for transportation in the U.S.; the blockade forced movement by land which, in turn, brought the realization of a need for, and construction of, better roads. As a consequence of the expense of moving freight by land, the use of navigable waterways became increasingly important. However, early expansion westward encountered the problem of a lack of navigable water in some areas. It was then that the era of canals began with the opening of the Erie Canal in 1825 joining the Hudson River and the Great Lakes; by 1850, there were 5,120 kms. of canals.

Canals, particularly their expense, were problematic but it was the railroad that brought the canal era as well as the use of steamboats (first used in 1812) to an end; Great Lakes traffic was the only water transport that did not decline. Ocean transport, from the time of the War of 1812, became characterized by larger and faster ships; the clipper ships of the 1840s were gradually replaced by steamships (coinciding with the use of iron in ship-building) which, again because of a problem of expense, had to be subsidized by the government.

The Baltimore and Ohio (1828) was the first public railway in the U.S. By 1860, and especially from 1865 to World War I, the railroad was the most important single form of land transportation. The New York-Chicago rail connection in 1853 had shifted the movement of trade from west to east instead of north to south, a trend that be-

came more firmly established with the completion of the first continental railroad at Ogden, Utah, in 1869. By the 1890s, the railroad network in the U.S. was complete as were telegraph and telephone networks that had been built concomitant to railroad construction. The first transoceanic cable had been completed in 1858.

As part of the infrastructure for industrialization, the changes in transportation and communications in the U.S. were important in economic and territorial expansion and as a link between different sections of the nation. These changes thrust Brazil, Chile, and the U.S. into closer contact with the world but the internal impact in Brazil and Chile varied from the U.S. experience. In all three nations, the construction of transportation networks relied on foreign investment. Latin American transportation systems were built by Europeans for their purposes and, therefore, were oriented to the sea; this served to pull Latin American nations away from each other and linked sections of each nation to the sea rather than to other regions of the nation.

Chile was the first South American nation to use steam navigation (1840), construct a railroad (1850), and use Morse telegraphy (1852). Brazil's first railroad was inaugurated in 1854; the railroad system grew rapidly after 1889. In Rio de Janeiro in 1851 the first steamship line to Europe and, in 1874, the transatlantic cable were inaugurated. Although Brazil and Chile had more contact with other nations, these transportation and communication routes of the nineteenth century did not compose part of an industrial infrastructure. They did, however, emphasize the export-oriented nature of their

economies.

Government intervention in the expansion of
economic linkages

Beginning as dependencies, the (external) government played a role in the economies of Brazil, Chile, and the U.S. in the colonial era although some private initiative and local autonomy were permitted so long as it was beneficial to Europe's economic interests. Government was involved in the economy by the nineteenth century directly or indirectly in three areas: protectionism, a shift from laissez-faire economic policy to intervention, and sectionalism based on conflict between economic interests.

Brazil. While still under Portuguese control, free trade was established and economic restrictions were lifted, especially from 1808 to 1816. Inflation first emerged as a problem after mid-nineteenth century (although it did not become a problem of major proportions until the mid-twentieth century). It was then that government began to intervene in the economy. Protectionist tariffs began in 1860 to aid the small-scale industry that was emerging but economic policies of the government were designed to encourage agriculture, commerce, and railroad construction as well as industry. The government took steps 1894-1910 to control inflation through a series of fiscal reforms and loans. The establishment of a republic in 1889 and a rapid increase in provincial powers had not, however, lessened the discontent and conflict that had grown during the empire period and the century closed without resolving sectionalist differences. Pedro I reigned 1822-1831. Forced to abdicate and return to Portugal, he left his five-year-old

son Pedro to rule; regents governed in his name 1831-1840 when at age fourteen Pedro was declared of age in hopes that reestablishment of direct monarchy would reduce the secessionism, revolts, and discontent that had been characteristic during the rule of Pedro I and the regency. Pedro II ruled 1840-1889 but failed to actively push for change. In 1889, Deodoro da Fonseca led the army revolt that forced Pedro II and his family into exile in Europe. A republic was proclaimed and a provisional government was established. Unrest grew under the Empire (1822-1889) most noticeably among the landed aristocracy (primarily because of creditors and excessive taxation), clergy, and army; secessionist movements and provincial revolts had already begun in 1817 (Pernambuco) due to growing republicanism (especially after 1870) and antagonism of the creoles over the preference shown to the Portuguese (European-born). Sectionalism after the establishment of a republic was based on antagonism against the domination over the federal government by São Paulo and Minas Gerais in favor of their economic interests (particularly those of the coffee planters). From 1893-1895, discontent became widespread with two abortive rebellions (Rio Grande do Sul and the navy under Admiral Custodo de Mello). However, São Paulo and Minas Gerais continued to be the most powerful provinces--politically and economically--into the twentieth century (one indication being that, until 1930, civilian presidents came either from São Paulo or Minas Gerais).

Chile. Chilean civil wars represented conflicts primarily between Liberal and Conservative factions. However, the Civil War of 1891 was in part due to President Balmaceda's position in favor of an

increase in government planning versus the laissez-faire Congressional forces that won the war. Laissez-faire forces also predominated in the copper industry (from 1811 to 1955) although Chile was the leading world producer of copper 1851-1880. Financial and administrative reforms were enacted 1891-1896 including an increase in provincial autonomy, similar to Brazil. Protectionist policies to aid the Chilean economy began in 1897.

United States. Prior to 1816, tariffs were intended mainly as a source of revenue but after 1816, they became protectionist in nature. Popular attitudes shifted towards a favoring of government intervention. Federal aid to beginning industries through tariffs and tariff rebates contributed to the growing importance of manufacturing as did the lenience shown toward business by the government as industrialization accelerated and corporate organization expanded. However, as the Civil War period approached, the laissez-faire position was gaining strength concomitant to the growing popular reaction against government intervention. Although the regions of the U.S. economically complemented one another, sectionalism grew because of different economic interests and the issue of slavery; what had been East-West conflict in the previous century became sharp rifts among manufacturers in the North, cotton planters in the South, and free farmers in the West. As in Brazil and Chile, sectionalism broke out into open conflict in the nineteenth century with the 1861-1865 Civil War. The manner in which Reconstruction of the South was conducted after the war contributed not only to the South becoming the most critical economic region of the U.S. but also to the strong sectionalistic feelings that continued

well into the twentieth century. Following the Civil War, government intervention in the economy increased and laissez-faire notions began to decline as (German-trained) U.S. economists began to seriously question them by the end of the century. Still, the business sector was not seriously limited by government intervention in the nineteenth century in spite of, e.g., demands for government intervention in the growth of corporations and the 1890 Sherman Anti-Trust Law. Entrepreneurship had come to be viewed as increasingly important as industrialization accelerated; it influenced all aspects of U.S. society and the government intervention that did or did not occur tended to support and encourage the entrepreneur.

Factors influencing changes in bases of differentiation:
the combined impact of economic change, demands for
reform, and government intervention

The nineteenth century was an era of reform particularly towards the close of the century. Reforms and the demand for reform were closely interrelated to changes in the economy which, individually or jointly, had an impact on the position of some groups within society and the general characteristics of society.

The abolition of slavery. Slavery emerged as an issue in Brazil around 1831; the British in particular pushed for abolition. Slaves were first freed in Ceará and Amazonas; the international slave trade was abolished in 1852. The emancipation movement grew rapidly after 1870, opposed strongly at first by the landed aristocracy but encouraged by the freeing of all children born of women in slavery (1871) and of all slaves over 60 (1885). All slavery was abolished in 1888. In Chile, slavery was abolished in 1823; opposition to this legisla-

tion did not emerge since slavery had not been important and, by this time, most slaves had disappeared either through assimilation or death. The process of achieving the total abolition of slavery in the U.S. was a long one beginning with the prohibition of the African slave trade in 1808 followed by a series of events including the organization of the underground railroad in 1838, the open debate of the issue in the Lincoln-Douglas debates in 1857, the Emancipation Proclamation in 1863 in the middle of a civil war over the issue, and culminating in 1865 with the 13th constitutional amendment prohibiting slavery.

Encouragement of immigration and internal migration. Immigration with government encouragement had a significant impact on Brazil, Chile, and the U.S. in the nineteenth century. The principal motives underlying government intervention in Brazil were the need for a new source of labor after abolishing slavery and a desire to settle the interior; in Chile, it was a desire to settle the southern region; and in the U.S., it was a combination of a need for labor (because of increasing industrialization and the abolition of slavery) and the settlement of the West:

1. Brazil. City growth accelerated but the most rapid urban growth did not occur until the twentieth century. The majority of Brazil's population was concentrated in São Paulo, Minas Gerais, Pernambuco, and Bahia by 1818 when the first land grants were given to Swiss and German immigrants to encourage settlement in the interior. Because of the labor shortage, European labor was brought under contract; since coffee planters had already begun to extensively replace slave labor with Italian laborers, the aboli-

tion of slavery did not have as severe an impact on coffee fazendas as it otherwise would have had. Total immigration to Brazil was about 960,000 from 1851 to 1890 and 4,800,000 from 1891 to 1900; Spanish and Italian immigration in particular became extensive while Portuguese immigrants continued to arrive in significant numbers.

2. Chile. Since the Chilean population preferred to remain in the Central Region, the government encouraged European immigration to settle south of the Bío-Bío River by offering free land grants and tax exemptions under an 1824 law. The first colonization law of 1845 established a colonization agency for southern Chile primarily designed to attract northern Europeans and especially skilled labor. After the close of the War of the Pacific (1884), soldiers joined others coming for free land and the settlement of the South as far as Puerto Montt intensified. Immigrants from some nations had been arriving since the beginning of the century but the peak periods were 1840-1860 for the Italians, 1881-1890 for the French, 1889-1890 for the Spanish (mainly Basques), and the late nineteenth and early twentieth centuries for Middle Easterners (mainly Syrians). By far, the largest group of immigrants were Germans, the main group to settle the South with their peak period extending from the 1850s into the early 1900s. Still, the foreign-born in Chile numbered only 25,199 in 1875, 87,077 in 1885, 79,036 in 1895, and 134,324 in 1907; they settled mainly in port cities and Santiago.
3. United States. After the War of 1812, the fear of Indian up-

risings was diminishing, southern cotton planters wanted to extend their territory, and farmers who did not own slaves wanted to migrate to the West. These as well as other factors contributed to the rapid migration westward which transportation changes increasingly facilitated. Particularly following the Civil War, the commercial city gave way to the industrial city. Rapid city growth was in part due to natural increase and rural-urban migration but also immigration which accounted for an estimated 50 per cent of the city growth particularly 1870-1900. Immigration provided a solution to the continual labor shortage in the North (where immigrant labor had been relied on since the seventeenth century) and the new territory. The federal government and many western states had immigration bureaus (but no programs to assist new immigrants). Immigration rapidly increased after 1840 originating predominantly in Europe (mainly Irish and German) with a yearly average during the 1845-1855 period of 300,000 or more. In the 1870s, 2,812,191 immigrants arrived which was surpassed in the 1880s with 5,246,613 immigrants. From the post-Civil War period until World War I, immigrants came increasingly from southern and eastern Europe and Asia. In spite of their contribution to economic expansion in the U.S. by being part of the labor force (generally as unskilled labor) and by buying U.S. products, discrimination grew and the notion of restricting immigration gradually became widespread (as it did in Brazil in the twentieth century); some results were the 1882 Chinese Exclusion Act and General Immigration Law and the reversal in 1885 of the 1864 law permitting labor to be imported.

Emergence of the wage system and labor organization. As the source of labor shifted from slavery to free labor, the wage system emerged in Brazil about 1850 and in the southern U.S. after 1865. Labor unrest and organization did not develop in Brazil in the nineteenth century. In contrast, the wage system emerged earlier in Chile; labor protest began in the 1850s and, during the early stages of industrialization in the 1880s, unionization began (in the mining regions) with violence becoming increasingly characteristic of labor activities until the 1920s. In the U.S., the wage system emerged concomitant to the rise of corporate organization prior to the Civil War; corporations, the major employer of wage earners from 1865-1914, signified different working conditions and problems which contributed to the labor unrest that reached a peak between 1892 and 1895. The U.S. government was slow to intervene in labor's problems given that a labor movement, led first by artisans, had already started (although weak) prior to the War of 1812, revived in the 1820s, but discontinued after the Panic of 1837 because of high unemployment. Organized labor did not become established until the Knights of Labor (1869-1890) followed by the more permanent organization of the American Federation of Labor (1881); in the South, labor organization did not become established until the twentieth century largely because of the paternalism of southern factories.

Government policy in relation to Amerinds. Plantation systems based on slavery disappeared but the paternalistic-dependent relationships that they had spawned continued, e.g., in labor-management relations in the southern U.S., Brazil, and Chile and in the orientation

of government toward some groups in society. It was this type of relationship that characterized government policy in relation to the Amerind population in the U.S. and to a certain extent in Chile. Reservations continue to exist in many parts of southern Chile; whether living on or off the reservations, Mapuches are now small farmers. They were never conquered (in battle) but peace was made in 1887. Amerinds in Brazil had, prior to the nineteenth century, ceased to be utilized as slave labor; they continued to live relatively isolated and primarily in Amazonia with an absence of government policies pertaining to them prior to the twentieth century. With the opening of the nineteenth century in the U.S. came the defeat of the Amerinds in the Southwest followed by the Seminole and Black Hawk Wars, the uprisings following the Civil War, and occasional outbreaks until 1890. Until 1843, the government had voiced the intention of protecting Amerinds' rights and in 1849 the paternalistic Bureau of Indian Affairs was created. Reservation policy was eventually developed by the Indian Peace Commission created in 1867 and by 1886 all Amerinds were in "Indian Territory" or on reservations.

Legislation related to religion. The U.S. Constitution had already provided for the separation of Church and State at the national level (many states had established religions) and freedom of religion in the previous century. This did not occur in Brazil until the Constitution of 1891. In Chile, freedom of religion was decreed in 1865 as part of anti-clerical reforms passed in 1865-1885. The 1845 colonization law in Chile to attract northern European immigrants had first specified that they be Catholic; more rapid immigration was de-

sired so persons of all faiths were admitted. The subsequent and widespread religious conflict was resolved by the 1871 constitutional amendment providing for freedom of religion. Therefore, by the end of the nineteenth century, religion had been removed (constitutionally) as a basis of differentiation in all three nations.

Legislation related to education. In the end result, the educational systems of Brazil, Chile, and the U.S. did not greatly differ. Several seminaries and academies existed in Brazil prior to the nineteenth century, the first having been started by Jesuits in the 1500s; particularly those schools for Amerinds provided only a rudimentary education. Brazilian history of this era includes reports describing (see Freyre, 1963:57-72 for extensive discussion of this topic) the severity of students' lives particularly in religious schools (similar accounts exist of early schools in Chile) and suggesting a relationship between the consequence of chronically poor health and the lessened capacity of these students to later fulfill their governmental (beginning under Pedro II) and other roles in careers that, by their nature, forced them out of their communities and into the cities. Still, these schools were vital to the families who could not send their children to other private schools because of the high cost of tuition. Education in Brazil after the establishment of the republic in 1889 continued to favor the elite; academic secondary schools constituted preparation for admission to the university for the elite while students other than from the elite attended vocational secondary schools which taught only the basics. The Chilean educational system, also elitist-oriented, developed more slowly; the San Luis Academy created in the nineteenth century

is considered the first secondary school although seminaries had been established in the eighteenth century. By 1800, the U.S. had three types of schools, i.e., tuition schools for the wealthy (for college preparation), tuition schools for apprentices, and charity or free schools; although all communities were to have an elementary public school, it was not the case in the pre-Civil War South and in the North it did not mean universal education except perhaps in Massachusetts due, for the most part, to the efforts of Horace Mann. In the nineteenth century, humanitarian reformers in the U.S. became the most active promoters for universal education, more qualified teachers, and tuition-free high schools and colleges; their achievements were, however, mainly in the establishment of institutions of higher education. Yale College had already been founded in 1701. Mt. Holyoke Seminary, the first college for women, began in 1837. The first institution of higher education in Chile was the Universidad de San Felipe founded in the eighteenth century; it closed with the founding of the Universidad de Chile in 1842 and the Universidad Católica (1888). Law schools established in Olinda and São Paulo in 1827 came to be the centers of higher education in Brazil for almost a century although a "true" university was not founded until the early twentieth century. Brazilian students and Chilean and U.S. college graduates who wanted to continue with advanced studies had to do so in Europe. Most U.S. scholars went to Germany; as a result, when graduate schools of the modern sort began in the U.S. (the first being at Johns Hopkins University in 1876), they were patterned after German schools (German-trained U.S. economists, as previously noted, were influential in changes made in U.S. economic

policy). The promotion of expanding educational opportunities had been of concern to the Brazilian government from the colonial period; this concern grew in Chile after 1850 and in the U.S. particularly after 1870. In 1891, as one result of this concern, education for Amerind children in the U.S. became compulsory. However, the expansion of educational facilities and legislation in the eighteenth and nineteenth centuries did not necessarily signify an actual increase in opportunities or in the universality of educational opportunities throughout the population in Brazil, Chile, or the U.S.

Legislation related to political participation. From the beginning of the republican period, certain tendencies became apparent that have continued to characterize Brazil, i.e., the army as a power in Brazilian politics, the active involvement of the clergy, and the extremely low mass participation in national politics in large part because of the high rate of illiteracy. The level of mass participation in Brazil was also affected at first by political inexperience and the fact that no real political parties existed. Demands for reform tended to break into open conflict in Chile, e.g., during the 1823-1827 period of discontent with the government and the 1851-1861 period when two Liberal revolts were suppressed (although it was an era of Liberal reform); particularly during the subsequent 1865-1885 reform period, efforts were made to expand suffrage. Véliz (1968:xviii-xxiv) describes the reaction against Catholicism in Europe as one of "nonconformity" (the emergence of alternatives such as Methodism) whereas in Latin America it took the form of "anti-clericalism" (as in the series of anti-clerical legislation in Chile in the latter part of the nineteenth

century). In spite of this reaction, the clergy has characteristically been involved in Brazilian politics (and has experienced the same "purges" as other groups in opposition to the government). In the twentieth century, the Latin American Catholic clergy has taken a stance of activist involvement of the Church in social and economic development; most recently, this position has been labelled a "theology of liberation" (see Gutierrez, 1973, for a detailed exposition of this perspective). Underlying these and other actions of the clergy is, however, the notion that Church and State represent two opposing groups. Political parties did emerge in Chile during the nineteenth century as they did in the U.S. especially after the War of 1812. There was also a growing demand in the U.S., encouraged by the election of Andrew Jackson, for public officials to come from the "masses" rather than the "traditional elite"; increasingly, more public offices became elective positions. By 1828, suffrage had been extended in most of the U.S. to non-propertied men and to all men by the 15th constitutional amendment in 1870. Wyoming Territory was the first (1869) to give suffrage to women.

Bases of differentiation at the close of the nineteenth century

Despite the legislation, the impact of economic growth, and the increasing heterogeneity of society through immigration and amalgamation, the bases of social stratification in Brazil and Chile remained relatively unchanged by the end of the nineteenth century. In Brazilian society based on the plantation system with an upper-class aristocracy and lower-class manual laborers, Amerinds remained outside the system,

i.e., "non-persons." Similarly, the original system in Chile consisted in an upper-class aristocracy and lower-class peasants and servants with Amerinds outside the system (Gil, 1966:23), i.e., "maintaining their own way of life" as in Brazil. By the end of the eighteenth century, the Chilean upper class was composed of Spaniards born in Europe, the "middle class" of creoles, and the lower class of mestizo manual laborers; surviving African slaves and Amerinds were outside the system.

Creoles, many of whom had accumulated great wealth, did not represent a true "middle class"; in fact, when it came to who could or could not hold high-level public offices, those offspring of the European-born aristocracy that had been born in Chile were considered to be creoles. Following independence, creoles replaced the European-born public officials in top-level positions; they also became Chile's upper class. A similar transition in the social stratification system occurred in Brazil and perhaps less abruptly in the U.S. following independence. Except for the upward mobility of creoles to the upper class following independence, the traditional class structure remained unchanged until the early twentieth century in Chile as similarly occurred in Brazil. In both nations, by the end of the nineteenth century, the system was undergoing transition as some groups, particularly in commerce, attained power.

In the U.S., several factors affected differentiation with some of the predominant influences being industrialization, the Civil War, the closing of the frontier, and the emergence of corporate business organization. The nouveaux riches, predominantly industrialists and financiers, emerged in the North as a result, e.g., of the stimulation

of industry during and after the Civil War and the growth of, and investments in, railroads and mining booms. In the South, landownership gradually shifted to farmers who had never owned slaves and, while the plantation aristocracy declined, small farmers became increasingly important in public affairs eventually forming a middle sector. The industrialization process and corporate organization contributed to a growing middle class but the closing of the frontier and the nature of corporate structure contributed to a slowing down of social mobility in the U.S. Immigrants of the nineteenth century in Brazil, Chile, and the U.S., in their majority, became part of the manual labor force but many of their descendants were to become middle-class members in the twentieth century.

It is suggested here that the political decision as to where provincial boundaries are geographically drawn is one determinant of each province's economic-industrial potential, ethnic composition, urban system, and functional linkages that are likely to emerge (a similar suggestion can be made in relation to nations). A rural-urban cleavage was clear-cut in the U.S. by the end of the nineteenth century but less so in Brazil and Chile. Generally, the conflicts emerging within the three nations during the nineteenth century were in part due to sectionalist differences based on opposing economic interests; in part they were due to the emergence of reformism which occurred in the U.S. in particular but was paralleled somewhat in Brazil and Chile.

During the nineteenth century, reform in Brazil and Chile was basically limited to a few legislative changes but more so in Chile where there had been continual conflict between Liberal reformers and

Conservatives since independence. In the U.S., the humanitarian movements of the early nineteenth century that pushed for, e.g., prison reform, became transformed (with the growing dissatisfaction and demands for reform accompanying industrialization, as in Europe, and the rise of big business) into organized movements by the end of the century. Demands for reform were, however, to become more characteristic of the twentieth century than of the nineteenth century in the three nations.

By the end of the nineteenth century, the boundaries of the three nations were relatively complete. Having had achieved independence, they were both politically and economically linked to the international system as world powers but with a basic difference in economic linkages that, keeping in mind the numerous contributing factors, can be traced directly to the existence (U.S.) or non-existence (Brazil and Chile) of an adequate industrial infrastructure prior to industrialization. At the close of the century, the U.S. was moving towards an economically dominant position internationally; Brazil and Chile were moving towards a position of increasing vulnerability by which the viability of their economies depended increasingly on the U.S. as well as other more developed nations and on the international system itself.

Factors Influencing the Expansion of Functional Linkages
and Redefinition of Lines of Differentiation
in the Twentieth Century

The twentieth century opened with a growing sense of uneasiness both within and between nations. Brazil had already established itself as an advocate of arbitration and negotiation; Chile consistently emphasized neutrality and non-intervention; and the U.S. had come to have, although somewhat unwillingly by this time, an "empire." To all

three nations, trade was vital--to Brazil and Chile because of their export economies and to the U.S. because of the growing need for foreign markets and investment sources in order for the economy to continue to expand. Political and economic functional linkages had already begun to form among the three nations but it was not until the twentieth century that these linkages crystallized first as unity for defense and eventually as cooperation in development. The internal demands for change that marked the beginning of the century receded in the face of world wars and world-wide depression. It was not until the 1950s and 1960s that internal demands again came to the forefront.

World war and depression sharply demonstrated the degree to which the international system had become interdependent--economically and politically--and the dangers of isolationism. In combination with internal demands, these events spurred the governments of Brazil, Chile, and the U.S. to redefine their international and national roles. Accompanied by an expansion of functional linkages at the international and national levels, this redefinition was, in large part, a reflection of the emerging awareness of the need for planning--social, economic, and political--if industrialization and national integration were to become realities.

Emerging Trends in the International System

The end of isolationism

The end of isolationism has not necessarily meant involvement in the conflicts of other nations. Brazil, in spite of the emphasis on arbitration and negotiation, was the only Latin American nation to de-

clare war (1917) on the Central Powers as well as assist the Allies during World War I and participate as a non-belligerent at the Paris Peace Conference; similarly, in 1942, Brazil first severed relations with the Axis Powers, declared war on Germany and, in 1943, began to assist the U.S. in the defense of the Atlantic. Throughout most of the twentieth century, Brazil has maintained close ties with the U.S. and, similar to Chile (particularly after the world-wide depression), has been actively involved in regional and international organizations. Chile's foreign policy has been clear-cut and consistent, characteristically: (1) non-involvement in European and U.S. conflicts but interested in trade and development assistance; (2) non-intervention in Latin American internal affairs by foreign powers; and (3) emphasis on limiting her interests to Latin America.

By World War I, U.S. "imperialistic" expansion had come to an end; the U.S. declared war in 1917, signed the armistice in 1918, and returned to isolationism. The rapid economic growth of the 1920s sparked by World War I, the depression years, and U.S. involvement in World War II combined to bring the realization of the economic and political international interdependence and the need to be actively involved in international affairs. The shift away from isolationism was reflected in the U.S. position in relation to Latin America and specifically Theodore Roosevelt's "big stick" policy. Franklin Roosevelt's Good Neighbor Policy reflected a reversal of the U.S. position and was first presented at the 1933 Pan American Conference in Montevideo with the U.S. declaration that no nation has the right to intervene in another. In large part, this reversal was due to: (1) the poor rela-

tions between the U.S. and Latin America, (2) the growing influence of Germany and Italy in Latin America and the need for hemispheric unity for mutual defense, and (3) the need to expand trade and investment activities in order to maintain a rapid rate of economic growth.

The end of isolationism--particularly in Brazil, Chile, and the U.S.--resulted from the perception of the need to participate in international affairs (a) to maintain peace or at least avoid open warfare and (b) to maintain economic growth. The concern for maintaining peace led to a growing emphasis on peace and hemispheric unity. The concern for economic growth led eventually to an emphasis on development planning.

Emphasis on peace and arbitration

This emphasis had long been part of the foreign policy of Brazil. In the twentieth century, Chile has been a firm supporter of international law and the peaceful resolution of conflict. The use of conciliation and arbitration in settling disputes was the point of discussion of the Pan American Conferences of 1923 in Santiago (resulting in a treaty), 1929 in Washington, and 1936 in Buenos Aires (when Roosevelt presented his peace plan consisting primarily in resorting to consultation and neutrality if conflict should arise between American nations) as well as the 1945 Inter-American Conference on War and Peace in Mexico City. In 1945, Brazil, Chile, and the U.S. became charter members of the United Nations, one instance in which the pursuit of peace and arbitration contributed to the emergence of international organizations.

Emphasis on hemispheric unity

Particularly after 1914, both the bases for a growing emphasis on hemispheric unity and the continuing factors underlying disunity were inter-American defense and economic relations. Defense agreements have included the 1938 Declaration of Lima in which 21 American nations stated that they would unite in the defense of their absolute sovereignty against foreign intervention, the creation of the Inter-American Defense Board at the 1942 Inter-American Conference in Rio de Janeiro to organize hemispheric defense, the Act of Chapultepec signed at the 1945 Inter-American Conference in Mexico City by which 19 American nations agreed to mutual defense if any were attacked, the Inter-American Mutual Assistance Treaty in 1947, and the 1952 military assistance pact between Chile and the U.S. for the defense of the hemisphere.

Discussions of common economic problems had begun early in the century. Trade relations improved after 1929. Transportation changes linked the nations more closely; the Panama Canal had opened in 1914 and by the end of 1941 the Pan-American Highway was two-thirds constructed. During and after World War II, inter-American relations became characterized by agreements combining defense and economic interests; contributing to this trend was legislation in the U.S. designed to aid developing areas.

The turning point in inter-American relations around 1945 was based on the second factor underlying hemispheric disunity--the question of the degree to which Latin American nations were economically independent once the U.S. became the dominant economic power in Latin America. In addition, after the 1945 conference in Mexico City, the

U.S. became more involved in other areas of the world and less concerned with the Good Neighbor Policy; Latin American nations then developed a more independent economic policy that lasted until the 1960s although defense agreements continued to be reached during this period.

There was renewed interest in economic cooperation, e.g., with the 1961 Alliance for Progress Charter, but a new low in inter-American relations was reached with U.S. intervention in the 1965 civil war in the Dominican Republic. The subsequent improvement in relations was in part due to Brazil's position, as has often occurred, of intermediary (one source of conflict with other Latin American nations) between the U.S. and Latin America after 1967.

Chile has continued to be more independent of political and economic interference (but not completely) from more developed nations than has the rest of Latin America and more interested in maintaining close ties with other Latin American nations. Despite the fluctuations in inter-American relations, defense and economic relations remain important to the three nations in this study and, particularly since World War II, the predominant theme has been "cooperation in development," related both to the emphasis on development planning and the role of international organizations.

Emphasis on development planning and the role
of government in economic decision making

Two world wars, the 1920-1921 "slump," and the 1930s depression sharply demonstrated the particular dangers of having an export economy. Wartime brought economic prosperity to Brazil and Chile with the demands for raw materials and to the U.S. with defense expenditures. The slow-

ing down of economic growth in peacetime jointly with the economic crises of the twentieth century led to an awareness of the need for planning which had already begun by World War II. This recognition of the need for planning was evident in the government intervention following the 1929 depression in the U.S. (New Deal legislation) as well as Brazil and Chile. The government role in the economy has increased since this period in all three nations.

The increase in the role of government in the economies of Brazil and Chile can primarily be viewed as a requisite for economic growth because these two nations are characterized by (1) export economies and (2) the lack of an adequate industrial infrastructure prior to industrialization. The Brazilian and Chilean governments have been most active in economic decision making as this relates to the major exports, import substitution industrialization, and agrarian reform.

In the twentieth century, the major exports have been nitrates (which lost importance with the development of synthetic nitrates) and copper in Chile, rubber and coffee in Brazil. Copper did not contribute to rapid economic growth in Chile for two related reasons: (a) the government ignored the copper industry until 1955 when legislation was passed to encourage production and (b) export earnings were affected not only by competition from other copper-producing nations, but in addition, U.S. companies owned and began to operate El Teniente in 1905 and Chuquicamata in 1913, the two largest copper mines in Chile. By 1964, Chile's copper production ranked second in the world but the decline in copper prices in 1970 brought the mining sector to a standstill. Although of greater regional than national importance in Brazil,

the decline in rubber production (peak period: 1910-1912) because of the beginning of competition from rubber plantations in the East Indies combined with the imbalances in the coffee cycle led to economic problems. Government intervention in the coffee cycle and competition from coffee-producing African nations contributed to making this a widely fluctuating cycle. As one consequence, coffee planting shifted to Paraná State (susceptible to frosts, sandy soil poor for growing coffee) from São Paulo where many coffee growers switched to other crops. Brazil's coffee production dropped from 80 per cent of the world total in 1925 to 37 per cent in 1968-1969. Although industrialization had begun long before the 1960s, fluctuations in coffee prices continued to seriously affect the economy.

By 1914, small-scale industry had emerged in Chile primarily consisting in the refining of sugar, textiles, iron processing, and cement. Industrialization increased at an uneven pace after the late 1930s, but particularly since 1945, import substitution and protectionist trade policies have resulted in greater production and less imports of consumer goods while capital goods (machinery, tools, etc.) have represented a growing proportion of total imports (26 per cent in 1952 and about 35 per cent in 1966). Still, import substitution serves only as a beginning phase of industrialization; as ECLA (1966) indicates, Chile has long passed this point such that import substitution policies are no longer effective. It is an illustration of substitutability as an obstacle to further industrialization. In 1939, the Corporación de Fomento de la Producción (Development Corporation) or CORFO, the first development agency in Latin America, was created to plan and supervise

industrialization; ODEPLAN (National Planning Office) was later created as a coordinating agency of all economic planning in Chile. CORFO is responsible for most government investment including: (a) direct ownership and control of petroleum, electricity, LAN-Chile airline, the railroads (80 per cent are government-owned), and shipping and (b) joint control with the private sector (corporate) of the major iron and steel works. Oil exploration began in 1942 and the Empresa Nacional Petrolera or ENAP (National Petroleum Company) meets all gasoline and over two-thirds of crude oil needs of Chile. The per capita consumption of electricity generated primarily by the Empresa Nacional de Electricidad or ENDESA (National Electric Enterprise) ranks first in Latin America.

Brazilian industry evolved due to the impact of World War I and immigration from the crafts phase at the beginning of the twentieth century to textiles and other small-scale industry in the 1930s. Economic decision making has been controlled by the Brazilian government since 1930 in recognition of the need for economic planning, although it had intervened prior to this. The 1930s and early 1940s represented a transition period that lasted until the close of World War II; in this phase, the production of non-durables was stimulated by the restricted import capacity (because of the depression) and by World War II. Following the war was the "take-off" period characterized predominantly by import substitution industrialization emphasizing heavy industry and limiting exports to surpluses (1947-1963); since the substitution of non-durable goods had already occurred, with the result that imports were mostly manufactured goods, the Brazilian government's import substitution policies encouraged rapid industrialization. However, global

development planning has not been realized with the exception of Celso Furtado's three-year plan which was put into effect in 1962. A serious attempt at planning first occurred under Kubitschek and now concentrates on: (a) transportation and power, (b) basic industries, and (c) less developed regions of Brazil with development agencies created for the Northeast, Amazon, and Southwest. Castelo Branco's Program of Economic Action for 1964-1966 reflected a "development strategy" emphasizing the private sector (agriculture in particular) and policies to control inflation followed by the 1967-1972 "strategy of the new economists" with similar goals but more flexible programs, and since mid-1970, a "developmental ideology" or the "challenge of the interior." About 70 per cent of imports are required to meet basic production-consumption needs but wheat is the only food staple in which Brazil is not self-sufficient. The central government of Brazil in the 1960s directly controlled or intervened in production and investment in shipping and transportation, petroleum, steel, electric energy, exports, iron, exchange and capital markets, banking and credit, wages and prices, and private investment.

One of the principal factors contributing to extremely uneven income distribution and slow development in Latin America is the plantation or latifundia system of land tenure. Thus, many writers such as Feder (1971), Beckford (1972), and Barraclough and Domike (1970) emphasize the need to replace the existing counter-productive system; to achieve this transformation, drastic measures in agrarian reform are necessary. In Chile, economic difficulties have had their source not only in the heavy reliance on the mining sector for exports but also in chronically low agricultural productivity. The government has inter-

vened in the agricultural sector in two major ways:

1. Governmental policies to reduce the cost of living have included price controls in agriculture and the subsidization of food imports while taxing agricultural output with the result of reducing the incentives to invest and to increase production in agriculture. The degree of mechanization and farming techniques remain far from adequate.
2. Government attempts to alter the system of land distribution and tenure that has contributed to low productivity accomplished little until the 1962 Agrarian Reform Law and later the 1967 Agrarian Reform Law. Some of the changes that were expected to result from these and related legislative acts were a decline in the concentration of landownership, a reduction of the problem of "absentee landlords," and a slowing down of the rural-urban flow which had inhibited agricultural production by too great a loss of rural manpower in recent years. By June of 1970, CORA (Agrarian Reform Corporation) had expropriated 1,319 landholdings (3,408,783 has.).

Mechanization of agriculture has also been slow in Brazil; the government has not effectively altered the dual technology (advanced vs. traditional labor-intensive) in agriculture in many regions. Productive commercial agriculture tends to be concentrated in the southern third of Brazil while subsistence farming predominates elsewhere. In addition, the characteristic "boom-bust" nature (Margolis, 1973:1-2) of Brazilian agriculture has led to the rapid destruction of forests and to extensive soil erosion. Agricultural production has been affected by similar problems as in Chile, i.e., concentrated ownership of the

land and extensive subsistence farming as well as rapid rural-urban migration. Agrarian reform was a dominant issue in the 1960s; of eleven major proposals, three agrarian laws were passed. However, in both Brazil and Chile, landholdings of less than 10 has. (indicating subsistence farming) increased in number while every other category showed a decline suggesting only partial success in agrarian reform in the 1960s.

In contrast to the export economies of Brazil and Chile, the U.S. had, by World War I, a "modern domestic market economy" (Fite and Reese, 1973:333) based on mass production, mass consumption, and a mass market which continued to expand throughout the century. Similar to Brazil and Chile, the government role in economic affairs increased but, as Fite and Reese (1973:424) point out, this occurred ironically during a period of strong resistance to government intervention. The general areas in which the U.S. government has intervened in the economy in this century are:

1. Trade. Policies in this area were designed to stimulate the export sector and particularly to protect U.S. industry.
2. New Deal legislation and emergence of a mixed economy. The government had previously intervened in the economy, e.g., by extensive controls and planning during World War I, but it was after 1920 that this role in economic affairs steadily and consistently increased. The expansion of this role occurred most rapidly and extensively with the New Deal legislation that covered all aspects of the economy; by World War II, the U.S. had a mixed economy based on private enterprise but with the role of government from 1950 to post-1970 becoming increasingly important (particularly in terms of

employment and government contracts) as in Brazil and Chile.

3. Agriculture. The government has intervened to a lesser degree in this area than is the case in Brazil and Chile. Major legislation related to agriculture has pertained primarily to conservation of resources (e.g., the 1936 Soil Conservation and Domestic Allotment Act) and controls over production (e.g., the soil bank plan in the 1956 Agriculture Act to reduce surpluses and a series of legislative acts designed to raise or lower price supports for agricultural products). Contrary to the trend in Brazil and Chile, there has been a decline in small holdings in the U.S. and an increase in large landholdings.

In the twentieth century, the impact of international crises on national economies contributed, in large part, to the emergence of the need for planning and to the increasing role of government in economic decision making to resolve immediate crises and to be responsible for national planning. The emphases on peace and arbitration, hemispheric unity, and development planning have jointly contributed to the emergence and increasing importance of international organizations in this century.

Emergence of international organizations

Increasingly, international organizations have been the means in the twentieth century of achieving objectives similar to those underlying hemispheric unity, i.e., cooperation in the resolution of, and readiness for, conflict and in economic development. These objectives are evident in the membership of Brazil, Chile, and the U.S. in, e.g.,

the United Nations and most of its agencies, the Organization of American States created in 1948, the Alliance for Progress, and the Inter-American Development Bank (IDB). One or both objectives are apparent in, e.g., U.S. membership in NATO and membership of Brazil and Chile in the Economic Commission for Latin America (ECLA). Lastly, pertaining to an issue touching on development, Chile created an affiliate of International Planned Parenthood in 1965, the first Latin American nation to do so (Sanders, 1967:1).

It is suggested here that, with the current emphasis on the importance of planning, nations are drawn into international organizations because: (a) to resolve common problems cooperatively is viewed as the most efficient means available of problem solving, (b) to resort to these means enhances the possibility of meeting internal demands and reducing potential or actual unrest, and (c) to utilize the assistance, e.g., loans through IDB and IBRD, is an alternative to, or a means of reducing, economic dependency (e.g., of Brazil and Chile) on specific more developed nations (e.g., the U.S.). The objectives of peace and arbitration, hemispheric unity, development planning, and international organizations have, in part, contributed to an additional trend--the increasing importance of the military.

Growth in importance of the military

At a practical level, defense spending has aided the U.S. economy and has continued to increase since the renewed emphasis on military strength during the Korean War. In contrast, the rejuvenation of Brazilian and Chilean economies during wartime has not been primarily due to defense expenditures which, although proportionately less in

Brazil and Chile than in the U.S. (Kemp, 1973:196-199), signify fewer financial resources for development needs. This difficulty, accompanied by a basic governmental concern to maintain a "modernly equipped" military force, is alleviated in part by military assistance loans viewed as essential because of the recognition that the maintenance of peace and unity for defense require military preparedness.

The growing importance of the military is of particular significance in Brazil and Chile where military rule began (most recently) in 1964 and 1973, respectively. It is suggested that this transition is due in part to the recognition that national planning, to be maximally effective, must occur in a setting in which internal unrest is minimized. Whether or not "coercive regimes" actually reduce unrest (Feierabend and Feierabend, 1972:924-925) is not the issue here. Rather, a military regime may come to be defined by the nation or by key groups within the nation as the only alternative in order to minimize unrest, a tendency that is possibly stronger in nations with a history of military involvement in the political arena.

In the twentieth century, international crises have contributed to periods of internal unrest in Brazil, Chile, and the U.S. in part because of necessary measures taken by governments to stabilize the economy. However, internal discontent, as well as the growing importance of the military, emerged also because of an awareness of the polarization (economic and political) of the world and of the internal unevenness of development.

Polarization of the world

Latin American nations have tended to remain non-aligned in the process of political polarization although, after 1964, Brazil became allied with the U.S. especially in combatting "insurgency" in the Western Hemisphere and in isolating Cuba. Polarization has been, however, economic as well as political. Technological changes have come at an accelerating rate in the U.S. since 1920; concomitant to scientific advances were rapid improvements in living conditions. In 1970, the U.S. had an infant mortality rate of 20.7; it was 78.8 in Chile and an estimated 85-95 in Brazil (112 in 1964). In 1970, there were 600 persons per physician in the U.S.; in Chile and Brazil, there were 2,000. In 1972, the U.S. had 62.8 telephones per 100 persons; Chile had 4.1 and Brazil had 2.2. Steel consumption per capita was 663 kilograms in the U.S. in 1972; it was 89 in Chile and 77 in Brazil.

Between 1950 and 1970, not only did developed nations benefit more than did developing nations from the rapid economic expansion within the international system; the system itself ceased to be bipolar (ECLA, 1973) as U.S. dominance declined, Western European and Japanese economies expanded, and socialist economies became part of the developed sector. The political dilemma of non-alignment versus alignment for Latin America has been, however, partly due to the emergence of U.S. hegemony in the hemisphere in this century and the attempts--with limited success--of Latin American nations to become less dependent economically. In the mid-1960s, Brazil and Chile attempted to establish closer ties with Africa and Asia mainly in trade relations but by 1970 this trend had been reversed.

Emergence of U.S. hegemony in Latin America

The "political" influence of the U.S. has been mediated largely through inter-American organizations and bilateral agreements. Although other developed nations are playing an increasingly more important role in Latin America, the U.S. continues to be the single, most important in economic relationships. The political and economic linkages that formed between the U.S. and Latin America in the twentieth century contributed to the emergence of U.S. hegemony and, correspondingly, Latin American dependence in terms of trade, investment, and (economic, technical, and military) assistance. If economic dependency is an obstacle to Latin American development, then conversely U.S. hegemony (Furtado, 1970:65-67) has also become an obstacle.

The U.S. continues to be one of the major sources of economic assistance to Brazil and the main source of foreign investment in Chile since 1939. As maritime nations, trade is vitally important to Brazil, Chile, and the U.S. and it is in this area where U.S. hegemony is apparent as is the attempt of Brazil and Chile to reduce the role of the U.S. Although there has been less reliance on the U.S., it continues to be an important trading partner of both Brazil and Chile.

Increasing economic dependency is now more characteristically financial-technological in contrast to capitalistic-commercial dependency (Perlman, 1976:254) during import substitution industrialization. This trend is due in part to expanding financial ties. It is also due, however, to the transfer of a technology during and after import substitution that is too advanced for the existing economies and needs of Latin American nations; in the international system, it is the multi-

national corporation (Clark, 1975:6, 19; Chase-Dunn, 1975:721) that has the greatest access to this technology. The impact of technology and foreign investment of the U.S. (and other nations) on Latin American economic dependency is therefore related to the growing influence of multinational corporations, another contributing factor to this dependency.

Emergence of multinational corporations

U.S. economic expansionism reflected, in part, the growth of corporations within the U.S. and their extension overseas after 1945 as was the case with other more developed nations. The impact of multinational corporations can be seen both in the importance of foreign direct investment for national economic growth and the significance of foreign control over national industries. Although there does not exist an overall consensus over whether or not foreign investment contributes to economic growth (nor do the data justify absolute conclusions), it is asserted that U.S. investment in Chile has made a significant contribution and, similarly, that the establishment of foreign manufacturing companies in Brazil was largely responsible for Brazil's rapid industrialization and economic growth.

A contrary assertion (Baklanoff, 1966:101-136) is that foreign investment in Brazil has not made a significant contribution to economic growth although, since foreign investment represents "modern" technology, it would contribute to rapid development if it were to operate jointly with national entrepreneurship (which has not emerged because of the implantation of foreign corporate control). Brazilian economic policy makers have traditionally been anti-foreign investment

except between 1955 and 1962; at the same time national investment in industrialization has been restricted by the difficulty of financing the import of machinery and equipment in particular.

One-third of Brazilian industry is controlled by foreign direct investment from the U.S., England, France, Germany, Japan, Belgium-Luxembourg, Canada, Holland, and Argentina; these industries are petroleum, chemicals, machinery and appliances, steel, electricity, pharmaceuticals, automobiles, foodstuffs, plastics, and ship-building. Japan has become increasingly important, investing more in, and selling more products to, Brazil than any other nation.

By 1970, over 100 U.S.-controlled corporations were operating in Chile (Cockcroft et al., 1973:4, 12-13) as well as European and Japanese firms. The U.S.-owned copper mines (prior to nationalization) had been one of the basic sources of conflict between the U.S. and Chile in this century and it has been in copper that most U.S. investments have been made. In addition to foreign control of copper and nitrates, foreign companies in Chile in 1970 controlled: 45 per cent of rubber products; 50 per cent of machinery and equipment and petroleum; 60 per cent of iron, steel, and metal products and chemicals; 90 per cent of advertising; almost 100 per cent of radio, television, pharmaceuticals, and office equipment; and 100 per cent of automotive assembly, copper fabricating, and tobacco.

Both U.S. hegemony and awareness of the impact of multinational corporations have sparked a movement in Latin America labelled and led by President Frei of Chile, i.e., the "Latinization" Movement.

Emergence of the "Latinization" Movement

The "Latinization" Movement developed in the 1960s with the objectives of expanding economic relations among Latin American nations and reducing the political and economic hegemony of the U.S., particularly in regional organizations. This has been evident in three major areas:

1. Creation of common markets. Brazil, Chile, Argentina, Bolivia, Paraguay, Peru, and Uruguay created LAFTA (Latin American Free Trade Association) in 1961 on the basis of research conducted by ECLA in the 1950s; the basic objective is to cooperate in import substitution industrialization at a regional rather than national level by developing a system of exchange of the industrial products of each of the member nations. A second common market, the Grupo Andino (Andean Group) made up of Colombia, Chile, Ecuador, Peru, and Venezuela was agreed to in 1966 (created in 1967) with the basic objective of increasing the flow of trade by reducing trade barriers among the member nations. Trade relations among Latin American nations had not, however, significantly changed by 1969; one basic difficulty is the transportation networks constructed by Europeans for overseas and not intra-regional trade. Of the total Chilean foreign trade, 99 per cent is shipped by ocean transport. Similarly, for international and intra-regional trade, Brazil still relies on ocean transport predominantly. Still, ECLA's (1966) studies indicate transportation to be one area in which some progress has been made--most specifically since 1964.
2. Nationalization. In Brazil, nationalization began with public

utilities in 1962 and all private oil refineries in 1964. In Chile, the Anaconda Company (copper) was nationalized in 1969 and the entire copper industry was nationalized in 1971.

3. Expansion of trade relations to other world regions. During the period of "economic nationalism" (1951-1964), Brazil established trade relations with Eastern Europe and developing nations in Asia and Africa; with the re-establishment of close relations with the U.S. and renewed emphasis on the Western Hemisphere and Western Europe, Brazil lessened the relations with Africa and Asia but maintained ties with Eastern Europe. Chile's closest relations have continued to be with Western Europe while relations with the U.S., although lessening, remain important. Under Frei's administration, Chile re-established relations with communist nations and, as Brazil had earlier done, emphasized cooperation with Africa.

The linkages between the U.S. and Latin America continue to be important. Whether or not it is a question of U.S. hegemony versus Latin American dependence remains an open question in the literature. The issue for Latin America is one of continuing cooperation through regional and international organizations but with Latin American leaders having a greater voice in determining the paths that these organizations and their nations will follow. In part, this position is a reflection of the recognition that social, economic, and political problems and needs vary among nations and that planning must take this into account if it is to be effective. ECLA's (1973) studies substantiate the observations made by several writers including Stallings (1972), Bodenheimer (1971), Clark (1975), Perlman (1976), Robinson (1976), and Beckford

(1972) that: Latin American nations must analyze their situation--social, economic, and political--and determine the most realistic solutions; to do so they cannot rely upon foreign technology nor foreign-trained manpower but, rather, must develop an appropriate technology and train their own manpower; and, lastly, only when dependency declines, will Latin American nations begin to share in the economic expansion within the international system.

Not only has the "Latinization" Movement been defined in terms of a nation's linkages to the international system but it is also highlighted by the awareness of uneven development internally in the U.S. as well as Brazil, Chile, and other Latin American nations. In turn, this awareness has produced internal demands for social, economic, and political reform.

The Rise of Internal Demands for the Expansion of Functional Linkages within National Systems

Brazil and Chile have been characterized by discontent throughout the twentieth century whereas the U.S. has experienced more distinct periods in which internal demands for change predominated. However, internal demands and the government response to these demands appear to have passed through three general and often overlapping phases in Brazil, Chile, and the U.S. in this century: early reform, conservative reaction, and renewal in reform.

Early reform period

During this period, the governments of Brazil, Chile, and the U.S. met some demands with legislation. The Progressive Movement that had

begun in the nineteenth century in the U.S. continued until 1917 and the outbreak of World War I; many political and economic reforms advocated by this movement became legislation, e.g., workmen's compensation laws. In Brazil and Chile, demands for change were organized but as conflict between groups rather than as a "movement" (which has been associated more as a concomitant of industrialization in Europe and the U.S.).

The 1901 election of Riesco as president of Chile signalled the rise of the "reformist" Liberal Party; demands for reform that had already begun among labor groups in the last century increased as a result of World War I and the economic measures necessarily taken by the government as a result of the depression. While Arturo Alessandri (candidate of labor and the middle class), elected in 1920, was an advocate of reform, it was Ibáñez (1927-1931) who put many of his reforms into effect. The reform legislation passed in the 1920s included the 1925 Constitution of Chile which was in itself a body of social and labor legislation, the Social Security Law (1924), and the Labor Code (1931)--the first labor code in the Western Hemisphere. Reforms continued until 1938 in Chile but so too did labor unrest which Morris (1966) explains as symptomatic of labor's non-participation in the reform process legislated by the ruling elite; this unrest is, in addition, illustrative of the emergence of combined "ideological-class conflict" that has continued in Chile throughout this century.

In Brazil, economic reforms were initiated as a consequence of abortive military revolts (1922 Tenentes' or Lieutenants' Revolt and 1924 revolt in São Paulo and Rio Grande do Sul); the most sudden change was the combination of middle-class and junior military officers' forces

that helped Vargas put an end to the "Old Republic" in 1930. In 1933, a series of social and political reforms were initiated by the Vargas administration.

Conservative reactionary period

During this phase, governments met demands for reform with conservatism and restrictive legislation. In the U.S., rapid change continued but the reformist demands that ended in 1917 did not recur until the 1960s. Post-1917 emerging trends in the U.S. illustrate some degree of fluctuation in the government's approach but they do imply an underlying tendency to become increasingly restrictive between 1917 and 1960 as seen in the following: governmental reaction (conservatism) predominated in the 1920s; Roosevelt's New Deal in the 1930s was reformist but did not effectively confront poverty or the basic problems faced by minority groups; Truman's Fair Deal did not receive Congressional approval in large part because of a return once again to conservatism; widespread labor unrest and large-scale strikes followed on the heels of World War II; and then the McCarthy "era" began and, in 1954, the Communist Party was outlawed.

In Chile, discontent continued in spite of reforms in a period characterized by conflict between opposing ideologies as seen, e.g., in the abortive revolt of the Fascists prior to the election of a Socialist government in 1938. The growth of communism among labor in the 1940s resulted in a period marked by violent strikes (1947-1948) and the outlawing of the Chilean Communist Party in 1948 (legalized in 1958).

Government reaction against communism in Brazil began much earlier

and overlapped with the early reform period of the late 1920s and early 1930s; strong anti-communist measures and anti-strike legislation were put into effect in 1927. Unrest grew in the early 1930s as illustrated, e.g., by the abortive revolt in São Paulo, the increasing popularity of radicalism and communism among workers and fascism among members of the middle class, and the abortive Communist-led revolt (1935) in Pernambuco and Rio de Janeiro that resulted in martial law, censorship, and the trial of Communist leaders. Soon after, Vargas declared his Estado Nôvo, a "benign dictatorship" that lasted from 1937 to 1945. The "Democratic Era" (1945-1964) was a period of political and economic disorganization although conflict was relatively absent except in the Northeast (contributing to the little success of SUDENE which already lacked government support prior to 1964). Reformist demands had increased in Brazil 1937-1964, rising particularly from a growing working class. The response to these demands was a reflection of the continuation of a political elite from the traditional upper class (landed aristocracy) combined with a slowly emerging bourgeoisie that identified with upper-class interests. The economic reforms included in legislation passed between 1937 and 1964 were reforms in name only; in actuality, they were never put into effect.

Renewal in reform

During this phase, governments again developed reformist legislation in response to internal demands. Fite and Reese (1973:472) point out that the post-1950 U.S. has been characterized by the three "themes" of "development of an affluent society, war, and the contra-

dictory problem of poverty." The renewed demands for socio-economic reform in the mid-1960s (extending into the 1970s) dealt with issues similar to those during the Progressive Era: peace marches protesting the war in Viet Nam, university protests related both to the war and to education, poverty marches, civil rights' protests, and conservation. It was also a period marked by assassinations: John F. Kennedy (1963), Malcolm X (1965), and Rev. Martin Luther King, Jr. and Robert F. Kennedy (1968). The U.S. government responded to the reformist demands with extensive legislation.

A similar response occurred in Chile with the election of Frei in 1964. Frei's election has been interpreted as mass support (Frei received 56.1 per cent of the vote, Allende received 38.9 per cent) for his non-violent, gradual, socio-economic reform program that was pursued until the 1970 election of Allende (who received 36.2 per cent of the vote, Alessandri received 34.9 per cent). The role of the middle class in Brazil and Chile has been negligible in reformism; generally, demands for change have arisen from the working class but organized demands for change in Chile have come from political parties (especially the Christian Democrats) and the Catholic Church (active in land reform, vocational and technical education, formation of credit unions and cooperatives).

In Brazil, the government since 1964 has responded to some demands with reform. Economic discontent was one of the basic reasons for the 1964 military coup. Since the coup, it has been mainly in economic planning that changes have occurred (Dutra's 1946-1951 administration is the only military regime in Brazil characterized by "economic mis-

management") with middle- and upper-class support of the military's neo-capitalist orientation (i.e., gradual growth emphasizing efficient resource allocation and solutions to immediate rather than long-run problems) to economic planning. The military has not been as successful in initiating basic reform in other areas, e.g., in low- and medium-income housing (especially in favelas), mass political participation, education, agrarian reform, and social welfare.

Reminiscent of Andreski's (1966) thesis that ruling classes and traditional Latin American economies are "parasitic" with the only possible means of change being subversion, the demands for reform in Brazil have become violent particularly since 1968 as seen in student demonstrations and the emergence of urban guerrilla and terrorist movements characterized by kidnappings of foreign officials (including the U.S. ambassador) and bombings. This activity also supports the argument of Feierabend and Feierabend (1972:924) that "coercive regimes" generate rather than reduce unrest and violence in the population.

Government reaction in Brazil is illustrated by the death of one of the most important leaders in the urban terrorist movement (Carlos Marighela, former Communist Deputy in Congress), shot by São Paulo police in 1969. The Catholic Church in Brazil, as in Chile, has been active in demanding reform with one of the most well-known leaders being Dom Helder Câmara; the government has also reacted against these demands rather than respond to them with reform measures as shown in the increasing number of arrests of Catholic priests for "subversive activities."

During the 1960s, the U.S. and Chile experienced a return to

reformist governments in contrast to a combination of reform and repression in Brazil; all three nations, however, experienced increasing demands for reform during this decade. The effect of the response to these demands is expected to be reflected in the research findings in this study.

Summary of twentieth-century trends

In summary, during the twentieth century, the concerns of peace and economic growth brought Brazil, Chile, and the U.S. out of isolationism and formed the basis of regional (hemispheric) and international cooperation. The organizations that emerged have increasingly become agencies through which development planning and funding for development are channeled. The increasing political and economic polarization within the international system contributed, on the one hand, to the national, regional, and international emphasis on the importance of the military; on the other hand, it contributed to the awareness of the unevenness of development that led to the "Latinization" Movement to reduce U.S. hegemony in Latin America. The recognition of uneven development internally in Brazil, Chile, and the U.S., it has been suggested, led to a resurgence of internal demands for change to more evenly distribute socio-economic and political participation in the benefits accompanying industrialization. The basic question of this study of 1960 and 1970 data for Brazil, Chile, and the United States is a simple one; i.e., was industrialization accompanied by national integration in Brazil, Chile, and/or the United States?

CHAPTER V

FUNCTIONAL LINKAGES AND LINES OF DIFFERENTIATION WITHIN NATIONAL SYSTEMS IN THE TWENTIETH CENTURY AND NATIONAL DATA ANALYSIS OF BRAZIL, CHILE, AND THE UNITED STATES BY PROVINCE FOR 1960 AND 1970

Relative Importance of the Selected Variables for Brazil, Chile, and the United States

The Control Variables: Ethnicity and Rural-Urban
Residence as Continuing Lines of
Differentiation

Ethnicity as a line of differentiation

The potential importance of ethnicity, specifically European vs. non-European ancestry, as a control variable stems from its relationship to, and changes in the definition of, the stratification system. In the twentieth century, the Brazilian two-class system of landed aristocracy and rural peasantry has expanded to include four emerging intermediate strata (nouveaux riches, urban middle class, urban lower class, rural proletariat); the Chilean stratification system now consists in (1) an upper class of landed aristocracy and nouveaux riches, (2) the predominantly urban middle class, and (3) the working class of manual laborers.

"Racial democracy" in Brazil and "racial homogeneity" in Chile have become controversial issues in this century in relation to determinants of social class and upward social mobility. In both nations, occupation has become the most important single determinant of social

class. Evidence of discrimination or the lack of equal opportunity and education in Brazil has been cited especially in the case of blacks, mulattoes, Amerinds, and mestizos; two groups are treated as unassimilated--the Japanese and the Amerinds. The middle position in the debate between Freyre's (1963:354-431; also see Freyre, 1956) consistent theme that Brazil is a "racial democracy" and the argument that "racial democracy" in Brazil is a myth (Ianni, 1970:258) is that discrimination is stronger by class than by race; "white" is defined by life style, family, education, and occupation (white-collar vs. blue-collar); and "skin color" becomes increasingly important as local competition to enter the upper class becomes stronger.

Gil (1966:33) presents Chileans' view of themselves as the "myth of race homogeneity" by which Chileans define themselves as not being mestizos and having "no Indian problem." In the controversy over the importance of ancestry in Chile, the view of social scientists is not in direct opposition but is one suggesting that ethnicity operates "mildly" as one factor in the stratification system; the population was already decidedly mestizo by the beginning of this century and there is a tendency, as in Brazil, for occupation and income to be lower and for upward social mobility to be more difficult as skin color becomes darker. Evidence of discrimination against Amerinds has been suggested but perhaps the most extreme position concerning ethnicity in Chile is represented by Morris (1966) who asserts that much of the persisting labor-related conflicts between groups is based on "racism."

There is no attempt made here to review the extensive literature substantiating the association between social class and ethnicity in

the U.S. since there is consensus among social scientists that an association does exist and that ethnicity continues to be a line of differentiation within the U.S. The "non-white" population in the U.S. was 11.4 per cent of the total population in 1960 and 12.6 per cent in 1970 (not varying greatly from 12.5 per cent in 1890 to the low of 10.2 per cent in 1930 and 1940). The 1960 and 1970 provincial data have a mean percentage non-European of 11.65 in 1960 and 11.82 in 1970; the standard deviation was 13.11 in 1960 and 11.51 in 1970; extreme values were 0.2 and 68.0 per cent in 1960, 0.4 and 61.2 per cent in 1970.

Of Brazil's total population, 36.6 per cent were of non-European ancestry in 1940 and 38.4 per cent in 1950; the estimate for 1960 was that non-Europeans made up about the same proportion of the population as in 1950. Because of the 1951 Afonso Arinos Law (prohibiting police reports, employment application forms, and census questionnaires from mention of skin color), the 1950 Brazilian census was the last to classify individuals according to ethnicity but it was by self-definition as it has been in the U.S. beginning with the 1960 census. Chile's population of non-European ancestry includes Amerinds and mestizos estimated to jointly make up 70 per cent of the total population in 1952 with a relatively even distribution by province except in those where the Amerind population is concentrated (Malleco, Cautín, and adjacent provinces); similar to Brazil, the Chilean census after 1952 does not include information concerning ethnic composition nor are data available on the basis of which estimates could be made for provinces. Since the literature on Brazil and Chile suggests stability in ethnic composition in the 1950s and 1960s, the 1950 data for Brazilian provinces and 1952

provincial estimates for Chile were held constant for 1960 and 1970. The mean percentage of non-European ancestry is 48.1 for Brazil and 71.48 for Chile; the standard deviation is 20.82 for Brazil and 4.14 for Chile; extreme values are 5.4 and 72.9 per cent for Brazil, 70.0 and 88.3 per cent for Chile. The cross-cultural combination of cases has a mean percentage of non-European ancestry of 35.72 in 1960 and 35.80 in 1970; the standard deviation is 29.13 in 1960 and 28.72 in 1970; extreme values are 0.2 and 88.3 per cent in 1960, 0.4 and 88.3 per cent in 1970.

Detailed examination of the data that are available for Brazil and Chile does not instill confidence in their reliability; in part, this is because Brazilian data exclude a jungle population of an unknown size and Chilean data are estimates or in the case of the census of persons of Araucanian ancestry (Chile, 1952:147), the data are questionable (e.g., that Atacama and Antofagasta Provinces each include only two persons of Araucanian ancestry). Given the difficulties with this variable, it is included only in the regression equations which were used to order variables for subsequent analysis on the basis of their relative importance and which must be interpreted cautiously in the case of ethnicity. Partial correlation analysis is treated more rigorously since it is the basis for subsequent causal analysis; therefore, both first-order (controlling for rural-urban residence) and second-order partials are presented, the latter for the reader's interest only. Significant associations by using second-order partials also appear in the tables showing the selection of variables for causal analysis to illustrate that it makes little difference whether first-order or second-order partials are

used for this selection procedure.

Since ethnicity is treated in the literature as an important component of the stratification system, an alternative control variable that is also a determinant within the stratification systems of the three nations is suggested here for future cross-cultural research--occupation and specifically white-collar vs. blue-collar occupation. Therefore,

Research Finding: Despite the accumulation of evidence in the literature suggesting that ethnicity is an important line of differentiation in Brazil, Chile, and the U.S., it is an inadequate control variable for cross-cultural research based on national censuses because of unreliable data and/or the governmental decision not to collect data related to ethnicity in some nations.

Rural-urban residence as a line of differentiation

Research Finding: Rural-urban residence must be controlled in the analysis of the relationship between industrialization and national integration in part because there is a significant association (zero-order) between percentage of the population living in cities of 20,000 or more and the industrial-economic variables in one or more of the nations in this study with the exception of number of ports and radios per capita (see table 46 in appendix C).

Research Finding: Rural-urban residence must be controlled in the analysis of the relationship between industrialization and national integration in part because there is a significant association (zero-order) between percentage of the population living in cities of 20,000 or more and the socio-political variables in one or more of the nations in this study (refer to r's in regression summary tables).

Research Finding: It therefore follows that rural-urban residence must be controlled in the analysis of the relationship between industrialization and national integration because, when controlled, it reduces or increases the strength of association between some elements of the industrial-economic and the socio-political sets of variables (see tables 7, 13, 19, 25, 31, 37).

The necessity of removing the effects of rural-urban residence is based on its relationship to both industrialization (as a stimulus to, and concomitant of, urbanization) and to national integration. It in-

tervenes not only where significant rural-urban differences persist as they do in Brazil and Chile in contrast to the U.S. but also where differences in the degree of national integration emerge among groups within urban centers.

Rural-to-urban migration, the major population movement and the major source of urban growth (which also stems from the urban annexation of outlying areas that is not reflected in in-migration data) within Brazil and Chile, has not only been stimulated by (import substitution) industrialization in the mid-twentieth century; it has also been in the direction of the largest (primate) cities. The center of Brazil's population was 480 kms. from the coast in 1960 (240 kms. in 1823) and almost all of the largest cities are on the coast as is the population concentration in spite of the population shift to the interior in this century; the concentration of each interior province's population in one urban center also intensifies rural-urban differences. The capital of Chile (Santiago) now accounts for an estimated 25 per cent of the nation's population. Still, it must be taken into consideration when interpreting data on the size of rural and urban populations that massive population shifts to urban centers as has occurred, e.g., in Brazil and Chile, necessarily subtracts from the rural population. Additionally, "urban" as "place" is not necessarily a social reality given, e.g., that rural "pockets" exist within urban centers.

With the continuation of the concentration of social, economic, and political institutions in the largest cities in Brazil and Chile, the diffusion of urban influence and access to institutions such as education and medical care have been slow to expand; the one exception is the

German region of southern Brazil where urban centers primarily serve agricultural interests. Therefore, rural-urban migration is the predominant means of coming into contact with these institutions. It is also a major factor in the characteristically uneven population distribution of Brazil and Chile and an urban population that has become too large given the level of industrialization.

The sharp rural-urban differences that were emerging in the U.S. at the beginning of the twentieth century have become relatively insignificant but the U.S. does not necessarily have an "even" distribution of population nor is there a lack of coastal population concentration, urban problems, a need for urban planning, and differences among urban groups in terms of their access to social, economic, and political institutions. The contrast with Brazil and Chile is more of a difference in degree rather than one of polar types. This contrast emerged basically because of the acceleration in the growth of the urban population after the Industrial Revolution in the U.S. rather than, as in Brazil and Chile, both prior to and during industrialization.

Industrialization in Brazil and Chile has not yet been rapid enough to absorb the influx of labor (given too that much of the influx is of unskilled labor) which, in turn, increases urban unemployment, slum growth, and the costs of services such as welfare and education. Government intervention in urban planning in specific cities, e.g., Brasília, of the three nations has not been entirely successful (Rabinovitz and Trueblood, 1973:11-19); the urban problems characteristic of other urban places are not lacking in these cities and have come to constitute obstacles to local planning as well (also see Epstein, 1973:171-182).

The intervening effects of rural-urban residence are mediated, therefore, through rural-urban differences, differences within urban populations and the governmental impact on alleviating these differences, variations in the degree to which urban influence and access to institutions diffuse to rural dwellers, and the relationship between the processes of urbanization and industrialization. As found in this research, the removal of these effects by controlling for rural-urban residence clarifies the relationship between industrialization and national integration.

The provincial data for 1960 and 1970, respectively, show an increase in the mean percentage living in cities from 25.06 to 48.72 in Brazil and from 30.68 to 60.18 in Chile, a decline in the dispersion of cases from a standard deviation of 19.54 to 16.34 in Brazil and from 26.37 to 18.8 in Chile with extreme values of 5.0 and 97.5 per cent in 1960, 25.1 and 99.9 per cent in 1970 for Brazil and of 0 and 82.8 per cent in 1960, 26.3 and 92.6 per cent in 1970 for Chile. When Brasília became the capital of Brazil in 1960, the município of Rio de Janeiro (the former capital), became the State of Guanabara which accounts for the high percentage (100 per cent in all practicality) of the population that is urban for the highest value.

The extreme values for Brazil reflect the rapid growth of the urban population as well as the observed decline in provincial differences. The U.S. provincial data reveal a different pattern; as in Brazil and Chile the mean percentage living in cities increases (from 37.74 in 1960 to 41.24 in 1970) but the standard deviation shows a greater dispersion of cases from 15.25 in 1960 to 16.22 in 1970; the ex-

treme values reflect the contradictory urban-to-rural and/or urban-to-suburban shift (lowest value of percentage living in cities is 9.1 in 1960 and 8.7 in 1970) as well as the continuation of urban growth (the highest value is 67.9 per cent in 1960 and 76.4 per cent in 1970). The data probably also reflect population shifts to different sections (both rural and urban) of the nation. In the cross-cultural data combining the 100 cases of the three nations, the mean percentage living in cities is 32.81 in 1960 and 47.85 in 1970; the standard deviation declines from 20.12 to 18.47; extreme values are 0 and 97.5 per cent in 1960, 8.7 and 99.9 per cent in 1970.

The Expansion of Industrial-Economic Functional Linkages

Industrialization: percentage of the labor force employed in industry

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage of the labor force employed in industry is significant, positive, and increasing 1960-1970 from .517 to .826 in Brazil and from .675 to .785 in Chile; the association is insignificant in the U.S. in 1960 and 1970; and there is a significant, positive association (.554) for the combined cross-cultural cases only in 1960 (see table 46 in appendix C).

Research Finding: There is a significant association, controlling for rural-urban residence, between industrialization as indicated by percentage of the labor force employed in industry and the socio-political set of variables in one or more of the nations in this study (refer to tables 7, 13, 19, 25, 31, 37).

Population growth in the U.S. in the twentieth century has not influenced the size and composition of the labor force in the same way as in Brazil and Chile. In viewing population data, the specious nature of crude birth and death rates should be noted as should the impact of

rapidly declining infant mortality rates on the crude death rate and age composition of the population. Still, Brazil's 1970 crude birth rate (37.8) was higher than the U.S. rate in 1910 (30.1) but the 1970 crude death rate (9.5) was the same as the U.S. rate in 1950-1954 and 1960 (9.5). Chile's 1970 crude birth rate (26.9) was comparable to the U.S. rate in 1920 (27.7) and during the post-World War II "boom" (24.5 in 1950-1954 and 23.7 in 1960) but the crude death rate (8.5) was lower than the U.S. rate in 1970 (9.4). Chile's 1960-1970 average annual population growth rate (1.5) was close to that of the U.S. (the average annual 1960-1970 rate was 1.3) while Brazil's was much higher (3.1 average 1960-1970). The size of the U.S. labor force was not "inflated" 1960-1970 as it was particularly in Brazil. The population "boom" after World War II in the U.S. occurred after and not during or prior to rapid industrialization and economic growth; the growth of the labor force in the 1960s was therefore not an "obstacle" to development.

Agricultural employment continued to decline in the U.S. (from 11.9 per cent of the labor force in 1950 to 3.5 per cent in 1970) as did employment in commerce (from 21.5 per cent in 1950 to 18.7 per cent in 1970). Typical of the more developed nations, the service sector increased (from 21.7 per cent of the labor force in 1950 to 28.0 per cent in 1970) following rapid industrialization; the industrial sector declined from 40.6 per cent of the labor force in 1950 to 40.3 per cent in 1960 and 37.0 per cent in 1970. Of the Brazilian labor force 10 years of age or more, 18.2 per cent were employed in industry in 1940, 17.8 per cent in 1950, 17.9 per cent in 1960, and 22.1 per cent in 1970; concomitantly, the percentage employed in agriculture declined (67 per cent in

1940 and 44.2 per cent in 1970) while there was an increase in employment in services (6.5 per cent of the labor force in 1940 and 15.8 per cent in 1970) and in commerce (5.5 per cent in 1940 and 8.9 per cent in 1970).

Of the total Chilean labor force 12 years of age or more, 30.2 per cent were employed in industry in 1940, 33.7 per cent in 1952, 33.2 per cent in 1960, and 31.3 per cent in 1970; the percentage employed in agriculture declined (35.7 per cent in 1940 and 21.2 per cent in 1970) while there was an increase in employment in services (20.3 per cent in 1940 and 25.6 per cent in 1970) and in commerce (9.2 per cent of the labor force in 1940 and 11.6 per cent in 1970). An additional occupation-related problem of increasing importance to Chile, similar to many developing nations, is that of losing high-level manpower through emigration (which exceeded immigration by 24,905 in 1960-1964) most frequently because of aspirations for higher salaries and professional advancement. It is a problem that emerges because of the level of development and, in turn, inhibits development. It is also a problem of increasing significance in Brazil in the 1960s and 1970s for similar reasons although highly-trained people still immigrate to Brazil from Europe.

The provincial data for Brazil in 1960 and 1970 reflect the extreme and increasing regional differences, the population shift from the north to the southeastern industrial centers, and the rapid growth of the manufacturing sector, in particular, upon approaching 1970. The lowest percentage of the labor force employed in industry in 1960 was 2.3 (Acre in the North) and the highest was 39.0 (Santa Catarina in the South followed closely by Rio de Janeiro in the East); the lowest percentage in industry was 1.7 (Roraima in the North) and the highest was

54.5 (São Paulo in the South) in 1970. The mean percentage of the labor force employed in industry declined slightly from 1960 (14.54 per cent) to 1970 (14.09 per cent); the greater dispersion of cases is shown by the standard deviations of 11.58 in 1960 and 13.91 in 1970.

Contrary to Brazil, the 1960 and 1970 Chilean provincial data show an overall but slight increase in the percentage of the labor force employed in industry; the mean percentage employed in industry was 27.48 in 1960 and 30.23 in 1970; extreme values were 12.5 and 60.4 per cent in 1960, 13.5 and 61.3 per cent in 1970. The standard deviation slightly declined from 13.59 in 1960 to 13.25 in 1970. The decline in the dispersion of cases does not conflict with the decrease shown in national data from 1960 to 1970 in spite of the increase indicated by the mean values and extreme values for individual provinces. These data substantiate the lower and more stable rate of growth in industrial employment than in Brazil in the 1960s.

The 1960 and 1970 U.S. provincial data reflect the decline in the percentage employed in industry with a decline in the mean percentage in industry from 35.7 in 1960 to 34.62 in 1970 and in the dispersion of cases with a standard deviation of 8.88 in 1960 and 7.96 in 1970 which also suggests weaker inter-provincial differences than in Brazil or Chile. The extreme values of 13.5 and 52.2 per cent in industry in 1960 and 16.8 and 48.2 per cent in 1970 illustrate both an increase in industrial employment at the lower extreme and a shift in sectoral employment with more rapid growth of non-industrial sectors at the upper extreme.

In the combination of the 100 cases for cross-cultural analysis, there is almost no change in the mean percentage employed in industry

(28.35 per cent in 1960 and 28.39 per cent in 1970) or the standard deviation (13.85 in 1960 and 13.89 in 1970); extreme values are 2.3 and 60.4 per cent in industry in 1960, 1.7 and 61.3 per cent in 1970.

Industrialization: percentage contribution of the major economic sectors to the G.N.P.

Research Finding: There is a significant association, controlling for rural-urban residence, between industrialization as indicated by contributions of the major economic sectors to the G.N.P. and the socio-political set of variables in one or more nations in this study (refer to tables 7, 13, 19, 25, 31, 37).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage contribution of industry to the G.N.P. is significant, positive, and increasing 1960-1970 from .441 to .645 in Brazil and from .489 to .535 in Chile; it is significant, positive, and declining 1960-1970 from .545 to .408 in the U.S.; and it is significant and positive for the combined cross-cultural cases (.496) only in 1970 (see table 46 in appendix C).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage contribution of commerce to the G.N.P. is significant, positive, and increasing 1960-1970 from .676 to .782 in Brazil; it is significant, positive, but declining 1960-1970 from .718 to .547 in Chile, from .526 to .429 in the U.S., and from .554 to .510 in the combined cross-cultural cases (see table 46 in appendix C).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage contribution of agriculture to the G.N.P. is negative and significant (-.423) only in Chile in 1970 (see table 46 in appendix C).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage contribution of services to the G.N.P. is significant, positive, and increasing 1960-1970 from .491 to .706 in Brazil; it is significant, positive, but declining 1960-1970 from .689 to .514 in Chile and from .524 to .452 in the U.S.; it is significant (.532) in the combined cross-cultural cases only in 1970 (see table 46 in appendix C).

The rate of economic growth averaged 4.6 per cent annually in the U.S. 1960-1970 and 4.4 per cent in Chile 1960-1970 (yearly rates show a

decline 1967-1970); the economic stagnation in Brazil 1960-1967 after rapid growth in the 1950s was followed by the shift in government planning towards a "development strategy" and an economic growth rate 1968-1972 approaching 10 per cent annually, one of the highest in the world. The impact of the Industrial Revolution diffused more evenly throughout the U.S. than it has in Brazil or Chile. One basic factor affecting sectoral (provincial and national) contributions to the G.N.P. as well as uneven internal development (regional differences) and sectionalism in Brazil and Chile is the emergence and continuation of dual economies based on the maintenance of export economies since the sixteenth century up to the attempts to move away from this position through import substitution industrialization. The dual economy continues to characterize Brazil and Chile as seen in the concentration, e.g., of population, educational, and other institutions where the "modern" sector (the more mechanized, commercialized, urbanized, and industrialized) predominates. In Brazil, this coincides with the region where European immigrants and their descendants have concentrated; in Chile, it is predominantly in the Santiago-Valparaíso area and the mining region.

Percentage contribution of industry to the G.N.P. The average annual percentage growth rate of industry 1959-1969 was 6.8 per cent in Brazil, 5.9 per cent in Chile, and 4.8 per cent in the U.S. (1960-1970). It has been the sector to show the most rapid rate of growth in Brazil after 1947. The provincial data for Brazil show a higher mean percentage contribution of industry to the G.N.P. in 1970 (1.47) than 1960 (1.34) but a slightly greater dispersion of cases (standard deviations are 3.08 in 1960 and 3.41 in 1970); the extreme values (0.1 and 15.0 per

cent in 1960, 0.1 and 16.6 per cent in 1970) do not indicate a rapid increase in industrialization nor a significant increase in provincial variations. At the national level, however, there has been an increase in the contribution of industry to the G.N.P. from 25 per cent in 1950 to 33.5 per cent in 1960 and 37 per cent in 1968. At the national level, the increase in industry as a percentage of the gross product was greater in Chile than Brazil growing from 34.1 per cent in 1950 to 36.6 per cent in 1960 and 51.6 per cent in 1970. Similar to Brazil, Chile's provincial data for 1960 and 1970 reveal a slight increase in the mean percentage contribution of industry to the G.N.P. (from 1.12 to 1.58), in the dispersion of cases (from a standard deviation of 1.17 to 1.65), and in the extreme values (0.2 and 4.4 per cent in 1960, 0.3 and 6.2 per cent in 1970). These measures approximate those for the U.S. more so than Brazil. However, the U.S. data reveal an opposite trend to that of Brazil and Chile. There was a gradual decline in the percentage contribution of industry to the G.N.P. in the U.S. from 46.2 in 1950 to 44.7 in 1960 and 40.9 in 1970; this is reflected in the provincial data for 1960 and 1970 which show a decline in the mean percentage contribution of industry to the G.N.P. from 0.9 to 0.82; the standard deviation declined from 1.16 to 1.01 and the extreme values declined from 0.1 and 4.8 per cent in 1960 to 0.04 and 3.8 per cent in 1970. Provincial differences are more extreme in Brazil than in the U.S. or Chile. The observed trends in the data for the three nations also represent the differences between a more developed nation (U.S.) in which the industrial sector is tapering off as other sectors increase in importance in contrast to industrializing nations (Brazil and Chile) that currently

emphasize planning for industrial growth. The mean percentage contribution of industry to the G.N.P. in 1960 and 1970 for cross-cultural analysis is 1.06 and 1.17; standard deviations are 1.83 and 2.03; extreme values are 0.1 and 15.0 per cent in 1960, 0.04 and 16.6 per cent in 1970.

Percentage contribution of commerce to the G.N.P. As the most important sector in the Chilean economy primarily in terms of export earnings, commerce accounted for 21.7 per cent of the gross product in 1950, 24.2 per cent in 1960, and declined to 18.7 per cent in 1970, reflecting in part the drop in mining prices (and thus in the value of exports) in 1970. The average annual percentage growth in commerce in Chile was 4.1 per cent 1960-1970; it was 6.1 per cent in 1960-1961 and 9.1 per cent in 1970 in Brazil. The percentage contribution of commerce to the gross product in Brazil was 13.8 in 1950, 15.5 per cent in 1960, and 22.2 per cent in 1968. Although the average annual percentage growth rate in commerce in the U.S. (4.7 per cent) was close to Chile's between 1960 and 1970, the percentage contribution of commerce to the gross product was higher than in Brazil or Chile, increasing from 28.8 per cent in 1950 to 30.1 per cent in 1960 and 31.1 per cent in 1970. The provincial data for Brazil show the increase in the commercial sector and an increase in internal variation; for 1960 and 1970, respectively, the mean percentage contribution of commerce to the G.N.P. is 0.62 and 0.90, the standard deviation is 1.16 and 1.65, and the extreme values are 0.1 and 4.4 per cent in 1960, 0.1 and 6.3 per cent in 1970. The provincial data for Chile and the U.S. reflect a decline in commerce as a percentage of the G.N.P.; the extreme values for Chile are 0.2 and 3.0 per cent in 1960, 0.2 and 2.4 per cent in 1970 and, for the U.S., 0.03 and 5.8 per cent in

1960, 0.03 and 5.3 per cent in 1970. In both nations, there is less of a dispersion of cases in 1970; the standard deviations for 1960 and 1970 are 0.76 and 0.61 in Chile, 0.96 and 0.93 in the U.S. The mean percentage contribution of commerce to the G.N.P. of the Chilean data dropped from 0.93 in 1960 to 0.75 in 1970 while it remained about the same in the U.S. (0.61 per cent in 1960 and 0.62 per cent in 1970). The mean percentage contribution of commerce to the G.N.P. in 1960 and 1970 for cross-cultural analysis when the 100 cases are combined is 0.69 and 0.72; standard deviations are 0.97 and 1.09; extreme values are 0.03 and 5.8 per cent in 1960, 0.03 and 6.3 per cent in 1970.

Percentage contribution of agriculture to the G.N.P. At a national level, the agricultural sector had an average annual percentage growth rate from 1959 to 1969 of 4.3 per cent in Brazil, 2.6 per cent in Chile, and 2.7 per cent in the U.S. (1960-1970). In all three nations, the percentage contribution of this sector to the gross product declined but for different reasons. In 1950, 1960, and 1970, respectively, the percentage contribution of the sector was 31.3, 28.3, and 17.7 (1968) in Brazil; 12.5, 12.2, and 9.6 in Chile; and 7.3, 4.3, and 3.2 in the U.S. Agriculture in the U.S. has steadily declined in importance after the Industrial Revolution in the late nineteenth century; however, agricultural productivity has increased so that national needs are met as is generally true of Brazil. Import substitution planning and the growth in the manufacturing sector have contributed to the decline in the importance of the agricultural sector in Brazil. In addition, agricultural production in 1970 was affected by drought in the Northeast, a 30-per-cent decline in coffee production, and a 16-per-cent decline in

cocoa production; this decline was offset somewhat by a 10-per-cent increase in agricultural production in central-south Brazil, the most productive area in agriculture. In Chile, an estimated two-thirds of the population depend on agriculture; at the same time, it has been a stagnant sector characterized by low productivity, growing at a slower rate than the population from World War II until around 1960 in large part due to government policies that do not encourage an increase in production. The underlying reasons for the decline in the importance of agriculture in the three nations differ but the decline also appears in the provincial data for 1960 and 1970. The mean percentage contribution of agriculture to the G.N.P. dropped from 1960 to 1970 from 1.13 to 0.71 for Brazil, 0.46 to 0.38 for Chile, and 0.09 to 0.06 for the U.S. The dispersion of cases lessened from 1960 to 1970 with standard deviations of 1.6 and 1.0 in Brazil, 0.26 and 0.21 in Chile, and 0.09 and 0.07 in the U.S. Lastly, the extreme values for Brazil were 0.2 and 6.7 in 1960, 0.1 and 4.2 per cent in 1970; for Chile, they were 0.1 and 1.0 per cent in 1960, 0.1 and 0.8 per cent in 1970; and for the U.S., they were 0.004 and 0.4 in 1960, 0.003 and 0.3 per cent in 1970. The slight provincial variations particularly in the U.S. and Chile limit the usefulness of this variable in regression and partial correlation analysis (after which it was omitted from the study) and as an indicator. The cross-cultural combination of cases for 1960 and 1970 have a mean percentage contribution of agriculture to the G.N.P. of 0.44 in 1960 and 0.31 in 1970, standard deviations of 0.91 and 0.57, and extreme values of 0.004 and 6.7 per cent in 1960, 0.003 and 4.2 per cent in 1970.

Percentage contribution of services to the G.N.P. In the provin-

cial data for 1960 and 1970, respectively, the mean percentage contribution of services to the G.N.P. was 0.46 and 0.44 in Brazil, 0.39 and 0.43 in Chile, 0.20 and 0.23 in the U.S., 0.31 and 0.33 for the combined cases; standard deviations were 0.79 and 0.74 in Brazil, 0.23 and 0.28 in Chile, 0.34 and 0.39 in the U.S., 0.48 and 0.49 for the combined cases; extreme values were 0.1 and 3.5 per cent in 1960 and 0.1 and 3.3 per cent in 1970 for Brazil, 0.2 and 1.0 per cent in 1960 and 0.2 and 1.1 per cent in 1970 for Chile, 0.01 and 2.0 per cent in 1960 and 0.01 and 2.3 per cent in 1970 for the U.S., 0.01 and 3.5 per cent in 1960 and 0.01 and 3.3 per cent in 1970 for the combined cases. In part, these data reflect the too rapid growth in services in Brazil and Chile given the level of development.

Communications: radios per capita

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and radios per capita is insignificant in 1960 and 1970 (see table 46 in appendix C).

Research Finding: There is a significant association, controlling for rural-urban residence, between communications as indicated by radios per capita and the socio-political set of variables in the combined cross-cultural cases with the exception of the (eligible) voting-age population registered to vote (refer to tables 7, 13, 19, 25, 31, 37).

The rapid spread of communications media such as radio and television is a twentieth-century phenomenon. It is only since 1950 that access to these media has accelerated in Chile and Brazil. In 1961, television sets per 1,000 population increased by 22.1 per cent in Brazil and 306.4 per cent in the U.S. but only 0.4 per cent in Chile. Other indicators show that there is greater access in Chile than Brazil

but much less than in the U.S. In 1970, the U.S. had 62.8 telephones per 100 population, Chile had 4.1, and Brazil had 2.2; newspaper circulation (number of copies) per 1,000 population was 297 in the U.S. in 1970 and, in 1971, it was 89 in Chile and 37 in Brazil.

With the expansion of radios in Brazil 1950-1960 and the advent of the transistor radio, minimum-wage earners now have access, in terms of cost, to radios; therefore, the decline of 66 radios per 1,000 population in 1960 to 60 in 1970 reflects in part the more rapid growth of population. In comparison, radios per 1,000 population in 1960 and 1970 grew from 94 to 143 in Chile and from 941 to 1,412 in the U.S.

Since provincial data for radios per capita were unavailable, the procedure used in this study was to assign the number of radios per capita at the national level to each province for cross-cultural analysis; these values in 1960 and 1970 were, respectively, .07 and .06 for Brazil, .09 and .14 for Chile, and .94 and 1.41 for the U.S. By combining the cases for cross-cultural analysis, the 1960 and 1970 data have a mean number of radios per capita of 0.51 and 0.76, a standard deviation of 0.43 and 0.66, and extreme values of 0.07 and 0.94 radios per capita in 1960, 0.06 and 1.41 in 1970.

Support, in a sense, for this procedure exists in Brazil and Chile. By the 1960s, the Chilean communications system was already characterized in part by insignificant provincial (and social class) differences in the distribution of radios (Silvert, 1965:177-180). In Brazil, both the population and the access to radios and television in 1970 were concentrated in the Southeast (Weil et al., 1975:274-277) and in the cities and towns of the other regions. Government ownership of the major means of

communications in the 1960s and the subsequent widespread use of television and radio for broadcasting educational programs led to increased access to these media throughout Brazil. The distortion of the U.S. data by the procedure used would not be due to provincial variations related predominantly to having at least one radio or none in a household or per person which is more likely to be the case in Brazil and Chile; rather, it would be due to variations from the opposite tendency of having one or more per household or per person. At any rate, the findings cannot be treated as definitive.

Access to marketing districts: number of ports

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and number of ports is insignificant in 1960 and 1970 (see table 46 in appendix C).

Research Finding: There is a significant association, controlling for rural-urban residence, between number of ports and the socio-political set of variables in one or more nations in this study with the exception of the secondary-school enrollment ratio, higher education, and percentage of the (eligible) voting-age population registered to vote (refer to tables 7, 13, 19, 25, 31, 37).

In this study, shipping was selected as the most important means of transporting freight since Brazil, Chile, and the U.S. are maritime nations while recognizing that other means have also been important to their development. The most important Brazilian ports are Santos and Rio de Janeiro. Maritime access to inland ports is primarily via the Amazon River. Similarly, in the U.S. the St. Lawrence Seaway gives access of Michigan and Chicago to the Atlantic, the Houston Ship Channel links the port of Houston to the Gulf of Mexico, and the Arkansas-Verdigris Navigation System links Tulsa to New Orleans. Chile's ports are all maritime

locations, the chief ones being Punta Arenas, Valparaíso, Talcahuano, Antofagasta, and San Antonio. Corral serves as Valdivia's port although smaller ships now have access to Valdivia because of changes, e.g., in river depth, produced by earthquakes in the 1960s.

In international trade, total tonnage (in thousand metric tons) loaded in 1953, 1964, and 1970, respectively, increased: in Brazil, from 4,375 to 14,587 and 39,970; in Chile, from 4,740 to 11,313 and 21,973; and in the U.S., from 81,116 to 157,251 and 218,256. Total tonnage (in thousand metric tons) unloaded in 1953, 1964, and 1970, respectively, also increased: in Brazil, from 11,789 to 18,174 and 28,073; in Chile, from 2,311 to 3,186 and 5,255; and in the U.S., from 116,103 to 225,513 and 292,786. In Brazil and Chile, the total tonnage handled in ports for international trade alone far exceeds freight shipped by railroads but the opposite is the case in the U.S. (although there is an overlap in the three nations of tonnage loaded and unloaded at ports and that proportion of railroad freight representing exports taken to ports or imports brought from ports); it can be suggested that this is due, in part, to the size of the domestic market in the U.S. which has expanded much more rapidly than in Brazil or Chile largely because of the more extremely uneven distribution of income in these two nations.

For each nation, the same ports are not necessarily included in both periods for which data were collected (1958-1960 and 1968-1970); however, only Brazil shows an increase in the number of ports involved. In the provincial data for 1960 and 1970, the Brazilian cases have a mean number of ports of 3.04 in 1960 and 3.44 in 1970, standard deviations of 2.88 and 3.19, and extreme values of 0 and 12 ports in 1960,

0 and 15 in 1970; the Chilean cases have a mean number of ports of 2.8, a standard deviation of 3.33, and extreme values of 0 and 14 ports in 1960 and 1970; and the U.S. cases have a mean number of ports of 3.56, a standard deviation of 4.55, and extreme values of 0 and 17 ports in 1960 and 1970. The combined cross-cultural cases have a mean number of ports of 3.24 in 1960 and 3.34 in 1970, a standard deviation of 3.88 in 1960 and 3.93 in 1970, and extreme values of 0 and 17 ports.

Average annual income in the major economic sectors

Research Finding: There is a significant association, controlling for rural-urban residence, between average annual income in the major economic sectors and the socio-political set of variables in one or more nations in this study (refer to tables 7, 13, 19, 25, 31, 37).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and average annual income in agriculture is significant and positive (.458) only in Chile in 1970 (see table 46 in appendix C).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and average annual income in industry is significant, positive, but declining 1960-1970 from .711 to .629 in Brazil; it is significant, positive, and increasing 1960-1970 from .658 to .674 in Chile; it is significant and positive in the U.S. only in 1970 (.418); and it is insignificant in the combined cross-cultural cases in 1960 and 1970 (see table 46 in appendix C).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and average annual income in commerce is significant, positive, but declining 1960-1970 from .737 to .510 in Brazil; it is significant and positive only in 1960 in Chile (.507) and the U.S. (.402); it is insignificant in the combined cross-cultural cases in 1960 and 1970 (see table 46 in appendix C).

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and average annual income in services is significant, positive, but declining 1960-1970 from .805 to .612 in Chile and from .508 to .440 in the U.S.; it is significant and positive in Brazil only in 1960 (.675);

and it is insignificant in the combined cross-cultural cases in 1960 and 1970 (see table 46 in appendix C).

The labor code in effect in Brazil during the 1960s was promulgated in 1943; the minimum-wage system establishes a scale designed to vary by province (and excludes agricultural laborers). In 1967, a new currency unit, the Cruzeiro Novo (New Cruzeiro) or CrN\$ replaced the cruzeiro (CrN\$1=Cr\$1,000 in 1967). In 1964, Goulart doubled the minimum-wage scale but the increase in the consumer price index in the 1960s reached a peak of 87.0 per cent in this year (with an average annual increase of 47.2 per cent 1960-1969). Data for Guanabara show an increase in average monthly wages 1964-1966 from CrN\$69 to CrN\$155 in commerce and from CrN\$61 to CrN\$147 in industry. Yet, in São Paulo, e.g., the cost-of-living index (1958=100) increased from 189 in December of 1960 to 3,010 in December of 1966; real minimum monthly wages in São Paulo declined from CrN\$1.54 in 1960 to CrN\$1.13 in 1969. The average annual increase in real income per capita was 2.5 per cent in the 1950s, 4.1 per cent in 1960-1961, 2.0 per cent in 1961-1962 (one period during which the government had put a stabilization program into effect), and -1.6 per cent in 1962-1963; similarly, the real price index for wheat (1948-1952=100) of 107 in 1958-1962, 110 in 1963-1967, and 108 in 1968-1969 also lends itself to the implication that real gains made in wages during the 1960s were in all practicality insignificant.

In Chile, the labor code of the 1960s was put into effect in 1931, including the stipulation of "equal pay for equal work" for men and women. The minimum- and vital-salary law was passed in 1937 and, as in Brazil, establishes a different scale for each province. Minimum pay was

determined for employees (salaried labor force) in 1942, for wage earners (except agricultural workers) in 1957, and for agricultural labor (using the same scale as for industry) in 1965. Cost-of-living increases became automatic on January 1 of every year for employees in 1961 and for wage earners in 1965. The nation-wide cost-of-living index (1950=100) was 1,388.9 in 1958 and, in Santiago, this index (1958=100) increased from 141 in 1960 to 583 in 1966. The annual average consumer price index in Chile (1958=100) was 7.1 in 1950, 154.7 in 1960, and 632 in 1966 (later rising to 1,278 in 1972 when 1963=100); there was an average annual increase in this index of 26 per cent 1960-1969. The percentage growth of real income per capita has fluctuated widely in Chile from 4.0 in 1950-1953, -1.9 in 1953-1956, 0.4 in 1956-1959, 3.2 in 1959-1962, 2.6 in 1961-1962, 0.3 in 1962-1963 to 1.4 in 1970. Wholesale prices for wheat (per 100 kilograms) declined slightly from US\$7.30 in 1960 to US\$7.10 in 1970. Thus, the apparent increases in wages, e.g., average monthly earnings in manufacturing of (escudos) E⁰100.05 in 1963 to E⁰1,041.63 in 1970, were largely consumed by inflation. In addition, with a rate of inflation of 30-40 per cent annually, the policy of automatic cost-of-living increases at the first of the year actually signifies a steady decline in wages during the 12 months of the year.

Income differences in Chile are influenced by two additional factors: (1) the existence of a mandatory profit-sharing system for employees, available also to unionized industrial and commercial wage earners; (2) the regalía en especie (payment in kind) in the form of housing and board which can constitute up to one-half of the wages for farm laborers (and up to 70 per cent of the wages of farm laborers in

Brazil).

In the U.S. the consumer price index (1967=100) was 72.1 in 1950, 88.7 in 1960, and 116.3 in 1970. Producers prices for wheat dropped from \$6.40 per 100 kilograms in 1960 to \$4.90 in 1970. National income per capita in current dollar value in 1950, 1960, and 1970, respectively, was \$1,501, \$2,219, and \$3,945; however, in constant dollars (1958 value), it was in the same years \$1,810, \$2,157, and \$3,050. The impact on wages can be seen, e.g., in the data on earnings in manufacturing. Average gross weekly earnings in manufacturing were, in current dollar value, \$89.70 in 1960, \$107.50 in 1965, \$122.50 in 1968, and \$133.70 in 1970; stated in terms of constant (1967) dollar value these earnings become \$101.20 in 1960, \$113.80 in 1965, \$117.60 in 1968, and \$115.00 in 1970. By taking inflation into account, wages were actually declining between 1968 and 1970.

Labor legislation in the twentieth-century U.S. has included state workmen's compensation laws and minimum-wage and maximum-hour legislation as well as a guarantee of collective bargaining. Only in Alaska are women and men guaranteed "equal pay for equal work." In contrast to Brazil and Chile, minimum wages do not vary provincially in the U.S.

Average annual income in agriculture. In the provincial data for 1960 and 1970, respectively, the mean income in agriculture is \$498.28 and \$1,066.40 for Brazil, \$103.88 and \$919.92 for Chile, \$1,919.16 and \$2,418.20 for the U.S., and \$1,110.12 and \$1,705.68 for the combined cases. The standard deviations are 158.47 and 264.48 for Brazil, 8.85 and 406.05 for Chile, 771.42 and 972.00 for the U.S., and 990.68 and 1019.84 for the combined cases. The extreme values are: \$296.67 and

\$670.78 in 1960, \$661.11 and \$1,651.56 in 1970 for Brazil; \$83.95 and \$118.52 in 1960, \$646.91 and \$2,249.38 for Chile in 1970; \$579.86 and \$3,667.97 in 1960, \$730.62 and \$4,621.64 in 1970 for the U.S.; \$83.95 and \$3,667.97 in 1960, \$646.91 and \$4,621.64 in 1970 for the combined cases. In the three nations, there was an overall increase in income but also an increase in provincial variations. The drastic change in income between 1960 and 1970 in Chile reflects the 1965 legislation to establish minimum wages for agricultural labor at the same level as in industry. Still, the data illustrate differences in Brazil and Chile based on a scale of minimum wages that varies by province as well as provincial variations in the degree of adherence by employers to the minimum-wage legislation.

Average annual income in industry. In the provincial data for 1960 and 1970, respectively, the mean income in industry is \$588.28 and \$1,154.04 for Brazil, \$310.04 and \$1,761.76 for Chile, \$4,254.18 and \$6,410.82 for the U.S., and \$2,351.67 and \$3,934.36 for the combined cases. The Brazilian cases showed a decline in the standard deviation from 245.50 to 226.68 whereas there was an increase from 96.39 to 367.53 for the Chilean cases, from 685.96 to 901.81 for the U.S. cases, and from 1978.80 to 2586.34 for the combined cases. An overall increase in income is shown by the extreme values that range from \$231.22 and \$1,252.22 in 1960 to \$954.56 and \$1,729.11 in 1970 in Brazil, from \$150.62 and \$481.48 in 1960 to \$1,345.68 and \$2,607.41 in 1970 in Chile, from \$2,905.54 and \$5,676.20 in 1960 to \$4,625.00 and \$8,281.69 in 1970 in the U.S., from \$150.62 and \$5,676.20 in 1960 to \$954.56 and \$8,281.69 in 1970 in the combined cases.

Average annual income in commerce. In the provincial data there was a decline in the standard deviation from 181.66 in 1960 to 123.19 in 1970 for Brazil but an increase from 74.95 to 460.14 for Chile, from 591.07 to 822.71 for the U.S., and from 2034.20 to 2559.15 for the combined cases. In all three nations there was an overall increase in income in commerce. The mean income in commerce for 1960 and 1970 is \$761.84 and \$1,626.32 for Brazil, \$196.12 and \$1,208.36 for Chile, \$4,416.56 and \$6,347.18 for the U.S., \$2,447.77 and \$3,882.26 for the combined cases. Extreme values are: \$515.56 and \$1,244.44 in 1960, \$1,429.78 and \$2,041.78 in 1970 for Brazil; \$83.95 and \$367.90 in 1960, \$520.99 and \$2,271.60 in 1970 for Chile; \$3,054.53 and \$6,167.05 in 1960, \$4,830.51 and \$8,800.00 in 1970 for the U.S.; \$83.95 and \$6,167.05 in 1960, \$520.99 and \$8,800.00 in 1970 for the combined cases.

Average annual income in services. Provincial data show an increase in income in this sector and an increase in the dispersion of cases. For 1960 and 1970, respectively, the mean income in services is \$608.68 and \$1,459.52 in Brazil, \$88.72 and \$512.80 in Chile, \$2,735.52 and \$4,099.56 in the U.S., \$1,542.11 and \$2,542.86 for the combined cases. Standard deviations are 170.76 and 387.71 in Brazil, 9.44 and 54.27 in Chile, 474.17 and 686.40 in the U.S., 1261.40 and 1682.65 for the combined cases. Extreme values are: \$367.11 and \$1,009.89 in 1960, \$867.33 and \$2,061.11 in 1970 for Brazil; \$74.07 and \$111.11 in 1960, \$427.16 and \$641.98 in 1970 for Chile; \$1,962.25 and \$4,027.35 in 1960, \$2,982.46 and \$5,945.95 in 1970 for the U.S.; \$74.07 and \$4,027.35 in 1960, \$427.16 and \$5,945.95 in 1970 for the combined cases.

The Relationship Between Trends in Socio-Political
Linkages and the Expansion of Industrial-
Economic Linkages

Social linkages: school enrollment

The training of skilled industrial workers, the growth of the individual's opportunities for a higher income, and the increase in mass participation in the political process not only expand the linkages of individuals and groups but, in turn, increase the nation's potential for more rapid development. Both Brazil and Chile have begun to reform their educational systems but in the 1960s they remained in a situation in which the effects of rapid population growth in the past counter-balanced efforts to expand the number of, and access to, educational facilities. Of recent basic legislative reforms in the U.S., two that have had a far-reaching impact were desegregation acts to expand access to all educational levels and the 1965 Higher Education Act which expanded access to university education by making federal aid available to undergraduates.

Education is both free and compulsory in Brazil and Chile up to age 15. Provincial variations within the U.S. range, in the case of free education, from 4 to 6 years of age at one extreme to 16-21 years of age at the other extreme; in the case of compulsory education, the variations are from 6 to 7 and from 14 to 18 years of age except in Louisiana and Mississippi where compulsory education laws were repealed after desegregation policies were put into effect by the national government.

Primary education in the 1960s lasted for four years beginning at age 7 in Brazil, for six years beginning at age 6 in Chile, and for eight

years beginning at age 6 in the U.S. In Brazil, primary schools in cities had already added a fifth grade in the 1960s and, as part of educational reform, compulsory primary education nation-wide became a six-year program in the 1970s. In Chile, educational reform included the addition of a seventh year to primary education in 1966 and an eighth year in 1967 in an attempt to improve the retention rate over a longer period of time and to delay specialization (technical education).

In spite of compulsory primary-education legislation, participation rates in Brazil and Chile are low and dropout rates are high. Among those with little or no schooling, the rural--particularly the lower class--population is disproportionately represented in both nations; they also have a disproportionately high dropout rate, a higher illiteracy rate, and less opportunity since rural schools not unusually offer only 2-4 years of education in Chile and 3 years in Brazil. Higher dropout rates have also been associated with lower-income groups which, in the case of Chile, reform has attempted to change.

Of the population aged 5-14, 26 per cent were enrolled in primary school in 1950 and 51.3 per cent in 1970 in Brazil; the respective figures for Chile were 66 and 88.6 per cent and, for the U.S., 96.3 per cent in 1960 (97.1 per cent for ages 5-13 in 1950) and 99.2 per cent in 1970. Between 1965 and 1968 the primary retention rate (completion of the four years) in Brazil was 21.5 per cent (of students entering first grade) in contrast to 34.1 per cent in Chile (those completing six years) for 1961-1968 and 1963-1970. Retention rates in primary education for the U.S. were 91.0 per cent between 1960-1961 and 1967-1968 and 93.4 per cent between 1962-1963 and 1969-1970.

Secondary-level education (until the 1970s) in Brazil consisted in a four-year cycle of basic academic education followed by a three-year cycle of either academic or technical-vocational. Prior to educational reform in Chile, secondary education consisted in six years in academic or seven years in technical schools; since the reforms in the late 1960s, it customarily begins at age 15 and lasts four years (three years of basic and one year of college preparatory education) similar to the U.S. system and normal education (since 1970) is incorporated into higher rather than secondary education.

Estimates of the secondary-age population enrolled in secondary school for Brazil were 10 per cent in 1950 and 12 per cent in 1960, for Chile 18 per cent in 1952 and 26.4 per cent in 1960, and for the U.S. 80.9 per cent in 1960 (91.8 per cent of those aged 14-17 were in school at some level). The higher participation rates in Chile, in contrast to Brazil, are partly due to the greater access of (urban) students to both public and private (tuition and tuition-free) secondary schools; however, dropout rates at the secondary level are high. While Brazil has maintained relatively low tuition rates for university students, the cost of secondary education (most schools charge tuition) has been the major factor to limit access to secondary schools and, consequently, to universities; to alleviate this problem, a scholarship program for lower-income students was initiated in 1966 and, in the same year, about 24,000 secondary students benefited from the program.

A second obstacle to secondary education in Brazil for the lower-income and rural student in particular (who does not receive special preparation, e.g., by tutors, for financial reasons) is the examination

used as a selection criterion by secondary schools and given after completion of four years of primary education; after primary schools in cities added a fifth year in the 1960s, the examination was used as a selection criterion only when secondary schools could not absorb all students who would otherwise be admitted by having completed primary school. The lower-income student does have one alternative--other than government assistance through scholarships--which is widely used, i.e., daytime employment and school attendance at night. It is not uncommon for the evening classes offered by many secondary schools to have more students than secondary-education programs during the day; this also accounts for the wider age distribution (including individuals in their mid-20s) in secondary-school enrollment figures for Brazil.

All three nations have a system of technical-vocational schools. The bias against technical-vocational education in Brazil and Chile is declining (although less so in Chile) through governmental encouragement as one aspect of industrialization policies except in one area--agriculture--mainly because agricultural occupations in Brazil continue to be associated with low social status as is the case in Chile. This has contributed to the failure in both nations to realize agricultural potential (and agricultural self-sufficiency in Chile) as well as the continuation of a dual economy in which agriculture falls predominantly in the traditional sector.

Vocational-education facilities (junior colleges) increased from 528 in 1950 to 827 in 1970 in the U.S. after a slight decline to 521 in 1960 but, in contrast to Brazil and Chile, this growth did not represent an aspect or direct consequence of national development planning

although the end result might be the same in all three nations, i.e., the redefinition of economic functional linkages by means of expanding social (educational) linkages.

The relatively recent expansion of the university system in Chile has been in the direction of meeting national educational planning goals to increase access (by establishing university branches) to a university education throughout the length of the nation. Public universities in Chile are tuition-free, private universities charge low tuition (about US\$35 a year), and some scholarships are available to university students. However, lower-income students in Chile who are working to financially assist their families find that the costs of, e.g., room and board, in many cases make a university education impossible to acquire; as a consequence, students from upper-class families are disproportionately represented among the student body. The situation is different in the case of the Technical University in Valparaíso founded by Federico Santa María for students from lower-income families; these students receive free tuition, free room and board, clothing, and a stipend. The degree of access that women have to university education in Chile is uniquely high; women represented almost 40 per cent of university enrollments by 1956 compared to 36.1 per cent in the U.S. in 1960 and 41 per cent in 1970.

Universities emerged more slowly in Brazil than in Chile or the U.S. Forms of higher education existed in Brazil prior to the twentieth century but it was not until 1920 that the first actual university was established (in Rio de Janeiro). University enrollment in Brazil per 100,000 population was 98 in 1950 (290 in Chile and about 2,300 in

the U.S.) and 132 in 1960 (257 in Chile and about 1,900 in the U.S.). The 1960 and 1970 provincial data for Brazil, Chile, and the U.S. at all three educational levels refer to combined public and private enrollment.

Primary-school enrollment ratio

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and the primary-school enrollment ratio is significant and positive (.447) only in Brazil in 1960 (see tables 2-5).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between percentage of the labor force employed in industry and the primary-school enrollment ratio in Brazil only in 1960 (.651) and in the combined cross-cultural cases in 1960 (.629) and 1970 (.436); the association is insignificant in Chile and the U.S. in 1960 and 1970 (see table 7).

Research Finding: There is a significant, negative association, controlling for rural-urban residence, between contributions of the major economic sectors to the G.N.P. and the primary-school enrollment ratio in Chile only in 1970 (commerce, -.437; services, -.571); the association is insignificant in Brazil, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 7).

Research Finding: There is a significant, positive (.737) association, controlling for rural-urban residence, between radios per capita and the primary-school enrollment ratio in the combined cross-cultural cases only in 1960 (see table 7).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between number of ports and the primary-school enrollment ratio in Chile only in 1960 (.521); the association is insignificant in Brazil, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 7).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between average annual income in the major economic sectors and the primary-school enrollment ratio in Brazil in 1960 (agriculture, .478; industry, .629) and 1970 (services, .446) and in the combined cross-cultural cases in 1960 (agriculture, .511; industry, .682; commerce, .663; services, .609); the association is negative and significant in Chile only in 1970 (agriculture, -.413; industry, -.550; services, -.523) and the association is insignificant in the U.S. in 1960 and 1970 (see table 7).

For the provincial data in 1960 and 1970, respectively, the mean primary-school enrollment ratios were 29.06 and 34.79 for Brazil, 51.98 and 59.89 for Chile, 66.46 and 53.01 for the U.S. The standard deviations for 1960 and 1970 were 8.38 and 8.88 in Brazil, 5.96 and 4.61 in Chile, 9.68 and 7.86 in the U.S. Extreme values of these ratios ranged from 13.4 to 50.0 in Brazil in 1960 and from 20.6 to 60.0 in 1970; in Chile, they ranged from 40.0 to 69.2 in 1960 and from 50.0 to 66.7 in 1970; and in the U.S., the ratios ranged from 55.0 to 82.0 in 1960 and from 40.0 to 90.0 in 1970. These results reflect, in part, the impact on the primary-school enrollment ratio of changes in population growth in the three nations with the corresponding variations in the age structure of the nation and by province. The standard deviations show less provincial variation in the ratio in Chile and the U.S. while it remains about the same with a slight increase between 1960 and 1970 in Brazil. Chilean data for 1970 are affected by the inclusion of two additional years of schooling that were part of secondary education in 1960. The combination of the cases from the three nations for cross-cultural analysis has a mean primary-school enrollment ratio of 53.49 for 1960 and 50.18 for 1970, a standard deviation of 17.56 in 1960 and 11.94 in 1970, and a range in ratios from 13.4 to 82.0 in 1960 and from 20.6 to 90.0 in 1970.

Regression and correlation results. Table 1 presents the abbreviations of variables used in regression and correlation tables as well as symbols used in the subsequent causal analysis. In the regression equations for the individual nations and for all cases combined, the F test (referring here and in subsequent tables to the overall F test at

TABLE 1

ABBREVIATIONS OF VARIABLES IN REGRESSION AND
CORRELATION TABLES AND NOTATION
IN CAUSAL MODELS

Variable Name	Tables	Diagrams
Industrial-economic set:		$X = \{i, g, r, w, p\}$
Labor force in industry	PIN	i
Where $g \subset X$, contributions to G.N.P. of:		$g = \{g_1, g_2, g_3, g_4\}$
Agricultural sector	AGG	g_1
Industrial sector	ING	g_2
Commercial sector	COG	g_3
Service sector	SEG	g_4
Radios per capita	RAD	r
Average annual income, where $w \subset X$, in:		$w = \{w_1, w_2, w_3, w_4\}$
Agricultural sector	IAG	w_1
Industrial sector	IIN	w_2
Commercial sector	ICO	w_3
Service sector	ISE	w_4
Number of ports	POR	p
Socio-political set:		$Y = \{v, e, l, s\}$
Voter registration as percentage of those eligible	VOT	v
School enrollment, where $e \subset Y$, at:		$e = \{e_1, e_2, e_3\}$
Primary level	PRI	e_1
Secondary level	SND	e_2
College level	COL	e_3
Illiteracy rates	ILL	l
Social security coverage	SSE	s
Control variables:		$Z = \{a, b\}$
Rural-urban residence	POP	a
Ethnicity	ETH	b

each step of the expansion of the equation) indicates that R is significant at the .05 level: in Brazil's cases (see table 2) for all steps in the 1960 equation and through the inclusion of income in agriculture (IAG) in the 1970 equation; in the Chilean cases (see table 3) for all steps in the 1960 equation and through the inclusion of rural-urban residence (POP) in the 1970 equation; in the U.S. cases (see table 4) through the inclusion of the percentage of the labor force employed in industry (PIN) in the 1960 equation and through the percentage contribution of agriculture to the G.N.P. (AGG) in the 1970 equation; and, in all cases combined (see table 5), for all steps in the 1960 and 1970 equations. Where R is significant, the percentage of variance explained in 1960 and 1970, respectively, is 75.1 and 55.7 per cent in Brazil, 80.6 and 57.1 per cent in Chile, 15.9 and 35.6 per cent in the U.S., and 74.5 and 45.0 per cent in all cases combined. The trend is apparently for some linear relationships to decline while new linear relationships appear possibly including variables not in this study. There is also the suggestion that the indicators of these relationships vary by nation which is evidenced in the final selection of those variables to be included in partial correlation analysis. Variables excluded on the basis of regression analysis are those at the steps in the expansion of the equation where R is not significant and those which contribute less than one per cent to the variance explained. Table 6 presents the procedure followed in the selection of variables--from those remaining after regression analysis--for causal analysis; this and similar tables for each socio-political variable are set up to illustrate that the elimination of ethnicity as a control variable has little impact on the

TABLE 2

SUMMARY OF REGRESSION OF PRIMARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: BRAZIL, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
PIN	.729	.532		26.235	.729
IAG	.787	.620	.088	17.975	.515
ISE	.810	.656	.036	13.394	.363
POP	.837	.701	.045	11.767	.447
COG	.842	.710	.009	9.328	.196
AGG	.853	.728	.018	8.049	.186
ING	.856	.734	.006	6.705	.233
IIN	.858	.737	.003	5.610	.714
SEG	.862	.743	.006	4.824	.215
POR	.863	.746	.003	4.116	.174
ETH	.864	.748	.002	3.508	-.338
ICO	.867	.751	.003	3.028	.379
<u>1970</u>					
ISE	.460	.211		6.173	.460
PIN	.553	.306	.095	4.870	.377
COG	.699	.489	.183	6.717	.024
IIN	.715	.512	.023	5.251	.323
SEG	.727	.528	.016	4.261	.067
ING	.743	.553	.025	3.718	.076
IAG	.746	.557	.004	3.056	-.080
POR	.748	.560	.003	2.549	.111
AGG	.750	.562	.002	2.147	.144
POP	.752	.565	.003	1.823	.271
ETH	.754	.569	.004	1.561	-.267
ICO	.754	.569	.000	1.323	.098

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, SS_{reg}=1268.374, and SS_{res}=418.867; in the 1970 equation, DF=12 and 12, SS_{reg}=1077.725, and SS_{res}=814.021. DF=23 for simple r. ETH= ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 3

SUMMARY OF REGRESSION OF PRIMARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: CHILE, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
POR	.485	.235		7.096	.485
SEG	.616	.379	.144	6.731	-.323
ICO	.675	.456	.077	5.879	.140
ING	.704	.496	.040	4.923	-.133
PIN	.775	.601	.105	5.725	-.093
POP	.834	.696	.095	6.887	-.128
IAG	.855	.732	.036	6.647	.139
IIN	.875	.766	.034	6.552	-.152
COG	.883	.780	.014	5.910	-.170
ETH	.893	.797	.017	5.523	.185
AGG	.896	.803	.006	4.822	-.123
ISE	.897	.806	.003	4.155	-.242
<u>1970</u>					
SEG	.569	.324		11.051	-.569
AGG	.660	.436	.112	8.516	-.224
ISE	.699	.489	.053	6.723	-.510
PIN	.721	.520	.031	5.428	-.179
IIN	.741	.549	.029	4.630	-.514
IAG	.749	.561	.012	3.837	-.439
ING	.753	.567	.006	3.190	-.294
POP	.755	.571	.004	2.662	-.168
ETH	.758	.574	.003	2.251	.173
ICO	.762	.581	.007	1.945	-.135
COG	.766	.586	.005	1.678	-.452

NOTE: N=25. Due to insufficient tolerance and F value, POR ($r=.039$) was excluded from the 1970 equation. In the final step of the expansion of the 1960 equation, $DF=12$ and 12 , $SS_{reg}=686.941$, and $SS_{res}=165.297$; in the 1970 equation, $DF=11$ and 13 , $SS_{reg}=298.755$, and $SS_{res}=210.411$. $DF=23$ for simple r . ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 4

SUMMARY OF REGRESSION OF PRIMARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
POP	.284	.080		4.226	-.284
ETH	.341	.116	.036	3.099	.199
PIN	.398	.159	.043	2.900	.083
IIN	.430	.185	.026	2.558	-.054
ING	.437	.191	.006	2.086	-.127
COG	.449	.202	.011	1.818	-.144
AGG	.453	.205	.003	1.553	-.109
ICO	.455	.207	.002	1.340	.008
ISE	.457	.209	.002	1.177	-.122
POR	.458	.210	.001	1.038	-.059
<u>1970</u>					
ICO	.312	.097		5.181	.312
SEG	.416	.173	.076	4.938	-.129
PIN	.458	.210	.037	4.083	-.164
IIN	.500	.250	.040	3.755	.111
ING	.536	.287	.037	3.558	-.054
POP	.561	.315	.028	3.302	-.135
ISE	.579	.335	.020	3.026	.273
COG	.585	.343	.008	2.676	-.111
POR	.593	.352	.009	2.415	-.058
AGG	.597	.356	.004	2.162	-.182
ETH	.597	.357	.001	1.922	.067

NOTE: N=50. Due to insufficient tolerance and F values, SEG (r=-.153) and IAG (r=-.077) were excluded from the 1960 equation and IAG (r=.225) from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=10 and 39, SS_{reg}=965.276, and SS_{res}=3625.805; in the 1970 equation, DF=11 and 38, SS_{reg}=1081.790, and SS_{res}=1943.649. DF=48 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 5

SUMMARY OF REGRESSION OF PRIMARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: BRAZIL, CHILE, AND UNITED STATES,
1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
RAD	.749	.562		125.942	.749
PIN	.795	.632	.070	83.542	.627
ISE	.833	.695	.063	73.106	.630
ETH	.845	.715	.020	59.611	-.485
IIN	.850	.724	.009	49.339	.698
POP	.855	.732	.008	42.339	.206
COG	.857	.735	.003	36.463	-.034
ING	.858	.737	.002	31.928	-.071
AGG	.861	.742	.005	28.899	-.380
IAG	.862	.744	.002	25.952	.536
SEG	.863	.745	.001	23.423	-.198
ICO	.863	.745	.000	21.241	.681
<u>1970</u>					
PIN	.437	.191		23.210	.437
COG	.522	.273	.082	18.227	-.108
ETH	.554	.307	.034	14.212	-.008
IIN	.627	.393	.086	15.390	.303
ICO	.642	.412	.019	13.225	.219
AGG	.651	.424	.012	11.414	-.219
ING	.660	.435	.011	10.151	-.035
IAG	.666	.444	.009	9.083	.179
POR	.669	.448	.004	8.120	-.032
POP	.670	.449	.001	7.267	.067
ISE	.671	.450	.001	6.555	.126
RAD	.671	.450	.000	5.950	.270

NOTE: N=100. Due to insufficient tolerance and F values, POR (r=.081) was excluded from the 1960 equation and SEG (r=-.102) from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=12 and 87, SS_{reg}=22754.906, and SS_{res}=7766.621; in the 1970 equation, DF=12 and 87, SS_{reg}=6358.984, and SS_{res}=7747.918. DF=98 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO= income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radios per capita.

TABLE 6

VARIABLE SELECTION FROM SETS X AND Z FOR CAUSAL ANALYSIS
 BASED ON REGRESSION AND PARTIAL CORRELATION WITH
 SET Y: PRIMARY-SCHOOL ENROLLMENT RATIO (PRI)

Selection Procedure

Step #1. Variables excluded because of associations less than $\pm .400$ with PRI when controlling for POP or POP and ETH:

1. Using first-order partials (by POP): None in 1960 or 1970.
2. Using second-order partials (by POP, ETH): IAG in the cross-cultural combination of cases in 1960.

Step #2. Remaining variables with significant partials of at least $\pm .400$ where $p < .05$:

1. Using either first- or second-order partials: PIN, IAG, IIN for Brazil in 1960 and ISE in 1970; POR for Chile in 1960 and COG, IIN, SEG, IAG, ISE in 1970; none in the U.S. in 1960 or 1970; PIN, RAD, ICO, IIN, ISE for the cross-cultural combination of cases in 1960 and PIN in 1970.
2. Additional variables by using first-order partials: IAG for the cross-cultural cases in 1960.*
3. Additional variables by using second-order partials: COG* in Brazil in 1960; RAD,* IIN in the cross-cultural cases in 1970.

Step #3. Variables with insignificant r but significant partials:

1. First-order: None.
2. Second-order: COG* in Brazil in 1960; RAD,* IIN in the cross-cultural cases in 1970.

Step #4. Remaining variables (with significant partials) from subsets g or w excluded because of ties to a variable with a stronger partial in the same subset using either first- or second-order partials: none in Brazil, U.S., or the cross-cultural cases in 1960 or 1970; none in Chile in 1960, ISE and IAG (tied to IIN) in 1970.

Step #5. Variables from set X selected for causal analysis: PIN, IAG for Brazil in 1960, ISE in 1970; POR for Chile in 1960, SEG and IIN in 1970; none for the U.S. in 1960 or 1970; RAD, PIN, ISE for the cross-cultural cases in 1960, PIN in 1970. POP remains as a control variable.

*Variables already excluded in regression analysis. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radios per capita.

TABLE 7
ZERO-ORDER AND PARTIAL CORRELATIONS BETWEEN PRIMARY-
SCHOOL ENROLLMENT RATIO AND THE INDUSTRIAL-
ECONOMIC VARIABLES, 1960 AND 1970*

	Zero-Order		First-Order by POP		Second-Order by POP, ETH	
	1960	1970	1960	1970	1960	1970
<u>A. Brazil</u>						
PIN	.729	.377	.651	.281	.597	.222
ING	.233	.076	.044	-.134	-.137	-.210
COG	.196	.024	-.162	-.314	-.434	-.396
AGG	.186	.144	.198	.065	-.012	-.055
SEG	.215	.067	-.006	-.183	-.217	-.273
IAG	.515	-.080	.478	-.178	.440	-.303
IIN	.714	.323	.629	.203	.601	.106
ICO	.379	.098	.081	-.048	-.163	-.147
ISE	.363	.460	.093	.446	-.033	.466
POR	.174	.111	.270	.171	.214	.104
<u>B. Chile</u>						
PIN	-.093	-.179	-.009	-.077	.004	-.044
ING	-.133	-.294	-.081	-.245	-.060	-.225
COG	-.170	-.452	-.113	-.437	-.123	-.436
AGG	-.123	-.224	-.174	-.331	-.170	-.325
SEG	-.323	-.569	-.327	-.571	-.311	-.558
IAG	.139	-.439	.138	-.413	.142	-.409
IIN	-.152	-.514	-.091	-.550	-.075	-.536
ICO	.140	-.135	.240	-.096	.200	-.135
ISE	-.242	-.510	-.237	-.523	-.223	-.508
POR	.485	.039	.521	.084	.573	.118
<u>C. United States</u>						
PIN	.083	-.164	.192	-.179	.219	-.184
ING	-.127	-.054	.034	.001	.051	.000
COG	-.144	-.111	.006	-.059	.017	-.062
AGG	-.109	-.182	-.066	-.165	-.037	-.161
SEG	-.153	-.129	-.005	-.077	.005	-.081
IAG	-.077	.225	-.013	.268	.035	.291
IIN	-.054	.111	.016	.187	.156	.222
ICO	.008	.312	.139	.381	.177	.382
ISE	-.122	.273	.026	.374	.092	.373
POR	-.059	-.058	.051	-.019	.006	-.036
<u>D. Brazil, Chile, and United States</u>						
PIN	.627	.437	.629	.436	.545	.482
ING	-.071	-.035	-.165	-.079	-.194	-.085
COG	-.034	-.108	-.182	-.166	-.140	-.180
AGG	-.380	-.219	-.363	-.238	-.396	-.237
SEG	-.198	-.102	-.302	-.163	-.284	-.169
RAD	.749	.270	.737	.315	.702	.492
IAG	.536	.179	.511	.187	.278	.226
IIN	.698	.303	.682	.328	.628	.514
ICO	.681	.219	.663	.251	.577	.393
ISE	.630	.126	.609	.153	.467	.225
POR	.081	-.032	.040	-.042	.039	-.045

*PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; RAD=radios per capita.

selection of variables for causal analysis. Similarly, zero-order, first-order, and second-order correlations appear in table 7. First-order partials refer only to correlations when controlling for rural-urban residence.

Secondary-school enrollment ratio

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and the secondary-school enrollment ratio is significant, positive, and increasing 1960-1970 from .779 to .856 in Brazil; it is significant, positive, and declining 1960-1970 from .849 to .697 in Chile; it is insignificant in the U.S. and in the combined cross-cultural cases in 1960 and 1970 (see tables 8-11).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between percentage of the labor force employed in industry and the secondary-school enrollment ratio in Brazil only in 1970 (.706) and in the combined cross-cultural cases in 1960 (.580) and 1970 (.569); the association is negative and significant in the U.S. only in 1970 (-.568); it is insignificant in Chile in 1960 and 1970 (see table 13).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between contributions of the major economic sectors to the G.N.P. and the secondary-school enrollment ratio in Brazil only in 1960 (commerce, .796; industry, .641; agriculture, .679; services, .734); the association is insignificant in Chile, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 13).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between radios per capita and the secondary-school enrollment ratio in the combined cross-cultural cases in 1960 (.942) and 1970 (.942). (see table 13).

Research Finding: The association, controlling for rural-urban residence, between number of ports and the secondary-school enrollment ratio is insignificant in Brazil, Chile, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 13).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between average annual income in the major economic sectors and the secondary-school enrollment ratio in Brazil in 1960 (commerce, .650; services, .505) and 1970 (industry, .580; commerce, .429), in Chile only in 1970 (agriculture, .428), and in the combined cross-cultural cases in 1960

(agriculture, .702; industry, .889; commerce, .876; services, .828) and 1970 (agriculture, .718; industry, .921; commerce, .911; services, .885); the association is insignificant in the U.S. in 1960 and 1970 (see table 13).

Provincial data for 1960 and 1970 show an increase in the mean secondary-school enrollment ratio for Brazil (from 5.78 to 10.79) and the U.S. (from 32.54 to 51.38) but a decline in Chile (from 13.51 to 11.01); provincial variations increased as indicated by the standard deviation in Brazil (from 3.14 in 1960 to 5.60 in 1970) and the U.S. (from 2.79 in 1960 to 8.71 in 1970) but decreased in Chile (from 4.32 in 1960 to 3.16 in 1970). Extreme values correspondingly show an overall increase in the secondary-school enrollment ratio for Brazil (ranging from 2.0 to 17.0 in 1960, from 4.2 to 28.4 in 1970) and the U.S. (ranging from 25 to 40 in 1960, from 36 to 70 in 1970) but an overall decline in Chile (ranging from 5.8 to 21.8 in 1960, from 4.6 to 16.4 in 1970). The combination of cases for cross-cultural analysis shows an increase in the mean secondary-school enrollment ratio (from 21.09 in 1960 to 31.14 in 1970), in the standard deviation (from 12.28 in 1960 to 21.48 in 1970), and in extreme values (ranging from ratios of 2 to 40 in 1960, from 4.2 to 70 in 1970). For Brazil and Chile, the secondary ratio is substantially lower than the primary ratio with less of a difference in the U.S. data. Again it reflects different age structures as well as differences in retaining students in school and the intervention of another variable, i.e., the age at which compulsory education ends. The trend suggested in the Chilean data, in direct contrast to Brazil and the U.S., is accounted for by the change in the Chilean educational system between 1960 and 1970 which decreased the size of the secondary-school population.

Regression and correlation results. In the regression of the secondary-school enrollment ratio on the industrial-economic variables, ethnicity, and rural-urban residence, the F test shows R to be significant at the .05 level at all steps of the expansion of the 1960 and 1970 regression equations in Brazil, Chile, the U.S., and the combined cross-cultural cases. Again with the exception of the U.S. cases, the percentage of variance explained by using this particular set of variables in a linear equation declines (although slightly) between 1960 and 1970, respectively, from 96.9 to 94.9 in Brazil (see table 8), from 84.3 to 80.3 in Chile (see table 9), and from 95.6 to 90.8 in the cross-cultural combination of cases (see table 11); in the U.S. (see table 10), the percentage of variance explained increased from 45 to 49.4 per cent. After eliminating all variables that contribute less than one per cent to the explanation of variance, the procedure of selection for causal analysis is given in table 12. Zero-order and partial correlations appear in table 13.

Higher education

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and higher education is significant, positive, and increasing 1960-1970 from .603 to .674 in Brazil; it is significant, positive, and declining 1960-1970 from .596 to .526 in Chile; it is significant and positive in the U.S. only in 1960 (.479); it is insignificant in the combined cross-cultural cases in 1960 and 1970 (see tables 14-17).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between percentage of the labor force employed in industry and higher education in the combined cross-cultural cases only in 1970 (.502); the association is insignificant in Brazil, Chile, and the U.S. in 1960 and 1970 (see table 19).

TABLE 8

SUMMARY OF REGRESSION OF SECONDARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: BRAZIL, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
COG	.894	.800		92.550	.894
ISE	.929	.864	.064	70.112	.760
ING	.941	.887	.023	55.125	.705
ETH	.957	.917	.030	55.612	-.575
POP	.970	.942	.025	62.415	.779
IAG	.974	.948	.006	55.731	.174
IIN	.976	.953	.005	49.405	.613
AGG	.977	.955	.002	42.771	.441
SEG	.982	.965	.010	46.061	.783
PIN	.984	.968	.003	42.838	.604
ICO	.984	.969	.001	37.540	.850
POR	.984	.969	.000	31.819	.015
<u>1970</u>					
PIN	.913	.833		115.526	.913
ING	.933	.872	.039	74.967	.598
SEG	.954	.911	.039	71.651	.664
POP	.960	.922	.011	59.679	.856
IIN	.962	.927	.005	48.303	.772
ETH	.967	.935	.008	43.226	-.497
AGG	.968	.938	.003	37.277	.371
COG	.972	.946	.008	35.519	.764
ISE	.973	.947	.001	30.132	.193
POR	.973	.948	.001	25.766	.018
IAG	.974	.948	.000	21.940	.333
ICO	.974	.949	.001	18.609	.627

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, SS_{reg}=228.853, and SS_{res}=7.192; in the 1970 equation, DF=12 and 12, SS_{reg}=713.181, and SS_{res}=38.324. DF=23 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 9

SUMMARY OF REGRESSION OF SECONDARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: CHILE, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
POP	.849	.721		59.500	.849
AGG	.857	.734	.013	30.481	-.380
PIN	.867	.752	.018	21.325	.504
IIN	.876	.769	.017	16.652	.601
IAG	.883	.780	.011	13.473	.018
ICO	.888	.789	.009	11.245	.346
ETH	.895	.802	.013	9.840	-.132
COG	.900	.809	.007	8.526	.573
ING	.916	.840	.031	8.761	.347
ISE	.917	.841	.001	7.457	.723
POR	.917	.842	.001	6.320	.138
SEG	.918	.843	.001	5.371	.571
<u>1970</u>					
POP	.697	.486		21.751	.697
IAG	.761	.580	.094	15.216	.592
POR	.781	.610	.030	10.950	.069
IIN	.803	.645	.035	9.092	.539
ISE	.827	.685	.040	8.273	.637
PIN	.840	.706	.021	7.227	.636
ICO	.857	.734	.028	6.732	.356
ING	.871	.759	.025	6.332	.394
SEG	.877	.769	.010	5.571	.528
AGG	.891	.794	.025	5.416	-.351
ETH	.894	.799	.005	4.717	-.089
COG	.896	.803	.004	4.084	.562

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, SS_{reg}=377.985, and SS_{res}=70.372; in the 1970 equation, DF=12 and 12, SS_{reg}=192.766, and SS_{res}=47.200. DF=23 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 10

SUMMARY OF REGRESSION OF SECONDARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
ISE	.440	.193		11.533	-.440
ETH	.514	.264	.071	8.454	-.132
PIN	.544	.296	.032	6.467	.056
POP	.582	.339	.043	5.772	-.390
IIN	.601	.361	.022	4.991	-.071
ING	.624	.389	.028	4.576	-.357
COG	.655	.430	.041	4.526	-.348
IAG	.661	.437	.007	3.986	-.140
POR	.669	.448	.011	3.613	-.345
ICO	.670	.449	.001	3.184	-.237
AGG	.670	.450	.001	2.827	-.137
<u>1970</u>					
PIN	.544	.296		20.248	-.544
POP	.582	.339	.043	12.075	-.155
ISE	.608	.369	.030	8.997	.143
COG	.626	.392	.023	7.260	-.235
IAG	.642	.412	.020	6.180	.178
IIN	.673	.453	.041	5.935	.088
SEG	.692	.479	.026	5.532	-.165
POR	.701	.491	.012	4.959	-.019
ING	.703	.494	.003	4.349	-.318
ICO	.703	.494	.000	3.820	-.024

NOTE: N=50. Due to insufficient tolerance and F values, SEG (r=-.373) was excluded from the 1960 equation and AGG (r=-.044) and ETH (r=-.016) from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=11 and 38, SS_{reg}=171.491, and SS_{res}=209.490; in the 1970 equation, DF=10 and 39, SS_{reg}=1839.315, and SS_{res}=1877.830. DF=48 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 11

SUMMARY OF REGRESSION OF SECONDARY-SCHOOL ENROLLMENT RATIO ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: BRAZIL, CHILE, AND UNITED STATES,
1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
RAD	.940	.885		755.679	.940
PIN	.956	.914	.029	520.240	.651
ISE	.966	.934	.020	459.587	.846
POP	.972	.944	.010	407.338	.361
IIN	.973	.947	.003	338.795	.898
SEG	.974	.949	.002	293.937	-.156
ING	.976	.953	.004	270.152	-.029
POR	.977	.955	.002	241.818	.038
IAG	.978	.956	.001	220.966	.727
AGG	.978	.956	.000	197.554	-.388
COG	.978	.956	.000	177.698	.010
<u>1970</u>					
RAD	.946	.895		839.985	.946
IAG	.949	.900	.005	439.584	.712
ETH	.950	.903	.003	298.334	-.818
POP	.950	.903	.000	223.474	-.293
ISE	.951	.904	.001	178.001	.895
ICO	.951	.906	.002	149.604	.919
POR	.952	.906	.000	127.628	.051
COG	.952	.907	.001	111.225	-.044
IIN	.952	.907	.000	98.327	.924
AGG	.952	.907	.000	87.720	-.365
SEG	.952	.907	.000	78.951	-.149
PIN	.952	.908	.001	71.660	.445
ING	.952	.908	.000	65.416	-.123

NOTE: N=100. Due to insufficient tolerance and F values, ICO (r=.887) and ETH (r=-.748) were excluded from the 1960 equation. In the final step of the expansion of the 1960 equation, DF=11 and 88, $SS_{reg}=14280.041$, and $SS_{res}=642.888$; in the 1970 equation, DF=13 and 86, $SS_{reg}=41476.526$, and $SS_{res}=4194.424$. DF=98 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radios per capita.

TABLE 12

VARIABLE SELECTION FROM SETS X AND Z FOR CAUSAL ANALYSIS
 BASED ON REGRESSION AND PARTIAL CORRELATION WITH
 SET Y: SECONDARY-SCHOOL ENROLLMENT RATIO (SND)

Selection Procedure
<p><u>Step #1.</u> Variables excluded because of associations less than $\pm .400$ with SND when controlling for POP or POP and ETH:</p> <ol style="list-style-type: none"> Using either first- or second-order partials (by POP or by POP, ETH): PIN, IIN for Brazil in 1960 and SEG, ING, COG in 1970; PIN, COG, ISE, SEG, IIN for Chile in 1960 and 1970; ISE for the U.S. in 1960. Additional variables by using second-order partials: AGG*, ICO*, ISE for Brazil in 1960 and ICO* in 1970; IAG* for the cross-cultural cases in 1960 and PIN in 1970.
<p><u>Step #2.</u> Remaining variables with significant partials of at least $\pm .400$ where $p < .05$:</p> <ol style="list-style-type: none"> Using either first- or second-order partials: ING, COG, SEG for Brazil in 1960 and PIN, IIN in 1970; IAG for Chile in 1970; PIN for the U.S. in 1970; PIN, RAD, IIN, ICO, ISE for the cross-cultural cases in 1960 and RAD, IAG, IIN, ICO, ISE in 1970. Additional variables by using first-order partials: AGG*, ICO, ISE for Brazil in 1960 and ICO* in 1970; IAG* for the cross-cultural cases in 1960 and PIN* in 1970. Additional variables by using second-order partials: AGG* for the cross-cultural cases in 1960 and 1970.
<p><u>Step #3.</u> Variables with insignificant r but significant partials:</p> <ol style="list-style-type: none"> First-order: None. Second-order: AGG* for cross-cultural cases in 1960 and 1970.
<p><u>Step #4.</u> Remaining variables (with significant partials) from subsets g or w excluded because of ties to a variable with a stronger partial in the same subset using either first- or second-order partials: SEG, ING (both tied to COG) for Brazil in 1960.</p>
<p><u>Step #5.</u> Variables from set X selected for causal analysis: COG, ISE (first-order) for Brazil in 1960 and PIN in 1970; POP (set Z) as only variable associated with SND for Chile in 1960, IAG in 1970; none for the U.S. in 1960 and PIN in 1970; RAD, PIN, ISE for the cross-cultural cases in 1960 and RAD, IAG in 1970. POP remains as a control variable.</p>

*Variables already excluded in regression analysis. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; RAD=radios per capita.

TABLE 13

ZERO-ORDER AND PARTIAL CORRELATIONS BETWEEN SECONDARY-
SCHOOL ENROLLMENT RATIO AND THE INDUSTRIAL-
ECONOMIC VARIABLES, 1960 AND 1970*

	Zero-Order		First-Order by POP		Second-Order by POP, ETH	
	1960	1970	1960	1970	1960	1970
<u>A. Brazil</u>						
PIN	.604	.913	.374	.706	-.077	.655
ING	.705	.598	.641	.117	.480	.000
COG	.894	.764	.796	.293	.701	.208
AGG	.441	.371	.679	.211	.374	.004
SEG	.783	.664	.734	.163	.614	.041
IAG	.174	.333	.004	.142	-.281	-.023
IIN	.613	.772	.134	.580	-.086	.504
ICO	.850	.627	.650	.429	.332	.327
ISE	.760	.193	.505	.169	.366	.204
POR	.015	.018	.207	.350	.051	.237
<u>B. Chile</u>						
PIN	.504	.636	-.179	.199	-.169	.215
ING	.347	.394	-.146	.034	-.130	.042
COG	.573	.562	-.101	.302	-.108	.304
AGG	-.380	-.351	-.220	-.087	-.217	-.085
SEG	.571	.528	-.037	.276	-.017	.293
IAG	.018	.592	.060	.428	.063	.432
IIN	.601	.539	.106	.130	.122	.149
ICO	.346	.356	-.187	.255	-.251	.253
ISE	.723	.637	.124	.371	.142	.389
POR	.138	.069	-.027	-.145	.000	-.140
<u>C. United States</u>						
PIN	.056	-.544	.208	-.568	.194	-.568
ING	-.357	-.318	-.187	-.282	-.203	-.282
COG	-.348	-.235	-.181	-.188	-.192	-.188
AGG	-.137	-.044	-.080	-.022	-.107	-.023
SEG	-.373	-.165	-.214	-.107	-.225	-.106
IAG	-.140	.178	-.056	.226	-.098	.227
IIN	-.071	.088	.026	.170	-.077	.174
ICO	-.237	-.024	-.095	.028	-.124	.028
ISE	-.440	.143	-.304	.239	-.375	.239
POR	-.345	-.019	-.234	.029	-.205	.034
<u>D. Brazil, Chile, and United States</u>						
PIN	.651	.445	.580	.569	.458	.348
ING	-.029	-.123	-.192	.026	-.301	-.189
COG	.010	-.044	-.245	.128	-.225	-.139
AGG	-.388	-.365	-.367	-.328	-.516	-.493
SEG	-.156	-.149	-.335	.008	-.377	-.187
RAD	.940	.946	.942	.942	.872	.836
IAG	.727	.712	.702	.718	.326	.403
IIN	.898	.924	.889	.921	.740	.778
ICO	.887	.919	.876	.911	.702	.744
ISE	.846	.895	.828	.885	.563	.666
POR	.038	.051	-.039	.096	-.073	.013

*PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; RAD=radios per capita.

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between contributions of the major economic sectors to the G.N.P. and higher education in Brazil in 1960 (commerce, .663; services, .455) and 1970 (commerce, .595); the association is insignificant in Chile, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 19).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between radios per capita and higher education in the combined cross-cultural cases in 1960 (.915) and 1970 (.945). (see table 19).

Research Finding: The association, controlling for rural-urban residence, between number of ports and higher education is insignificant in Brazil, Chile, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 19).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between average annual income in the major economic sectors and higher education in Brazil only in 1970 (agriculture, .568; commerce, .604), in the U.S. only in 1970 (agriculture, .463), and in the combined cross-cultural cases in 1960 (agriculture, .789; industry, .903; commerce, .897; services, .883) and in 1970 (agriculture, .775; industry, .934; commerce, .921; services, .875); the association is insignificant in Chile in 1960 and 1970 (see table 19).

Whether university enrollment is defined in terms of total population or school population, there is a distortion of university enrollment data (and to a lesser degree of primary and secondary enrollment data) that must be taken into account and which is based on the type of census taken in the three nations in this study. The censuses of the U.S. in 1960 and 1970 and of Brazil in 1970 were de jure; those of Brazil in 1960 and Chile in 1960 and 1970 were de facto. One result is, e.g., that a university population appears in Chilean provinces where there are no universities although most provinces now have a university or a branch of a university and, in this case (where no university exists), university enrollment as a percentage of primary

and secondary enrollments is extremely small. Provincial university enrollment figures in both de jure and de facto censuses also depend on whether a province has one or more (or no) universities, the size and prestige of these universities, and whether or not they are located in large cities, i.e., their "drawing power" for prospective students both within and from outside the province. These factors contribute to an understanding of the 1960 and 1970 provincial data.

In the provincial data for 1960 and 1970, respectively, the mean enrollment in higher education as a percentage of primary and secondary enrollment was 0.69 and 0.75 per cent in Brazil, 0.47 and 0.69 per cent in Chile, 7.32 and 16.23 per cent in the U.S.; these figures reflect not only lower university enrollments in Brazil and Chile than the U.S. but also the very uneven distribution of universities among provinces. This characteristic also appears in the extreme values which ranged from 0.14 to 3.56 per cent in 1960 and 0.29 and 3.48 per cent in 1970 in Brazil, 0.02 and 4.11 per cent in 1960 and 0.02 and 6.07 per cent in 1970 in Chile, 3.5 and 12.9 per cent in 1960 and 10.0 and 25.7 per cent in 1970 in the U.S. The dispersion of cases increased between 1960 and 1970 in the three nations although insignificantly so in Brazil; the standard deviations for 1960 and 1970 were, respectively, 0.74 and 0.76 in Brazil, 0.95 and 1.41 in Chile, 1.97 and 3.73 in the U.S. By combining the cases of the three nations for cross-cultural analysis, the mean enrollment in higher education as a percentage of primary and secondary enrollment increased from 3.95 in 1960 to 8.48 per cent in 1970, the standard deviation increased from 3.71 in 1960 to 8.26 in 1970, and extreme values of 0.02 and 12.9 per cent in 1960 became 0.02

and 25.7 per cent in 1970.

Regression and correlation results. In the 1960 and 1970 regression equations, R is significant at the .05 level as determined by the F test at each step of the expansion of the equations for Brazil (see table 14), the U.S. (see table 16), the combined cross-cultural cases (see table 17), and for Chile in 1970 (see table 15). In the 1960 equation for Chile, R is significant through the inclusion of percentage contribution of industry to the G.N.P. (ING) so the remaining two variables are excluded. The percentage of variance explained by including all variables where R is significant declines 1960-1970 from 92.3 to 90.7 per cent for Brazil but increases from 62.4 to 84.1 per cent for Chile, from 54.2 to 58.1 per cent for the U.S., and from 89.7 to 93.9 per cent for the combined cross-cultural cases. For the combined cross-cultural cases in 1960, three variables were temporarily included (PIN or percentage of labor force in industry, ISE and IAG or average income in services and agriculture) since the usefulness of radios per capita (RAD) is questionable, although they each contribute less than one per cent to explaining variance. For each of these three variables, simple r indicates a strong association and is significant at the .001 level. After eliminating variables on the basis of regression analysis, the procedure used for variable selection for causal analysis appears in table 18. Zero-order and partial correlations are found in table 19.

TABLE 14

SUMMARY OF REGRESSION OF HIGHER EDUCATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: BRAZIL, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
COG	.797	.636		40.261	.797
ING	.904	.817	.181	49.309	.484
ETH	.912	.832	.015	34.669	-.431
IAG	.922	.850	.018	28.546	-.167
ISE	.931	.867	.017	24.845	.514
POR	.933	.870	.003	20.213	-.025
AGG	.936	.876	.006	17.230	.290
SEG	.944	.891	.015	16.419	.612
IIN	.948	.899	.008	14.952	.314
POP	.953	.909	.010	14.092	.603
ICO	.959	.921	.012	13.797	.628
PIN	.961	.923	.002	12.109	.293
<u>1970</u>					
COG	.801	.643		41.440	.801
ING	.893	.798	.155	43.526	.504
IAG	.921	.849	.051	39.438	.606
ISE	.931	.866	.017	32.558	-.201
ETH	.938	.880	.014	28.014	-.485
POP	.941	.885	.005	23.205	.674
POR	.945	.894	.009	20.489	.056
PIN	.947	.897	.003	17.466	.608
SEG	.947	.898	.001	14.694	.640
AGG	.951	.906	.008	13.508	.336
IIN	.952	.906	.000	11.518	.649
ICO	.952	.907	.001	9.767	.727

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, SS_{reg}=11.988, and SS_{res}=.990; in the 1970 equation, DF=12 and 12, SS_{reg}=12.411, and SS_{res}=1.270. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 15

SUMMARY OF REGRESSION OF HIGHER EDUCATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: CHILE, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
POP	.596	.355		12.669	.596
COG	.650	.423	.068	8.066	.247
ISE	.697	.486	.063	6.634	.562
AGG	.723	.523	.037	5.491	-.424
IAG	.758	.574	.051	5.140	.208
PIN	.768	.591	.017	4.335	.312
IIN	.776	.603	.012	3.695	.333
ICO	.779	.608	.005	3.102	.203
ING	.790	.624	.016	2.767	.102
ETH	.792	.627	.003	2.362	-.124
SEG	.794	.630	.003	2.018	.272
<u>1970</u>					
ISE	.565	.319		10.814	.565
IAG	.751	.564	.245	14.231	-.028
POP	.804	.647	.083	12.856	.526
ING	.835	.698	.051	11.587	.102
COG	.863	.745	.047	11.132	.259
PIN	.885	.783	.038	10.880	.413
ICO	.900	.810	.027	10.363	.193
AGG	.907	.823	.013	9.321	-.410
ETH	.912	.832	.009	8.261	-.124
IIN	.915	.837	.005	7.227	.232
POR	.916	.840	.003	6.230	.104
SEG	.917	.841	.001	5.327	.267

NOTE: N=25. Due to insufficient tolerance and F value, POR (r=.098) was excluded from the 1960 equation. In the final step of the expansion of the 1960 equation, DF=11 and 13, $SS_{reg}=13.680$, and $SS_{res}=8.009$; in the 1970 equation, DF=12 and 12, $SS_{reg}=40.328$, and $SS_{res}=7.569$. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 16

SUMMARY OF REGRESSION OF HIGHER EDUCATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: UNITED STATES, 1960 AND
1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
POP	.479	.229		14.310	.479
ETH	.629	.396	.167	15.457	-.426
PIN	.680	.462	.066	13.200	-.045
ISE	.697	.486	.024	10.664	.198
IAG	.707	.501	.015	8.839	.256
SEG	.723	.523	.022	7.882	.272
ICO	.727	.529	.006	6.743	.143
IIN	.731	.535	.006	5.896	.252
COG	.735	.540	.005	5.222	.262
AGG	.736	.541	.001	4.611	.230
POR	.736	.542	.001	4.093	.082
<u>1970</u>					
IAG	.508	.258		16.762	.508
POP	.576	.332	.074	11.724	.387
ISE	.668	.446	.114	12.391	.054
ETH	.699	.489	.043	10.806	-.338
SEG	.724	.524	.035	9.716	.197
ING	.751	.564	.040	9.275	.037
COG	.755	.570	.006	7.963	.140
ICO	.759	.577	.007	7.000	.125
PIN	.761	.579	.002	6.137	-.347
POR	.762	.581	.002	5.420	.143
IIN	.762	.581	.000	4.805	.350
AGG	.762	.581	.000	4.291	.077

NOTE: N=50. Due to insufficient tolerance and F value, ING (r=.203) was excluded from the 1960 equation. In the final step of the expansion of the 1960 equation, DF=11 and 38, $SS_{reg}=103.564$, and $SS_{res}=87.389$; in the 1970 equation, DF=12 and 37, $SS_{reg}=397.105$, and $SS_{res}=285.302$. For simple r, DF=48. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 17

SUMMARY OF REGRESSION OF HIGHER EDUCATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
BRAZIL, CHILE, AND UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
RAD	.912	.832		488.361	.912
POP	.929	.863	.031	306.336	.395
ETH	.938	.881	.018	237.984	-.830
PIN	.942	.889	.008	190.654	.502
ISE	.943	.890	.001	152.591	.894
IAG	.945	.893	.003	129.595	.803
COG	.945	.894	.001	111.609	.045
AGG	.946	.896	.002	98.841	-.329
SEG	.947	.897	.001	87.145	-.105
ING	.947	.897	.000	78.053	-.006
IIN	.947	.897	.000	70.302	.909
POR	.947	.897	.000	63.762	.105
ICO	.947	.897	.000	58.206	.904
<u>1970</u>					
RAD	.942	.888		777.607	.942
IAG	.955	.913	.025	514.926	.773
POP	.958	.919	.006	366.077	-.227
PIN	.961	.924	.005	289.879	.409
ETH	.963	.928	.004	244.741	-.831
ISE	.966	.934	.006	219.471	.882
AGG	.966	.934	.000	188.403	-.389
SEG	.968	.937	.003	170.169	-.133
COG	.968	.938	.001	151.640	-.028
ING	.968	.938	.000	136.672	-.139
ICO	.969	.939	.001	124.057	.924
IIN	.969	.939	.000	112.534	.937
POR	.969	.939	.000	102.715	.094

NOTE: N=100. In the final step of the expansion of the 1960 equation, DF=13 and 86, SS_{reg}=1221.716, and SS_{res}=138.853; in the 1970 equation, DF=13 and 86, SS_{reg}=6350.571, and SS_{res}=409.008. For simple r, DF=98. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radios per capita.

TABLE 18
VARIABLE SELECTION FROM SETS X AND Z FOR CAUSAL ANALYSIS
BASED ON REGRESSION AND PARTIAL CORRELATION WITH
SET Y: HIGHER EDUCATION (COL)

Selection Procedure
<p><u>Step #1.</u> Variables excluded because of associations less than $\pm .400$ with COL controlling for POP or POP and ETH:</p> <ol style="list-style-type: none"> Using either first- or second-order partials (by POP or by POP, ETH): ING, ICO, ISE for Brazil in 1960 and PIN, ING, SEG, IIN in 1970; AGG, ISE for Chile in 1960 and AGG, ISE, PIN in 1970; PIN for the cross-cultural cases in 1960. Additional variables by using second-order partials: SEG for Brazil in 1960; PIN* for the cross-cultural cases in 1970.
<p><u>Step #2.</u> Remaining variables with significant partials of at least $\pm .400$ where $p < .05$:</p> <ol style="list-style-type: none"> Using either first- or second-order partials: COG for Brazil in 1960 and COG, IAG, ICO in 1970; IAG for the U.S. in 1970; RAD, IAG, IIN, ICO, ISE for the cross-cultural cases in 1960 and 1970. Additional variables by using first-order partials: SEG for Brazil in 1960; PIN* for the cross-cultural cases in 1970. Additional variables by using second-order partials: IAG for Brazil in 1960; AGG* for the cross-cultural cases in 1960 and 1970.
<p><u>Step #3.</u> Variables with insignificant r but significant partials:</p> <ol style="list-style-type: none"> First-order: None. Second-order: IAG for Brazil in 1960; AGG* for the cross-cultural cases in 1960 and 1970.
<p><u>Step #4.</u> Remaining variables (with significant partials) from subsets g or w excluded because of ties to a variable with a stronger partial in the same subset using either first- or second-order partials: SEG (tied to COG) for Brazil in 1960; IAG (tied to ISE) for the cross-cultural cases in 1960.</p>
<p><u>Step #5.</u> Variables from set X selected for causal analysis: COG, IAG (second-order) for Brazil in 1960 and COG, IAG in 1970; POP (set Z) as only variable associated with COL for Chile in 1960 and 1970; similarly, POP (set Z) for the U.S. in 1960 and IAG in 1970; RAD, ISE for the cross-cultural cases in 1960 and RAD, IAG in 1970. POP remains as a control variable; therefore, IAG is excluded for Brazil in 1960 since second-order partials will not be used.</p>

*Variables already excluded in regression analysis. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; RAD=radios per capita.

TABLE 19
ZERO-ORDER AND PARTIAL CORRELATIONS BETWEEN HIGHER EDUCATION
AND THE INDUSTRIAL-ECONOMIC VARIABLES, 1960 AND 1970*

	Zero-Order		First-Order by POP		Second-Order by POP, ETH	
	1960	1970	1960	1970	1960	1970
<u>A. Brazil</u>						
PIN	.293	.608	-.027	.122	-.358	-.057
ING	.484	.504	.304	.122	.103	.013
COG	.797	.801	.663	.595	.552	.550
AGG	.290	.336	.349	.179	.082	-.022
SEG	.612	.640	.455	.313	.284	.219
IAG	-.167	.606	-.385	.568	-.563	.496
IIN	.314	.649	-.204	.392	-.363	.238
ICO	.628	.727	.340	.604	.076	.541
ISE	.514	-.201	.182	-.389	.010	-.391
POR	-.025	.056	.078	.250	-.028	.129
<u>B. Chile</u>						
PIN	.312	.413	-.151	-.001	-.150	-.011
ING	.102	.102	-.269	-.249	-.269	-.261
COG	.247	.259	-.324	-.040	-.326	-.042
AGG	-.424	-.410	-.308	-.244	-.307	-.247
SEG	.272	.267	-.238	-.005	-.237	-.014
IAG	.208	-.028	.270	-.356	.270	-.360
IIN	.333	.232	-.098	-.196	-.096	-.219
ICO	.203	.193	-.143	.070	-.161	.081
ISE	.562	.565	.172	.361	.176	.361
POR	.098	.104	-.011	-.029	-.007	-.039
<u>C. United States</u>						
PIN	-.045	-.347	-.239	-.339	-.330	-.337
ING	.203	.037	-.079	-.144	-.132	-.149
COG	.262	.140	.013	-.031	-.011	-.020
AGG	.230	.077	.173	.024	.118	-.002
SEG	.272	.197	.027	.026	.004	.052
IAG	.256	.508	.171	.463	.071	.422
IIN	.252	.350	.159	.224	-.140	.117
ICO	.143	.125	-.061	-.002	-.156	-.004
ISE	.198	.054	-.060	-.140	-.238	-.141
POR	.082	.143	-.117	.031	-.012	.131
<u>D. Brazil, Chile, and United States</u>						
PIN	.502	.409	.370	.502	.070	.211
ING	-.006	-.139	-.183	-.031	-.353	-.309
COG	.045	-.028	-.227	.104	-.219	-.198
AGG	-.329	-.389	-.302	-.361	-.507	-.573
SEG	-.105	-.133	-.294	-.014	-.367	-.243
RAD	.912	.942	.915	.945	.736	.839
IAG	.803	.773	.789	.775	.440	.525
IIN	.909	.937	.903	.934	.662	.805
ICO	.904	.924	.897	.921	.653	.762
ISE	.894	.882	.883	.875	.593	.618
POR	.105	.094	.027	.130	.029	.070

*PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; RAD=radios per capita.

Social linkages: illiteracy rates

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and illiteracy rates is significant, negative, and increasing 1960-1970 from $-.538$ to $-.618$ in Brazil; it is significant, negative, and declining 1960-1970 from $-.803$ to $-.723$ in Chile; it is significant and negative in the combined cross-cultural cases only in 1960 ($-.469$); it is insignificant in the U.S. in 1960 and 1970 (see tables 20-23).

Research Finding: There is a significant, negative association, controlling for rural-urban residence, between percentage of the labor force employed in industry and illiteracy rates in Brazil only in 1970 ($-.449$), in Chile in 1960 ($-.534$) and 1970 ($-.443$), and in the combined cross-cultural cases in 1960 ($-.629$) and 1970 ($-.745$); the association is insignificant in the U.S. in 1960 and 1970 (see table 25).

Research Finding: There is a significant, negative association, controlling for rural-urban residence, between contributions of the major economic sectors to the G.N.P. and illiteracy rates in Brazil only in 1960 (agriculture, $-.444$) and in Chile in 1960 (industry, $-.461$; commerce, $-.530$; services, $-.566$) and 1970 (industry, $-.423$; commerce, $-.703$; services, $-.709$); the association is insignificant in the U.S. and the combined cross-cultural cases in 1960 and 1970 (see table 25).

Research Finding: There is a significant, negative association, controlling for rural-urban residence, between radios per capita and illiteracy rates in the combined cross-cultural cases in 1960 ($-.717$) and 1970 ($-.841$). (see table 25).

Research Finding: There is a significant, negative association, controlling for rural-urban residence, between number of ports and illiteracy rates in Brazil only in 1970 ($-.501$) and in Chile in 1960 ($-.550$) and 1970 ($-.433$); the association is insignificant in the U.S. and the combined cross-cultural cases in 1960 and 1970 (see table 25).

Research Finding: There is a significant, negative association, controlling for rural-urban residence, between average annual income in the major economic sectors and illiteracy rates in Brazil in 1960 (agriculture, $-.764$; industry, $-.425$; commerce, $-.612$; services, $-.573$) and 1970 (industry, $-.632$), in Chile in 1960 (agriculture, $-.455$; services, $-.444$) and 1970 (agriculture, $-.603$; industry, $-.551$; commerce, $-.457$; services, $-.668$), in the U.S. in 1960 (agriculture, $-.635$; industry, $-.590$; services, $-.414$) and 1970 (agriculture, $-.638$; industry, $-.527$), and in the combined cross-cultural cases in 1960 (agriculture, $-.592$; industry, $-.696$; commerce, $-.650$; services, $-.614$) and 1970 (agriculture, $-.619$; industry, $-.841$; commerce, $-.780$; services, $-.687$). (see table 25).

A high rate of illiteracy has been one of the major obstacles in Brazil to the expansion of functional linkages particularly in terms of mass participation in the political process. Of the Brazilian population aged 15 years and over, illiterates--defined by the national census as not knowing how to read or write--represented 56.2 per cent in 1940, 50.7 per cent in 1950, 39.5 per cent in 1960, and 33.1 per cent in 1970. Rural-urban differences in illiteracy are sharp. In 1950, the illiterate population represented 15.6 per cent of the urban population in contrast to 63.5 per cent of the rural population; in 1960, the illiteracy rate was 39.5 per cent for the nation but 66 per cent in rural areas and, in 1970, the more urban-industrial areas (Guanabara, Rio de Janeiro, São Paulo, and the Federal District) had an illiteracy rate of 18-19 per cent in contrast to 33.1 per cent for the nation. High but declining illiteracy and provincial variations appear in the 1960 and 1970 provincial data for Brazil in which the mean percentage illiterate declines from 42.42 to 38.86 per cent, the standard deviation increases from 12.73 to 13.17, and extreme values range from 17 to 60 per cent illiterate in 1960 and from 17 to 56.5 per cent in 1970.

Chile has high literacy rates while functional illiteracy rates are comparable to illiteracy rates in Brazil. Illiteracy among the Chilean population--defined as not knowing how to read or write as in Brazil--aged 15 years and over declined from 21.3 per cent in 1940 to 19.7 per cent in 1950, 16.4 per cent in 1960, and 11.7 per cent in 1970. For the same population, functional illiteracy (three years of schooling or less) was, e.g., in 1960, 37 per cent with a rate of 24.8 per cent in urban areas in contrast to 66 per cent in rural areas. Partly

because of rural-urban differences, illiteracy rates in Chile--although much lower than in Brazil and although continuing to decline--vary widely by province which is illustrated by the provincial data for 1960 and 1970. The mean percentage illiterate declines from 21.15 to 20.16 per cent, the standard deviation declines from 8.41 to 8.01, and extreme values range from 6.1 to 32.2 per cent illiterate in 1960 and from 5.9 to 30.7 per cent in 1970. In Brazil and Chile, illiteracy rates have declined not only as a result of expanding opportunities for formal schooling. Both nations have had active literacy campaigns conducted by the government as well as private organizations.

The indicator of illiteracy used for the U.S. in this study was functional illiteracy rates (population 25 years of age and over with less than five years of schooling). These rates were 13.7 per cent in 1940, 11.1 per cent in 1950, 8.3 per cent in 1960, and 5.3 per cent in 1970. The mean percentage functionally illiterate in the provincial data was 8.36 in 1960 and 5.38 in 1970; the standard deviation declined from 5.13 to 3.24; extreme values ranged from 2.9 to 21.3 per cent functionally illiterate in 1960 and from 1.9 to 13.1 per cent in 1970. The use of a different indicator for the U.S. means that data for the 50 U.S. cases are not strictly comparable to the data for Brazil and Chile which must be considered in the cross-cultural analysis combining the cases from the three nations; in the cross-cultural combination of cases for 1960 and 1970, the mean percentage illiterate was 20.07 in 1960 and 17.45 in 1970, the standard deviation declined from 16.29 in 1960 to 15.94 in 1970, and extreme values ranged from 2.9 to 60.0 per cent illiterate in 1960 and from 1.9 to 56.5 per cent in 1970.

Regression and correlation results. In the summary regression tables, R, as determined by the F test, is significant at the .05 level for all steps of the expansion of the equations in 1960 and 1970 for Brazil (see table 20), Chile (see table 21), the U.S. (see table 22), and the cross-cultural combination of cases (see table 23). The percentage of variance in illiteracy rates explained by the 1960 and 1970 equations declines slightly from 90.8 to 81.2 per cent for Brazil, from 95.7 to 94.2 per cent for Chile, and from 87.0 to 82.7 per cent for the U.S. (functional illiteracy); it, however, increases from 80.5 to 84.9 per cent in the cross-cultural combination of cases. Table 24 shows the procedure of selecting variables for causal analysis following the elimination of variables in regression that explain less than one per cent of the variance. Zero-order and partial correlations are found in table 25.

Social linkages: percentage of the economically-active covered by social security

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage of the economically-active population covered by social security is significant, positive, and increasing 1960-1970 from .650 to .712 in Brazil; it is significant, positive, but declining 1960-1970 from .584 to .480 in the U.S.; it is significant and positive in the combined cross-cultural cases only in 1960 (.447); it is insignificant in Chile in 1960 and 1970 (see tables 26-29).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between percentage of the labor force employed in industry and percentage of the economically-active covered by social security in Brazil in 1960 (.951) and 1970 (.607), in the U.S. in 1960 (.888) and 1970 (.748), and in the combined cross-cultural cases in 1960 (.777) and 1970 (.756); the association is insignificant in Chile in 1960 and 1970 (see table 31).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between contributions of the

TABLE 20

SUMMARY OF REGRESSION OF ILLITERACY RATES ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
BRAZIL, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
IAG	.746	.557		28.934	-.746
COG	.888	.788	.231	41.092	-.531
ING	.922	.850	.062	39.953	-.440
ETH	.938	.881	.031	37.189	.531
PIN	.945	.893	.012	31.741	-.553
SEG	.949	.902	.009	27.761	-.466
IIN	.952	.906	.004	23.569	-.634
POR	.952	.907	.001	19.640	-.205
AGG	.952	.907	.000	16.398	-.385
ISE	.952	.907	.000	13.800	-.720
POP	.952	.908	.001	11.675	-.538
ICO	.953	.908	.000	9.902	-.745
<u>1970</u>					
IIN	.775	.600		34.643	-.775
IAG	.836	.699	.099	25.557	-.081
ISE	.856	.734	.035	19.339	-.318
AGG	.874	.765	.031	16.318	-.435
POP	.886	.786	.021	14.005	-.618
COG	.893	.798	.012	11.879	-.525
POR	.896	.804	.006	9.997	-.272
ETH	.899	.808	.004	8.455	.543
PIN	.900	.810	.002	7.117	-.709
ICO	.900	.811	.001	6.036	-.426
SEG	.901	.812	.001	5.118	-.522

NOTE: N=25. Due to insufficient tolerance and F value, ING (r=-.511) was excluded from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=12 and 12, $SS_{reg}=3534.055$, and $SS_{res}=356.891$; in the 1970 equation, DF=11 and 13, $SS_{reg}=3382.038$, and $SS_{res}=780.840$. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 21

SUMMARY OF REGRESSION OF ILLITERACY RATES ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
CHILE, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
ISE	.804	.646		42.075	-.804
POR	.888	.789	.143	41.309	-.467
IIN	.933	.870	.081	47.102	-.655
SEG	.951	.905	.035	48.150	-.798
IAG	.956	.915	.010	40.931	-.258
POP	.962	.926	.011	37.664	-.803
PIN	.965	.932	.006	33.405	-.777
AGG	.969	.939	.007	31.180	.155
ICO	.971	.943	.004	27.689	-.494
ETH	.975	.951	.008	27.738	.262
COG	.977	.955	.004	25.506	-.796
ING	.978	.957	.002	22.674	-.632
<u>1970</u>					
ISE	.807	.652		43.146	-.807
POR	.891	.794	.142	42.415	-.467
SEG	.929	.863	.069	44.422	-.792
POP	.948	.899	.036	44.750	-.723
AGG	.964	.930	.031	50.693	.130
ETH	.966	.934	.004	42.603	.264
PIN	.967	.936	.002	35.904	-.757
ING	.969	.940	.004	31.433	-.634
IAG	.970	.941	.001	26.674	-.701
IIN	.970	.941	.000	22.516	-.768
ICO	.970	.941	.000	19.050	-.491
COG	.970	.942	.001	16.301	-.802

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, $SS_{reg}=1626.316$, and $SS_{res}=71.724$; in the 1970 equation, DF=12 and 12, $SS_{reg}=1449.916$, and $SS_{res}=88.942$. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 22

SUMMARY OF REGRESSION OF ILLITERACY RATES ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
ETH	.779	.607		74.143	.779
IAG	.909	.826	.219	112.171	-.641
POR	.917	.841	.015	81.460	.088
AGG	.921	.849	.008	63.545	-.115
ING	.923	.852	.003	50.995	-.093
IIN	.925	.856	.004	42.785	-.596
ICO	.927	.859	.003	36.736	-.331
ISE	.929	.863	.004	32.443	-.413
PIN	.931	.867	.004	29.199	-.004
SEG	.933	.870	.003	26.211	-.059
POP	.933	.870	.000	23.235	-.117
<u>1970</u>					
ETH	.712	.508		49.585	.712
IAG	.872	.761	.253	75.191	-.644
POR	.884	.783	.022	55.358	.102
IIN	.893	.799	.016	44.738	-.528
AGG	.897	.805	.006	36.445	.012
PIN	.898	.808	.003	30.182	.346
ING	.901	.811	.003	25.899	-.015
ISE	.904	.818	.007	23.169	-.185
ICO	.909	.827	.009	21.266	-.279
COG	.909	.827	.000	18.735	-.015
POP	.909	.827	.000	16.604	-.124

NOTE: N=50. Due to insufficient tolerance and F values, COG (r=-.051) was excluded from the 1960 equation and SEG (r=-.002) from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=11 and 38, SS_{reg}=1122.838, and SS_{res}=166.940; in the 1970 equation, DF=11 and 38, SS_{reg}=426.240, and SS_{res}=88.679. For simple r, DF=48. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 23

SUMMARY OF REGRESSION OF ILLITERACY RATES ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
BRAZIL, CHILE, AND UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
RAD	.730	.533		112.059	-.730
PIN	.828	.686	.153	106.196	-.722
ICO	.836	.699	.013	74.403	-.687
IAG	.852	.727	.028	63.334	-.628
COG	.867	.752	.025	57.146	-.196
ISE	.877	.769	.017	51.661	-.662
IIN	.885	.783	.014	47.575	-.726
ING	.890	.792	.009	43.382	-.114
AGG	.892	.796	.004	39.176	.280
POR	.895	.802	.006	36.072	-.112
POP	.896	.804	.002	32.879	-.469
SEG	.897	.805	.001	29.991	-.006
ETH	.897	.805	.000	27.394	.599
<u>1970</u>					
IIN	.812	.660		190.341	-.812
PIN	.891	.795	.135	188.192	-.725
ICO	.904	.818	.023	144.270	-.736
IAG	.908	.826	.008	112.758	-.613
RAD	.916	.839	.013	98.292	-.778
POP	.917	.841	.002	82.164	-.028
AGG	.917	.842	.001	70.177	.258
ING	.919	.845	.003	62.412	-.110
SEG	.920	.848	.003	55.810	-.051
ISE	.921	.848	.000	49.952	-.649
ETH	.921	.849	.001	45.027	.630

NOTE: N=100. Due to insufficient tolerance and F values, COG (r=-.123) and POR (r=-.099) were excluded from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=13 and 86, SS_{reg}=21149.263, and SS_{res}=5107.289; in the 1970 equation, DF=11 and 88, SS_{reg}=21354.448, and SS_{res}=3794.033. For simple r, DF=98. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radios per capita.

TABLE 24

VARIABLE SELECTION FROM SETS X AND Z FOR CAUSAL ANALYSIS
 BASED ON REGRESSION AND PARTIAL CORRELATION WITH
 SET Y: ILLITERACY RATES (ILL)

Selection Procedure

Step #1. Variables excluded because of associations less than $\pm .400$ with ILL when controlling for POP or POP and ETH:

1. Using either first- or second-order partials (by POP or by POP, ETH): PIN, ING, COG, SEG for Brazil in 1960 and ING, COG, AGG, SEG, ICO in 1970; IIN, ICO for Chile in 1960.
2. Additional variables by using second-order partials: IIN* for Brazil in 1960 and PIN* in 1970; IIN*, ISE* for the U.S. in 1960; IAG, ICO, ISE for the cross-cultural cases in 1960 and IAG, ISE in 1970.

Step #2. Remaining variables with significant partials of at least $\pm .400$ where $p < .05$:

1. Using either first- or second-order partials: IAG, ICO, ISE for Brazil in 1960 and IIN in 1970; PIN, ING, COG, POR, SEG, IAG, ISE for Chile in 1960 and PIN, ING, COG, SEG, POR, IAG, IIN, ICO, ISE in 1970; IAG for the U.S. in 1960 and IAG, IIN in 1970; PIN, RAD, IIN for cross-cultural cases in 1960 and PIN, RAD, IIN, ICO in 1970.
2. Additional variables by using first-order partials: IIN*, AGG* for Brazil in 1960 and PIN*, POR* in 1970; IIN*, ISE* for the U.S. in 1960; IAG, ICO, ISE for cross-cultural cases in 1960 and ISE*, IAG* in 1970.
3. Additional variables by using second-order partials: IAG* for Brazil in 1970; PIN* for the U.S. in 1970.

Step #3. Variables with insignificant r but significant partials:

1. First-order: AGG* for Brazil in 1960 and POR* in 1970; IAG for Chile in 1960.
2. Second-order: IAG for Brazil in 1970; IAG for Chile in 1960; PIN* for the U.S. in 1960 and 1970.

Step #4. Remaining variables (with significant partials) from subsets g or w excluded because of ties to a variable with a stronger partial in the same subset using either first- or second-order partials: IAG, ICO, ISE (all tied to IIN) for the cross-cultural cases in 1960 and ICO (tied to IIN) in 1970.

Step #5. Variables from set X selected for causal analysis: IAG for Brazil in 1960 and IIN, IAG (second-order) in 1970; ISE, POR, SEG, IAG for Chile in 1960 and ISE, POR, SEG in 1970; IAG for the U.S. in 1960 and IAG, IIN in 1970; RAD, PIN, IIN for the cross-cultural cases in 1960 and IIN, PIN, RAD in 1970. POP remains as a control variable. Therefore, IAG is excluded for Brazil in 1970 since second-order partials will not be used.

*Variables already excluded in regression analysis. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radios per capita.

TABLE 25
ZERO-ORDER AND PARTIAL CORRELATIONS BETWEEN ILLITERACY RATES
AND THE INDUSTRIAL-ECONOMIC VARIABLES, 1960 AND 1970*

	Zero-Order		First-Order by POP		Second-Order by POP, ETH	
	1960	1970	1960	1970	1960	1970
<u>A. Brazil</u>						
PIN	-.553	-.709	-.381	-.449	-.119	-.300
ING	-.440	-.511	-.268	-.187	.008	-.055
COG	-.531	-.525	-.269	-.085	.062	.050
AGG	-.385	-.435	-.444	-.324	-.134	-.101
SEG	-.466	-.522	-.275	-.154	.026	-.001
IAG	-.746	-.081	-.764	.144	-.793	.422
IIN	-.634	-.775	-.425	-.632	-.363	-.522
ICO	-.745	-.426	-.612	-.164	-.405	.026
ISE	-.720	-.318	-.573	-.309	-.472	-.370
POR	-.205	-.272	-.340	-.501	-.264	-.393
<u>B. Chile</u>						
PIN	-.777	-.757	-.534	-.443	-.529	-.415
ING	-.632	-.634	-.461	-.423	-.452	-.401
COG	-.796	-.802	-.530	-.703	-.541	-.710
AGG	.155	.130	-.176	-.280	-.172	-.273
SEG	-.798	-.792	-.566	-.709	-.558	-.695
IAG	-.258	-.701	-.455	-.603	-.457	-.604
IIN	-.655	-.768	-.281	-.551	-.271	-.524
ICO	-.494	-.491	-.167	-.457	-.226	-.528
ISE	-.804	-.807	-.444	-.668	-.436	-.652
POR	-.467	-.467	-.550	-.433	-.540	-.408
<u>C. United States</u>						
PIN	-.004	.346	.035	.339	.194	.416
ING	-.093	-.015	-.035	.039	.045	.041
COG	-.051	-.015	.011	.042	.082	.026
AGG	-.115	.012	-.098	.031	.032	.118
SEG	-.059	-.002	.002	.060	.068	.025
IAG	-.641	-.644	-.635	-.638	-.742	-.707
IIN	-.596	-.528	-.590	-.527	-.291	-.440
ICO	-.331	-.279	-.312	-.254	-.303	-.361
ISE	-.413	-.185	-.414	-.146	-.298	-.237
POR	.088	.102	.142	.147	-.061	-.034
<u>D. Brazil, Chile, and United States</u>						
PIN	-.722	-.725	-.629	-.745	-.531	-.649
ING	-.114	-.110	.077	-.110	.105	.007
COG	-.196	-.123	.086	-.126	.015	.067
AGG	.280	.258	.247	.269	.284	.325
SEG	-.006	-.051	.203	-.043	.171	.077
RAD	-.730	-.778	-.717	-.841	-.520	-.686
IAG	-.628	-.613	-.592	-.619	-.289	-.305
IIN	-.726	-.812	-.696	-.841	-.477	-.686
ICO	-.687	-.736	-.650	-.780	-.368	-.545
ISE	-.662	-.649	-.614	-.687	-.280	-.324
POR	-.112	-.099	-.019	-.096	-.013	-.030

*PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; RAD= radios per capita.

major economic sectors to the G.N.P. and percentage of the economically-active population covered by social security in Chile only in 1960 (industry, .403) and in the U.S. in 1960 (industry, .424) and 1970 (industry, .516); the association is insignificant in Brazil and in the combined cross-cultural cases in 1960 and 1970 (see table 31).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between radios per capita and percentage of the economically-active covered by social security in the combined cross-cultural cases in 1960 (.600) and 1970 (.687). (see table 31).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between number of ports and percentage of the economically-active covered by social security in Brazil in 1960 (.412) and 1970 (.553); the association is insignificant in Chile, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 31).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between average annual income in the major economic sectors and percentage of the economically-active covered by social security in Brazil in 1960 (industry, .669; services, .436) and 1970 (industry, .441), in the U.S. only in 1970 (commerce, .435), and in the combined cross-cultural cases in 1960 (industry, .564; commerce, .547; services, .516) and 1970 (agriculture, .408; industry, .705; commerce, .646; services, .534); the association is insignificant in Chile in 1960 and 1970 (see table 31).

The 1960 and 1970 provincial data in this study refer only to the estimated percentage of the labor force covered by the main system in each nation. The Brazilian social security system was revised by legislation in 1966; the main system covers all wage and salary earners (primarily in urban areas) in industry, commerce, and domestic services. Coverage was extended to agricultural workers in 1971 and continues to be on a voluntary basis for clergy and self-employed fishermen. Nationwide the percentage of the labor force covered by social security systems was 18.5 in 1960 and 36.4 per cent in 1970. Provincial variations were extensive in the 1960s because of greater coverage in urban areas

and the omission of rural workers until 1971. For the 1960 and 1970 provincial data the mean percentage of social security coverage increased from 21.34 to 27.55, the standard deviation shows a greater dispersion of cases by increasing from 14.51 to 18.73, and extreme values ranged from 6.0 to 48.2 per cent coverage in 1960 and from 7.7 to 62.2 per cent in 1970. The data tend to support Roett's (1972:49-50) assertion that the military regimes in the 1960s accomplished little in the area of social welfare legislation; indications are that the greatest increases in the percentage of the labor force covered by the main social security system occurred where coverage was already most extensive, i.e., in the most urban-industrial areas since rural workers continued to be excluded during the 1960s.

The Chilean social security system established in 1924 was expanded by each subsequent government including those after 1952 when the current system came into effect. Originally established to reduce economic instability, the system has instead become an obstacle to development largely because of over-expansion; this has occurred in response to internal demands to transform the system into a means of counteracting rising inflation and acquiring personal loans. In 1961-1962, 65.7 per cent of the Chilean labor force was covered by social security schemes and by 1971 when an additional system was created to cover wholesalers, retailers, small businessmen, farmers, and carriers, almost the entire labor force was covered. The impact on the economy in the 1960s was to further increase the difficulties in accumulating capital for industrialization. Provincial variations did continue to exist, however, during the 1960s. This is seen in the data for Chilean

provinces in 1960 and 1970, respectively, with a mean percentage of social security coverage of 51.85 and 63.14 per cent, standard deviations of 12.84 and 15.64, and extreme values ranging from 33.2 to 72.3 per cent coverage in 1960 and from 40.4 to 88.1 per cent in 1970.

The basic system in the U.S. was established by the 1935 Social Security Act. The main system covers all employed and self-employed members of the labor force except those temporarily employed in agriculture and domestic services and the self-employed who have a yearly income of less than \$400; voluntary coverage is available to persons employed in non-profit institutions, some clergy, and most government employees except at the federal level. About 72,700,000 persons were covered by the main social security system in 1970. Provincial data for 1960 and 1970, respectively, have a mean percentage of social security coverage of 63.04 and 71.16 per cent, standard deviations of 11.86 and 13.40, and extreme values ranging from 36.3 to 81.1 per cent coverage in 1960 and from 41.0 to 91.6 per cent in 1970. The combination of the cases from the three nations for cross-cultural analysis has a mean percentage of social security coverage of 49.82 per cent in 1960 and 58.26 per cent in 1970. The standard deviation increases slightly from 21.33 to 23.69. Values for 1960 range from 6.0 to 81.1 per cent coverage and for 1970 from 7.7 to 91.6 per cent.

Regression and correlation results. The F test shows R to be significant at the .05 level for all steps of the expansion of the equations in 1960 and 1970 for Brazil (see table 26), the U.S. (see table 28), and the cross-cultural combination of cases (see table 29) whereas no R is significant in the equations for Chile (see table 27)

TABLE 26

SUMMARY OF REGRESSION OF SOCIAL SECURITY COVERAGE ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-
URBAN RESIDENCE: BRAZIL, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
PIN	.955	.912		239.608	.955
ISE	.974	.949	.037	207.898	.684
POP	.978	.958	.009	160.482	.650
IAG	.981	.962	.004	129.113	.425
AGG	.982	.965	.003	106.847	.275
ICO	.984	.969	.004	96.106	.613
COG	.985	.971	.002	81.597	.527
POR	.985	.971	.000	69.383	.215
SEG	.986	.972	.001	58.649	.483
ING	.986	.973	.001	51.027	.495
IIN	.986	.974	.001	44.497	.820
ETH	.987	.974	.000	38.001	-.465
<u>1970</u>					
PIN	.828	.687		50.524	.828
COG	.878	.771	.084	37.109	.524
POR	.894	.800	.029	28.057	.249
POP	.921	.848	.048	28.050	.712
ETH	.924	.854	.006	22.291	-.465
IIN	.929	.863	.009	18.994	.689
ISE	.931	.868	.005	15.970	.153
ICO	.935	.875	.007	14.102	.448
ING	.940	.884	.009	12.716	.498
IAG	.942	.888	.004	11.192	.153
AGG	.943	.889	.001	9.491	.284
SEG	.944	.892	.003	8.281	.487

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, SS_{reg}=4920.926, and SS_{res}=129.493; in the 1970 equation, DF=12 and 12, SS_{reg}=7509.159, and SS_{res}=906.781. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 27

SUMMARY OF REGRESSION OF SOCIAL SECURITY COVERAGE ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-
URBAN RESIDENCE: CHILE, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
ING	.392	.154		4.201	.392
POR	.486	.236	.082	3.403	.339
PIN	.513	.263	.027	2.508	.285
IIN	.562	.316	.053	2.316	.316
SEG	.603	.364	.048	2.179	.254
IAG	.613	.376	.012	1.813	.000
ETH	.620	.384	.008	1.520	-.254
AGG	.624	.389	.005	1.275	-.155
POP	.631	.398	.009	1.103	.086
ICO	.632	.399	.001	.932	.086
ISE	.632	.400	.001	.789	.134
<u>1970</u>					
ING	.388	.150		4.077	.388
POR	.482	.233	.083	3.342	.339
IAG	.508	.258	.025	2.439	.132
PIN	.525	.276	.018	1.908	.272
ETH	.538	.289	.013	1.548	-.254
SEG	.550	.303	.014	1.305	.237
ISE	.554	.307	.004	1.077	.120
COG	.555	.308	.001	.893	.234
AGG	.557	.310	.002	.750	-.124

NOTE: N=25. Due to insufficient tolerance and F values, COG (r=.238) was excluded from the 1960 equation and POP (r=.134), IIN (r=.216), and ICO (r=.084) from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=11 and 13, SS_{reg}=1585.104, and SS_{res}=2372.098; in the 1970 equation, DF=9 and 15, SS_{reg}=1821.460, and SS_{res}=4045.879. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 28

SUMMARY OF REGRESSION OF SOCIAL SECURITY COVERAGE ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-
URBAN RESIDENCE: UNITED STATES,
1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
PIN	.870	.757		149.958	.870
POP	.928	.861	.104	146.005	.584
SEG	.931	.868	.007	101.164	.442
ETH	.933	.870	.002	75.942	-.154
POR	.934	.873	.003	60.533	.297
IAG	.936	.877	.004	51.493	.030
ISE	.938	.881	.004	44.481	.441
IIN	.939	.881	.000	38.268	.194
AGG	.939	.883	.002	33.649	-.078
ICO	.940	.884	.001	29.769	.431
ING	.940	.884	.000	26.433	.607
COG	.940	.884	.000	23.617	.458
<u>1970</u>					
ING	.609	.371		28.349	.609
PIN	.733	.537	.166	27.327	.609
POP	.830	.690	.153	34.215	.480
IIN	.876	.768	.078	37.396	.472
AGG	.901	.812	.044	38.211	-.041
POR	.907	.824	.012	33.633	.298
ETH	.916	.839	.015	31.406	-.104
IAG	.917	.841	.002	27.107	.030
ISE	.917	.842	.001	23.732	.359
COG	.918	.842	.000	20.921	.470
SEG	.918	.843	.001	18.601	.427
ICO	.918	.843	.000	16.647	.518

NOTE: N=50. In the final step of the expansion of the 1960 equation, DF=12 and 37, SS_{reg}=6101.119, and SS_{res}=796.522; in the 1970 equation, DF=12 and 37, SS_{reg}=7422.878, and SS_{res}=1374.794. For simple r, DF=48. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 29

SUMMARY OF REGRESSION OF SOCIAL SECURITY COVERAGE ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
BRAZIL, CHILE, AND UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
PIN	.826	.683		211.794	.826
RAD	.855	.732	.049	132.900	.631
ETH	.864	.748	.016	94.994	-.452
COG	.870	.757	.009	74.060	.259
ICO	.872	.761	.004	60.105	.600
IIN	.875	.766	.005	50.920	.614
POP	.877	.769	.003	43.828	.447
ING	.877	.770	.001	38.269	.202
POR	.878	.771	.001	33.776	.205
IAG	.878	.771	.000	30.089	.457
AGG	.878	.771	.000	27.068	-.306
SEG	.878	.772	.001	24.562	.062
ISE	.878	.772	.000	22.422	.579
<u>1970</u>					
PIN	.765	.586		138.800	.765
IIN	.818	.669	.083	98.269	.634
ETH	.837	.701	.032	75.297	-.387
ICO	.847	.718	.017	60.477	.552
POR	.854	.729	.011	50.707	.180
IAG	.855	.731	.002	42.183	.381
POP	.856	.733	.002	36.135	.181
ING	.856	.734	.001	31.425	.209
SEG	.857	.734	.000	27.724	.140
RAD	.857	.735	.001	24.693	.570
COG	.857	.735	.000	22.202	.206
AGG	.857	.735	.000	20.133	-.251
ISE	.857	.735	.000	18.379	.450

NOTE: N=100. In the final step of the expansion of the 1960 equation, DF=13 and 86, $SS_{reg}=34764.447$, and $SS_{res}=10256.760$; in the 1970 equation, DF=13 and 86, $SS_{reg}=40867.099$, and $SS_{res}=14709.400$. For simple r, DF=98. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radio per capita.

in 1960 or 1970. The percentage of variance explained by the particular sets of variables included in the equations declines between 1960 and 1970 from 97.4 to 89.2 per cent in Brazil, from 88.4 to 84.3 per cent in the U.S., and from 77.2 to 73.5 per cent in the cross-cultural combination of cases. After removing variables that contribute less than one per cent to explaining variance, variable selection for causal analysis is by the procedure shown in table 30 with zero-order and partial correlations appearing in table 31.

Political linkages: percentage of the (eligible) voting-age population registered to vote

Research Finding: The association (zero-order) between percentage of the population living in cities of 20,000 or more and percentage of the (eligible) voting-age population registered to vote is significant and positive in Brazil only in 1970 (.418) and in Chile only in 1960 (.591); it is insignificant in the U.S. and the combined cross-cultural cases in 1960 and 1970 (refer to tables 32-35).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between percentage of the labor force employed in industry and percentage of the (eligible) voting-age population registered to vote in Chile only in 1960 (.400); the association is insignificant in Brazil, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 37).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between contributions of the major economic sectors to the G.N.P. and percentage of the (eligible) voting-age population registered to vote in Chile in 1960 (industry, .651; commerce, .689; services, .766) and in 1970 (industry, .539; commerce, .433; services, .629); the association is insignificant in Brazil, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 37).

Research Finding: The association, controlling for rural-urban residence, between radios per capita and percentage of the (eligible) voting-age population registered to vote is insignificant in the combined cross-cultural cases in 1960 and 1970 (see table 37).

Research Finding: The association, controlling for rural-urban residence, between number of ports and percentage of the (eligible) voting-age population registered to vote is insignificant in Brazil,

TABLE 30
VARIABLE SELECTION FROM SETS X AND Z FOR CAUSAL ANALYSIS
BASED ON REGRESSION AND PARTIAL CORRELATION WITH
SET Y: SOCIAL SECURITY COVERAGE (SSE)

Selection Procedure
<p><u>Step #1.</u> Variables excluded because of associations less than $\pm .400$ with SSE when controlling for POP or POP and ETH:</p> <ol style="list-style-type: none"> Using either first- or second-order partials (by POP or by POP, ETH): ING, COG, SEG, IAG, ICO for Brazil in 1960 and ING, COG, SEG, ICO in 1970; COG, SEG, ICO, ISE for the U.S. in 1960 and COG, SEG, IIN in 1970; IAG for the cross-cultural cases in 1960. Additional variables by using second-order partials: ISE for Brazil in 1960 and IIN* in 1970; ISE* for the cross-cultural cases in 1960 and 1970.
<p><u>Step #2.</u> Remaining variables with significant partials of at least $\pm .400$ where $p < .05$:</p> <ol style="list-style-type: none"> Using either first- or second-order partials: PIN, IIN for Brazil in 1960 and PIN, POR in 1970; PIN, ING for the U.S. in 1960 and PIN, ING, ICO in 1970; PIN, RAD, IIN, ICO for the cross-cultural cases in 1960 and PIN, RAD, IIN, ICO in 1970. Additional variables by using first-order partials: POR,* ISE for Brazil in 1960 and IIN* in 1970; ING* for Chile in 1960; ISE* for the cross-cultural cases in 1960 and ISE,* IAG* in 1970.
<p><u>Step #3.</u> Variables with insignificant r but significant partials:</p> <ol style="list-style-type: none"> First-order: POR for Brazil in 1960* and 1970; ING* for Chile in 1960; IAG* for the cross-cultural cases in 1970. Second-order: POR for Brazil in 1970.
<p><u>Step #4.</u> Remaining variables (with significant partials) from subsets g or w excluded because of ties to a variable with a stronger partial in the same subset using either first- or second-order partials: ICO (tied to IIN) for the cross-cultural cases in 1970.</p>
<p><u>Step #5.</u> Variables from set X selected for causal analysis: PIN, ISE (first-order) for Brazil in 1960 and PIN, POR in 1970; none for Chile in 1960 or 1970; PIN for the U.S. in 1960 and ING, PIN in 1970; PIN, RAD for the cross-cultural cases in 1960 and PIN, IIN in 1970. POP remains as a control variable.</p>

*Variables already excluded in regression analysis. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radioes per capita.

TABLE 31

ZERO-ORDER AND PARTIAL CORRELATIONS BETWEEN SOCIAL SECURITY
COVERAGE AND THE INDUSTRIAL-ECONOMIC VARIABLES,
1960 AND 1970*

	Zero-Order		First-Order by POP		Second-Order by POP, ETH	
	1960	1970	1960	1970	1960	1970
<u>A. Brazil</u>						
PIN	.955	.828	.951	.607	.933	.556
ING	.495	.498	.304	.071	.067	-.029
COG	.527	.524	.155	-.076	-.188	-.182
AGG	.275	.284	.346	.092	.020	-.107
SEG	.483	.487	.248	-.032	-.032	-.157
LAG	.425	.153	.381	-.097	.319	-.276
IIN	.820	.689	.669	.441	.658	.346
ICO	.613	.448	.260	.140	-.095	.011
ISE	.684	.153	.436	.093	.304	.116
POR	.215	.249	.412	.553	.354	.495
<u>B. Chile</u>						
PIN	.285	.272	.309	.272	.298	.230
ING	.392	.388	.403	.377	.385	.351
COG	.238	.234	.254	.193	.274	.189
AGG	-.155	-.124	-.135	-.075	-.150	-.093
SEG	.254	.237	.269	.198	.243	.153
LAG	.000	.132	.002	.080	-.001	.067
IIN	.316	.216	.345	.171	.330	.109
ICO	.086	.084	.049	.051	.146	.110
ISE	.134	.120	.110	.048	.085	-.000
POR	.339	.339	.330	.319	.295	.284
<u>C. United States</u>						
PIN	.870	.609	.888	.748	.887	.763
ING	.607	.609	.424	.516	.418	.521
COG	.458	.470	.218	.332	.212	.339
AGG	-.078	-.041	-.220	-.127	-.251	-.137
SEG	.442	.427	.197	.268	.191	.277
LAG	.030	.030	-.130	-.101	-.176	-.131
IIN	.194	.472	.066	.340	-.032	.322
ICO	.431	.518	.264	.435	.244	.437
ISE	.441	.359	.207	.187	.167	.191
POR	.297	.298	.107	.183	.151	.219
<u>D. Brazil, Chile, and United States</u>						
PIN	.826	.765	.777	.756	.734	.685
ING	.202	.209	.039	.140	.036	.067
COG	.259	.206	.016	.134	.075	.013
AGG	-.306	-.251	-.276	-.297	-.291	-.315
SEG	.062	.140	-.123	.052	-.086	-.020
RAD	.631	.570	.600	.687	.506	.590
LAG	.457	.381	.393	.408	.141	.140
IIN	.614	.634	.564	.705	.456	.625
ICO	.600	.552	.547	.646	.415	.513
ISE	.579	.450	.516	.534	.354	.294
POR	.205	.180	.129	.160	.136	.123

*PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; RAD=radios per capita.

Chile, the U.S., and the combined cross-cultural cases in 1960 and 1970 (see table 37).

Research Finding: There is a significant, positive association, controlling for rural-urban residence, between average annual income in the major economic sectors and percentage of the (eligible) voting-age population registered to vote in Brazil only in 1960 (commerce, .431) and in Chile in 1960 (services, .563) and in 1970 (services, .474; agriculture, .403); the association is insignificant in the U.S. and the combined cross-cultural cases in 1960 and 1970 (see table 37).

Suffrage is defined by legislative decree as universal in Brazil, Chile, and the U.S. However, the size of the electorate and the number of registered voters in the three nations have been affected both by the legislative restriction and expansion of functional linkages on the basis of age, sex, literacy, compulsory registration and voting, and related legislation. The minimum voting age was 18 in Brazil by 1960, in Chile by 1970, and in the U.S. by 1971. In Brazil, only employed women are included under compulsory voting legislation; women gained the right to vote in national elections in the U.S. in 1920 and in Chile in 1949. Illiterates are disenfranchised in Brazil and Chile, representing about 40 per cent of the eligible age group in Brazil and about 25 per cent in Chile; in the U.S., the 1965 Voting Rights Act eliminated requirements of the ability to read (in 20 of the cases and to read English in Alaska, English or Hawaiian in Hawaii, English or the person's native language in Louisiana). It is compulsory in Brazil and Chile for the eligible population to register and for the registered population to vote. In Brazil, suffrage has not been extended to persons who are enlisted in the military (except sergeants and NCOs since 1964), have lost their political rights, or cannot speak Portuguese. In Chile, the right to vote is not given to persons who are NCOs or enlisted in the military

and police force, have had political rights suspended for physical or mental reasons, have been charged or convicted of crimes that carry a prison sentence of three years and one day or more, and, lastly, those men who have not served the compulsory military term of duty and are under the age of 25. Reform in Chile removed party influence over voter registration and contributed to the increase in votes from 1958 (1,250,350 total votes or 83.5 per cent of those registered) to 1964 (2,530,697 total votes or 87.4 per cent of those registered). Additional restrictions in the U.S. are residence requirements in some of the 50 cases from six months to two years in length and the disenfranchisement of convicts in most of the 50 cases; on the other hand, suffrage was extended for national elections to residents (U.S. citizens) of the District of Columbia in 1961.

Of the eligible voting-age population in 1960, 34.4 per cent were registered to vote in Brazil, 37.4 per cent in Chile (1961), and 64.4 per cent in the U.S. There are indications that a larger base for a potentially more rapid expansion of political functional linkages exists in Chile than in Brazil. Prior to the military regime of the 1970s in Chile, mass parties and a mass electorate already existed as well as higher literacy rates than in Brazil. The 1946-1964 period in Brazil was too short a span of time for the expansion of politico-economic linkages to peasants and workers to the extent that they would become a political force; this one factor contributed most to the failure of Goulart's appeal to popular support in 1964. Following the 1964 coup, mass parties were abolished, the emergence of a mass electorate has consistently been blocked, and political apathy has increased. The

percentage of registered voters who voted in presidential elections in Brazil was 72.1 in 1950, 59.7 in 1955, and 81 in 1960; in the 1970 parliamentary elections, 77.5 per cent of those registered voted but of those eligible to vote (given that registration and voting are compulsory) an estimated 50 per cent did not vote or invalidated their ballots in many cases by leaving them blank.

Voter participation in Chile is disproportionately greater in urban areas and among upper- and middle-income groups; the lowest participation is found among lower-income groups in rural areas. In spite of compulsory registration and voting, voter turnout declined prior to the 1964 election; the percentage of registered voters who voted in presidential elections was 88.1 in 1938, 80.3 in 1942, 75.9 in 1946, 86.6 in 1952 (when women first voted), 83.5 in 1958, 87.4 in 1964, and 83.7 in 1970.

In the U.S., voter turnout is much lower than in Brazil or Chile possibly, in part, because it is not compulsory to register and/or vote. Of the voting-age population eligible to vote, the percentage voting in presidential elections was 55.4 in 1940, 52.7 in 1944, 48.1 in 1948, 57.6 in 1952, 55.9 in 1956, 58.5 in 1960, 58.1 in 1964, 55.2 in 1968, and 51.0 in 1972.

The variable for the provincial analysis in this study is specifically the percentage of the eligible (including literacy requirements where these prevail) voting-age population registered to vote as estimated in election years. The restricted definition of this variable limits its usefulness as an indicator of political participation. However, to increase the comparability of the provincial data within

nations and cross-culturally, the years selected for the data are limited to presidential election years since 1960 covering the longest time span possible up to and including 10 years; cross-time analysis is consequently weakened nationally and in the cross-cultural comparison. Data pertain to 1960 and 1966 for Brazil, 1964 and 1970 for Chile, 1962 and 1972 for the U.S.

The provincial data for Brazil reflect the expected slight changes although there is an overall increase in voter registration. The mean percentage of the eligible registered is 72.06 in 1960 and 74.37 in 1966 with values ranging from 37.2 to 91.9 per cent in 1960 and from 38.5 to 89.7 per cent registered in 1966. Provincial variations, taking into consideration the compulsory registration legislation, are wide but declining as indicated by the decline in the standard deviation from 16.62 in 1960 to 11.42 in 1966.

The Chilean provincial data reflect the higher nation-wide participation level in Chile than in Brazil but, similar to Brazil, a decline in provincial variations. In 1964 and 1970, respectively, the mean percentage of the eligible registered increased from 60.84 to 82.14 per cent, the standard deviation declined from 8.55 to 6.39, and values that ranged from 48.0 to 78.0 per cent registered in 1964 increased to 67.9 and 92.7 per cent in 1970.

Voter registration in the U.S. varies. Registration was not required or not reported for 15 cases in 1962 and 8 in 1972. In these cases, a zero value was assigned for the voter registration variable but the cases were kept in the study in order to benefit from their inclusion for the rest of the variables; this, however, weakens the voter

registration data. The 1962 and 1972 provincial data show the same but stronger trends in the U.S. as were observed in the Brazilian data with an increase in the mean percentage of the eligible registered from 52.29 to 63.91 per cent, a decline in the standard deviation from 36.46 to 29.20, and a change in extreme values ranging from 42.0 to 97.8 per cent registered in 1962 and from 60.3 to 92.5 per cent in 1972. The combination of the cases from the three nations for cross-cultural analysis results in an increase in the mean percentage registered from 59.37 to 71.08 per cent, a decline in the standard deviation from 28.45 to 22.87, and values ranging from 37.2 to 97.8 per cent registered in the first time period and from 38.5 to 92.7 per cent in the second time period.

Regression and correlation results. R is significant at the .05 level as determined by the F test for all steps in the expansion of the equations for Chile (see table 33) in 1960 and 1970, the U.S. (see table 34) in 1960, and the cross-cultural combination of cases (see table 35) in 1960 and 1970. No R is significant at the .05 level for the U.S. (table 34) in 1970. In Brazil (table 32) in 1960 and 1970 R is significant at the .05 level through the inclusion of average annual income in agriculture (IAG). Where R is significant at the .05 level, the percentage of variance explained is 38.4 in the U.S. in 1960; it declines in Brazil between the two time periods from 47.6 to 36.6 per cent and in the combination of cases from 29.5 to 21.0 per cent in contrast to a very slight increase from 87.3 to 88.8 per cent in Chile. After excluding variables in those steps where R is not significant and/or variables which contribute less than one per cent to explaining variance,

TABLE 32

SUMMARY OF REGRESSION OF VOTER REGISTRATION ON
INDUSTRIAL-ECONOMIC SET, ETHNICITY, AND RURAL-
URBAN RESIDENCE: BRAZIL, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
ETH	.617	.380		14.150	-.617
POR	.647	.419	.039	7.952	-.065
PIN	.669	.448	.029	5.700	.144
ISE	.678	.460	.012	4.274	.224
IIN	.688	.473	.013	3.417	-.023
IAG	.690	.476	.003	2.735	.047
AGG	.691	.478	.002	2.230	.349
SEG	.692	.479	.001	1.842	.320
COG	.708	.502	.023	1.680	.313
ING	.715	.511	.009	1.466	.287
<u>1970</u>					
ETH	.518	.269		8.473	-.518
POP	.570	.324	.055	5.295	.418
PIN	.601	.361	.037	3.962	.365
IAG	.605	.366	.005	2.897	.387
ICO	.609	.371	.005	2.243	.314
POR	.612	.375	.004	1.804	.100
IIN	.617	.380	.005	1.494	.422
SEG	.620	.385	.005	1.254	.323
COG	.623	.388	.003	1.058	.337
AGG	.629	.396	.008	.918	.313
ING	.633	.401	.005	.791	.282
ISE	.634	.402	.001	.672	-.071

NOTE: N=25. Due to insufficient tolerance and F values, POP (r=.043) and ICO (r=.323) were excluded from the 1960 equation. In the final step of the expansion of the 1960 equation, DF=10 and 14, SS_{reg}=3390.634, and SS_{res}=3237.107; in the 1970 equation, DF=12 and 12, SS_{reg}=1258.470, and SS_{res}=1870.003. DF=23 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 33

SUMMARY OF REGRESSION OF VOTER REGISTRATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN
RESIDENCE: CHILE, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
SEG	.855	.732		62.870	.855
POR	.872	.760	.028	34.925	.260
IIN	.886	.785	.025	25.629	.632
AGG	.894	.800	.015	20.067	-.271
POP	.906	.822	.022	17.609	.591
ISE	.926	.859	.037	18.300	.745
ETH	.930	.864	.005	15.557	-.223
PIN	.933	.870	.006	13.499	.637
ICO	.933	.871	.001	11.315	.469
ING	.933	.872	.001	9.564	.747
COG	.934	.872	.000	8.114	.811
IAG	.934	.873	.001	6.885	.118
<u>1970</u>					
SEG	.694	.482		21.479	.694
AGG	.764	.584	.102	15.502	-.441
COG	.802	.643	.059	12.641	.543
IAG	.863	.746	.103	14.690	.506
IIN	.909	.826	.080	18.074	.502
ETH	.918	.843	.017	16.126	-.121
PIN	.922	.850	.007	13.824	.416
ING	.927	.860	.010	12.378	.625
POP	.934	.873	.013	11.492	.380
ISE	.939	.883	.010	10.591	.579
ICO	.942	.888	.005	9.407	.188
POR	.942	.888	.000	7.999	-.037

NOTE: N=25. In the final step of the expansion of the 1960 equation, DF=12 and 12, SS_{reg}=1531.019, and SS_{res}=222.340; in the 1970 equation, DF=12 and 12, SS_{reg}=871.532, and SS_{res}=108.948. For simple r, DF=23. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 34

SUMMARY OF REGRESSION OF VOTER REGISTRATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
PIN	.419	.175		10.248	.419
IAG	.475	.226	.051	6.880	.215
ICO	.513	.263	.037	5.483	.096
AGG	.540	.292	.029	4.654	-.286
POP	.582	.339	.047	4.519	.290
ISE	.591	.349	.010	3.849	.235
ING	.600	.360	.011	3.375	.103
COG	.615	.378	.018	3.121	.090
POR	.617	.380	.002	2.734	.069
ETH	.619	.383	.003	2.424	-.052
IIN	.619	.384	.001	2.155	.000
<u>1970</u>					
AGG	.262	.069		3.557	-.262
ING	.372	.138	.069	3.785	.098
POR	.397	.158	.020	2.880	.110
IAG	.407	.165	.007	2.237	.190
ICO	.426	.181	.016	1.957	.113
PIN	.445	.198	.017	1.771	.130
ISE	.468	.219	.021	1.688	.234
COG	.469	.220	.001	1.450	.058
SEG	.476	.227	.007	1.305	.085
ETH	.478	.228	.001	1.155	-.007
POP	.479	.229	.001	1.031	.068

NOTE: N=50. Due to insufficient tolerance and F values, SEG (r=.102) was excluded from the 1960 equation and IIN (r=.073) from the 1970 equation. In the final step of the expansion of the 1960 equation, DF=11 and 38, SS_{reg}=25034.283, and SS_{res}=40117.154; in the 1970 equation, DF=11 and 38, SS_{reg}=9605.869, and SS_{res}=32168.339. DF=48 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports.

TABLE 35

SUMMARY OF REGRESSION OF VOTER REGISTRATION ON INDUSTRIAL-
ECONOMIC SET, ETHNICITY, AND RURAL-URBAN RESIDENCE:
BRAZIL, CHILE, AND UNITED STATES, 1960 AND 1970

	R	R ²	R ² Change	F	Simple r
<u>1960</u>					
RAD	.252	.063		6.662	-.252
ISE	.363	.131	.068	7.370	-.156
PIN	.428	.183	.052	7.186	.053
IIN	.463	.214	.031	6.488	-.232
IAG	.489	.239	.025	5.934	-.077
ETH	.516	.266	.027	5.643	.087
POR	.527	.278	.012	5.066	.043
ICO	.536	.287	.009	4.593	-.206
POP	.538	.290	.003	4.086	.126
ING	.541	.292	.002	3.685	.174
AGG	.543	.295	.003	3.350	.198
<u>1970</u>					
RAD	.309	.095		10.400	-.309
PIN	.365	.133	.038	7.474	.026
IAG	.421	.178	.045	6.930	-.087
ISE	.425	.181	.003	5.260	-.257
ICO	.438	.192	.011	4.484	-.284
ING	.443	.196	.004	3.785	.180
SEG	.445	.198	.002	3.259	.194
COG	.452	.204	.006	2.925	.137
AGG	.455	.207	.003	2.612	.145
POP	.458	.210	.003	2.370	.249

NOTE: N=100. Due to insufficient tolerance and F values, COG (r=.161) and SEG (r=.215) were excluded from the 1960 equation and IIN (r=-.267), POR (r=.063), and ETH (r=.251) from the 1970 equation. In the final step of the expansion of the equation in 1960, DF=11 and 88, SS_{reg}=23648.617, and SS_{res}=56464.798; in the 1970 equation, DF=10 and 89, SS_{reg}=10890.559, and SS_{res}=40895.060. DF=98 for simple r. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; POR=ports; RAD=radio per capita.

the procedure to select variables for causal analysis is shown in table 36 and zero-order and partial correlations appear in table 37.

Additional findings based on regression analysis may be summarized as follows:

Research Finding: Linear combinations of the industrial-economic and socio-political sets of variables based on zero-order correlations are possible for research at single points in time except in the case of social security coverage in Chile (1960 and 1970) and voter registration in the U.S. (1970).

Research Finding: The set of variables on which the socio-political set was regressed was: (1) most useful for Brazilian cases where over 80 per cent of the variance in the socio-political variables was explained in 1960 and 1970 except for primary education (over 50 per cent of the variance was explained) and voter registration (less than 50 per cent of the variance was explained); (2) less useful in Chile (than in Brazil) where over 80 per cent of the variance was explained in 1960 and 1970 except for higher education in 1960 (over 50 per cent of the variance was explained), social security coverage in 1960 and 1970 (less than 50 per cent of the variance was explained), and primary education in 1970 (over 50 per cent of the variance was explained); (3) even less useful for cross-cultural analysis (than in Brazil and Chile) where variance explained was less than 80 per cent for primary education (but over 50 per cent), social security coverage (over 50 per cent was explained), and voter registration (less than 50 per cent was explained); and (4) least useful in the U.S. where over 80 per cent of the variance was explained only in the case of illiteracy rates and social security coverage (over 50 but less than 80 per cent of the variance in higher education was explained).

TABLE 36

VARIABLE SELECTION FROM SETS X AND Z FOR CAUSAL ANALYSIS
 BASED ON REGRESSION AND PARTIAL CORRELATION WITH
 SET Y: VOTER REGISTRATION (VOT)

Selection Procedure

Step #1. Variables excluded because of associations less than $\pm .400$ with VOT when controlling for POP or POP and ETH:

1. Using either first- or second-order partials (by POP or by POP, ETH): IIN for Brazil in 1970; IIN, ICO for Chile in 1960 and PIN, AGG, IIN in 1970; PIN for the U.S. in 1960.
2. Additional variables by using second-order partials: PIN* for Chile in 1960.

Step #2. Remaining variables with significant partials of at least $\pm .400$ where $p < .05$:

1. Using either first- or second-order partials: ING, COG, SEG, ISE for Chile in 1960 and ING, COG, SEG, IAG, ISE in 1970.
2. Additional variables by using first-order partials: ICO* for Brazil in 1960.

Step #3. Variables with insignificant r but significant partials:

1. First-order: ICO* for Brazil in 1960.
2. Second-order: None.

Step #4. Remaining variables (with significant partials) from subsets g or w excluded because of ties to a variable with a stronger partial in the same subset using either first- or second-order partials: COG (tied to SEG), ING (tied to SEG), IAG (tied to ISE) for Chile in 1970.

Step #5. Variables from set X selected for causal analysis: none for Brazil in 1960 and POP (set Z) as only variable associated in 1970; SEG, ISE for Chile in 1960 and 1970; none for the U.S. or the cross-cultural cases in 1960 or 1970. POP remains as a control variable.

*Variables already excluded in regression analysis. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; AGG=contributions of agriculture to G.N.P.; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.

TABLE 37

ZERO-ORDER AND PARTIAL CORRELATIONS BETWEEN VOTER REGISTRATION
AND THE INDUSTRIAL-ECONOMIC VARIABLES, 1960 AND 1970*

	Zero-Order		First-Order by POP		Second-Order by POP, ETH	
	1960	1970	1960	1970	1960	1970
<u>A. Brazil</u>						
PIN	.144	.365	.142	.038	-.273	-.232
ING	.287	.282	.298	.017	-.001	-.146
COG	.313	.337	.386	.016	.068	-.132
AGG	.349	.313	.349	.211	-.071	-.059
SEG	.320	.323	.343	.044	.032	-.132
LAG	.047	.387	.038	.299	-.127	.126
IIN	-.023	.422	-.077	.225	-.292	-.121
ICO	.323	.314	.431	.128	.076	-.074
ISE	.224	-.071	.265	-.137	.045	-.123
POR	-.065	.100	-.060	.199	-.259	.022
<u>B. Chile</u>						
PIN	.637	.416	.400	.205	.394	.196
ING	.747	.625	.651	.539	.646	.537
COG	.811	.543	.689	.433	.699	.431
AGG	-.271	-.441	-.109	-.334	-.114	-.339
SEG	.855	.694	.766	.629	.763	.632
LAG	.118	.506	.158	.403	.157	.401
IIN	.632	.502	.399	.360	.392	.358
ICO	.469	.188	.242	.101	.299	.119
ISE	.745	.579	.563	.474	.557	.472
POR	.260	-.037	.194	-.145	.177	-.162
<u>C. United States</u>						
PIN	.419	.130	.360	.138	.357	.138
ING	.103	.098	-.067	.076	-.071	.077
COG	.090	.058	-.076	.032	-.078	.032
AGG	-.286	-.262	-.354	-.276	-.365	-.277
SEG	.102	.085	-.060	.060	-.063	.061
LAG	.215	.190	.160	.179	.154	.182
IIN	.000	.073	-.075	.049	-.120	.050
ICO	.096	.113	-.023	.096	-.030	.096
ISE	.235	.234	.106	.227	.098	.228
POR	.069	.110	-.043	.094	-.034	.098
<u>D. Brazil, Chile, and United States</u>						
PIN	.053	.026	-.019	-.043	.030	.056
ING	.174	.180	.137	.067	.140	.104
COG	.161	.137	.111	.012	.097	.065
AGG	.198	.145	.220	.102	.218	.095
SEG	.215	.194	.182	.074	.171	.106
RAD	-.252	-.309	-.295	-.245	-.346	-.157
LAG	-.077	-.087	-.115	-.064	-.040	.088
IIN	-.232	-.267	-.285	-.223	-.361	-.119
ICO	-.206	-.284	-.257	-.228	-.297	-.126
ISE	-.156	-.257	-.208	-.200	-.209	-.077
POR	.043	.063	.018	.030	.019	.053

*PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; LAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; RAD=radios per capita.

Causal Analysis of the Changing Relationship Between
Socio-Political and Industrial-Economic Functional
Linkages in 1960 and 1970: Brazil, Chile, and
the United States

The difficulties presented by multicollinearity and/or the need to find more adequate indicators than many of those used in this study place limits on generalization. However, the simplification procedure of selecting variables to represent the two subsets that caused the greatest difficulty and of using the notation for mathematical sets and subsets in the causal models makes trends in the nations more easily observable.

In spite of the methodological problems in this study which make the findings suggestive rather than finally definitive, it has been shown that (1) rural-urban residence needs to be controlled in the investigation of industrialization and national integration, (2) the industrial-economic and socio-political variables in many cases do covary, (3) theoretical propositions concerning the relationship between industrialization and national integration can be formulated for future research, and (4) the usefulness of the social indicators used in this project can be evaluated. Inconclusive findings can be clarified in future research that hopefully avoids the methodological problems related to social indicators encountered in this study.

Of the variables in set X (industrial-economic), two have been excluded from the study, i.e., contributions of the agricultural sector to the G.N.P. (g_1) and average annual income in commerce (w_3). Of set Z (control variables), ethnicity (b) has been excluded. Radios per capita (r) is included only for the cross-cultural analysis. It

should be noted that several variables excluded by regression or because of ties do have significant partials with the socio-political set. First-order partial correlations (controlling for rural-urban residence) appear in the causal models for the association between elements of set X (the strongest and in some cases the only significant associations) and between sets X and Y; rural-urban residence (a) is included only when no industrial-economic variable is significantly associated with the particular socio-political variable (in this case, rural-urban residence appears for both time 1 and time 2 if it is significantly associated with the socio-political variable at both time periods). Notation for partial correlation coefficients is C; for zero-order correlations, it is zC. As already stated, the discussion of, and conclusions reached on the basis of, the causal models is in general terms, e.g., "industrialization" and "income"; however, the notation appearing in parentheses in the models indicates the specific variables involved, e.g., (C_{iw_2}) signifies the partial correlation between percentage of the labor force employed in industry and average annual income in industry.

Given the size of the first-order partials, there are clearly other variables not included in this study that influence socio-political linkages. Still, the examination of partials for the three nations shows that, in spite of there being multiple causation of socio-political linkages, one pattern appears in all cases; i.e., an increase in income is the first functional linkage established by industrialization and as such intervenes in the association between industrialization and socio-political integration. It was on the basis of this conclusion that the causal models were constructed.

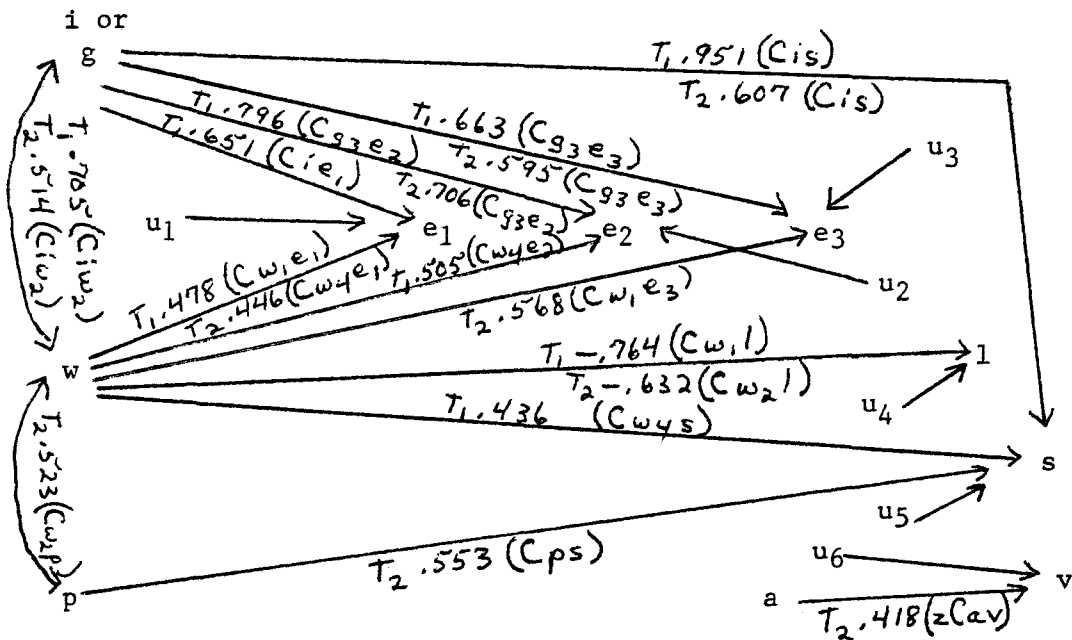
Research Finding: Causal analysis based on partial correlations controlling for rural-urban residence indicates that the industrial-economic and socio-political sets co-vary in many, but not all, instances.

Brazil

Standard deviations indicated an increase between 1960 and 1970 in provincial variations in the industrial-economic set except for income in industry (w_2) and, in the socio-political set, with the exception of voter registration (v) and two variables for which variations remained relatively stable, i.e., primary (e_1) and higher (e_3) education. This increase or stability of provincial variations reflects the continuing over-concentration of industrial-economic and socio-political linkages in a few provinces.

In Brazil, income intervenes in the association of industrialization with educational linkages basically at the primary level. Causal analysis (see figure 2) at single points in time illustrates the pattern of co-variation of industrial-economic and socio-political linkages; regression analysis has indicated that a linear equation would explain at least 50 per cent of the variance in the socio-political variables except in the case of voter registration. In general terms (1) educational linkages (e_1 , e_2 , e_3) have a positive association with industrial-economic linkages and specifically with industrialization (i , g_3) and/or income (w_1 , w_4); (2) illiteracy (l) has a negative association with industrial-economic linkages and specifically with income (w_1 , w_2); (3) social security coverage (s) has a positive association with industrial-economic linkages and specifically with industrialization (i), number of ports (p), and income (w_4); (4) voter registration (v) is not

Fig. 2. Causal model, selected variables from sets X, Y, and Z: Brazil, 1960 (T_1) and 1970 (T_2)



i=Labor force in industry

g=Contributions of the major economic sectors to the G.N.P.

g3=Percentage contribution of commerce to the G.N.P.

w=Average annual income

w1=Average annual income in agriculture

w2=Average annual income in industry

w4=Average annual income in services

p=Number of ports

e1=Primary-school enrollment ratio

e2=Secondary-school enrollment ratio

e3=College enrollment

l=Illiteracy rates

s=Social security coverage

v=Voter registration as percentage of those eligible

a=Rural-urban residence

$u_1, u_2, u_3, u_4, u_5, u_6$ =Error terms

C=First-order partial controlling for rural-urban residence

zC=Zero-order correlation coefficient

significantly associated with industrial-economic linkages. Cross-time analysis based on the causal model suggests (1) curvilinear relationships over time between the industrial-economic and socio-political variables and (2) if attention is focused on selecting predictors of socio-political variables, a shift in the most adequate predictor primarily because of interaction between, and changes in the association of, income and industrialization.

The suggestion of cross-time curvilinearity is supported by observing that, in general, there was a decline in the strength of associations between industrial-economic and socio-political linkages with the exception of the selection of income (w_1) as a predictor of higher education (e_3) and ports (p) as a predictor of social security coverage (s) in 1970. Declining associations occurred concomitantly with a 1960-1970 increase in the mean values of all variables in the model except that labor force in industry (i) remained stable and illiteracy (l) declined.

In relation to the suggestion concerning the shift in the most adequate predictors, it is necessary to discuss each variable separately:

1. Education. Industrialization (i , g_3) first appears as the best predictor of education (e_1 , e_2 , e_3) for analysis at a single point in time. A different conclusion is reached, however, after cross-time analysis of the different educational levels.

- a. Primary education. The cross-time stability of industrialization (i) and the increase in primary education (e_1) and income (w) was accompanied by a decline in the association of industrialization (i) with income (w_2). Since industrialization (i) was not selected as a predictor in 1970 and income (w) maintains a

(weak) association with primary education, it is concluded that

- (1) the association of industrialization is in part direct and in part indirect (through income) with primary education and
- (2) income is a more adequate single predictor of primary education for cross-time analysis.

- b. Secondary education. It is concluded that the most adequate predictor of this educational level for analysis at one or more points in time is industrialization (i or g_3). The selection of income (w_4) in 1960 and its exclusion in 1970 first appears to be based on the association of income to industrialization in 1960 which declined by 1970 (the association of tied income variables with g_3 remained relatively stable as shown in table 38 in appendix C). There are, however, two intervening factors as noted in the background literature: (1) the major obstacle to higher education in Brazil was the cost of secondary education--thus its association with income in 1960--which the Brazilian government attempted to resolve in the mid-1960s by offering financial assistance to low-income students, a policy that apparently had an effect on the 1970 data; (2) secondary students are disproportionately concentrated in the more industrialized region of Brazil which contributes to the strong association in 1960 and 1970 with industrialization (i , g_3) particularly when recalling that this variable is a ratio representing each province's relative share of secondary students.

- c. Higher education. The conclusions here are that (1) for the time period studied, industrialization (g_3) is the best pre-

dictor of higher education (e_3) at one or more points in time in part because of the tendency for institutions of higher education to be over-concentrated in more industrialized regions but (2) where income is removed as an obstacle to secondary education, as in Brazil, it becomes more closely associated with higher education. The suggestion does appear in the model that industrialization is declining as a determinant of educational linkages at this level while income is emerging as an equally adequate predictor.

2. Illiteracy rates. Causal analysis shows income (w_1 , w_2) as the best predictor of illiteracy (1) at one or more points in time. The decline in the strength of association is due, it is suggested, to the impact of widespread literacy campaigns in Brazil.
3. Social security coverage. The best predictor of social security coverage (s) at one or more points in time is industrialization (i) since the association with income is weaker and only occurs at one point in time. The decline in the strength of this association can be explained by the relative stability in industrialization (i) 1960-1970 while social security coverage (s) increased as did provincial variations. This association as well as the association of ports (p) with social security coverage (s) probably stems, it is suggested here, from the over-concentration of population in addition to socio-political and industrial-economic linkages--and specifically the concentration of the labor force (especially unionized labor)--in areas (the more urban-industrial) covered to a greater degree by labor legislation (given that agricultural labor

was not yet covered by social security in 1970) and where less avoidance of adhering to this legislation occurs.

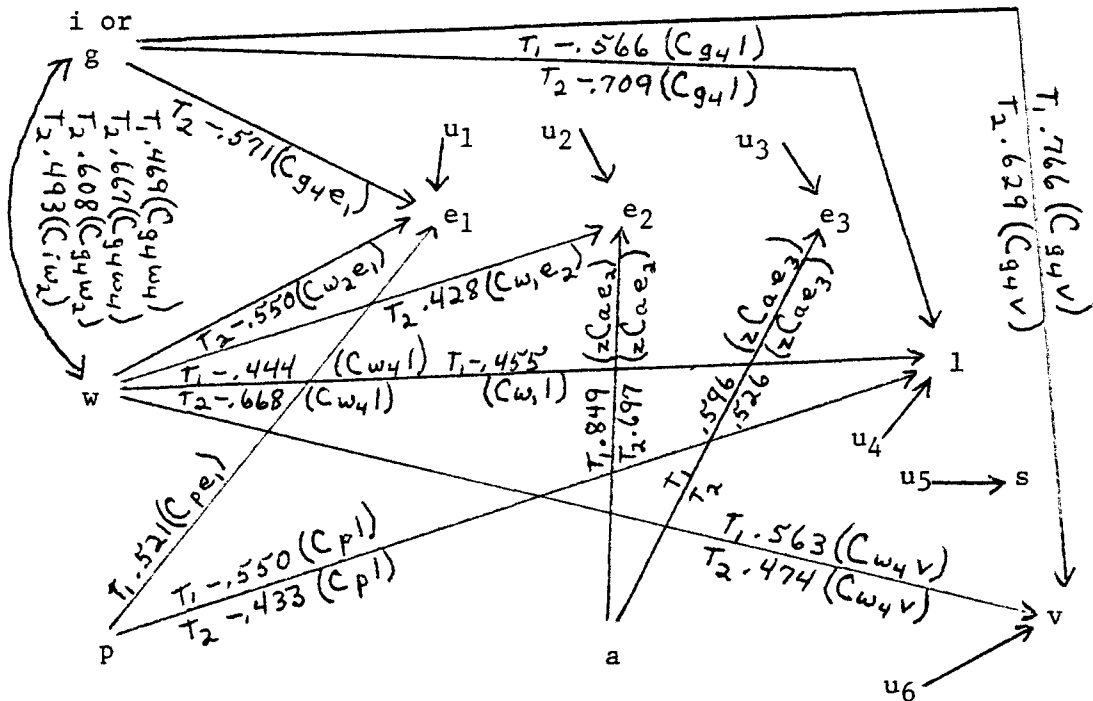
4. Voter registration. The 1960 and 1970 mean values indicate an increase in voter registration (v); in addition, provincial variations declined. The lack of an association with the industrial-economic variables may be due to (1) it is an inadequate indicator of political linkages or (2) industrial-economic linkages in reality are not directly associated with political linkages. There is some evidence in the data collected to support the second explanation. As shown in the causal model, a weak association exists between voter registration (v) and the control variable, rural-urban residence (a), in 1970. However, in the regression analysis less than 50 per cent of the variance in voter registration was explained in the Brazilian data. Another possibility is to investigate associations within the socio-political set (see table 42 in appendix C) in which case voter registration has a first-order partial of .610 with the secondary-school enrollment ratio in 1960. The implication is that political linkages are more closely related to educational linkages than to the industrial-economic set. The background literature on Brazil would support this suggestion given the observation that high illiteracy rates have disenfranchised about half of the adult population. Conclusions cannot, however, be reached until the patterns of associations in Chile and the U.S. have been analyzed.

Chile

Of the variables included in the causal model (figure 3) for the Chilean cases, standard deviations indicated an increase in provincial variations for industrialization (g_4), income (w), higher education (e_3), and social security coverage (s). Provincial differences continue to exist in relation to these linkages but, generally speaking, this is less of a characteristic of Chile than it is of Brazil. The consistent selection of percentage contributions of services to the G.N.P. (g_4) as the indicator of the level of industrialization in Chile concurs with the over-emphasis on the service sector as noted in the background discussion.

Causal analysis of the Chilean cases shows a pattern of co-variation between the industrial-economic and socio-political linkages differing from that in the Brazilian cases in many instances. Income (w) clearly intervenes in the association of industrialization (g_4) with the socio-political variables only in the case of secondary education (e_2). Analysis at single points in time shows that (1) the association of educational linkages (e_1, e_2) to industrial-economic linkages (specifically number of ports or p , industrialization or g_4 , and income or w_1, w_2) does not reveal a consistent pattern; (2) similar to Brazil, illiteracy (l) has a negative association with the industrial-economic set and specifically industrialization (g_4), ports (p), and income (w_1, w_4); (3) voter registration (v) has a positive association with industrial-economic linkages and specifically industrialization (g_4) and income (w_4); and (4) social security coverage (s) is not significantly associated with industrial-economic linkages.

Fig. 3. Causal model, selected variables from sets X, Y, and Z: Chile, 1960 (T_1) and 1970 (T_2)



i =Labor force in industry

g =Contributions of the major economic sectors to the G.N.P.

g_4 =Percentage contribution of the service sector to the G.N.P.

w =Average annual income

w_1 =Average annual income in agriculture

w_2 =Average annual income in industry

w_4 =Average annual income in services

p =Number of ports

e_1 =Primary-school enrollment ratio

e_2 =Secondary-school enrollment ratio

e_3 =College enrollment

l =Illiteracy rates

s =Social security coverage

v =Voter registration as percentage of those eligible

a =Rural-urban residence

$u_1, u_2, u_3, u_4, u_5, u_6$ =Error terms

C =First-order partial controlling for rural-urban residence

zC =Zero-order correlation coefficient

Regression analysis at single points in time indicated that linear equations would explain at least 50 per cent of the variance in the socio-political variables with the exception of social security coverage. The suggestion was made that cross-time analysis implies curvilinear relations between the two sets of variables which is supported by the Chilean data only in the case of voter registration (v) and in the association of ports (p) with primary education (e_1) and illiteracy (l). Concomitantly, the 1960 and 1970 mean values showed an overall increase in all variables except illiteracy and secondary education which declined and number of ports which remained stable.

The use of cross-time analysis to determine the most adequate predictors of the socio-political variables leads to different conclusions from the analysis of Brazilian cases. In the Chilean cases, the strong interaction between income (w) and industrialization (g_4) makes it difficult to determine, in the association with illiteracy (l) and voter registration (v), whether or not income (l) is acting as an intervening variable or (2) is associated with these two variables only because of its association with industrialization. At any rate, industrialization is the more adequate predictor of illiteracy (l) and voter registration (v) in 1960 and 1970. Similar to Brazil in 1960, voter registration is significantly associated (.434) with secondary education (see table 43 in appendix C) as well as in 1970 (.440) in Chile.

The association of ports (p) with illiteracy (l) is significant but declining and it does not serve as a predictor of primary education (e_1) in 1970. More so than in Brazil, Chilean ports tend to be located unevenly within the nation and at points of heavy (urban) concentration

(which is also very unevenly distributed) which probably accounts for the association with illiteracy rates (given that these rates are significantly lower in urban than rural areas in Chile) and with primary education (e_1) which refers in this study to a province's relative share of primary students. This observation in combination with the negative rather than positive association of industrialization (g_4) and income (w_2) with primary education (e_1) illustrates the basic problem encountered in using the primary-school enrollment ratio as an indicator of education; i.e., it is not only a reflection of increasing educational linkages but is also strongly affected by population growth rates (as determined by in-migration and out-migration as well as birth and death rates). The usefulness of this ratio as an indicator is therefore greatly reduced.

Of the industrial-economic variables, only income (w_1) serves as an indicator of secondary education (e_2) in Chile and only in 1970. In regression analysis, rural-urban residence (control variable) explained 72.1 per cent of the variance in secondary education in 1960 and 48.6 per cent in 1970. The implication is not so much that income becomes associated with secondary education as industrialization increases; rather, since this variable is the province's relative share of secondary students and secondary schools in Chile are located only in urban centers, the implications are that (1) level of urbanization is the most adequate predictor and (2) income is associated in 1970 probably as a function of its association with level of urbanization. Doubt is cast, at any rate, on the usefulness of the secondary-school enrollment ratio for the same reason as the primary-school enrollment ratio.

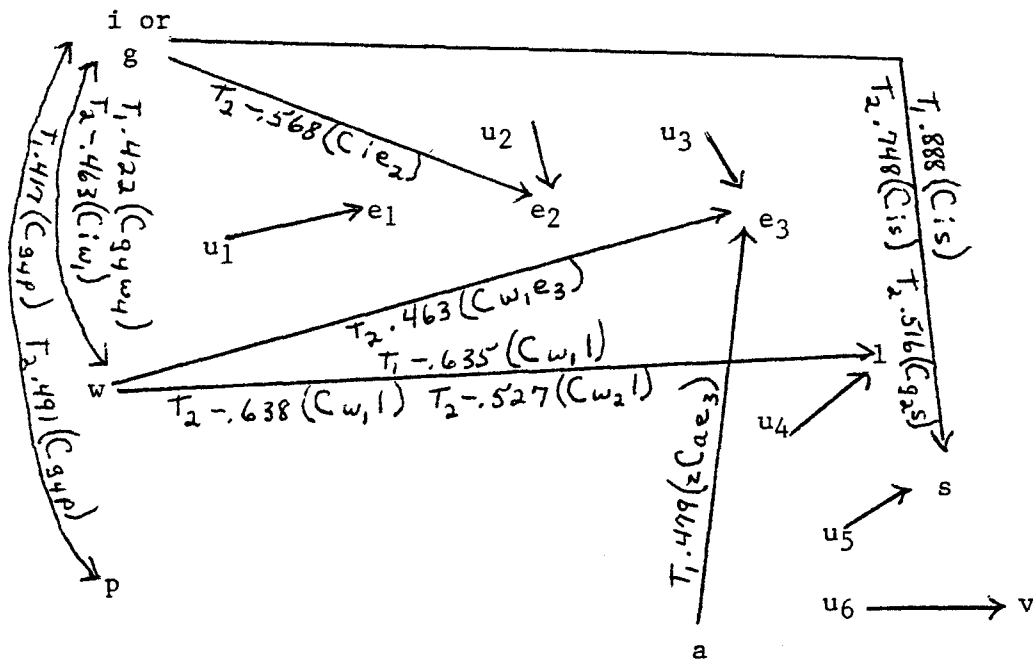
No industrial-economic variable serves as a predictor of higher education (e_3). Only the control variable, rural-urban residence (a), is significantly associated in 1960 and 1970. Likewise, there is no industrial-economic variable associated with social security coverage (s) in Chile. As noted in the background literature, social security coverage has become so extensive in Chile that it has become more of an obstacle to, rather than a concomitant of, industrialization given the level of industrialization.

The United States

Provincial variations increased 1960-1970 in the U.S. cases for industrialization (g_4), income (w), social security coverage (s), secondary (e_2) and higher (e_3) education. In part, this reflects the concentration of population and industrial activities in certain regions of the nation, a historical trend similar, but in a lesser degree, to what has been characteristic in Brazil and Chile.

The co-variation of the industrial-economic and socio-political variables follows a more clear-cut pattern in the U.S. than in Brazil or Chile. Causal analysis (see figure 4) at single points in time indicates that: (1) educational linkages (e_1, e_2, e_3) are inconsistently associated with industrial-economic linkages as in Chile; (2) illiteracy (1) has a negative association with industrial-economic linkages and specifically income (w_1, w_2); (3) social security coverage (s) has a positive association with industrial-economic linkages and specifically industrialization (i, g_2); (4) voter registration (v) is not significantly associated with industrial-economic linkages as in Brazil.

Fig. 4. Causal model, selected variables from sets X, Y, and Z: United States, 1960 (T_1) and 1970 (T_2)



i =Labor force in industry

g =Contributions of the major economic sectors to the G.N.P.

g_2 =Percentage contribution of industry to the G.N.P.

g_4 =Percentage contribution of the service sector to the G.N.P.

w =Average annual income

w_1 =Average annual income in agriculture

w_2 =Average annual income in industry

w_4 =Average annual income in services

p =Number of ports

e_1 =Primary-school enrollment ratio

e_2 =Secondary-school enrollment ratio

e_3 =College enrollment

l =Illiteracy rates

s =Social security coverage

v =Voter registration as percentage of those eligible

a =Rural-urban residence

$u_1, u_2, u_3, u_4, u_5, u_6$ =Error terms

C =First-order partial controlling for rural-urban residence

zC =Zero-order correlation coefficient

Regression analysis indicated that linear equations were possible except for voter registration (v) but 50 per cent or more of the variance was explained only in the case of social security coverage (s), illiteracy (l), and higher education (e_3). Implied cross-time curvilinear relations based on the causal model appear as possible only in the case of social security coverage (s) concomitant to a 1960-1970 increase in social security coverage and a decline in industrialization (i or g_2). All other variables included in the model showed a 1960-1970 increase except for a decline in the primary education ratio (e_1) and illiteracy (l) while number of ports (p) remained stable.

Income does not appear to intervene in the association of industrialization and socio-political linkages since (1) income and industrialization are associated with different variables and (2) income and industrialization are weakly associated and have become dissociated in terms of a positive relationship. It can be suggested at this point, however, that once a more advanced level of industrialization has been attained, income (l) becomes dissociated from industrialization and (2) operates independently to establish socio-political linkages.

On the basis of the causal model, it is concluded that income (w_1 , w_2) is the most adequate predictor of higher education (e_3) and illiteracy rates (l) while industrialization (i , g_2) is the most adequate predictor of social security coverage (s) at one or more points in time in the U.S. The indicators of educational linkages present problems in analysis similar to those encountered in Chile. The primary education ratio has been excluded for lack of a significant association with any variable. As was the case of primary education in Chile, in-

dustrialization (i) is negatively associated with secondary education (e_2) in the U.S. and, similar to Chile, higher education (e_3) is associated with income (w_1) in 1970. Rural-urban residence (a), the control variable, is weakly associated with higher education in 1960 but becomes dissociated in 1970.

A final comment on the causal model for the U.S. cases prior to analysis of the combined cross-cultural cases and the synthesis of conclusions based on these models is related to number of ports (p). The lack of association between access to marketing districts and the socio-political variables supports implications made concerning this variable in Brazil and Chile; i.e., its association with socio-political linkages in these nations may be due to its association with some industrial-economic linkage included or not included in this study. In the case of the U.S., an association--although weak--does appear with industrialization (g_4).

Brazil, Chile, and the U.S.: cross-cultural analysis

In the combined cross-cultural cases, there was an increase in provincial variations observed in all industrial-economic variables except percentage of the labor force in industry which remained relatively stable. Of the socio-political set, only secondary and higher education and social security coverage showed an increase in provincial variations cross-culturally.

By combining the cases of the three nations, the pattern of covariation of industrial-economic and socio-political variables at single points in time (see figure 5) is characterized by the following:

1. Educational linkages (e_1 , e_2 , e_3) have a positive association with

industrial-economic linkages and specifically industrialization (i), income (w_1 , w_4), and radios per capita (r). Therefore,

Research Finding: Co-variation of educational with industrial-economic linkages is substantiated by a positive association with industrialization and income in Brazil and cross-culturally (and with radios per capita cross-culturally); this association is inconsistent in Chile and the U.S.

2. Illiteracy (l) has a negative association with industrial-economic linkages and specifically industrialization (i), income (w_2), and radios per capita (r). Therefore,

Research Finding: Co-variation of illiteracy rates with industrial-economic linkages is substantiated by a negative association with: income in Brazil, Chile, the U.S., and cross-culturally; industrialization in Chile and cross-culturally; access to marketing districts in Chile; and radios per capita cross-culturally.

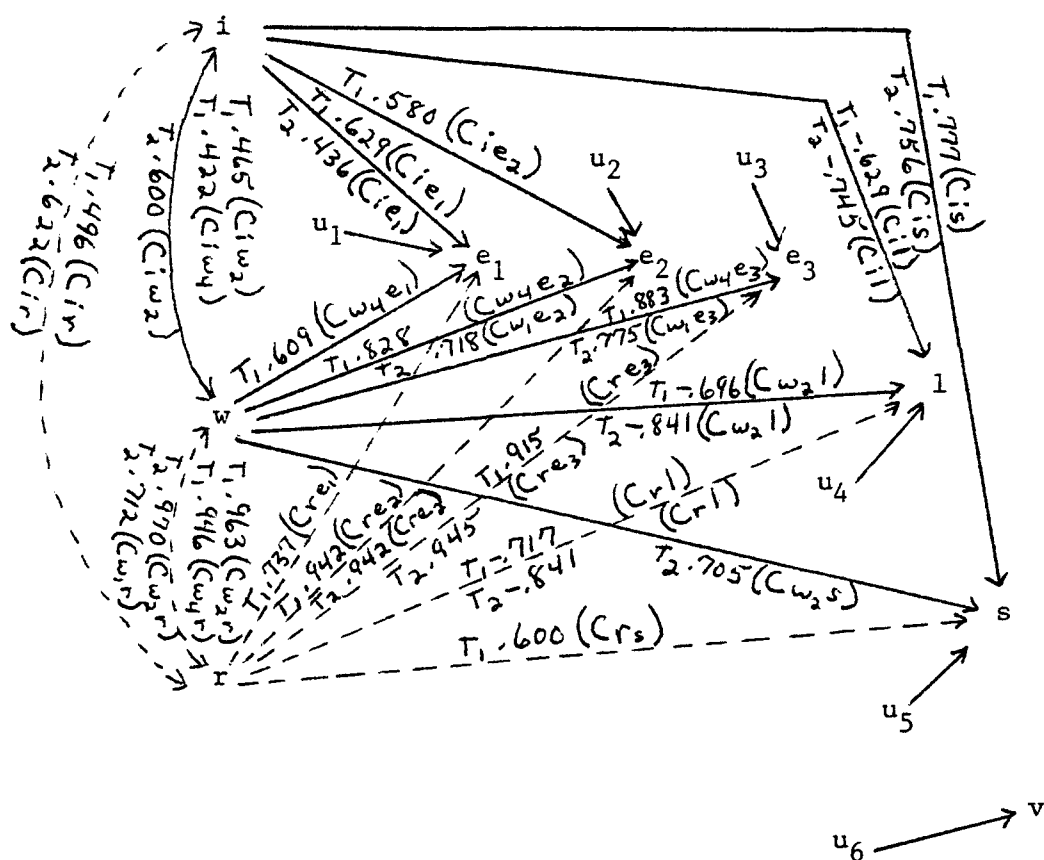
3. Social security coverage (s) has a positive association with industrial-economic linkages and specifically industrialization (i), income (w_2), and radios per capita (r). Therefore,

Research Finding: Co-variation of social security coverage with industrial-economic linkages is substantiated by a positive association with: industrialization in Brazil, the U.S., and cross-culturally; income in Brazil and cross-culturally; access to marketing districts in Brazil; and radios per capita cross-culturally. This co-variation was not observed in Chile.

4. Voter registration (v) is not significantly associated with industrial-economic linkages. Therefore,

Research Finding: Co-variation of voter registration with industrial-economic linkages occurs only in Chile where it has a positive association with industrialization and income.

Fig. 5. Causal model, selected variables from sets X, Y, and Z: cross-cultural analysis, 1960 (T_1) and 1970 (T_2)



i=Labor force in industry

w=Average annual income

w_1 =Average annual income in agriculture

w_2 =Average annual income in industry

w_4 =Average annual income in services

e_1 =Primary-school enrollment ratio

e_2 =Secondary-school enrollment ratio

e_3 =College enrollment

l=Illiteracy rates

s=Social security coverage

v=Voter registration as percentage of those eligible

$u_1, u_2, u_3, u_4, u_5, u_6$ =Error terms

C=First-order partial controlling for rural-urban residence

Regression analysis of the cross-cultural data at single points in time determined that linear equations were possible in the association of industrial-economic linkages with all socio-political linkages except voter registration. The mean values for the two sets of variables indicated a 1960-1970 increase in all but illiteracy rates (1) and the primary education ratio (e_1) which declined and industrialization (i) which remained relatively stable. Given these trends, it is suggested on the basis of the causal model that cross-time curvilinearity appears in relation to educational (e_1 , e_2 , e_3) linkages and to a lesser extent in the case of social security coverage (s).

Research Finding: In no case did direct examination of the residuals on scatterplots reveal any other type of linear relationship (i.e., a non-linear association). Although the effects of rural-urban residence were removed in causal analysis but were not in regression analysis, the effects of this control variable were strongest in relation to the association of educational with industrial-economic linkages in Chile and the U.S. It was also demonstrated that second-order partials controlling for ethnicity and rural-urban residence did not vary significantly from controlling only for rural-urban residence in the selection of variables for causal analysis. Therefore, on the basis of the observed decline in strength of association and/or a lack of association between the industrial-economic and socio-political linkages, the possibility is suggested that, where cases are provinces, the association between the two sets of variables within a nation may be linear at single points in time but curvilinear in cross-time analysis.

In the causal model for combined cross-cultural cases, the interaction between income (w_1 , w_2 , w_4) and industrialization (i) is again observed as is, in cross-time analysis, the role of income as an intervening variable in the association between industrialization and socio-political linkages, particularly in relation to education (e_2) and illiteracy (1). Omitting radios per capita (r) momentarily, at one or more points in time industrialization (i) is the most adequate predic-

tor cross-culturally of primary education (e_1) and social security coverage (s); income appears as the most adequate predictor of secondary (e_2) and higher (e_3) education and illiteracy (l). Referring to tables 13 and 19 (pages 151 and 161), industrialization (i) has first-order partials in 1970 of .569 with secondary education (e_2) and .502 with higher education (e_3). Given the comparison of these partials with the strength of association of income with each level of education, the tendency for industrialization--as it increases in level--to be most strongly associated with a higher level of education, and:

Research Finding: Interaction between income and industrialization is observed in association with primary education in Brazil, secondary education as well as illiteracy and voter registration in Chile, and education and illiteracy cross-culturally. This interaction does not appear in the causal analysis for the U.S.

Research Finding: Income is the most adequate single predictor of: primary education and illiteracy in Brazil; secondary education (1970) in Chile; higher education (1970), illiteracy in the U.S.; secondary and higher education and illiteracy cross-culturally.

Research Finding: Industrialization is the most adequate single predictor of: secondary and higher (income would also serve) education and social security coverage in Brazil; illiteracy and voter registration in Chile; social security coverage in the U.S.; primary education and social security coverage cross-culturally.

it is concluded that:

Research Finding: Selection between income and industrialization as the most adequate single predictor of socio-political linkages shifts concomitantly with changes in the strength of association between income and industrialization. The strength of association depends on the level of industrialization and specifically whether (referring to the 1960-1970 period) it is (1) accelerating as in Chile, (2) stabilizing as in Brazil, or (3) tapering off after reaching an advanced level as in the U.S. Respectively, income increases and industrialization declines as predictors of socio-political linkages.

Therefore,

Research Finding: The expectation that economic linkages are established prior to socio-political linkages is supported; i.e., when rural-urban residence as a line of differentiation is controlled (and/or differences decline), increases in income--an economic linkage--generated by industrialization in turn generate socio-political linkages within a specific population.

In the causal model of the combined cross-cultural cases, radios per capita (r) is most consistently associated (dotted lines indicate that findings are not definitive) with secondary (e_2) and higher (e_3) education and illiteracy (1); this coincides with the pattern of association between income (w) and the socio-political linkages. In addition, radios per capita (r) is more closely associated with income (w) than industrialization (i). It is therefore suggested that (1) as income increases, radios become more accessible and (2) the association of radios per capita with the socio-political linkages is primarily because of its association with income. The background literature supports this suggestion specifically in the observation that the rapid spread of communications as a twentieth-century phenomenon has not been so much a concomitant as it has been an obstacle to development by accelerating internal demands for change.

Voter registration is excluded from the causal model for the cross-cultural cases for lack of significant associations. It is one example of the need to evaluate the social indicators used in this study. The conclusions based on causal analysis are tentative. The findings do, however, permit revisions in the analytic model developed for this study.

Social indicators: evaluation

One of the objectives of this research was to determine whether percentage of the labor force employed in industry or percentage contributions of the major economic sectors to the G.N.P. would serve as a more adequate indicator of industrialization. If percentage of the labor force employed in industry and percentage contributions of the major economic sectors were indicators of the same phenomenon (industrialization), then it is expected that they would (1) be closely associated, (2) be similarly related to the socio-political variables, and (3) reflect the same trends over time, i.e., increase, remain stable, or decline. This is not the case. First, where an association of the four sectors does exist with labor force in industry, the closest and in most cases the only sector associated is the industrial sector with first-order partials (see tables 38-41 in appendix C) of .705 in 1960 and .704 in 1970 in Chile, .590 in Brazil in 1970, and .460 in the U.S. in 1970. Labor force in industry is not associated with any of the sectors in 1960 in Brazil and the U.S. or in the cross-cultural cases in 1960 or 1970. Secondly, the causal models illustrate that either labor in industry or sectoral contributions to the G.N.P. is selected as most adequate and, in those cases when both are included in the models, the strength of association with the socio-political linkages differs. Therefore, they do not have a similar relationship with the socio-political variables. Lastly, they do not reflect the same trends over time; the mean values for these variables in 1960 and 1970, as already noted, show that they differ within and among the three nations as to whether they decline, increase, or remain stable.

Sectoral percentage contributions to the G.N.P. depend in part on the history of growth of each sector, the current stage of industrialization, and the pattern of industrialization, i.e., the sequence in which each sector was emphasized prior to, during, and following rapid industrialization. The history of the major economic sectors in this sense is important as a background influence on the actual level and rate of, and obstacles to, industrialization. As an indicator of industrialization per se, the suggestion here is that it is the percentage contribution of the industrial sector that reflects growth or decline in industrial productivity, traditional versus advanced technology, and inefficient or efficient utilization of the labor force, i.e., industrialization. The mean values of the data on sectoral contributions to the G.N.P. in 1960 and 1970 indicate that the industrial sector was the most important in the three nations.

Percentage of the labor force in industry depends in part on (1) the availability of skilled labor, (2) the capacity of industry to absorb available labor, and (3) the level of industrialization, given that at more advanced levels the percentage of the labor force in industry declines as other economic sectors increase in importance. This variable was selected as the most or one of the most adequate indicators of industrialization in all causal models except that for Chile; the partial correlation tables show that it is significantly associated with socio-political variables in Chile even though it was not selected for inclusion in the causal analysis. Therefore, both industrial percentage contributions to the G.N.P. and labor force in industry can be used for national and cross-cultural analysis. The suggestion here,

however, is that industrial contributions to the G.N.P. is a more sensitive indicator of the actual level of industrialization whereas labor in industry reflects the stage of industrialization. There is an additional factor in the determination of which would be the most adequate indicator of industrialization; i.e., if a linear model is being used, it is suggested that industrial contributions to the G.N.P. is most adequate and, if a curvilinear model orients the analysis, labor force in industry would be the most adequate. Therefore,

Research Finding: The selection of adequate social indicators depends in part on whether the underlying analytic model for research assumes linearity or curvilinearity in the study of processes or sub-processes of development and change.

Two final suggestions concerning the use of percentage contributions of the industrial sector are that (1) as far as possible, industry should be defined as manufacturing and (2) percentage contributions should be stated in relation to total provincial income rather than G.N.P. which would reveal greater provincial variations and would be more consistent with the selection of provinces as the units of analysis.

Of the industrial-economic set of linkages only average annual income was significantly associated with all socio-political linkages in one or more nations. It has already been suggested that (1) income intervenes as the first type of functional linkage established by industrialization in the association of industrialization with socio-political linkages and (2) since ethnicity is an inadequate control variable, it can be replaced by white-collar versus blue-collar occupation as a line of differentiation. Support for the second suggestion

is seen in the selection for causal analysis of income variables that most frequently were either income in agriculture or income in services, i.e., the sectors in which income is lowest. Two conclusions concerning income are (1) the variable should be defined as average annual income rather than income in the major economic sectors to avoid multicollinearity and (2) average annual income should include both wage and salary earners rather than just wage earners as in this study, particularly if occupation is used as a control variable.

Access to marketing districts as indicated by number of ports was not found to be an adequate predictor of socio-political linkages. It is associated with industrialization in the U.S. but not in Brazil or Chile; the conclusion here is that this association in the U.S. reflects, as noted in the background information, that transportation networks in the U.S. were part of the industrial infrastructure rather than an obstacle to industrialization as has been the case in Brazil and Chile. This variable should therefore be relocated in the analytic model as a background factor influencing industrialization.

The problems encountered with radios per capita as an indicator of communications have been discussed in terms of its inadequacy for national analysis where provinces are the units of analysis. The necessity of relocating communications in the analytic model has already been implied in the suggestion that income determines access to communications which, in turn, possibly explains the strong associations of radios per capita with social linkages. An alternative indicator of communications for which provincial data would more likely be available in the three nations in this study is newspaper circulation which would

then also be influenced by literacy rates or educational level.

Decisions reached concerning the indicators of educational linkages used in this study are that (1) they are inadequate as social indicators and (2) a single indicator (i.e., of one dimensionality) of educational linkages is preferable. The interpretation of the association of primary- and secondary-school enrollment ratios with industrial-economic linkages was restricted by the interference of population growth particularly as this affects age structure. This is possibly the underlying reason why the rural-urban differences in primary education noted in the descriptive background were not substantiated in this study, especially for the Chilean cases. The association of higher education as a percentage of primary- and secondary-school enrollments was associated with the industrial-economic linkages although inconsistently. However, since the bottleneck in education tends to be at the secondary level in many nations, a single indicator of educational linkages preferably would concern this level. In addition, the causal models give a suggestion that the higher the level of industrialization and/or income, the higher the level of education with which they are most strongly associated. An alternative indicator of education for future research--where provinces are the units of analysis and published data are relied on--is total secondary-school enrollment of a cohort at a single point in time expressed as a percentage of the cohort's primary-school enrollment at a single point in time. This indicator would reflect relative educational attainment and retention rates; it would also avoid the problem of changes in educational structure as these affect data on enrollment at each level. If field re-

search is conducted in place of relying on published data, then the indicator suggested is average number of years of school completed by the population 25 years of age and over.

Illiteracy rates are considered to be adequate as a social indicator. Two changes are suggested concerning this variable for future research. First, it would be preferable to define the indicator as literacy rather than illiteracy rates; otherwise, that part of the analytic model dealing with the establishment of functional linkages must treat indicators of implied non-integration and integration simultaneously. Secondly, it is suggested that functional literacy would be a more adequate indicator than literacy which was found to be the case in the U.S. data in this study. Functional literacy reflects the strength of educational linkages and as such can also be used as an indicator of educational linkages if comparable data between nations can be collected.

Voter registration as defined in this study is inadequate as an indicator of political participation which has already been noted. It is suggested that this indicator be redefined for future research as votes cast (valid) in national elections as a percentage of the voting-age population. Since descriptive data demonstrates the impact of high illiteracy rates on voter participation and it was associated with secondary education in this study, political linkages also must be relocated in the analytic model.

Social security coverage was found to be an inadequate social indicator in part, it is suggested, because (1) it might more accurately

be defined as an economic rather than a social linkage and (2) coverage and the extent of coverage depend on legislation and government planning, not the level of industrialization per se. The capacity to finance social security programs, it is suggested, co-varies with industrialization and, given this assertion, over-extensive coverage is not concomitant to a high level of industrialization but rather it is an obstacle to industrialization as has been the case in Chile. A possibly more adequate indicator of social linkages to replace social security coverage for future research is suggested as the availability of health care and specifically the number of doctors per 100,000 population.

Additional findings concerning social indicators are based on the problem of multicollinearity encountered in this study and the following observations:

1. Social security coverage in Chile includes almost the entire labor force and is dissociated from industrial-economic linkages while this association is declining in Brazil and the U.S.
2. Education at the primary and secondary levels is expanding as is voter registration while the association with industrial-economic linkages tends to be declining
3. There was an overall decline 1960-1970 in the percentage of the variance explained, with few exceptions, in the socio-political variables in each nation and cross-culturally
4. As the urbanization process begins to taper off at a high level, the need to control for rural-urban residence declines
5. Different variables in many instances were selected as the most

adequate for causal analysis in 1960 and 1970 in each nation and cross-culturally while the cross-cultural combination of cases concealed differences among nations

6. The co-variation in cross-time analysis between two social indicators is necessarily affected when one of these, e.g., number of ports, does not substantially vary from time 1 to time 2 (which therefore reduces its usefulness as a social indicator)
7. The percentage contributions of the four major economic sectors to the G.N.P. were affected by the number of cases (50 in the U.S. versus 25 in Brazil and Chile) by defining these indicators in terms of the national rather than the provincial level of analysis

The conclusions are therefore that:

Research Finding: The adequacy of specific social indicators varies--depending on the level of national development--at different points in time within nations and cross-culturally.

Research Finding: Once the phenomenon represented by a specific social indicator becomes a predominant characteristic of a population, i.e., evenly distributed in relative terms, the usefulness of the social indicator lessens for national analysis although it might continue to be useful for cross-cultural analysis.

Research Finding: Where units of analysis are provinces within nations, different sets of social indicators need to be selected for (1) cross-time analysis within nations, (2) analysis at single points in time within nations, (3) cross-time, cross-cultural analysis, and (4) cross-cultural analysis at single points in time.

Research Finding: The selection of social indicators depends in part on research objectives. If the objective is generalization and theory construction, the same indicators must be selected for all nations in cross-cultural analysis. If the objective is social policy, different indicators must be selected by nation.

Research Finding: The definition of any specific social indicator must be one dimensional in order to maximize its usefulness.

Research Finding: Where units of analysis are provinces, the

definition of each social indicator must be in terms of the provincial level of analysis in order for the number of cases within each nation not to affect cross-cultural analysis; i.e., national-level indicators, e.g., G.N.P. or variables defined in relation to the G.N.P., do not serve as social indicators when provinces are the units of analysis.

In summary, the selection of social indicators for inclusion as industrial-economic and socio-political linkages in the revised analytic model includes: industrialization as indicated by percentage of the labor force in industry (curvilinear model) or percentage contributions of manufacturing to provincial income (linear model); average annual income of wage and salary earners; communications as indicated by newspaper circulation; educational linkages as indicated by secondary-school enrollment of a cohort as a percentage of the cohort's primary-school enrollment (for research based on secondary sources), average number of years of school completed by the population 25 years of age and over (for field research), or functional literacy; political participation as indicated by valid votes cast in national elections as a percentage of the voting-age population; and availability of health care as indicated by the number of doctors per 100,000 population.

The directionality of relationships

The strength of association between industrial-economic and socio-political linkages in the causal models tended to be weakest in the U.S. The mean values of the data for the three nations indicate in most cases that socio-political linkages are stronger, in relative terms, in the U.S. than in Brazil or Chile. Since the U.S. is at a more advanced level of industrialization, it is suggested--although not substantiated

in this study--that the association between industrialization and national integration is curvilinear. It has also been concluded that industrialization generates (1) economic linkages directly and (2) socio-political linkages indirectly through income and directly until more advanced levels of industrialization are reached.

In the revised analytic model in figures 6 and 7, one directionality continues to be assumed in the association of industrialization with socio-political linkages and income. Interaction, i.e., recognizing that income and socio-political linkages have an impact on industrialization (e.g., extreme income inequality or an excess of unskilled labor), is incorporated into the background context. The assumption of one directionality is also made concerning the relationship between income and socio-political linkages with the exception of educational linkages. Given the literacy requirement for voting in many nations and the relationship between income and level of educational attainment, income and education are therefore assumed to interact in generating political linkages. This reverses in part one expectation at the beginning of this study, i.e., that political linkages precede social linkages.

Background context: sources of variations

Functional linkages to the international system have a significant impact on the emergence and maintenance of variations among and within nations. Although Brazil, Chile, and the U.S. similarly began by being linked functionally to the international system as political and economic dependencies, the course of events in the on-going process of the redefinition of functional linkages from the sixteenth to

the twentieth century led to one basic line of differentiation of interest in this study. That is, by the twentieth century the U.S. was an industrial nation; Brazil and Chile were not.

In none of these three nations did economic independence accompany political independence. During the period of time extending from the Napoleonic Wars and their impact on the U.S. economy to the twentieth century, the realization grew and was confirmed by the 1929 world-wide depression that national economies within the international system were not independent but rather were, and must be, interdependent. That industrialization had to be a planned process in Brazil and Chile was one consequence of their being caught up in the rapid industrialization of Western Europe and the U.S. as suppliers of raw materials, markets for manufactured goods, and sources of capital investment by nations such as the U.S. concerned with maintaining a rapid rate of national economic growth. Although Brazil and Chile were world powers politically, their economic links to the international system had not substantially changed from the sixteenth to the twentieth century.

Small industry had emerged in Brazil and Chile prior to the twentieth century but the industrialization process did not begin to accelerate until import substitution in this century. The problems or obstacles faced by the three nations in this study prior to and during industrialization are similar and yet different. It is not the fact that industrialization occurred earlier in the U.S. that differentiates its experience from that of Brazil and Chile. Rather, it is the sequence of certain events that is important, e.g., formation of an

industrial infrastructure prior to and not during industrialization, emergence of national entrepreneurship prior to and not after the dominance of the multinational corporation, growth of the tertiary sector after and not prior to the growth of the secondary sector, rapid urbanization concomitant to and not prior to industrialization, rapid population growth after and not prior to or during periods of rapid economic growth, emergence of internal demands for change during and not prior to rapid industrialization, and concentration of landownership after and not prior to growth in agricultural production. "Cooperation in development" among nations in this century has been limited by the conflict that often emerges between the goals, e.g., of the U.S., to maintain rapid economic growth and, e.g., of Brazil and Chile, to industrialize. As Brazil, Chile, and other Latin American nations found themselves moving increasingly toward the periphery of the international system, the "Latinization" Movement began and, concomitantly, the role of international organizations has become increasingly important.

This study, however, is not one of contrasts but of differences in degree. The functional linkages of nations to the international system contribute to variations not only cross-culturally but also within nations. The mean values of the provincial data for the three nations in this study tend to reflect national trends noted in the literature although provincial variations were observed to be undergoing change (increasing or declining) in many instances. Thus, given the historical context of this research, influences on both industrialization and national integration that have contributed to cross-cultural and to provincial variations concerning the nations in this

study are in the following areas:

1. Economy. Differences in the degree to which: the different economic sectors are emphasized, a domestic market exists, a modern technology and skilled labor force are available, self-sufficiency in agriculture exists, the balance of trade is favorable, resources and production are nationally owned and/or controlled, transportation and communications networks represent one component of the industrial infrastructure, marketing districts are accessible, trade relations expand, economic growth is relatively even, all regions are included in development planning, and the capacity to finance reform legislation expands.
2. Political system. Differences in the degree to which: the political elite responds effectively to demands for change, the system is centralized and/or authoritarian, the military is involved in the decision-making process, a mass-party system has evolved, the transition in power is abrupt or smooth, sectionalist differences are reduced, and suffrage expands.
3. Demographic and ecological change. Differences in the degree to which: migratory movements contribute to industrialization, the population has a relatively even distribution, population growth rates decline, and city primacy is reduced.
4. Educational system. Differences in the degree to which: education is universal, retention rates increase, higher education is available, and specialization contributes to development.
5. Stratification system. Differences in the degree to which: the plantation system continues to have an impact, the two-class system

has expanded, restrictions to social mobility are removed, the middle class plays a role in reform or identifies with the upper class, class conflict exists, and extreme income inequality has been reduced.

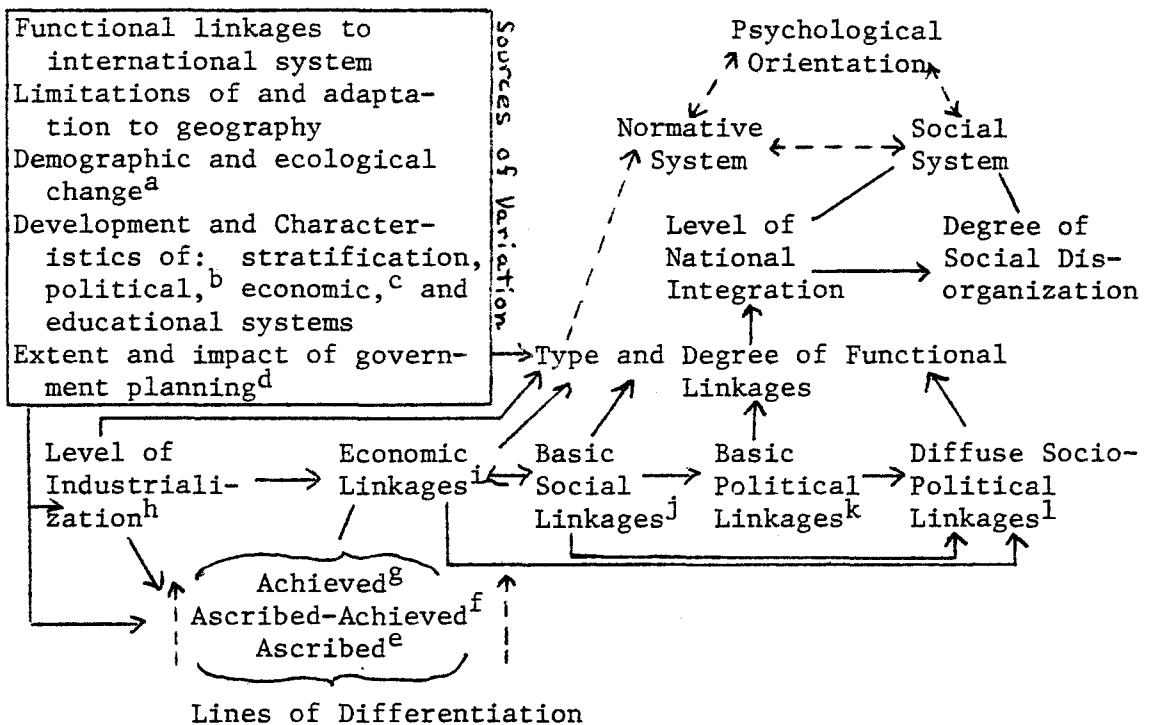
6. Geography. Differences in the degree to which: basic resources for national needs are available, priority resources for international needs are available, barriers to international and/or inter-provincial contact exist, natural water routes are available, and natural disasters have an impact on economy and society.

Although far from comprehensive, this listing of background contextual factors supports the decision not to basically revise this section of the original analytic model although some changes were made in the ordering of factors.

The revised analytic model

Figure 6 presents the general revised analytic model incorporating suggested variables, sources of variation or contextual factors, and the proposed direction of relationships based on the findings from this study. Lines of differentiation are shown as moving from predominantly ascribed to ascribed-achieved and lastly to achieved. The impact of industrialization on lines of differentiation and functional linkages is primarily through its relationship with income. Economic, social, and political functional linkages associated with industrialization are viewed as being the most basic or minimum to fulfill national system needs after which more diffuse linkages are gradually generated. The type and degree of functional linkages define the level of national

Fig. 6. General revised analytic model for cross-cultural research on industrialization and national integration*



*Unbroken lines indicate the path of interest in this research.

^aPopulation growth and distribution; migratory movements.

^bIncluding administrative divisions, civil conflicts, party system, characteristics of political elite.

^cIncluding history of major sectors, transportation and communications networks, access to marketing districts, inflation, real income per capita.

^dIncluding legislation related to economy, polity and society.

^eFamily background, ethnicity, sex, religion.

^fRural-urban residence.

^gOccupation (blue collar - white collar).

^hPercentage of labor force in industry (curvilinear model) or percentage contribution of manufacturing to provincial income (linear model).

ⁱAverage annual income of wage and salary earners; newspaper circulation.

^jSecondary-school enrollment as percentage of cohort's primary-school enrollment, average number of years of school completed by population 25 years of age and over or functional literacy; number of doctors per 100,000 population.

^kValid votes cast in national elections as percentage of voting-age population.

^lMembership in voluntary associations or interest groups.

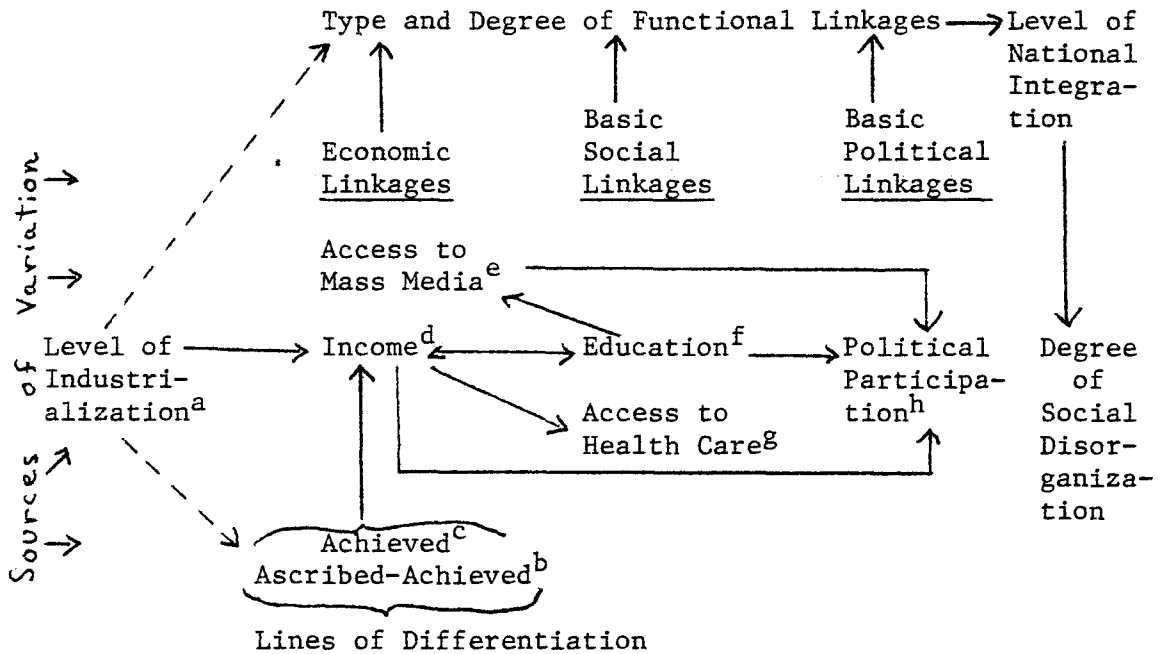
integration at any point in time which in turn is suggested to be directly associated with the degree of social disorganization.

Figure 7 illustrates the specific analytic model proposed for future research that, although different directions in associations are proposed, is largely repetitive of this study in order to confirm or reject inconclusive findings by incorporating social indicators considered to be more adequate than those used in this study. Rural-urban residence is redefined as an ascribed-achieved rather than ascribed characteristic and, as suggested, is viewed together with occupation as necessary control variables. Contrary to one expectation in this study, basic social functional linkages are located in the model as occurring prior to basic political functional linkages.

At this point, it is concluded that national integration is a concomitant of industrialization and, considering the causal analyses of the three nations in this study, it is further concluded that the overall expectation has been supported, i.e., that only at very high levels of industrialization does an economically, socially, and politically integrated society emerge. None of the three nations in this study can be defined as highly integrated.

The suggested relationship between industrialization and national integration needs to be confirmed by further research based on more adequate social indicators and the proposed association between economic and socio-political linkages must be clarified. Theoretical propositions to orient future research are presented in the final chapter.

Fig. 7. Revised analytic model for proposed cross-cultural research on industrialization and national integration



^aPercentage of labor force in industry (curvilinear model) or percentage contribution of manufacturing to provincial income (linear model).

^bRural-urban residence.

^cOccupation (blue collar - white collar).

^dAverage annual income of wage and salary earners.

^eNewspaper circulation.

^fSecondary-school enrollment as percentage of cohort's primary-school enrollment, average number of years of school completed by population 25 years of age and over or functional literacy.

^gNumber of doctors per 100,000 population.

^hValid votes cast in national elections as percentage of voting-age population.

Summary of Research Findings

Of the industrial-economic set of variables in this study, industrialization, as indicated by percentage of the labor force employed in industry in 1960 and 1970, shows an increase in Chile and a decline in the U.S. whereas insignificant change is observed in Brazil and the combined cross-cultural cases. Industrialization, as indicated by percentage contributions of the major sectors (agriculture, industry, commerce, services) to the G.N.P. in 1960 and 1970, shows an increase in industry and commerce in Brazil, in industry and services in Chile, in services in the U.S., and in commerce, industry, and services in the combined cross-cultural cases; a decline or insignificant change was noted in the other sectors for each nation. The number of ports increased only in Brazil. Income in the four major economic sectors increased in the three nations. Communications, as indicated by radios per capita, can be analyzed only in the combined cross-cultural cases due to the lack of data at the provincial level.

Provincial variations increased 1960-1970: in labor force in industry, percentage contribution of commerce to the G.N.P., income in agriculture and services, and number of ports in Brazil; in percentage contribution of industry and services to the G.N.P. and income in the four sectors in Chile; in percentage contributions of services to the G.N.P. and income in the four sectors in the U.S.; and in the percentage contributions of all sectors except agriculture to the G.N.P., radios per capita, number of ports, and income in the four major sectors in the combined cross-cultural cases. Provincial variations for other variables in each nation either decreased or remained relatively stable.

Of the education indicators--as part of the socio-political set of variables in this study--only higher education shows an overall increase in the three nations and cross-culturally although relatively stable in Brazil; the primary-school enrollment ratio declined in the U.S. and cross-culturally but increased in Brazil and Chile; the secondary-school enrollment ratio increased except in Chile. Illiteracy declined in the three nations and cross-culturally. Social security coverage and voter registration increased in the three nations and cross-culturally. Provincial variations increased 1960-1970 in: the primary-school enrollment ratio in Brazil (slightly); the secondary-school enrollment ratio in Brazil, the U.S., and cross-culturally; higher education in Brazil (very slightly), Chile, the U.S., and cross-culturally; illiteracy in Brazil; social security coverage in all cases. In all other cases, the provincial variations declined.

In spite of its importance to this study, ethnicity was excluded as an inadequate control variable because of the unreliability and/or lack of data at the provincial level. Rural-urban residence remained as a control variable; it was found to be significantly associated with the industrial-economic variables (except number of ports and radios per capita) and the socio-political variables. Although of declining importance in the U.S., rural-urban differences, contrary to much of the existing literature, continue to exist. Rural-urban residence is not associated with all variables in all three nations in this study but it must be controlled because of its effects on the relationship between some of the variables. The 1960 and 1970 data show an overall increase in the percentage of the population living in cities of 20,000 or more

in the three nations. Provincial variations appear to be declining in Brazil and Chile in contrast to the increase in variations in the U.S.

Regression analysis shows that linear combinations of the industrial-economic and socio-political sets of variables based on zero-order correlations are possible for research at single points in time except in the case of social security coverage in Chile (1960 and 1970) and voter registration in the U.S. (1970). The set of variables on which the socio-political set was regressed was most useful (in terms of percentage of variance explained) for the Brazilian cases, less useful for the Chilean cases, even less useful for cross-cultural analysis, and least useful for the U.S. cases.

In general, it was found that the industrial-economic and socio-political functional linkages do co-vary. When controlling for rural-urban residence, there is a significant association with the socio-political set of variables (in one or more nations in this study and cross-culturally) of industrialization as indicated by labor force in industry, industrialization as indicated by contributions of the major economic sectors to the G.N.P., communications as indicated by radios per capita (but not with voter registration), number of ports (but not with secondary-school enrollment ratio, higher education, or voter registration), and average annual income in the major economic sectors. The only element of the industrial-economic set significantly associated with all socio-political variables is average annual income.

The findings in this study are inconclusive because of the problems encountered with multicollinearity and inadequate social indicators. Still, the causal analysis based on first-order partial correlations

controlling for rural-urban residence tends to support the expectation that industrialization breaks down lines of differentiation within a specified population increasingly on the basis of achievement rather than ascription by first generating economic functional linkages. Economic functional linkages, specifically increases in income, were found to generate basic social and political functional linkages. The possibility was suggested, contrary to one of the expectations of the study, that social linkages (specifically educational) with income and the communications linkages generated by income jointly operate to generate basic political linkages.

The decision to use provinces as the units of analysis proved to be beneficial in this study. The combination of the provincial cases of the three nations into a cross-cultural subfile led to the observation that variations among nations were concealed in many instances both for industrial-economic and socio-political variables. It was suggested that, where cases are provinces, the association between the two sets of variables within a nation may be linear at single points in time but curvilinear in cross-time analysis. The implication is that the adequacy of any particular set of social indicators will depend in part on whether the underlying analytic model assumes linearity or curvilinearity in the study of processes or sub-processes of development and change. If the phenomenon represented by a specific social indicator has become evenly distributed, in relative terms, within a population, its usefulness as a social indicator lessens for national analysis although it might continue to be useful for cross-cultural analysis; therefore, the selection of adequate social indicators also depends in part on the

level of national development. This implies the need for different sets of indicators depending on whether research is at the national or cross-cultural level and whether it is at one or more points in time. Additionally, the adequacy of any set of indicators will depend on the research objectives; if the objective is generalization and theory construction, the same indicators would have to be used in cross-cultural research but, if the objective is to formulate social policy at the national level, different indicators would have to be selected for each nation.

Aside from the observed interaction between income and education, one directionality was assumed in the revised analytic model, given the necessity of including the context of background influences on the relationship between industrial-economic and socio-political linkages in cross-cultural research. Inadequate social indicators were excluded and replaced by a new set for future research. In addition, it was suggested that both rural-urban residence and occupation (blue collar - white collar) be controlled as lines of differentiation based, respectively, on ascribed-achieved and achieved characteristics. The overall conclusion of the study is that national integration is a concomitant of industrialization in its accelerating and stabilizing phases after which national integration becomes more closely associated with the combined effect of existing economic, social, and political linkages than with industrialization. These conclusions apply only to the Western Hemisphere.

CHAPTER VI

IMPLICATIONS OF FINDINGS FOR SOCIOLOGY

Implications for Theory

The following theoretical propositions applicable at this point only to the Western Hemisphere are presented for future research concerning the relationship between industrialization and national integration:

- 1:1 The component parts of the international system are interdependent nations, identifiable individually by their distinct political-geographic boundaries.
- 1:2 Maintenance of the international system in the twentieth century is mediated through cooperation in development and conflict resolution.
- 1:3 The needs of the international system for system maintenance through cooperation in development and conflict resolution change as world development increases and as economic and political polarization becomes increasingly multi-directional.
- 1:4 The position of any nation within the international system at any point in time is defined by its capacity to contribute toward the fulfillment of international system needs.
- 1:5 The capacity of any nation to contribute toward the fulfillment of the international system's development needs at any point in time is determined by the needs of the international system and by the nation's economic resources, the extent to which these

resources are nationally owned and/or controlled, whether these resources are raw materials and/or manufactured products and/or capital, whether available raw materials are more vital to national or international needs or to both, and the extent to which the nation is economically dependent on another nation or nations, i.e., the capacity of the nation to fulfill its national system needs and the type of economic ties of the nation to the international system.

- 1:6 The capacity of any nation to fulfill the national system's development needs is determined by its ties to the international system and ties within the national system. The ties within provinces and of provinces to the nation determine the provincial capacity to contribute toward the fulfillment of the national system needs.
- 2:1 Those ties established to fulfill national and international system needs are called functional linkages.
- 2:2 Functional linkages break down existing lines of differentiation between and within nations.
- 2:3 By breaking down successively existing lines of differentiation such that former lines of differentiation are weakened, functional linkages eventually generate national and international integration.
- 3:1 Lines of differentiation within a specified national population are first defined on the basis of ascribed characteristics (e.g., ethnicity, religion, sex, family background).
- 3:2 As lines of differentiation based on ascribed characteristics are broken down, they are gradually replaced by differentiation defined

on the basis of ascribed-achieved characteristics (e.g., rural-urban residence).

- 3:3 As lines of differentiation based on ascribed-achieved characteristics are broken down, they are gradually replaced by lines of differentiation defined on the basis of achieved characteristics (e.g., occupation) which are then, in a continual process, redefined along increasingly more narrow lines.
- 3:4 Once lines of differentiation are predominantly based on achieved characteristics, the remaining--although weakened--lines of differentiation based on ascribed and ascribed-achieved characteristics are called cultural residues; i.e., they are dysfunctional to the fulfillment of national system development needs.
- 4:1 Development is an economic, political, and social process in which industrialization and integration are sub-processes.
- 4:2 The process of industrialization has far-ranging social and economic consequences that originate in the role of industrialization in breaking down existing lines of differentiation through the establishment of functional linkages.
- 4:2:1 At the onset of, and acceleration in, industrialization, it is functional to the fulfillment of national system needs that extreme income inequalities be reduced to make possible the emergence of a mass domestic market, that there be an adequate supply of skilled labor and high-level manpower for industrialization to accelerate more rapidly, that the cost of social and public health services to the central government be reduced to allow more capital to be directed toward industrialization, and that

potential disruption from increasing internal demands be avoided to facilitate industrialization in an atmosphere of relative social and political stability.

- 4:2:2 Industrialization contributes to the fulfillment of national system needs by generating basic economic, social, and political functional linkages, e.g., increases in the level of income, education, health, and political participation, and thereby breaking down existing lines of differentiation.
- 4:2:3 Industrialization first establishes basic economic functional linkages and specifically increases in income. By so doing, industrialization breaks down existing ascribed and/or ascribed-achieved lines of differentiation which are gradually replaced by differentiation on the basis of achieved characteristics and specifically occupation.
- 4:2:4 As long as industrialization is accelerating, industrialization and income operate jointly to generate basic social functional linkages such as education and health care. Once basic social functional linkages are established, they, in combination with industrialization and income generate basic political functional linkages, e.g., increases in voter participation in national elections as a percentage of the voting-age population.
- 4:2:5 In spite of variations within and between nations and the notion that governmental planning in the twentieth century can achieve in a single decade what previously evolved over a much longer period of time, planned industrialization in the Western Hemisphere can and does generate functional linkages in the same

manner as has industrialization, e.g., in the U.S.

4:3 Basic economic, social, and political functional linkages, once established, exert an independent influence on the establishment of additional functional linkages.

4:3:1 Once established, basic economic functional linkages (income) generate other economic linkages, specifically functional linkages to communications or mass media.

4:3:2 Once established, basic social linkages (education) contribute toward generating functional linkages to mass media and, jointly with economic linkages (income and mass media), generate basic political functional linkages (voter participation).

4:3:3 Once established, basic economic, social, and political linkages generate increasingly more diffuse socio-political functional linkages.

4:3:4 As industrialization stabilizes or tapers off at an advanced level, it is the existing--and first of all increases in income--basic functional linkages rather than industrialization that generate new economic, social, and political functional linkages.

5:1 National integration is that process which, due to the establishment of functional linkages generated by industrialization, consists in the redefinition of lines along which a population within political-geographic boundaries is differentiated such that there is a weakening of former differences based predominantly and consecutively, as the level of industrialization increases, on ascribed, ascribed-achieved, and achieved characteristics.

5:2 Variations in the level of national integration among and within

nations at any point in time stem from differences in the type and degree of functional linkages and type of lines of differentiation that exist.

- 5:3 National economic integration in the twentieth century begins to emerge first because of the functional linkages established by industrialization which is, first of all, an economic process and reinforced by the emphasis on economic linkages of the nation to the international system through organizational (regional and international) cooperation in development and priorities of national governments in the emphasis on autonomous economic decision making to reduce the role of the multinational corporation and other nations in the national economy.
- 5:4 National integration in the Western Hemisphere is a concomitant of industrialization--whether planned or unplanned--in its accelerating and stabilizing phases. However, a highly integrated society (economically, socially, and politically integrated) does not accompany the beginning of an advanced level of industrialization. Rather, it is an "ideal" potentially possible only at some as yet undetermined highly advanced post-industrial phase. Therefore, the relationship between industrialization and national integration is curvilinear cross-culturally and, over time, nationally.
- 5:5 The degree of effectiveness of national planning for development depends in part on whether or not it occurs in the light of national system needs. Premature expansion of any type of functional linkage through government planning which may or may not be a response to internal demands can lead to over-integration economi-

cally, socially, and/or politically which, in turn, becomes an obstacle to development and the sub-process of industrialization whether it is accelerating, stabilizing, or tapering off at an advanced level.

5:6 Social, economic, and political changes occur at different rates within nations which may give rise to under-integration and/or over-integration.

5:7 The level of national integration at any point in time gives rise to social disorganization because of (a) economic, social, and political functional linkages that begin at different times and expand at different rates, (b) continuing lines of differentiation some of which are cultural residues, and/or (c) over-integration economically, socially, and/or politically, concomitant to the increase in internal demands for change that accompany and follow rapid industrialization.

The implications for sociological theory of the research findings, the revised analytic model, and the above theoretical propositions designed to orient future research revolve around basically one assertion, i.e., that the construction of a theory of development is eventually possible. First, the procedure of formulating intermediate-level theoretical propositions based on research of the sub-processes of development with the intention of gradually constructing a universally applicable global theory appears to be an advantageous one. Second, there is some evidence to support the implication that the use of basic concepts, e.g., functional linkage, permits the discovery of common threads in the experiences of nations in the development process in spite of differ-

ences in the sequence of specific events and other sources of variation among nations. Third, the process of discovering these common threads is facilitated in cross-cultural research by focusing on the differences in the degree to which specific characteristics and/or trends occur rather than contrasts in experiences; this approach does not ignore nor should it ignore that nations' experiences in development have been different given that the sources of differences in degree are also sources of contrasts. The conclusion that the adequacy of specific social indicators differs by nation and by time period reflects the notion that development is a multilinear process. Fourth, if common threads can be discovered by using basic concepts such as functional linkage, the possibility also exists that many of the existing theories, models, and concepts related to development such as modernization theory, the dependency model of development, and the concept of multilinear evolution may in the end be incorporated as useful components into a theory of development. Last, macro-sociological theory has focused on nations as units of analysis; there is evidence in this study to suggest that this may have been, up to this point in time, one obstacle to fuller comprehension of development and its sub-processes, e.g., industrialization and national integration, as well as to theory building. The use of smaller units of analysis, i.e., provinces, in this study raises two questions concerning the nature of the relationship between industrialization and national integration and, in more general terms, the nature of the development process itself given that the suggested sources of provincial variations related to these two processes within nations are comparable to sources of variation among nations. Specifically, is the

relationship between these two sub-processes of development linear within nations at single points in time and curvilinear in cross-time and/or cross-cultural analysis? If so, why?

Methodological Problems

One methodological problem encountered in this study that has not yet been discussed as a problem per se concerns the units of analysis and specifically the question of appropriate procedure in cross-cultural research using provinces as the units of analysis when some, but not all, of the nations included in the study have a federal district. An argument can be made in favor of assigning to federal districts--where they exist--the status of provinces given that their social, economic, and political characteristics often vary significantly from those of provinces within a nation. Of the nations in this study where this problem appeared (Brazil and the U.S.), a stronger case can be made for treating Washington, D.C.--in contrast to Brasília--as a separate entity since it exists totally outside of provincial boundaries. Support for this approach can be found in Brazil where the former capital (Rio de Janeiro) was given provincial status (Guanabara State) once Brasília was inaugurated as the new capital. On the other hand, Brasília is in the interior of, rather than adjacent to, Goiás and has been influential in the transformation of the predominant characteristics of Goiás. This might lend support to a position of not treating federal districts as separate entities. However, to use a single criterion consistently, it is suggested that federal districts be treated separately in future cross-cultural research, i.e., that they be treated as a unit of analysis equal to the status of provinces.

Other methodological problems encountered during this research have been discussed in varying degrees. They pertain directly to one set of problems related to social indicators, i.e., how to use existing data. The solution to difficulties introduced by assigning the national rate of radios per capita to each province in the three nations is obvious, i.e., select a different indicator for which provincial data are available. If indicators of a particular phenomenon for which data exist are found to be inadequate, it is preferable to then omit that phenomenon from cross-cultural research until a field-study phase can be undertaken. The interference of multicollinearity and its effect on the findings in this study illustrate the importance of careful selection and/or definition of social indicators and particularly the requisite that definitions be of one dimensionality; this problem emerged in this study in the case of average annual income in and contributions to the G.N.P. of the major economic sectors. However, the significant associations found among different elements of the industrial-economic set are not considered a problem of multicollinearity; rather, this is a case of close associations because of economic linkages generated by industrialization.

Lastly, methodological problems related to the use of existing data for cross-cultural research pertain to the comparability and reliability of data collected from secondary sources. These problems are:

1. In official sources of data, e.g., national censuses, of different nations or of one nation at different points in time, data collection may be on a de jure or de facto basis which reduces the comparability of data when provinces are the units of analysis.

2. Census data and other data collected by official agencies are frequently collected at different points in time; e.g., agricultural, manufacturing, and other specialized censuses are usually done in years other than the population census year in the three nations in this study. This reduces the comparability of data within and between nations when the selection of specific time periods is important to the achieving of the research objectives. In this study, the data on production and income in the major economic sectors and school enrollment data were affected in particular with data pertaining at one extreme to 1959-1960 and 1968-1970 at the other extreme in the three nations. As already noted earlier, voter participation data were even more strongly affected but, in this case, more so by the decision to select national election years within or as close as possible to the 1960s decade. The consequences include not only a reduction in comparability but also, e.g., the failure for certain trends to appear in the data as is the case with the estimated 23 per cent annual increase in university enrollments in Brazil that began in 1970. A related issue is the fact that collection of data at two points in time conceals fluctuations--both in the data and in indices that have been developed--during the interim period. One possible solution where yearly data exist, as is the case particularly with economic statistics, is to use averages of, e.g., five-year periods, as the points in time for cross-time analysis; this, however, is not a solution in the case of indicators for which yearly data are not available. In addition, if both types of indicators are used in a study, it is preferable not to

combine these two methods since the reliability of the findings would be reduced. The development and use of indices (single or composite) for social data would reduce but not eliminate this problem given that indices also fluctuate although to a lesser degree; it is an alternative that should continue to be considered.

3. Data collected by official agencies reflect what the nation, certain national or provincial agencies, and/or the government selectively define as important. One consequence is that all nations do not collect the same data which limits the selection of, and adequacy of many, social indicators for cross-cultural research based on existing data. A second and related consequence is the issue of whether or not to include missing cases that may be provinces within nations or nations in cross-cultural analysis. This issue is raised in this study in relation to provincial voter registration data in the U.S. Since missing cases were included (i.e., where voter registration is not required), this becomes one possible reason for the lack of a linear equation in searching for an explanation of voter participation in the U.S. To avoid the interference of this problem in future research, missing cases should be excluded or a different social indicator for which data are available for all provinces should be selected. A third consequence of the selective nature of data collection by official agencies was, in this study, the necessity of excluding ethnicity as a control variable; the rather obvious conclusion here is that, once a line of differentiation within a population has been obliterated officially, then official sources of data cannot be used if the researcher is seeking

to discover whether or not that particular line of differentiation continues to exist.

4. The data in censuses or other official publications released by national agencies are often estimates and/or based on sample data. In addition, data not infrequently in these sources pertain only to "reporting institutions," a situation signifying in a sense accidental or biased sampling which should therefore be treated as such. The comparability of cross-time national or cross-cultural data is reduced if the procedure for estimates and/or sampling changes as is often the case. Reliability of the data is reduced when data refer only to reporting institutions and when error introduced into the data by the procedures used for making estimates or sampling is not calculated and/or not made available to those who use the data.
5. The official sources of data and specifically censuses in all three nations in this study disproportionately exclude certain segments of the population, e.g., the Amerind population in Brazil and Chile and the non-white (especially males in the young-adult age group) in the U.S. Additionally, it has already been noted that Brazilian census data often represent only urban data which, at any rate, are more reliable than data for rural areas. Distortion of the data and particularly the effect on reliability is apparent under both these circumstances.
6. Existing literature, e.g., case studies, on specific nations can often serve as a source of data for U.S. researchers if, as in this study, the data represent census data from these nations that would otherwise be unavailable in the U.S. Particular caution needs to

be exercised, however, since these sources do not always indicate if they are relying on population figures, sample figures, estimates, or projections. For example, 1970 provincial data pertaining to percentage of the population living in cities of 20,000 or more in Brazil and Chile that are available in studies of these nations are frequently based on projections that were, especially for Brazil, extreme underestimates. As a consequence, these sources frequently present different figures for the same variable in the same year. In this study, official sources of data for the three nations were relied on predominantly; when these were unavailable, other existing studies were used only if both the sources and type of data were clearly identified and the reliability of the studies could be cross-checked. Reliability was cross-checked by comparing those data that appeared both in the studies and in census data available in the U.S. This remains, however, one source of error in this research. The problem of the unavailability of published data on other nations to U.S. researchers within the U.S. is a real one.

The above problems are all serious sources of error in this study. A related problem and additional source of error indicated early in the study is the variation among nations in urban classifications and in the definition, e.g., of the service sector. Lastly, one of the major sources of error in this research relates to the possibility that some or all of the variables eliminated prior to causal analysis should have been left in the study.

When data for selected and/or newly developed indicators are unavailable within the U.S. to researchers interested in cross-cultural

research thus requiring travel to other nations, it then becomes propitious to do field research in addition to utilizing published data. There is much to be said in favor of simultaneously using both types of sources of data. On the one hand, field research carries its own set of potential pitfalls but does avoid problems associated with the use of published data, allows the researcher greater freedom in the selection and/or development of social indicators, and permits more control over the type of data collected as well as sources of error. On the other hand, some data are available only through the use of secondary sources, e.g., provincial internal income or votes cast in national elections; the reliability of these data can be checked in part by comparison with findings from field research or, when militarized regimes are included, with observations made by foreign observers within the nation.

Given the main concerns of this study and similar types of cross-cultural research topics, the primary disadvantage of field research is its costliness particularly when units of analysis are provinces and the adequacy of commonly used social indicators is questioned. It is therefore suggested that research based on published data serves, and should continue to be done, to refine the analytic model in this study (or others that have been developed in several fields) and to select the most adequate of available social indicators as well as develop and test indices (single or composites) for use as social indicators. Once these objectives have been achieved, subsequent cross-cultural field research combining the use of primary and secondary sources will then be more productive.

One final comment on problems related to the selection of indicators concerns the importance of government planning today. Indicators must be defined in such a way so as to reflect but not distort the impact of government planning. As an example, the primary- and secondary-school enrollment ratios used in this study were defined as inadequate social indicators. These ratios contributed to the inconclusiveness of the research findings in part because they were affected by, rather than a reflection of, the impact of educational reform in Chile during the 1960s. The suggested alternatives to these indicators, e.g., average educational level attained by persons 25 years of age and over or functional literacy, serve as illustrations of indicators that will reflect the impact of reform over time but the indicators will not themselves be affected by that reform. In sum, the objective is not to explain the indicator but to explain trends in society over time as measured by the indicator. In turn, when the reliability and comparability of social statistics used as social indicators are reduced, it follows that their validity as social indicators declines.

The methodological problems related to cross-cultural research based on published data alone or in combination with field research and to the discovery of adequate social indicators affect commonly used longitudinal research designs in cross-cultural analysis, e.g., the quasi-experimental, cross-lagged comparison and, of particular interest for the topic of this study, panel analysis. To the extent that research findings continue to be distorted by these problems so too will they be inconclusive and thus an obstacle to theory construction. In turn, plausible solutions to these problems at this point in time have

several implications for cross-cultural research on development and its sub-processes.

Implications for Future Research

The following discussion of implications that the findings as well as problems encountered in this study have for future research limits itself to: (1) research that uses and attempts to determine the adequacy of social statistics as social indicators (including social, economic, and political data); (2) concerns cross-cultural and/or longitudinal analysis specifically within the Western Hemisphere; and (3) uses a central explanatory concept susceptible to measurement as a basis for an analytic model guiding the research.

Given the research findings, methodological problems, and suggestions made in this study, the closely interrelated implications for future research are as follows:

1. Implicit in the suggestion that research continue to concentrate on analyzing available social statistics to be followed by field research later is the need to prepare the groundwork now for future field research. On the one hand, de Neufville (1975:10, 44-45, 241-243) describes the process of formulating adequate social indicators as a complex one covering several years from the conceptualization of an indicator to its full acceptance. The nature of this process thus provides support to the assertion that it is requisite to consider future field research needs while developing both social indicators and analytic models. On the other hand, social statistics vary in the degree to which they represent social, economic, and political reality particularly when the problems associated with the

use of these data are considered as is the awareness that this reality is constantly changing. Only through direct observation, where this is possible, can the researcher check the accuracy of social indicators, the association between social indicators, and the analytic models based on the use of available data. The analytic model, i.e., its components, and at least some of the social indicators must therefore be directly observable in field research.

2. Since the question was raised concerning the possibility that development and the association between sub-processes of development vary depending on the units of analysis, more research should be done using provinces as units of analysis. More cross-time research is needed both within nations and comparing nations. Future research must also focus on the possibility of including assumptions of both linearity and curvilinearity in analytic models pertaining to the study of development and/or its sub-processes; the difference in these assumptions may be the difference between static and dynamic models but this has yet to be determined. Additionally, once an analytic model has been designed, there is a need for much more longitudinal national and cross-cultural research of the type described above.
3. Underlying this necessity for more research is the need to continue in the direction of developing analytic models that incorporate specific indicators. Consensus exists in that social indicators must be grounded in theory (de Neufville, 1975:10, 58-69, 242; also see Wilcox, et al., 1972:1-49) but there is disagreement over the most appropriate theoretical approach. It has been and continues to be

the position of the author, with support from Land and Spilerman (1975:1-3), that the most fruitful and practical approach at this time is to develop and use analytic models that permit the gradual build-up of intermediate-level theory rather than prematurely attempt to use general systems theory as a basis for these models. Also pertaining to the development of analytic models is the conclusion in this study that distinct sets of social indicators must be defined for national versus cross-cultural analysis, for single-time versus cross-time research, and for theory building versus social policy as research objectives. The implication is that, although specific indicators may vary depending on these circumstances as well as the fact that social reality constantly changes, an analytic model for the study of development and/or its sub-processes must be flexible enough to be applicable in all of these research situations.

4. The findings of this study tend to show that the use of basic concepts, e.g., functional linkage, is useful in developing analytic models and contributes to the understanding of development and/or its sub-processes. The search for additional basic concepts of this type that are susceptible to measurement should continue; they serve to guide future longitudinal research although the operationalization of these concepts must necessarily undergo constant revision.
5. Since the industrialization process and functional linkages generated by this process have an impact that varies over time as suggested by the findings in this study, the regression of integration variables at time 2 on industrialization variables at time 1 (and

consecutively of economic on industrial, social on economic, and political on social, etc.) might contribute to a greater understanding of the association between industrialization and national integration. The implication is that different methodologies should be used in cross-time research followed by a comparison of the findings to determine which methodology is more appropriate. In this case, the suggestion is to use both panel analysis (Heise, 1970:3-12) in combination with regression analysis of the same variables at the same points in time and to compare the results.

6. In addition to those problems that are methodological in nature (how to use existing data), there is a second set of problems related to social indicators and therefore cross-cultural research, i.e., how to develop a system of comparative data or social statistics as social indicators for use now and in the future. As the social indicator movement began to gain popularity in the U.S., Bauer (1966:1-67) was one who defined the need to remove weaknesses and gaps in existing data. This study confirms the need for improvement in social statistics if they are to be used as social indicators but this improvement, in turn, limits comparison with the past. In addition, these improvements do not necessarily remove basic weaknesses in the data. The OAS recently designed the COTA system (a classification system for ten-year censuses of American nations) to standardize data submitted to the OAS by member nations. Revisions have been made in the 1950 and subsequent data; while past data can be similarly revised, basic weaknesses have not been removed nor are comparable data available for all indicators in all member nations of

the OAS. The efforts of the OAS do represent, however, one step forward toward increasing the comparability (but not necessarily the reliability) of cross-cultural data. Zapf's (1975:492) promotion in favor of the standardization of census data can be expected to have similar results. Efforts such as these should continue but a greater effort to accumulate more as well as more reliable cross-cultural comparative data should be organized. The validity of social indicators can be implied from longitudinal research but only if obstacles to this research are removed. This is not to say that a system of social indicators cannot be defined at this point in time; its usefulness and the validity of its components, however, cannot be determined until longitudinal, cross-cultural research based on comparative, reliable data becomes a reality. Lastly, in relation to a system of social indicators, such a system must present a multi-dimensional (Zapf, 1975:490-491) picture of the social, economic, and political characteristics of the social system at specific points in time; greater attention needs to be paid to discovering, as concluded in this study, individual indicators or components of the system each of which is simultaneously of one dimensionality and adequately representative of a specific component of the social system.

The broadest implication for future research concerns the need for increased cooperation, both nationally and internationally, among social scientists involved in cross-cultural research in the Western Hemisphere and/or in the development of social indicators for this type of research. A certain amount of hemispheric cooperation at the govern-

mental level might be encouraged recognizing that there are basically two related and inherent difficulties with cooperation at this level. First, the governmental role in data collection on the nation and its population constitutes part of the political process and is therefore biased to the extent that the type of data collected and the communication of social statistics on the nation are selective. Second, a national government must necessarily concentrate on collecting data required for effective planning to meet the nation's needs as defined by priorities established by the government itself. One result, as noted in this study, is the lack of data on certain groups within the nation. Zapf (1975:492) indicates, similarly, that data on certain groups can be found only in monographs. This does not constitute an adequate source of data, however, when provinces are the units of analysis. In this case, certain indicators and in fact certain characteristics of a population, e.g., ethnic composition, must be excluded from cross-cultural analysis until field research can be done. It therefore becomes more practical to suggest that hemispheric cooperation at the governmental level be encouraged in the direction of permitting social scientists to conduct research and communicate the findings. Cooperation in the collection of comparative data then becomes the responsibility of social scientists.

Interaction between government policy makers and social scientists should continue to be promoted. Researchers working with existing social statistics recognize the urgency of improving the data which in fact is an obstacle to effective government planning given the inadequacy of some and the uncertain validity of many social indicators. The

social indicator movement in the U.S. began as a program evaluation technique and a basis for governmental planning (Wilcox et al., 1972:1-49). Although Land (1975:21-33) argues that the use of social indicators as a basis for social policy should follow rather than precede improvements in the measurement of social change and therefore in social reporting, social scientists would like policy makers to utilize their findings on social indicators and the association between them. Recognizing this tendency, de Neufville (1975:10, 241-243) asserts that social indicators must not only be grounded in theory but also related to social policy if social scientists expect policy makers to accept the indicators that they develop. It is suggested here that sociologists (and social scientists in general) need to exercise caution. Sociologists working toward the development of adequate social indicators grounded in theory must remember, in their eagerness for their work to form a part of the basis for social policy, that policy makers are not infrequently untrained in sociology. The potential for distortion, misuse, and/or rejection of sociological research findings is considerable.

It was one conclusion of this study that the collection of data for national planning needs does not necessarily satisfy the needs of national or cross-cultural research oriented toward theory building and vice versa. It is suggested, however, that there are points of intersection between research for social policy and research for theory building where some social indicators could satisfy the needs of both. In this sense, all researchers involved in an attempt to develop adequate social indicators are directly or indirectly contributing to a

foundation for social policy. It is at those potential points where interests intersect that interaction between policy makers and social scientists at national and hemispheric levels should be encouraged as well as cooperation between social scientists oriented toward theory building and those oriented toward social policy research.

The effort to establish a system of indicators for research within nations and cross-culturally also requires cooperation among social scientists and particularly those involved in comparative research as well as between social scientists in the U.S. and in other nations of the hemisphere. Concomitant to the growing need for cooperation is the increasing unlikelihood that cooperation will expand. With respect to sociology, trends within the U.S. do not favor cooperation. Similarly, the breakdown in inter-American relations appears to have carried over into sociology. In the last decade, Rex Hopper (Wagley, 1964) described Latin American sociology as a discipline concerned primarily with promoting social change. The situation is no different today when the lack of cooperation (or declining cooperation) between U.S. and Latin American sociologists is explained by Portes (1975:131-140) as primarily because of the contrast between U.S. sociology as academic and scientific versus Latin American sociology as a force for change. Given that "scientific sociology" is now taught in Latin American universities, it is suggested here that the "oppositeness" of the two approaches is a false one in the same sense that theory construction and social policy do not have to be conflicting research objectives. Points where interests intersect can be found but not until dialogue begins.

The decline of cooperation between U.S. and Latin American socio-

logists is a critical one. As long as U.S. and Latin American sociology continue to develop independently of each other, there will be no dialogue over the development of social indicators applicable nationally and cross-culturally within the hemisphere, the groundwork for future field research cannot be prepared, Latin American sociologists cannot be certain that the measures they are using to determine where change is necessary within their nations are valid, and the lack of cooperation will continue to be a major obstacle to cross-cultural research.

Sociology and sociologists, perhaps inadvertently, have been caught up in a series of political processes. Within the U.S., sociologists find themselves in a rather peculiar position of attempting to be objective observers of society and apolitical in their work. Yet, the process of obtaining funds for research is political. The selection of social indicators for policy making is political which de Neufville (1975:236-239, 243-245), for one, condemns. Whatever use or misuse is made by policy makers of sociological research findings all too often embroils the sociologist's work in political debate and controversy. The implications for research within the U.S. and for improved relations between U.S. and Latin American sociologists are clear. However, the possibility that the sociological research process will be divorced from political processes and that different sources of research funding will be created so that cross-cultural research can be conducted in an atmosphere free of the dictates of funding agencies and/or government is unlikely. One alternative is, as suggested, to increase the dialogue between sociologists and funding agencies on points where their interests intersect, i.e., research that would contribute both to the field

of sociology and to the needs of policy makers in their problem-solving role. In this manner, the funds that are becoming increasingly scarce might be directed toward research that is more productive than is too often the case.

The apparatus for hemispheric cooperation among sociologists exists, e.g., in the form of research institutes most often associated with universities, international libraries, and library exchange services. Access to this apparatus is, however, more illusory than real. Data banks and other data sources need updating and upgrading. Cross-cultural data possessed by universities within the U.S. in particular and, therefore, by library exchange services tend to have a selective audience, a situation that is possibly more detrimental to students than to professional sociologists. One possible solution in terms of hemispheric cooperation is to encourage an acceleration of existing university exchange programs of students and professionals with an emphasis on cross-cultural research. This constitutes, however, only a stopgap measure.

The obstacles faced by sociologists are varied, stemming not only from within the field itself, e.g., inadequate research tools, but also from sources external to the field over which sociologists have little or no control. The suggested need for more attention to analytic models and basic unifying concepts, adequate social indicators, the groundwork for future field research, comparative cross-cultural data, and increasing cooperation in research efforts in the Western Hemisphere necessitates communication among sociologists at a plane where cultural differences and "cultural defensiveness" have been overcome. If these differ-

ences cannot be overcome, it does not speak well for the profession nor for those of us--both in the U.S. and Latin America--who are members of the profession. If Portes' (1975:131-140) suggestion is taken, in order to pursue the directions for future research outlined in this report, it is concluded that U.S. sociologists interested in cross-cultural research will have to turn their attention to other world regions where cooperation in research is possibly more feasible until Latin American sociologists initiate cooperative research efforts. There is no other alternative from this perspective. It ignores, however, that there can be compromise over specific research interests and objectives to open the way to cooperation without compromising the attempt to attain as high a level of scientific excellence as is possible.

Sociologists trained in the scientific method are in an ideal position to serve as catalysts in the synthesis of research findings, model building, and theory construction in several fields both nationally and cross-culturally in order to construct a system of social indicators of use to policy makers, social scientists, and future research. First, however, the artificially-created obstacles that place limitations on their thinking and on their research must be removed and their hands must be untied.

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APPENDIX A

GEOGRAPHICAL DESCRIPTION OF BRAZIL, CHILE,
AND THE UNITED STATES

Geographical Barriers to International
Contact

Of the three nations, Chile has been the most adversely affected as a maritime nation by geographical conditions. It has also benefited, however, from the three centuries of isolation that geography has afforded. To the west lies the Pacific Ocean; Chile has few and poor natural harbors which improve somewhat towards the south as the coastline becomes more irregular in Forest Chile. To the east lie the Andes Mountains (and smaller ranges in the North); they are the second highest mountain range in the world and one which has no "breaks" (no low passes) causing difficulties even for the most advanced aircraft. To the north lies the Atacama, one of the most arid deserts in the world. And to the south lies the Antarctica.

The United States and Brazil do not have physical barriers to international contact comparable to these. Brazil's regions of difficult access (North and Central-West) receive an influx of people from bordering nations; the Amazon Basin, though still formidable to cross, has the advantage of the Amazon River which is navigable by ocean steamer 3,680 kms. to Iquitos, Peru. In addition, the fact that the U.S. and Brazil have an Atlantic coastline with good harbors has contributed to the greater contact of these two nations with Europe as well as their greater involvement in European conflicts compared to that of Chile.

Primary Resources

Brazil, Chile, and the U.S. have had, since their origins, extensive mineral, forest, agricultural, fishing, and hydroelectric potential. Of the three nations, Chile has the greatest potential in hydroelectric power exceeded only by Norway and Canada and representing five times that of the U.S. The three nations have reserves of coal, petroleum, and iron ore for industrial needs but the Chilean economy in particular, with the richest and largest copper reserves in the world (40 per cent of the world total), relies on the mining sector.

Of the third of Chile's national territory that is not desert or mountains, 56 per cent is forest (one-fifth of Chile); although only a third of this forest is commercially exploitable, it is one of the most valuable in Latin America. An estimated 56 per cent of Brazil is covered by three major forests: the Amazon Tropical Rain Forest, the Coastal Subtropical Rain Forest, and the Paraná Pine Forest in the

southern highlands. Forestry has always been an important economic activity in Brazil as it has in the U.S. since the early colonial period. Originally, about 50 per cent of the U.S. was covered by forests but a 90-per-cent depletion in resources, primarily in the last 100 years, has left five major forest regions: the Mixed Northern, Central Hardwood, Southern Mixed, Rocky Mountain, and Pacific Coast.

Since its origins the U.S. has had greater agricultural potential than Brazil or Chile but particularly the territory acquired from 1790 to 1860 had some of the most valuable farmland in the world as well as mineral, water, and timber resources. In 1960, the population/km.² of cultivable land was 17 in the U.S., 8 in Brazil, and 9.7 in Chile; the ratio of cultivable land to total land was 45.5 per cent in the U.S., 18.9 per cent in Brazil, and 18.5 per cent in Chile. Two-thirds of Chile's area is wasteland agriculturally (desert and mountains) and only 20 per cent of the cultivable area is being utilized; however, this constitutes one of the world's largest cultivated areas in relation to total population and active farm population. Despite this, Chile imports food to meet basic needs because of a history of low agricultural productivity. In contrast, although more than half of Brazil's territory is unexploited in agriculture, it is self-sufficient in food production except for wheat.

Although Brazil, Chile, and the U.S. are all maritime nations with extensive coastlines, the U.S. leads in fishing catch and consumption of sea products both of which remain very small in Brazil. Despite being a relatively new industry in Chile contributing .3 per cent of the G.N.P., fishing and fish produce rank second in importance in Latin America. By 1970, Chile's fishing catch was (in 1,000 metric tons) 1,179 (including foreign craft in port) and 1,487 in 1971 in contrast to 515 in Brazil in 1970 and 2,767 in the U.S. in 1971.

Brazil and Its Major Regions: Basic Facts

Brazil

The following data for Brazil and its regions refer to the 1960s unless otherwise indicated. The same is true of the subsequent data for Chile and the U.S. and their major regions.

Area: 8,456,508 km.² Represents 5.7 per cent of world land area and 47.3 per cent of South America. Greatest width: 4,320 kms. Greatest length: 4,328 kms.

Climate: Located within more degrees of latitude than any other South American nation. Extends through tropical, subtropical, and temperate zones.

Borders: 15,719 kms. with 10 South American nations (all but Chile and Ecuador).

Settlement: Discovered by Pedro Alvarez Cabral in 1500; colonization began in 1521; first permanent Portuguese settlement was São

Vicente in 1532; territory completed by end of seventeenth century except for Maranhão State created in 1621 and incorporated into Brazil in 1777 nor had Acre yet been annexed (1903). Settled along coast and then to interior.

Other features: Triangle formed by Rio de Janeiro, São Paulo, and Belo Horizonte cities represents social, political, and industrial center, dominant in mining and locale for all automobile plants, four largest iron and steel mills, all shipyards; São Paulo, Rio Grande do Sul, and Guanabara States account for 90 per cent of industrial production; 81 per cent of G.D.P. comes from East and South Regions. Over 90 per cent of population found in East, South, and Northeast Regions in 1872 and in 1970. Drought Polygon includes States of Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, and part of Sergipe, Bahia, Minas Gerais.

Brazil: Região Norte (North Region)

Area included: States of Amazonas, Pará and territories of Amapá, Rondônia, Acre, Roraima. Represents 42 per cent of national territory.

Features: Predominant is Amazon Basin--hot, wet, dense equatorial jungle; access is difficult. The region was entered in colonial period mainly by Jesuits to establish missions; permitted the French access to the region. Population clusters near cities especially Belém (largest city and commercial center of the region), Manaus (second largest city), Bragança; Macapá is principal port; accounted for 3.4 per cent of Brazil's population in 1872, 3.7 per cent in 1960, and 3.8 per cent in 1970; about 60 per cent of region's population was in Pará in 1970; 1960 density/km.² was 0.7 and, in 1970, ranged from 0.2 in Roraima to 1.8 in Pará. The region of concentration of Amerinds although population is predominantly mameluco; Japanese colonies exist in Amapá, Rondônia, and Amazonas. Economy is predominantly extractive (rubber, timber, nuts); some small-scale industry of consumer goods (for local consumption) and primary processing of region's products; accounts for only two per cent of production in each of major sectors but less critical economically than Northeast Region.

Brazil: Região Nordeste (Northeast Region)

Area included: States of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Fernando de Noronha. Represents 11.4 per cent of national territory.

Features: Tropical but irregular rainfall; droughts, floods; represents most of Drought Polygon. Part of original area of settlement; agricultural coastal plain characterized by casa grande of the early sugar engenho and now the usina; pastoral zone to interior settled by migration from coast and characterized by vaqueiro, corrals, and more recently cattle fazendas. Maranhão occupied early by French; Pernambuco settled early by Dutch and, under their protection, Sephardic Jews. Recife is principal city of region; population is concentrated

along coast; accounted for 22.1 per cent of Brazil's population in 1960 and about 21 per cent in 1970; 1960 density/km.² 16.3 and, in 1970, ranged from 6.7 in Piauí to 57.4 in Alagoas. Ethnic composition: predominantly mixed; of region's population, heavy concentration of mulattoes, persons of African ancestry, and most of those of European ancestry along the coast; mamelucos concentrated in interior; Japanese found in Natal in Rio Grande do Norte. Accounts for 15 per cent of Brazil's agricultural production, 9 per cent of commerce, 7 per cent of industry, 12 per cent of services; contributes 15 per cent of G.D.P.; droughts, political unrest, and little attention from national government prior to 1964 make this Brazil's most critical region; some improvement since 1964 but still has one of world's lowest per capita incomes, extremely high mortality rates, and predominantly subsistence farming with four million rural dwellers having no land or permanent jobs.

Brazil: Região Centro-Oeste (Central-West Region)

Area included: States of Mato Grosso, Goiás, and the Federal District. Represents 22.2 per cent of national territory.

Features: Tropical, sub-tropical; dense forest, savanna; plateau with valleys and gorges cut by numerous rivers makes access to, and crossing of, region difficult; similar to Mountain Region of U.S., it has been an area crossed rather than settled. Settlers entered region during mining period (1700-1775) but settlement is sparse; some influence from Bolivia and Paraguay; accounted for 2.2 per cent of Brazil's population in 1872, 4.2 per cent in 1960, and 5.5 per cent in 1970; population concentrated in southern part of region; 1960 density/km.² 1.6 and, in 1970, ranged from 1.3 in Mato Grosso to 4.6 in Goiás and 93.1 in Federal District. Ethnic composition: all ethnic groups represented; population of Goiás is predominantly of European ancestry; Mato Grosso is about 50 per cent of European ancestry and 50 per cent mameluco with some persons of African ancestry; Japanese are found in Mato Grosso and Goiás. By 1970, Brasília had some impact but still development of region only beginning; primary sector predominates (small farming, cattle, yerba maté, some mining); accounts for 5 per cent of Brazil's agricultural production, 2 per cent of commerce, 1.5 per cent of industry, and 3 per cent of services; combined with North Region, contributes about 4 per cent of G.D.P.

Brazil: Região Sul (South Region)

Area included: States of São Paulo, Paraná, Santa Catarina, Rio Grande do Sul. Represents 9.6 per cent of national territory.

Features: Temperate; subtropical along littoral. Pastoral zone in extreme south settled in eighteenth century from other regions; strong Spanish influence from bordering nations; characterized by estancias and gaúcho. Region of foreign colonization settled first by Germans and Italians followed by Polish, Russian, Arab, and, more re-

cently, Dutch and Japanese as well as German immigrants; noted for non-Luso-Brazilian characteristics. Population concentrated along coast; accounted for 35 per cent of Brazil's population in 1960 and 37 per cent in 1970; 1960 density/km.² 30.6 and, in 1970, ranged from 24.9 in Rio Grande do Sul to 71.9 in São Paulo. Ethnic composition: the region of European concentration (about 90 per cent of European ancestry); Germans settled in Rio Grande do Sul, Paraná, São Paulo, and Santa Catarina; Italians settled in Rio Grande do Sul, Paraná, and São Paulo; Polish immigrants settled in Paraná. Japanese colonies exist mainly in São Paulo State (São Paulo City has largest Japanese population outside of Japan) but also in Paraná and Rio Grande do Sul. South Region is Brazil's center of industry and commercial agriculture; accounts for 51 per cent of Brazil's agricultural production, 47.5 per cent of commerce, 53.5 per cent of industry, and 47 per cent of services; São Paulo City is most important industrial center of Brazil; São Paulo State is richest state of Brazil, most important state in agriculture, locale of two-fifths of Brazil's industries, one-third of income.

Brazil: Região Leste (East Region)

Area included: States of Sergipe, Bahia, Minas Gerais, Espírito Santo, Rio de Janeiro, Guanabara. Represents 14.8 per cent of national territory. Following facts include part of São Paulo State.

Features: Rainy, tropical in north; subtropical in southern highlands with rugged terrain and Brazil's highest mountains. Part of area of original settlement; mineral region settled in seventeenth century by bandeirantes and later by mamelucos, mulattoes, and (English and Jewish) immigrants; coffee region settled in nineteenth century characterized first by coffee fazendas and now estancias and an industrial belt. Densely populated with population clustered along coast; accounted for 35 per cent of population in 1960 and 32.6 per cent in 1970; 1960 density/km.² was 19.7 and, in 1970, ranged from 13.4 in Bahia to 3631.0 in Guanabara. Ethnic composition: the region of concentration of persons of African ancestry although majority of population is of European ancestry except in Bahia (only Brazilian state where majority of population is not of European ancestry); Japanese are found in Minas Gerais, Rio de Janeiro City, and Salvador. Economy is based on coffee (which began with slave labor and free labor of immigrants), mining, industry; accounts for 27 per cent of Brazil's agricultural production, 39.5 per cent of commerce, 36 per cent of industry, 38 per cent of services.

Chile and Its Major Regions: Basic Facts

Chile

Area: 756,629 km.² (excluding Antarctica territory). Greatest width: 352 kms. (least 22.4 and average 176). Greatest length: 4,208 kms.

Climate: Of South American nations, second only to Brazil in

degrees of latitude represented from north to south. Ranges from tropical in north to sub-Antarctic in south.

Borders: 170 kms. with Peru to the north, 856 kms. with Bolivia and 5,120 kms. with Argentina to the east.

Settlement: Southern Chile discovered by Fernão de Magalhães in 1520; Spanish under Diego de Almagro began conquest from Peru in 1536; first permanent Spanish settlement was Santiago in 1541; territory completed in nineteenth century. Central Valley in topographical terms (combination of Central and Forest Regions) was colonial Chile; settlement extended north after War of the Pacific (1879-1884) by which Chile acquired territory north of Aconcagua Province from Peru and Bolivia; settlement increased south of Bío-Bío River with end of Araucanian Indian Wars (1887) and incorporation of their territory.

Other features: Social, political, and industrial centers are Santiago, Valparaíso, and Concepción cities; 75 per cent of population lives between Coquimbo and Bío-Bío River, 44.6 per cent in Santiago and Valparaíso Provinces, and about 25 per cent in Greater Santiago metropolitan area alone; 70 per cent of manufacturing and 80 per cent of production workers in manufacturing are in Valparaíso, Santiago, and Concepción Provinces. Chile has jurisdiction over a section of the Antarctica as well as Rapa Nui (Easter Island) 3,728 kms. west of Caldera, Juan Fernández Islands 576 kms. west of Valparaíso, and other small Pacific islands.

Chile: Zona Norte Grande (Big North Region)

Area included: Provinces of Tarapacá, Antofagasta. Represents 24.3 per cent of national territory.

Features: Part of territory acquired from Peru and Bolivia. Predominant is white desert more barren than Sahara--the Atacama; high plateau basins, extremely narrow lowlands along coast; rainfall is rare. Population concentrated in cities, towns; size varies according to fluctuation in mining sector; accounted for 4.6 per cent of Chile's population in 1960 and 4.8 per cent in 1970; 1960 density/km.² 2.1 for Tarapacá, 1.7 for Antofagasta and, in 1970, respectively, 3.0 and 2.0. Ethnic composition: predominantly mestizo. Economy based on mining (iron ore, copper, nitrates, iodine) and totally dependent on international trade; region accounting for largest source of Chile's income but receives little government assistance; accounts for 16 per cent of Chile's unionized labor force. Region where Communist Party began in Chile.

Chile: Zona Norte Chico (Little North Region)

Area included: Provinces of Atacama, Coquimbo. Represents 15.5 per cent of national territory.

Features: Part of territory acquired from Peru and Bolivia. Transitional region; Mediterranean climate, steppe vegetation, drought; predominant are numerous short transverse valleys which make north-

south movement difficult. Accounted for 5.8 per cent of Chile's population in 1960 and 5.5 per cent in 1970; 1960 density/km.² 1.5 for Atacama, 7.8 for Coquimbo and, in 1970, respectively, 1.9 and 8.5. Ethnic composition: predominantly mestizo. Economy is based on mining (iron ore, copper) and agriculture.

Chile: Zona Central (Central Region)

Area included: Provinces of Aconcagua, Valparaíso, Santiago, O'Higgins, Colchagua, Curicó, Talca, Maule, Linares, Ñuble. Represents 12.2 per cent of national territory.

Features: Also referred to as Mediterranean Chile or Central Valley in regional terms (topographically, central valley extends south to Puerto Montt and then drops to ocean floor); very fertile, sloping plain; of the 20 per cent of national territory that is level land, most of that which is arable is found in this region. Represents Chile of colonial and early republican periods; region where hacienda system was established and majority of latifundia still found in this region. Region of concentration of population, labor force, ports, major cities, industry, and commerce; accounted for 60.4 per cent of Chile's population in 1960 and 62.4 per cent in 1970; 1960 density/km.² ranged from 14.0 for Maule to 137.8 for Santiago and, in 1970, from 14.5 for Maule to 181.9 for Santiago. Ethnic composition: predominantly mestizo but greater proportion of Amerinds than in north or extreme south. Economy based on mining (copper), vegetables, vineyards, orchards, cattle, other agriculture; accounts for 25 per cent of Chile's hydroelectric power.

Chile: Zona Sur (Forest Chile)

Area included: Provinces of Concepción, Arauco, Bío-Bío, Malleco, Cautín, Valdivia, Osorno, Llanquihue. Represents 13.3 per cent of national territory.

Features: Temperate, colder than Central Region, rainy, abundant forests, grazing lands. Chile's "frontier" at the time of Araucanian Indian Wars; settled predominantly by European immigrants brought under colonization laws; Lake Region (Valdivia, Osorno, Llanquihue) settled by German immigrants (about 10,000 annually averaging about 100 from 1846 to 1926); the need to clear land for agriculture south of Bío-Bío River led to predominantly small farms rather than latifundia though the latter exist in this region. Accounted for 26.4 per cent of Chile's population in 1960 and 24.4 per cent in 1970; 1960 density/km.² ranged from 9.2 for Llanquihue to 95.0 for Concepción and, in 1970, respectively, 10.9 and 112.3. Ethnic composition: mainly mestizo but this is Chile's region of concentration of Amerinds (Mapuches) who live predominantly on reducciones. Industry predominates only in province of Concepción where, in addition, organized labor is active especially in coal zone; about 24 per cent of labor force in Concepción Province (equal to 78.3 per cent in region) employed in industry.

Chile: Zona Patagónica (Patagonian Region)

Areas included: Provinces of Chiloé, Aysén, Magallanes. Represents 34.7 per cent of national territory.

Features: Also referred to as Channel Region, Island Region, or Archipelagic Chile; consists predominantly in islands, channels, glaciers, rugged terrain, scarce arable land; a wilderness region. Accounted for 2.8 per cent of Chile's population in 1960 and 2.9 per cent in 1970; concentrated on Chiloé, in Puerto Aysen and Punta Arenas; rest of region mainly uninhabited; 1960 density/km.² 3.7 for Chiloé, 0.4 for Aysén, 0.6 for Magallanes and, in 1970, respectively, 4.1, 0.5, and 0.7; extensive seasonal emigration to Argentina for work; Punta Arenas is world's city located farthest to the south. Ethnic composition: mainly mestizo. Economy based on agriculture and cattle as well as oil and coal in Magallanes; landholdings are large in Aysén and Magallanes; Tierra del Fuego characterized by large commercial sheep ranches and oil.

United States and Its Major Regions: Basic Facts

United States

Area: 9,160,412 km.² Represents 6.9 per cent of world land area. Greatest width of coterminous states: 4,320 kms. Greatest length of coterminous states: 2,560 kms.

Climate: Coterminous states lie in temperate zone; sub-tropical crop belt along Gulf of Mexico.

Borders: 3,093 kms. of coterminous states with Mexico and 6,379 kms. with Canada; 2,456 kms. of Alaska with Canada.

Settlement: Discovered by Cristoforo Colombo in 1492. First permanent Spanish settlement was St. Augustine in 1565; first permanent English settlement was Jamestown in 1607. English colonization began in late sixteenth century; settled predominantly along Atlantic coast and then to interior; territory completed in twentieth century.

Other features: 72 per cent of population and 78.5 per cent of manufacturing are found along Atlantic and Pacific coasts and in East North Central Region (Ohio, Indiana, Illinois, Michigan, Wisconsin). U.S. has jurisdiction over Puerto Rico, American Samoa, Canal Zone, Guam, Trust Territories of the Pacific Islands, Virgin Islands.

United States: Atlantic Region

Area included: District of Columbia and States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Delaware, New Jersey, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida. Represents 12.1 per cent of national territory.

Features: Heavily forested, predominantly temperate; Appalachian Mountain system includes Blue Ridge, Green, White, and Allegheny Moun-

tains; gradual rise of terrain from east to Piedmont Plateau and Appalachians; Atlantic coastal plain narrow in New England where climate, soil, irregular topography resulted in system of small self-sufficient landholdings; wide coastal plain and rich soil further south was locale for plantation system which later spread to South Central Region. Accounted for 39.4 per cent of U.S. population in 1960 and 39.2 per cent in 1970; 1960 density/km.² 63.6 and 71.7 in 1970. Ethnic composition: 11.9 per cent of non-European ancestry in 1950, 12.9 per cent in 1960, and 14.2 per cent in 1970. Accounts for about 41 per cent of U.S. non-agricultural labor force, 41 per cent of manufacturing labor force, 44.6 per cent of manufacturing establishments, 16.9 per cent of agricultural production, and 35.3 per cent of manufacturing exports.

United States: North Central Region

Area included: States of Ohio, Michigan, Indiana, Wisconsin, Illinois, Iowa, Minnesota, Missouri, North Dakota, South Dakota, Kansas, Nebraska. Represents 21.3 per cent of national territory.

Features: Temperate; Mississippi River Valley is prominent with prairies gradually appearing to west of forested downward slope from Alleghenies in eastern part of region; prairies extend westward to the rise in terrain and Great Plains that characterize western part of region; droughts in Great Plains states largely due to overplanting of wheat and loss of topsoil in past; Ozark Mountains in Missouri. Accounted for 28.7 per cent of U.S. population in 1960 and 27.8 per cent in 1970; 1960 density/km.² 26.5 and 29.1 in 1970. Ethnic composition: 5.3 per cent of region's population of non-European ancestry in 1950, 7.1 per cent in 1960, and 8.7 per cent in 1970. High agricultural production accounting for 44.1 per cent of total in U.S.; contributes 37 per cent of U.S. manufacturing exports and accounts for 28 per cent of non-agricultural labor force, 33 per cent of manufacturing labor force, and 26.9 per cent of manufacturing establishments.

United States: South Central Region

Area included: States of Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas. Represents 17.2 per cent of national territory.

Features: Temperate in north, sub-tropical in south; eastern half forested, western section part of Great Plains; Appalachian Mountain system extends into northeastern part of region, Ozark Mountains in north central section; coastal plain along Gulf of Mexico is sub-tropical crop belt. Accounted for 16.2 per cent of U.S. population in 1960 and 15.8 per cent in 1970; 1960 density/km.² 18.5 and 20.5 in 1970. Ethnic composition: 20.1 per cent of non-European ancestry in 1950, 19.2 per cent in 1960, and 18.1 per cent in 1970. Rich agricultural region, part of Cotton Belt; accounts for 14 per cent of non-agricultural labor force, 13 per cent of manufacturing labor force, 12.1 per cent of manufacturing

establishments in U.S.; contributes 18.6 per cent of total agricultural production and 12.5 per cent of manufacturing exports.

United States: Mountain Region

Area included: States of Montana, Idaho, Wyoming, Colorado, Utah, Nevada, New Mexico, Arizona. Represents 24.2 per cent of national territory.

Features: Temperate, predominantly semi-arid tableland extending from Mexico to Canada; eastern boundary of region formed by Rocky Mountain system including Sawatch, Front, Sangre de Cristo, Park, and San Juan Ranges; in northwest is part of Columbia Plateau; along western boundary of region is rugged, arid Great Basin (Nevada, part of Utah and Idaho). Accounted for 3.8 per cent of U.S. population in 1960 and 4.1 per cent in 1970; 1960 density/km.² 3.1 and 3.7 in 1970. Ethnic composition: 4.5 per cent of non-European ancestry in 1950, 5 per cent in 1960, and 5.8 per cent in 1970. Economy based on agriculture (grazing, some irrigated farming) and mining. Accounts for 4 per cent of non-agricultural labor force, 2 per cent of manufacturing labor force, 2.8 per cent of manufacturing establishments in U.S.; contributes 8.4 per cent of total agricultural production, 1.7 per cent of manufacturing exports.

United States: Pacific Region

Area included: States of Washington, Oregon, California, Alaska, Hawaii. Represents 25.2 per cent of national territory.

Features: Mainland coterminous area: forested with abundant rainfall in coastal northwest; Columbia Plateau in Washington and Oregon; Great Basin extends into parts of Oregon and California; mountain ranges include Cascades, Sierra Nevada, and coast ranges; narrow coastal lowlands. Accounted for 11.9 per cent of U.S. population in 1960 and 13.1 per cent in 1970; 1960 density/km.² 9.2 and 11.5 in 1970. Ethnic composition: 7.8 per cent non-European ancestry in 1950, 8.9 per cent in 1960, 11.1 per cent in 1970. Agriculture important in some sections of region; accounts for 13 per cent of non-agricultural labor force, 11 per cent of manufacturing labor force, and 13.6 per cent of manufacturing establishments in U.S.; contributes 12 per cent of total agricultural production and 13.5 per cent of manufacturing exports.

APPENDIX B

POLITICO-ADMINISTRATIVE SYSTEMS OF BRAZIL, CHILE, AND THE U.S.
FROM THE SIXTEENTH TO THE MID-TWENTIETH CENTURIES, FUNCTIONAL
LINKAGES AND LINES OF DIFFERENTIATION IN THE SIXTEENTH,
SEVENTEENTH, AND EIGHTEENTH CENTURIES

Politico-Administrative Systems

Prior to 1548, the government in Brazil had an administrative system similar to Portugal's until the Crown was unified with the Spanish Crown (1580/81-1640). In 1533, Brazil had been divided into (hereditary) captaincies and, as a result, the expense of colonization fell to individuals rather than the Crown. During the unification of Crowns, the Spanish administrative and viceroyalty systems were adopted in Brazil.

Since the conquistadores who, by Crown approval, ruled in Spanish territories as adelantados (provincial governors), governors, or captains-general were increasingly perceived as a potential threat to the absolutism of the Crown, direct government was soon established in Spanish colonies. Under the viceroyalty that had been created in Peru in 1542, supreme authority in Chile was vested in the real audiencia (in Chile, the governor was also the president of the audiencia). Under this system, the Crown appointed the gobernador (governor), teniente general (deputy to the governor), corregidores (governors of cities and departments), and other officials.

Local political administration was by the Castilian system of authority vested in cabildos (municipalities) appointed by the governor when a city was founded and the corregidores appointed by the Crown. The members of cabildos (which could call open meetings of the local population) named their own successors with the exception of three of the six regidores (councilmen) assigned to lifetime positions and whose offices were to be sold at public auction when they died. Under Carlos III, government reorganization and reform included the establishment of a system of intendants (fiscal administrators) throughout Spanish territory and the captaincy-general of Chile (1778). Brazilian administration became similarly unified.

The Brazilian and Chilean municipalities in the eighteenth century gained some degree of self-government. England had also viewed it as advantageous to allow some autonomy in her colonies. Government on the eastern seaboard of the U.S. reflected the English system but varied according to whether colonies were corporate, proprietary, or royal. While the colonies in the East were involved in the War for Independence in the eighteenth century, Spain organized California, New Mexico, and

Texas as Provincias Internas with a commandent-general under the Crown.

Brazil

The preindependence experience of Brazil varied from that of the rest of Latin America. Rio de Janeiro became the capital of the Portuguese Empire (1808) and Brazil became a kingdom (1815-1822). After independence (1822), it became an empire (1822-1889) and then a republic (1889-1930).

Brazil reflects the tendency of Latin American governments to become increasingly centralized. The first constitution (1824) promulgated during the empire period remained in effect until 1891 when a new constitution established a federal republic, a president to be elected for four years, a bicameral legislature, and separation of Church and State. The rise of Getúlio Vargas to power in 1930 brought the fall of the republic and the beginning of "benevolent dictatorship"; in this period, the powers of the central government were increased to an extensive degree. Further centralization was apparent in the Constitution of 1934 which stated that the president, ineligible for re-election, was to be elected by Congress and in the Constitution of 1937 proclaimed by Vargas and which gave the president dictatorial powers.

During the "Democratic Era" (1945-1964), characterized by the emergence of mass parties and the beginnings of a mass electorate, a new constitution (1946) was promulgated by which the president was to be elected for a five-year term (later reduced to four) by popular vote and could not succeed himself; in addition, the government was given the authority to ban anti-democratic parties. Still, Rosenbaum and Tyler (1972:3-28) assert that this was not a "democratic" era but merely an "interlude" between the authoritarian regimes of the Vargas dictatorship and the post-1964 military governments because the major characteristics of the 1937-1945 period persisted 1945-1964, e.g., centralization of authority and militant anti-communism. A parliamentary form of government was established by the 1961 constitutional amendment with control centralized in a Council of Ministers.

The increasing authoritarianism of the governments of Castelo Branco, Costa e Silva, and Garrastazú Médici following the 1964 coup is reflected in the constitutional changes and institutional acts issued by the military leadership. The first institutional act issued in 1964 merely provided the guidelines for governing Brazil. Castelo Branco gained dictatorial powers in 1965 and issued a second institutional act abolishing all existing political parties, authorizing increased federal intervention in the provinces (thus a decline in provincial autonomy), and establishing indirect presidential elections (by a majority vote in congress). Castelo Branco also replaced members of the supreme court, began the "suppression of radicalism" and suspended constitutional rights.

There were thirteen political parties that had emerged 1945-1965 to be abolished. The largest were the Partido Social Democrático or P.S.D. (Social Democratic Party), União Democrática Nacional or U.D.N. (National Democratic Union), and the Partido Trabalhista Brasileiro or P.T.B. (Brazilian Labor Party). Following in importance were the Partido Comunista Brasileiro or P.C.B. (Brazilian Communist Party) which was illegal having lost its rights in 1947, Partido Comunista do Brasil or PCdB (Communist Party of Brazil) which was a pro-Chinese offshoot of the P.C.B. in 1961 and also illegal, and the Partido Social Progresista or P.S.P. (Social Progressive Party). Minor parties not ideologically well-defined were the Partido Democrata Cristão or P.D.C. (Christian Democrats), Partido Socialista Brasileiro or P.S.B. (Brazilian Socialist Party), and the Partido de Representação Popular or P.R.P. (Popular Representation Party). The remaining parties were ill-defined, unorganized, and not ideologically aligned. For the 1966 elections, two new parties were allowed to participate but were not true parties since they were established rapidly prior to the elections; these were the Aliança Renovadora Nacional or ARENA (National Renovating Alliance) which was pro-government and the Movimento Democrático Brasileiro or M.D.B. (Brazilian Democratic Movement).

The power of the president and federal control over provinces were increased in the Constitution of 1967 (still in effect) by which the nation's name changed from "United States of Brazil" to "Brazil." In 1968, Congress was suspended for an indefinite period, the president gained the power to rule by decree, and extensive censorship began. An institutional act issued at this time included authorization for the president to declare states of siege, suspend individuals' political rights for ten years, and nullify parliamentary decrees; this act was followed by the 1969 constitutional amendment made by the junta and extensively restricting congressional power as well as strengthening presidential authority in the decision-making process.

Presidential succession in Brazil

The term of the first president, Deodoro da Fonseca (1889-1891), who was forced to resign by a naval revolt, was completed by the vice-president, Floriano Peixoto (1891-1894). Prudente José de Moraes Barros (1894-1898), Manuel Ferraz de Campos Sales (1898-1902), and Francisco de Paula Rodrigues Alves (1902-1906) served full terms. Afonso Augusto Moreira Pena (1906-1910) died in 1909; his term was completed by Nilo Peçanha. The 1910 election was the first to confront directly the issue of the military role in politics but (Marshal) Hermes Rodrigues da Fonseca (1910-1914) won the election and was succeeded by the pro-militarist candidate Venceslau Brás Pereira Gomes (1914-1918). Rodrigues Alves (who served 1902-1906) was re-elected in 1918 but died before taking office; the vice-president, Delfim Moreira da Costa Ribeiro, served as acting-president until new elections in 1919 when Epitácio da Silva Pessoa (1919-1922) was elected; Artur da Silva Bernardes (1922-1926) succeeded him.

Washington Luís Pereira de Sousa, elected in 1926, was deposed after the 1930 elections (before finishing his term); the newly elected president, Júlio Prestes de Albuquerque, was prevented from taking office by the losing candidate Getúlio Dornelles Vargas. With the support of young military officers and much of the population, Vargas led a revolt in the southern states, took over the government, and forced Pereira de Sousa to resign. Vargas' "benevolent dictatorship" ended in 1945 when some of the same military officers who had helped him gain office in 1930 forced him to resign; he was allowed to run in elections and became a senator. Chief Justice José Linhares succeeded Vargas in 1945 until elections could be called. Eurico Gaspar Dutra served 1946-1951 when Vargas was re-elected to serve 1951-1956; unable to contend with problems such as rising inflation, Vargas was forced to resign by the armed forces in 1954 and, soon after, he committed suicide. The vice-president, João Café Filho, was to finish his term but resigned in 1955; Carlos Coimbra da Luz was deposed three days after being named acting-president and was replaced by Nereu Ramos. Juscelino Kubitschek de Oliveira, in spite of military opposition, served a full term (1956-1961). He was succeeded by the popular Jânio da Silva Quadros who won about 45 per cent of the popular vote in a three-man race; his orthodox economic policies, progressive social ideas, and independent line in foreign policy brought a warning by the army to use caution which resulted in his resignation eight months after being inaugurated.

Vice-president João Belchior Marques Goulart, ideological heir to Vargas, served as president although he was left-wing and therefore opposed by the three top military leaders. Goulart's government was a modified parliamentary system dividing executive power between the president and an appointed prime minister; a national plebiscite in 1963 returned full presidential power to him. On March 20, 1964, General Castelo Branco reasserted the non-political role of the armed forces; on March 31, he led a coup supported by several state governments and Goulart fled to Uruguay. Humberto de Alencar Castelo Branco served 1964-1967 and was succeeded, in indirect elections, by Arthur da Costa e Silva (1967-1971). When Costa e Silva suffered a stroke in 1969, a military junta prevented the vice-president from taking office, took over the government, and named Emílio Garrastazú Médici (a "hard-liner") president after which Congress "elected" him. In 1974, Ernesto Geisel was named president.

Chile

Chilean independence was declared in 1810 after which Chile underwent Spanish reconquest (1814-1817) and finally achieved independence in 1818. Two basic factors shaped the early political history of Chile as was true of other Spanish American nations. First, the intelligentsia that participated in the independence movements were in their majority republicans influenced by French intellectuals and the French Revolution as well as the success of the War for Independence of the U.S.; thus, once independence was achieved, Spanish American nations

established republican forms of government for which they were not prepared. Second, the period of wars between the time that independence was first declared and finally achieved contributed to the importance assigned to the military. These two factors combined with the divisiveness that had emerged among groups sharply differentiated along political, social, economic, and religious lines and contributed to a long period of Conservative-Liberal conflict following independence.

After Chilean independence was declared in 1810, internal divisions led to conflict between two factions--one led by José Miguel Carrera Verdugo and the other by Bernardo O'Higgins--with juntas governing in the meantime. The first junta (1810-1811) elected by open cabildo in Santiago was deposed on September 4, 1811, when the Carrera family led a coup and established a new junta. The Carreras spearheaded a second coup and formed a new junta on November 15, 1811; José Miguel Carrera became dictator (1811-1812). New juntas served in 1812-1813 and, with the second dictatorship of Carrera, in 1813-1814. This in-fighting facilitated the 1814-1817 Spanish reconquest of Chile. Even though Carrera and O'Higgins finally joined forces, it was too late; the forces of the viceroy of Peru defeated their armies and re-established royal government in Chile. After independence, the Liberal faction controlled the government 1818-1830. The Conservatives won the 1829-1830 Civil War and remained in power until 1861.

The Chilean government has passed through several phases since independence:

1. An autocratic system from 1818-1823 under O'Higgins who, as Supreme Director, created a highly centralized government
2. Anarchy 1823-1830 with a federalist form of government adopted for a short time in 1826 and, due to growing discontent, the promulgation of a second federalistic constitution in 1828
3. Autocratic Republic 1830-1871 under the 1833 Constitution giving broad powers to the president with the "presidential system" becoming similar to a monarchy (the president named his own successor) until 1860 when an era of party-supported presidents began and lasted until 1890
4. Liberal Republic 1871-1891 with the first constitutional reform in 1871 stating in part that the president cannot succeed himself
5. Parliamentary Republic 1891-1925 beginning after the 1891 Civil War (with the parliamentary system fully established by 1910) and characterized by the supremacy of political parties that ruled while presidents remained inactive 1891-1920 and rapid ministerial turnover 1895-1925 (there were 121 different cabinets and 530 different ministers during this period)
6. The emergence of new mass parties and a mass electorate after the 1920 election with the 1941-1958 period characterized by government based on party coalitions and the 1958-1964 period by the mass electorate becoming a power in the governing of the nation

There were eleven major parties in existence in 1964: Partido Nacional (National Party), Partido Radical (Radical Party), Partido Liberal (Liberal Party), Partido Demócrata Cristiano de Chile (Christian

Democratic Party of Chile), Partido Democrático Nacional or PADENA (National Democratic Party), Partido Independiente (Independent Party), Partido Democrático Social (Social Democratic Party), Vanguardia Nacional Popular (National Vanguard of the People), Partido Comunista de Chile (Communist Party of Chile), Partido Socialista (Socialist Party), and Unión Socialista Popular (Popular Socialist Union). The last three parties formed a coalition in 1956 known as the Frente de Acción Popular or FRAP (Popular Action Front). Like Brazil, the emerging party system became a confusing array of mass parties but, in contrast, Chile is the only Latin American nation in which parties are definitely aligned into three blocs (Right, Center, Left) as in Europe; one result has been the frequent comparison of Chile to France.

The Chilean Constitution of 1833 was replaced by the Constitution of 1925, amended in 1943, 1957, and 1959 and still in effect; it provides for a unitary republic with three branches of government, a president elected by direct vote for a six-year term and ineligible to succeed himself (a vice-president is not elected), responsibility of the cabinet to the president, expansion of suffrage, separation of Church and State, provincial autonomy, guarantee of freedom of religion, and extensive social and labor legislation. Constitutional rule was suspended in September, 1973.

Presidential succession in Chile

The dictatorship of Bernardo O'Higgins lasted until 1823 when he resigned; a junta replaced him until Ramón Freire y Serra was named president in 1823. Freire resigned in 1826 as did acting-presidents Manuel Blanco Encalada in 1826 and Agustín de Eyzaguirre in 1827; Congress named Freire president in 1827 but he resigned in the same year and was replaced by the vice-president, Francisco Antonio Pinto (1827-1829). Pinto resigned in 1829 and was succeeded by the vice-president, Francisco Ramón Vicuña Larraín (1829). A junta ruled in 1830 until Francisco Ruiz Tagle was named president; he resigned in the same year and the vice-president, José Tomás Ovalle, served as acting-president. From 1831 to the 1891 Civil War, the presidents were Joaquín Prieto Vial (1831-1841), Manuel Bulnes Prieto (1841-1851), Manuel Montt y Varas (1851-1861), José Joaquín Pérez Mascayano (1861-1871), Federico Errázuriz Zañartu (1871-1876), Aníbal Pinto Garmendía (1876-1881), Domingo Santa María González (1881-1886), and José Manuel Balmaceda Fernández (1886-1891).

After Balmaceda committed suicide in 1891, a junta ruled until Jorge Montt (1891-1896) took office; he was succeeded by Federico Errázuriz Echaurren (1896-1901). Errázuriz died in 1901 and Germán Riesco Errázuriz (1901-1906) became president, succeeded by Pedro Montt y Montt who died in 1910 and whose term was finished by the vice-president, Elías Fernández Albano. Ramón Barros Luco served 1911-1915 and Juan Luis Sanfuentes Andonaegui 1915-1920. Elected in 1920, Arturo Alessandri Palma was forced out by the military in 1924 when a junta

headed by General Lu s Altamirano ruled. Carlos Ib   ez del Campo led a coup in January, 1925, and recalled Alessandri who resigned in October of the same year. Emiliano Figueroa Larra n became president in 1925 and was forced out by Ib   ez in 1927; Ib   ez named himself dictator-president but resigned in 1931. For two days, Pedro Opazo was acting-president, resigned, and was succeeded by Juan Esteban Montero Rodr  guez who became acting-president for about one month after which he resigned. Manuel Trucco was acting-president until Montero was again named president (1931-1932); he was deposed in 1932 by a coup.

In 1932, a socialist junta led by Carlos D  vila took over in June and served for a month after which D  vila served as acting-president for two months until deposed by a coup in September; General Bartolom   Blanche served as acting-president for less than one month and resigned after which Abraham Oyanedel served as acting-president for three months until Alessandri was re-elected (1932-1938). Pedro Aguirre Cerda (1938-1941), candidate of the Popular Front, died in office and the vice-president, Ger  nimo Mendez, completed his term (1941-1942). Juan Antonio R  os Morales (1942-1946) died in office and was succeeded by Alfredo Duhalde who resigned after one month; Vice-Admiral Vicente Merino Bielech served for three months until the leftist candidate Gabriel Gonz  lez Videla took office (1946-1952). Twenty-one years after being forced out of office, Carlos Ib   ez was re-elected (1952-1958); he was succeeded by Jorge Alessandri Rodr  guez (1958-1964), Eduardo Frei Montalva (1964-1970), and Salvador Allende Gossens (1970-1973). In 1973, after a military coup and Allende's death, a junta took power led by General Augusto Pinochet Ugarte.

United States

In relation to political changes, the U.S. differs from Brazil and Chile, it is suggested, basically in the following:

1. In spite of assassinations and deaths in office, the electoral transition in power has been smoother in the U.S. and the presidential election procedure differs by being both direct (by popular vote) and indirect (Electoral College)
2. There has been only one major change in the system of government in the U.S. after independence, i.e., the change from the original confederation system which failed, in large part because of finance, to the federal system under a constitution
3. The U.S. has resorted to the procedure of constitutional amendments (26 amendments by 1971) in contrast to promulgating new constitutions with one result being that of having the oldest written federal constitution in the world

Similar to Brazil and Chile, the U.S. has placed limitations on presidential terms of office with the 22nd constitutional amendment in 1951 whereby the president can serve only two terms.

Presidential succession in the U.S.

The first president, George Washington, served 1789-1797 followed by John Adams (1797-1801), Thomas Jefferson (1801-1809), James Madison (1809-1817), James Monroe (1817-1825), John Quincy Adams (1825-1829), Andrew Jackson (1829-1837), and Martin Van Buren (1837-1841). William Henry Harrison died one month after inauguration and his vice-president, John Tyler, finished his term (1841-1845). James K. Polk (1845-1849) was succeeded by Zachary Taylor (1849-1850) who died in office; the vice-president, Millard Fillmore, finished his term (1850-1853). Fillmore was succeeded by Franklin Pierce (1853-1857), James Buchanan (1857-1861), and Abraham Lincoln (1861-1865) who was assassinated in 1865 and succeeded by the vice-president, Andrew Johnson (1865-1869), Ulysses S. Grant (1869-1877), and Rutherford B. Hayes (1877-1881). James A. Garfield was shot and died in 1881 after his inauguration; his vice-president, Chester A. Arthur, served his term (1881-1885), succeeded by Grover Cleveland who served two non-successive terms (1885-1889 and 1893-1897) and Benjamin Harrison (1889-1893).

William McKinley (1897-1901) was assassinated in 1901; the vice-president, Theodore Roosevelt, finished his term and was elected for two additional terms (1901-1909). William Howard Taft (1909-1913) and Woodrow Wilson (1913-1921) were followed by Warren G. Harding (1921-1923) who died in office in 1923; the vice-president, Calvin Coolidge, completed his term (1923-1925) and was elected for an additional term (1925-1929). Herbert Hoover (1929-1933) was succeeded by Franklin D. Roosevelt (1933-1945) who died in office in 1945; his fourth term was completed by the vice-president, Harry S. Truman (1945-1949), who was elected for an additional term (1949-1953). Dwight D. Eisenhower (1953-1961) was succeeded by John F. Kennedy (1961-1963) who was assassinated in 1963; the vice-president, Lyndon B. Johnson, completed his term (1963-1965) and was elected for an additional term (1965-1969). Richard M. Nixon (1969-1974) resigned in 1974; his term was finished (1974-1977) by the vice-president, Gerald R. Ford.

Brazil, Chile, and the United States in the Sixteenth and Seventeenth Centuries

Functional Linkages to the International System

Impact of mercantilism

Brazil, Chile, and the United States were discovered, explored, and colonized by European nations during the era of mercantilist expansion. Some consequences were:

1. Their economic, political, and social ties were first of all to Europe, still a predominant tendency in the twentieth century. The central point of contact was the colonial city. It was in the sixteenth and seventeenth centuries that most of the largest cities of today were founded in Brazil (e.g., São Paulo and Rio de Janeiro)

and Chile (e.g., Santiago and Concepción), with early evidence of a tendency toward primate cities. The founding of cities continued over a longer period of time in the U.S. with urban growth occurring at a slower pace in the southern colonies because of the nature of the plantation system. Colonial cities in the three nations early became centers of international commerce and, importantly, of contact with European ideas, e.g., republicanism.

2. The highly competitive nature of mercantilist expansion made itself felt in the following ways:
 - a. Competition over territory in the New World. It was because of French encroachment that João III, King of Portugal, began to colonize Brazil and it was by destroying a French colony that Rio de Janeiro was founded (1567). France invaded Maranhão 1615-1619 and the area from the São Francisco River to Maranhão came under Dutch control, with Recife as their capital, from 1624 to 1654 when they were expelled. In the U.S., it was after mid-seventeenth century that the majority of the English colonies were founded or acquired; the Spanish from 1521 and into the seventeenth century explored the southeast to the Mississippi River and the west as far north as Oregon and as far east as Kansas; the Dutch settled on the Hudson while Swedes first settled on the Delaware; and, in the latter seventeenth century the French, primarily interested in furs, explored the St. Lawrence River Valley, the Great Lakes Region, the Fox River and Illinois, the Ohio Valley, the Mississippi Valley, and Louisiana. Chile did not experience such competition in part because of geographical barriers and in part because it was thought to be territory relatively poor in natural resources.
 - b. New World involvement in European conflicts. The colonial cities of Brazil and Chile became involved in the attempts of England, France, and the Netherlands to colonize in Spanish territories and to destroy Spain's monopoly in the Indies. Freebooters from these nations raided coastal settlements on the Atlantic and Pacific in the latter half of the sixteenth century and during the seventeenth century. This activity not only contributed to the decline of Spanish commerce but also Chilean cities, e.g., La Serena and Valdivia, in particular, suffered by being burned and/or captured.
3. Economic linkages predominated since the three nations were established as economic dependencies expected to buy European manufactured products, provide raw materials for European needs, and absorb excess European population. It was a situation more advantageous to Europe than to the colonies.

Predominance of linkages to Europe:
two consequences

External control over extractive, export economies. Brazil, Chile, and the U.S. began with extractive, export economies (forest and agricultural products) under economic policies dictated by foreign powers. Although mercantilists had a primary concern for precious

metals (especially gold and silver) as well as for the expansion of markets, gold was not discovered in Brazil until the close of the seventeenth century and much later in the U.S. while other metals were not yet important. Some precious metals, e.g., silver, were exported from Chile. Copper exports to Spain and Peru began in 1601 but Chile was considered poor in this respect thus experiencing relatively little interference from Spain. Still, the Crowns of Spain and Portugal were to receive revenues mainly from taxation such as the quinto or royal fifth of subsoil products and customs duties; taxation thus early became an issue in the three nations and would later play a key role in their struggles for independence. Portugal rigidly monopolized trade and laid the basis for the characteristically cyclical nature of the Brazilian economy that continues today. Both the brazilwood cycle (1500-1550) and the sugar-cane cycle (1550-1700) in Brazil were export economies; however, Jaguaribe's (1968:101) distinction should be noted, i.e., that the brazilwood cycle was a "simple, extractive economy" in contrast to the sugar-cane cycle which was "slavocratic-capitalistic." Chile was not as rigidly controlled although Spain did prohibit general inter-colonial trade. England was prohibitive by means of the Navigation Acts of 1651 and 1660 and similar policies although the U.S. colonies encountered slightly different trade problems. In the seventeenth century, all regions exported agricultural products but the South was dominant in exports to England. Although tobacco cultivation and the subsequent development of large plantations (requiring greater investment in land and labor) led the South to become more specialized and more affected by price changes than other regions, it was the only region not to have an unfavorable balance of trade. New England reduced this unfavorable balance in part by fishing, ship-building, and inter-colonial trade; Pennsylvania and New York resorted to some fur trade and ship-building as well as extensive trade with the West Indies.

Immigration. In the sixteenth and seventeenth centuries, immigrants came predominantly from the colonizing nation. In Brazil, there was also an influx of Dutch and French immigrants including French Calvinists in Rio de Janeiro who began the first Protestant activities in America, Spanish settlers during the sixty years of the union of the Portuguese and Spanish Crowns, and, under the protection of the Dutch, many Sephardic Jews. Immigrants to Chile were in their majority from the Crown of Castile. In the U.S., there was particularly massive English immigration to the Massachusetts Bay Colony 1630-1642 but Dutch and Swedish immigrants played an important role in the colonies.

Lines of Differentiation and Functional Linkages Within National Systems

Bases of differentiation among groups

The basis for a paternalistic and dependent society was established with the shift to the sugar-cane cycle in Brazil (mainly in Bahia and Pernambuco) and, similarly, with the development of agriculture in Central Chile and the southern U.S. colonies. The specific

forms that emerged were the engenho and fazenda in Brazil, the latifundia and hacienda originating in the mercedes de tierras in Chile, and the southern plantation and large estate in the U.S.

Engenho is a term associated with sugar plantations whereas fazenda refers most frequently to the coffee plantations that followed. In Chile, mercedes de tierras were land grants given to conquistadores; they could be chacras near cities or haciendas. Haciendas were divided into latifundia which were sometimes further divided into hijuelas. This continual division of land (a tendency even in the twentieth century) was one factor that led to the decline of the "first aristocracy" in Chile. The term hacienda is today used to refer to the type of latifundia system in Chile. Wolf and Hansen (1972:29-30, 135-137) distinguish between two types of latifundia systems in Latin America on the basis of whether or not the Amerinds encountered by colonizers were politically organized. Where political states existed (e.g., the Incas), the Spaniards took over the political organization; in this case, the hacienda system emerged based on local labor. In contrast, where the Amerinds had no political state (e.g., in Brazil), war was the only means of conquering them; in this case, the fazenda system emerged based primarily on African slave labor. The Chilean case would not necessarily refute their thesis. The hacienda system was established in the Central Region and local labor was used (many of these Amerind groups are now extinct mainly through amalgamation). The Araucanian (Mapuche) Wars were fought in the South; the latifundia that later emerged in the South were the result of government incentives to European immigrants to settle this region. However, geography is also a factor; the topography of southern Chile encouraged the stronger tendency to establish small farms. At any rate, the impact of the plantation systems in the three nations would come to compound the difficulty of national integration and lack of skilled labor once industrialization began in the three nations.

Response to the labor shortage

Slave, indentured servant, and Amerind. The shortage of labor was a problem faced by all three nations. The response in the colonial era of the U.S. depended in part on the type of land tenure and in part on geography. The New Englanders generally had landholdings small enough for the individual farmer and his family to maintain; therefore, in agriculture and other economic activities (e.g., the labor of servants) indentured labor was used. Some indentured labor was used in the South where the plantation system predominated but heaviest reliance was on African slaves once the slave trade began in the seventeenth century (1619). Brazil has always had a labor shortage first resorting to the enslavement of Amerinds for plantation work; when they proved to be "unadaptable" (by continually trying to escape), African slaves began to be imported in the sixteenth century and particularly in the latter half of the century. Although African slaves were relatively numerous in Chile at the end of the seventeenth century, they were never imported on a large scale because of the avail-

ability of Amerinds and mestizos as a labor source. The Chilean slave trade soon stopped and those Africans who survived the climate (most died from diseases such as tuberculosis but numbered an estimated 20,000 at the beginning of the nineteenth century) were assimilated, thus disappearing as a distinct group. The Chilean labor force originally consisted, therefore, in Amerind slave labor (but definitely not Mapuches) and mainly Picunches and Huilliches (who had become extinct by the end of the eighteenth century). Under the encomendero system, a conquistador was assigned a specific number of Amerinds (an encomienda) to work his land and be house servants for a designated period after which they were assigned to someone else. Although the New Laws (1542) had prohibited the enslavement of Amerinds, stipulating that they were to be paid for their labor, the practice continued in some parts of Chile until independence.

The mestizo. Although amalgamation existed in the colonial U.S. among immigrant, Amerind, and African slave, it did not occur to the extent of developing as large a segment of mixed ancestry as in Brazil and Chile. Mestizaje emerged very early in Chile's history and Chile gradually became a mestizo nation. Although the mulatto (Spaniard-African) and zambo (African-Amerind) existed, they were by far out-numbered by and absorbed into the mestizo (primarily Basque and Andalusian with Amerind) segment. Extensive amalgamation also occurred early in Brazil but an extremely complex set of distinctions among groups according to physical features emerged and continues to exist today. Similar to Chile, the basic components were Portuguese, Amerind, and African slave resulting in the mestiço or mameluco (Portuguese-Amerind), mulatto (Portuguese-African), and zambo (African-Amerind). In all three nations, those groups of mixed ancestry were found predominantly among manual laborers.

The aristocracy and the creoles: origins

The aristocracy. The early aristocracy of Brazil consisted predominantly in the sugar-cane planters, developing to the extent that Portuguese "houses" (mansions) of Brazil established branches in Europe. The "first aristocracy" in Chile during the sixteenth and seventeenth centuries was composed of the encomenderos (conquistadores from Extremadura and Andalusia and their descendants); two factors--their disdain of work and too extensive division of property--led to their decline. The aristocracy of both Brazil and Chile was defined in part by a disdain for manual labor as was true in the southern U.S. However, most colonists in the U.S. had come from middle- and lower-class origins (in fact, they came looking for land and work as skilled laborers) and, as a result, there was no particular disdain for work or trade. Differences in the U.S. in this period tended to be made on the basis of age, sex, and ancestry as well as occupation; an aristocracy did emerge, however, dominated by English officials, wealthy merchants and bankers, and the plantation and estate owners. In none of the three nations has the notion of aristocracy completely disappeared.

The creoles. The creole (persons born in the New World of European ancestry), by fact of birth, could hold only minor positions in public office, if any at all. The preference in Brazil, Chile, and the U.S. shown, respectively, to the Portuguese, Spanish, and English who were European-born became a source of discontent and eventually a factor in the independence of the three nations.

Education

In Brazil and Chile, only the elite received an education as was generally the case in the southern colonies of the U.S. where more than a basic education was received only by children of plantation owners; in contrast, the New England colonies gave more emphasis to education. Before the turn of the century, Harvard College and the College of William and Mary had been founded. However, the elite were most often European-educated as was true in Brazil and Chile, an important factor in the case of creoles exposed to republican ideas while studying in Europe.

Religion

The Portuguese Crown originally stated that only Catholics were to enter Brazil and particularly after 1591 "aliens" (non-Catholics) were excluded; however, there was considerable avoidance in enforcing this policy. Portugal itself had been influenced by Africa (one reason why it is suggested that "race consciousness" was not as prominent among the Portuguese as were religious differences) and, in the end, African cults were allowed to exist in Brazil. In addition, Portugal had a Semitic population; conversion was forced on Jews in Brazil ("new Christians") in order to escape the Inquisition with the result that the Inquisition was never introduced in Brazil. In large part, this stemmed from the recognition of the important role played by Jews in Brazilian commerce. However, the distinction between "old" and "new" Christians continued until the late eighteenth century.

Spain was more rigid in controlling emigration to her territories excluding "heretics, Moors, Jews, and their descendants" (Langer, 1972: 538). The Inquisition was introduced with a tribunal in Lima (which would have authority over Chile as part of the Viceroyalty of Peru) 1570-1571; although some Chileans were taken to Lima, the Inquisition had little effect on Chile.

In the U.S., religious intolerance was one reason for emigration from England; it was also a prominent reason for emigration from Massachusetts (the 1691 charter gave all non-Catholics religious freedom and the right to vote). Thus, while religion was one line of differentiation, intolerance served to stimulate a more rapid formation of new colonies in the U.S.

Provincial autonomy, sectionalism, and government intervention in the economy

Increasing local autonomy in Brazil, Chile, and the U.S. was accompanied by the emergence of politico-economic sectionalism in the form of blocs representing specific economic interests, especially in Brazil and the U.S. In the case of the U.S., as Hicks et al. (1970:3, 86-87) indicate, the variation in economic interests of the original colonies resulted in different patterns of development; expansion to the frontier created additional sectional differences between the heterogeneity of frontier society emphasizing equality and individualism in contrast to eastern society with its emphasis on distinctions in social class and property rights.

Government intervention in key sectors of the economy later reached a climax during the wars for independence of the three nations followed by a reaction--to which the already existing sectionalism lent strength--against government intervention; this reaction would continue until the twentieth century. However, in the sixteenth and seventeenth centuries, the policies of the colonizing powers created antagonism in part because they showed preferential treatment to the economic interests of the aristocracy in the U.S. as well as Brazil and Chile. The plantation aristocracy, mainly by policies of non-intervention, was in the most favored position.

The role of private initiative

Private initiative, with Crown approval, was particularly evident in two areas: the land and the frontier. Land was the one natural resource that met with a laissez-faire approach by England, Spain, and Portugal. It was primarily because of this approach that no conflict emerged between the Portuguese Crown and plantation owners in Brazil. Similarly, in Chile, the mercedes de tierras, once assigned, could either be sold or become hereditary. In Brazil, Chile, and the U.S.--whether referring to small farms in New England, southern plantations, or generally to the majority of the English colonies that had originated as proprietary grants of land to individuals by the Crown--it was private initiative that developed the land; on the other hand, this contributed in the U.S. to the early emergence of urban and rural land speculation that has always been characteristic of the U.S. economy.

In large part, the most inaccessible regions of the frontier were left to the adventurer and the missionary. Religious orders were given the responsibility by the Crown of establishing and maintaining Spanish/Portuguese control in the interior and/or on the frontier. This they accomplished by establishing missions in Chile (south of the Bío-Bío River) and the U.S. (Arizona, Texas, California). The same activities were carried out in Portuguese territories. In particular, the Jesuits were assigned to Araucanian territory in Chile in 1593, to Amazônia in Brazil in 1549, and to U.S. territory in the seventeenth and eighteenth centuries.

The pioneer, adventurer, and outlaw also played an important role. The Paulistas or bandeirantes (descendants of Portuguese who had settled in São Vicente) began in 1629 to search the Brazilian interior for Amerinds (as slaves) and land; although a "law unto themselves" (DeKadt, 1968:41-46), they are credited with opening up much of the interior of Brazil. In 1693, they stopped their slave-raiding activities and began searching for gold which they discovered in Minas Gerais shortly before the turn of the century. The continually shifting frontier of the U.S. depended first on the adventurer and pioneer; later, immigrants were to play an important role as settlers as they did in southern Chile and in southeastern Brazil. Perhaps also creditable to private initiative (but without Crown approval) were the extensive smuggling activities as one result of the restrictions placed upon Brazil, Chile, and the U.S. by the trade policies of the colonizing nations.

Boundaries and population concentration

By the end of the seventeenth century, the population of Chile was concentrated in the Central Region although territorial jurisdiction extended south to include the Patagonia. The Spaniards had encountered the Araucanians when they progressed south through the Central Valley 1540-1553. Although they succeeded in reaching the Straits of Magellan, the Indian Wars--beginning with the first general Mapuche uprising in 1562--forced them to retreat to the north of the Bío-Bío River by 1599. Brazil was relatively complete; Maranhão had not yet been incorporated nor had Acre been annexed and Brazilian territory still included the Cisplatine Province (present-day Uruguay). The U.S. colonies remained limited to the eastern seaboard. The concentration of population in the Central Valley of Chile and along the coast in Brazil and the U.S. has continued to be the predominant tendency.

Trends in the Eighteenth Century

Largely as one consequence of conflict, the international system experienced a gradual transition by which the functional linkages characterizing the system were redefined; this was a process that would accelerate in subsequent centuries. The linkages of specific groups to national systems were also gradually redefined during the eighteenth century.

The International System

Brazil, the U.S., and, to a lesser degree, Chile continued to be involved in European conflicts in the eighteenth century. During the War of the Spanish Succession (1701-1713), the French attacked Brazilian ports and Spain found it increasingly difficult to protect her territory in the New World. The U.S. became more closely involved during the French and Indian Wars. These and other conflicts contributed to a redefinition of the international system in the following ways: (1) Eng-

land became the dominant power when she gained control of the seas as one outcome of the eighteenth- and early nineteenth-century European conflicts and, seemingly, at that time strengthened her position on the American continent with the expulsion of the French after the French and Indian Wars and (2) toward the end of the eighteenth century (1790s) when England and France went to war, the U.S. remained neutral which was the beginning of a policy that, with intermittent reversals, would characterize the U.S., Brazil, and Chile from independence until the twentieth century and would also become one of the bases of inter-American cooperation.

The competition among European powers over territory began to shift gradually to competition over trade accompanied by a suggestion of a shift in the trade relations of Brazil, Chile, and the U.S. Brazilian commerce continued to be a monopoly of Portugal until 1808, Chilean copper exports continued to go mainly to Spain and Peru until 1810, and England continued to dominate U.S. commerce up to 40-50 years after independence. However, there were differences such as: (1) the U.S. began to take the initiative in establishing trade relations after independence, e.g., by beginning to trade with China and Russia in the 1780s and (2) English influence was growing in Brazil by the end of the eighteenth century with England soon having a monopoly on Brazilian trade.

The European powers inadvertently prepared their colonies for independence in large part by relaxing their control over their dependencies as seen in the following trends:

1. Economic restrictions lessened. Brazilian economic activities that competed with those of Portugal continued to be restricted but, particularly between 1750 and 1777, commerce between the two nations was encouraged by removing some restrictions and taxes and by organizing trading companies. The series of reforms instituted by Carlos III 1764-1782 included the opening of some Chilean ports to trade with other nations. In the U.S., there had been continual disagreement with England after the French and Indian Wars over English political and economic controls. England's subsequent view of the colonies as a source of revenue principally from taxation fed the flames of the conflict over demands for more autonomy. A hint of a similar process occurred in Brazil after the U.S. gained independence. The Inconfidencia Mineira (independence movement in Minas Gerais) began in 1786. It was desirous of establishing a republic as in the U.S. and ended in 1789 when Joaquim José de Silva Xavier (Tiradentes) led an abortive revolution in Minas Gerais in reaction against the gold tax. Tiradentes was executed and became a national hero. Nothing else, however, resulted at this time although this movement was a reflection of the continual conflict between the miners and the Crown over taxes.
2. Internal political autonomy continued to increase. In addition, creoles in Brazil, Chile, and the U.S. began obtaining more government positions which provided them with some experience, though inadequate in most cases, in self-government.
3. Encouraged by the expulsion of the French and with the assistance of France, Spain, and the Netherlands, the U.S. won its War for

Independence (1775-1783) which, as previously suggested, encouraged both Brazil and Chile.

4. The Jesuit religious order was expelled from Brazil and Chile, an event that at first had an adverse impact on both nations since the Jesuits had played an important role in their internal development. The sharpest impact was felt in Chile where the land controlled by the Jesuits became property of the aristocracy. In addition, there was sharp regress in education, agriculture, and other economic activities in which Jesuits had predominated. However, it is suggested here that this impact was also a force for Brazil and Chile to take the initiative of development in these areas.

National Systems

Analysis of the redefinition of functional linkages at the national level during the eighteenth century shows this to be a period during which Brazil, Chile, and the U.S. began to diverge. Chile continued to experience the same trends as in the sixteenth and seventeenth centuries. For the U.S., the eighteenth century signified independence and the groundwork of an "industrial revolution." In Brazil, the economy's shift to the mining cycle was accompanied by social, economic, and political ramifications.

Impact of the mining cycle in Brazil

Following the bandeirantes' discovery of gold at the end of the seventeenth century, the Brazilian economy entered the mining cycle (1700-1775) which further strengthened Brazil's tendency to have an export economy. Gold (in Minas Gerais) became the major export with the diamond rush (1730-1800) in Minas Gerais and Goiás also of importance. The components for a change in functional linkages were mainly the following:

1. One result of the mining boom was a massive population exodus from the sugar-cane area in the Northeast to the mining area in the south-central region
2. A second result was the first large influx of Portuguese immigrants (this had not occurred earlier because sugar-cane plantations required a much greater capital investment than mining)
3. Lastly, it was in the mining area that Brazil experienced its first real "urban boom"

The redefinition of functional linkages in Brazil occurred in the following:

1. The mining cycle with the concomitant shift of the economic, population, and urban center from the Northeast to the South signalled: (a) the beginning of the decline of the politico-economic power of the sugar plantation aristocracy although in this century they remained prominent, (b) one basis of the twentieth-century problem of the Northeast (the most critically poor region of Brazil), and (c) increasing conflict between miners and the Portuguese Crown

(which exacted a "royal fifth" of all mining products) contributing to eventual independence (recalling that the sugar plantation owners were not in conflict with the Crown, their lesser role in the independence movement added to their decline)

2. The influx of Portuguese (accustomed, as already discussed, to African and Semitic populations), the mining cycle (with an emphasis on individualism), and the decline in sugar plantations (with less emphasis on the need for slave labor) can be suggested as contributing to the following events in the process of redefining the lines of differentiation between certain groups within Brazil:
 - (a) marriages with Amerinds were officially recognized (1755),
 - (b) distinctions between "old" and "new" Christians ended (1773),
 - and (c) particularly between 1750 and 1777 there was a strong movement advocating "racial equality"

Continuation of sixteenth- and seventeenth-century trends in Chile

Chile in the eighteenth century was still an agricultural nation with an export economy that relied on the mining sector (mainly copper) as well as agriculture (especially wheat exports to Peru). The continuing trends from previous centuries that predominated during the eighteenth century were related to mestizaje and the aristocracy. Although Chile increased contact with other nations after Spain had eased trade restrictions, the relative geographic isolation was the major factor in the process of Chile becoming a mestizo nation. Events of the eighteenth century directly or indirectly contributing to this process were:

1. The Chilean population remained concentrated in the Central Region.
2. There were five epidemics in the eighteenth century (in 1743, two in 1774, 1779, and 1793) of which those in 1774 have been identified as typhoid and typhus and that in 1793 as smallpox (Mattelart, 1964:309). These epidemics were probably of more serious proportions because of the population concentration but, in turn, it can be suggested that, by reducing the population, they probably contributed to more extensive amalgamation.
3. A few Swiss, English, Polish, French, Italian, Portuguese, and Irish immigrants began arriving after 1700 but immigration continued to be at an extremely low rate and, it follows, did not introduce persons of European ancestry in significant numbers. Additionally, the history of Basque immigration to Chile shows it to have been most significant in the eighteenth century; Basques were one of the basic elements in the formation of the mestizo group.

Not only did the mestizo population increase but mestizos also became functionally linked to the economic system as a major source of (manual) labor. Encomiendas were abolished in 1791 by the Crown because of abuses to Amerinds under this system. Although the practice continued in some parts of Chile until independence, encomiendas were in their majority replaced by inquilinos (mestizo laborers)--a practice that continues in the twentieth century. Lastly, Basque immigration

also played a role in the emergence of a new (Castilian-Basque) aristocracy in the eighteenth century which replaced the old aristocracy of conquistadores from Extremadura and Andalusia and their descendants.

Bases for changes in functional linkages in the U.S.

Some of the events in the eighteenth-century U.S. that primarily laid the groundwork for post-eighteenth-century changes in functional linkages were as follows:

1. The increase in population by immigration and a high birth rate both contributed to a large supply of labor (but a scarcity of skilled labor towards the end of the century) and increased the demand for land resulting, in turn, in an increase in land prices.
2. The War for Independence sparked the growth of large-scale, capitalistic business and further speculation.
3. Speculation and the lack of expanding national and foreign markets led to a commercial "slump" that began in 1783. As already stated, the confederation system of government failed largely because of financial difficulties.
4. The federal system of government was based on a constitution that specifically recognized the rights of individuals although the right to vote was still limited to "white adult male property owners" (Fite and Reese, 1973:44). Contributing to the maintenance of distinctions among groups on the basis of ancestry was the continuation of slavery and of immigration predominantly from northern Europe; the greatest influx of immigrants in the eighteenth century were Germans (beginning in 1683 with the founding of Germantown, Pennsylvania) and Scotch-Irish.
5. The western farm politico-economic bloc emerged as one consequence of westward expansion. At the time of the War for Independence, the merchants of eastern port towns were dominant economically and often politically. However, the U.S. still had a predominantly export economy dependent on agriculture. The feudalistic type of land tenure system in the formerly French-controlled territory was eliminated after independence. The Mississippi River trade particularly benefited agriculture in the "West" which became a region of "free farmers" opposed to slavery and the plantation system that, in the next century, would become a third sectionalistic bloc. By the end of the eighteenth century, the sectionalist conflict between the eastern aristocracy and the "western" farmers had come into sharp focus.
6. Westward expansion was also accompanied by the expansion of the "urban" system eventually linked by transportation and communications systems that would, in turn, serve as a link between the populations in different sections of the nation. Although a road system joined settlements in New England by 1740, land transportation was more expensive than by water so the more important settlements of the eighteenth century were built near navigable rivers or the ocean.

In 1791, the factory system began with the use of power-driven machinery for spinning cotton--the beginning of the Industrial Revolution

in the United States--and, in 1793, the cotton gin was invented. These two innovations, in combination with the above trends during the eighteenth century, would come to have an impact on the redefinition of functional linkages within the U.S. in the nineteenth century.

APPENDIX C

TABLE 38
 ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND
 SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY)
 PARTIAL CORRELATIONS AMONG INDUSTRIAL-ECONOMIC
 VARIABLES: BRAZIL, 1960 AND 1970

	PIN	ING	COG	AGG	SEG	LAG	IIN	ICO	ISE
<u>1960</u>									
0 ⁰ :	.486								
ING 1 ⁰ :	.336								
2 ⁰ :	.106								
0 ⁰ :	.455	.870							
COG 1 ⁰ :	.167	.864							
2 ⁰ :	-.177	.818							
0 ⁰ :	.331	.779	.580						
AGG 1 ⁰ :	.375	.859	.770						
2 ⁰ :	.059	.815	.650						
0 ⁰ :	.464	.965	.931	.793					
SEG 1 ⁰ :	.282	.957	.933	.899					
2 ⁰ :	.010	.943	.907	.862					
0 ⁰ :	.322	.195	.069	.235	.105				
LAG 1 ⁰ :	.250	.111	-.110	.236	-.002				
2 ⁰ :	.160	.004	-.288	.126	-.142				
0 ⁰ :	.792	.427	.451	.291	.445	.499			
IIN 1 ⁰ :	.705	.179	-.058	.393	.157	.499			
2 ⁰ :	.703	.074	-.234	.324	.041	.472			
0 ⁰ :	.472	.674	.784	.499	.716	.452	.596		
ICO 1 ⁰ :	.155	.575	.573	.718	.603	.440	.151		
2 ⁰ :	-.260	.399	.350	.533	.416	.396	.005		
0 ⁰ :	.547	.531	.631	.350	.554	.522	.638	.818	
ISE 1 ⁰ :	.312	.383	.320	.456	.346	.520	.304	.643	
2 ⁰ :	.144	.247	.144	.303	.189	.483	.238	.563	
0 ⁰ :	.211	-.027	-.005	.178	-.002	.187	.114	.080	.123
POR 1 ⁰ :	.339	.040	.127	.183	.079	.227	.312	.280	.302
2 ⁰ :	.266	-.080	.003	.052	-.045	.186	.273	.183	.241
<u>1970</u>									
0 ⁰ :	.787								
ING 1 ⁰ :	.590								
2 ⁰ :	.518								
0 ⁰ :	.829	.870							
COG 1 ⁰ :	.519	.768							
2 ⁰ :	.442	.742							
0 ⁰ :	.519	.779	.575						
AGG 1 ⁰ :	.488	.796	.559						
2 ⁰ :	.263	.789	.492						
0 ⁰ :	.789	.964	.930	.794					
SEG 1 ⁰ :	.517	.940	.857	.853					
2 ⁰ :	.413	.932	.841	.850					
0 ⁰ :	.314	.333	.449	.441	.456				
LAG 1 ⁰ :	.112	.186	.353	.381	.355				
2 ⁰ :	-.165	.037	.249	.147	.225				
0 ⁰ :	.745	.532	.658	.475	.592	.463			
IIN 1 ⁰ :	.514	.213	.343	.377	.268	.365			
2 ⁰ :	.248	-.036	.187	-.082	.014	.057			
0 ⁰ :	.593	.421	.692	.281	.523	.566	.657		
ICO 1 ⁰ :	.354	.140	.547	.149	.268	.500	.503		
2 ⁰ :	.165	-.009	.482	-.159	.127	.371	.298		
0 ⁰ :	.157	-.017	-.007	-.094	-.044	-.315	.035	.152	
ISE 1 ⁰ :	.087	-.126	-.169	-.141	-.188	-.374	-.055	.104	
2 ⁰ :	.150	-.115	-.158	-.131	-.178	-.391	-.017	.146	
0 ⁰ :	.036	-.055	-.069	.169	-.058	.013	.282	.103	.025
POR 1 ⁰ :	.342	.085	.123	.243	.103	.075	.523	.234	.049
2 ⁰ :	.159	-.066	-.009	-.014	-.061	-.152	.346	.056	.083

NOTE: N=25. DF=23 for zero-order correlations, 22 for first-order and 21 for second-order partials. $p < .05$ for zero-order and first-order of at least $\pm .400$ and for second-order of $\pm .410$. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; LAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports.

TABLE 39
ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND
SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY)
PARTIAL CORRELATIONS AMONG INDUSTRIAL-ECONOMIC
VARIABLES: CHILE, 1960 AND 1970

	PIN	INC	COG	AGG	SEC	LAG	IIN	ICO	ISE
<u>1960</u>									
ING	0 ⁰ : .784								
	1 ⁰ : .705								
	2 ⁰ : .702								
COG	0 ⁰ : .674	.773							
	1 ⁰ : .368	.695							
	2 ⁰ : .374	.709							
AGG	0 ⁰ : -.417	-.397	-.204						
	1 ⁰ : -.290	-.292	.035						
	2 ⁰ : -.295	-.301	.037						
SEC	0 ⁰ : .652	.829	.933	-.174					
	1 ⁰ : .349	.779	.869	.065					
	2 ⁰ : .341	.774	.887	.059					
LAG	0 ⁰ : -.014	-.185	.028	.218	.041				
	1 ⁰ : -.005	-.203	.056	.225	.072				
	2 ⁰ : -.006	-.207	.057	.225	.070				
IIN	0 ⁰ : .587	.531	.563	-.088	.601	-.140			
	1 ⁰ : .256	.319	.172	.168	.270	-.173			
	2 ⁰ : .249	.308	.179	.165	.258	-.176			
ICO	0 ⁰ : .537	.420	.728	-.299	.508	.189	.285		
	1 ⁰ : .305	.228	.607	-.169	.254	.229	-.076		
	2 ⁰ : .358	.296	.630	-.164	.328	.249	-.041		
ISE	0 ⁰ : .637	.559	.730	-.353	.757	.194	.538	.532	
	1 ⁰ : .213	.320	.368	-.174	.469	.349	.017	.240	
	2 ⁰ : .205	.309	.376	-.180	.460	.350	.005	.300	
POR	0 ⁰ : .360	.143	.213	-.043	.109	.313	.015	.187	.113
	1 ⁰ : .329	.064	.123	.014	-.020	.321	-.139	.113	-.054
	2 ⁰ : .319	.037	.136	.005	-.052	.325	-.165	.200	-.080
<u>1970</u>									
ING	0 ⁰ : .788								
	1 ⁰ : .704								
	2 ⁰ : .693								
COG	0 ⁰ : .657	.772							
	1 ⁰ : .438	.678							
	2 ⁰ : .441	.682							
AGG	0 ⁰ : -.446	-.378	-.202						
	1 ⁰ : -.207	-.198	.038						
	2 ⁰ : -.229	-.213	.036						
SEC	0 ⁰ : .648	.833	.909	-.182					
	1 ⁰ : .459	.770	.875	.045					
	2 ⁰ : .429	.762	.889	.031					
LAG	0 ⁰ : .532	.518	.766	.036	.664				
	1 ⁰ : .313	.363	.693	.285	.562				
	2 ⁰ : .307	.358	.692	.282	.563				
IIN	0 ⁰ : .755	.700	.675	-.152	.732	.757			
	1 ⁰ : .493	.544	.496	.198	.608	.683			
	2 ⁰ : .457	.524	.507	.187	.582	.697			
ICO	0 ⁰ : .492	.414	.722	-.244	.481	.549	.358		
	1 ⁰ : .485	.339	.719	-.155	.421	.502	.259		
	2 ⁰ : .567	.394	.748	-.144	.496	.531	.350		
ISE	0 ⁰ : .666	.562	.731	-.338	.767	.629	.771	.520	
	1 ⁰ : .378	.351	.599	-.110	.667	.496	.613	.475	
	2 ⁰ : .346	.327	.604	-.127	.650	.494	.591	.547	
POR	0 ⁰ : .313	.142	.217	-.004	.097	.291	.190	.186	.115
	1 ⁰ : .202	.014	.102	.112	-.034	.207	.036	.132	-.044
	2 ⁰ : .161	-.022	.096	.101	-.085	.199	-.027	.186	-.091

NOTE: N=25. DF=23 for zero-order, 22 for first-order and 21 for second-order correlations. $p < .05$ for zero-order and first-order of at least $\pm .400$ and for second-order of $\pm .410$. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEC=contributions of services to G.N.P.; LAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports.

TABLE 40
ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND
SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY)
PARTIAL CORRELATIONS AMONG INDUSTRIAL-ECONOMIC
VARIABLES: UNITED STATES, 1960 AND 1970

	PIN	ING	COG	AGG	SEC	LAC	IIN	ICO	ISE
<u>1960</u>									
ING	0 ⁰ : .484 1 ⁰ : .389 2 ⁰ : .384								
COG	0 ⁰ : .275 1 ⁰ : .131 2 ⁰ : .127	.880 .833 .832							
AGG	0 ⁰ : -.232 1 ⁰ : -.306 2 ⁰ : -.328	.353 .318 .310	.391 .362 .359						
SEC	0 ⁰ : .233 1 ⁰ : .106 2 ⁰ : .101	.866 .812 .812	.981 .974 .974	.400 .373 .370					
LAC	0 ⁰ : -.021 1 ⁰ : -.102 2 ⁰ : -.133	.073 -.062 -.084	.062 -.070 -.085	-.026 -.067 -.107	.096 -.028 -.042				
IIN	0 ⁰ : .081 1 ⁰ : .004 2 ⁰ : -.069	.318 .228 .221	.184 .068 .048	.246 .215 .158	.196 .083 .066	.493 .463 .411			
ICO	0 ⁰ : .375 1 ⁰ : .284 2 ⁰ : .271	.452 .303 .295	.397 .238 .233	-.032 -.110 -.138	.374 .209 .204	.422 .370 .346	.498 .450 .441		
ISE	0 ⁰ : .284 1 ⁰ : .148 2 ⁰ : .122	.557 .388 .383	.543 .376 .379	.057 -.032 -.082	.576 .422 .426	.562 .532 .497	.595 .564 .500	.738 .576 .667	
POR	0 ⁰ : .149 1 ⁰ : .034 2 ⁰ : .061	.461 .332 .362	.513 .402 .426	.341 .305 .353	.524 .417 .441	.320 .260 .332	.041 -.054 .093	.256 .126 .170	.373 .230 .324
<u>1970</u>									
ING	0 ⁰ : .380 1 ⁰ : .460 2 ⁰ : .460								
COG	0 ⁰ : .143 1 ⁰ : .203 2 ⁰ : .201	.884 .859 .859							
AGG	0 ⁰ : -.001 1 ⁰ : .012 2 ⁰ : .017	.498 .487 .489	.458 .444 .448						
SEC	0 ⁰ : .079 1 ⁰ : .136 2 ⁰ : .132	.830 .793 .794	.971 .964 .965	.440 .425 .432					
LAC	0 ⁰ : -.470 1 ⁰ : -.463 2 ⁰ : -.460	.017 -.092 -.091	.065 -.044 -.037	-.121 -.163 -.183	.096 -.015 -.002				
IIN	0 ⁰ : -.070 1 ⁰ : -.035 2 ⁰ : -.012	.426 .308 .331	.360 .270 .246	.125 .072 .052	.340 .186 .219	.521 .476 .438			
ICO	0 ⁰ : .114 1 ⁰ : .154 2 ⁰ : .154	.466 .384 .385	.436 .346 .346	-.024 -.076 -.076	.396 .293 .294	.425 .377 .385	.732 .693 .733		
ISE	0 ⁰ : -.141 1 ⁰ : -.112 2 ⁰ : -.114	.408 .278 .278	.465 .341 .340	-.043 -.119 -.117	.492 .365 .364	.468 .415 .431	.468 .348 .378	.665 .613 .614	
POR	0 ⁰ : -.002 1 ⁰ : .026 2 ⁰ : .010	.486 .417 .426	.528 .464 .470	.380 .357 .386	.554 .491 .492	.320 .267 .337	.268 .164 .266	.344 .272 .281	.369 .276 .278

NOTE: N=50. DF=48 for zero-order, 47 for first-order and 46 for second-order correlations. $p < .05$ for zero-order and first-order correlations of at least .280 and for second-order correlations of $\pm .250$. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEC=contributions of services to G.N.P.; LAC=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports.

TABLE 41

ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND
SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY) PARTIAL
CORRELATIONS AMONG INDUSTRIAL-ECONOMIC VARIABLES: BRAZIL,
CHILE, AND UNITED STATES, 1960 AND 1970

	PIN	ING	COG	AGG	SEG	RAD	LAG	IIN	ICO	ISE
<u>1960</u>										
ING										
0 ⁰ :		.320								
1 ⁰ :		.144								
2 ⁰ :		.150								
COG										
0 ⁰ :		.313	.797							
1 ⁰ :		.009	.763							
2 ⁰ :		.067	.771							
AGG										
0 ⁰ :		-.213	.601	.308						
1 ⁰ :		-.166	.713	.466						
2 ⁰ :		-.170	.713	.467						
SEG										
0 ⁰ :		.144	.919	.877	.663					
1 ⁰ :		-.078	.906	.869	.776					
2 ⁰ :		-.037	.914	.867	.778					
RAD										
0 ⁰ :		.538	-.093	-.084	-.396	-.233				
1 ⁰ :		.496	-.208	-.274	-.377	-.361				
2 ⁰ :		.317	-.382	-.297	-.618	-.472				
LAG										
0 ⁰ :		.395	-.039	-.059	-.269	-.151	.818			
1 ⁰ :		.310	-.155	-.256	-.244	-.277	.805			
2 ⁰ :		.009	-.256	-.246	-.344	-.298	.496			
IIN										
0 ⁰ :		.533	-.026	-.035	-.346	-.173	.965	.868		
1 ⁰ :		.465	-.157	-.251	-.323	-.319	.963	.857		
2 ⁰ :		.254	-.332	-.279	-.590	-.440	.888	.619		
ICO										
0 ⁰ :		.533	-.017	-.012	-.337	-.156	.971	.861	.971	
1 ⁰ :		.464	-.146	-.221	-.314	-.299	.969	.850	.968	
2 ⁰ :		.254	-.299	-.215	-.551	-.389	.906	.600	.885	
ISE										
0 ⁰ :		.508	.015	.027	-.313	-.108	.948	.885	.967	.981
1 ⁰ :		.422	-.118	-.186	-.287	-.255	.946	.876	.964	.980
2 ⁰ :		.162	-.255	-.149	-.518	-.314	.829	.675	.862	.927
POR										
0 ⁰ :		.198	.174	.319	.046	.206	.082	.221	.092	.128
1 ⁰ :		.103	.106	.251	.076	.143	.033	.177	.033	.072
2 ⁰ :		.107	.106	.255	.077	.143	.038	.256	.043	.116
										.166
										.109
										.191
<u>1970</u>										
ING										
0 ⁰ :		.452								
1 ⁰ :		.381								
2 ⁰ :		.345								
COG										
0 ⁰ :		.361	.823							
1 ⁰ :		.270	.763							
2 ⁰ :		.171	.755							
AGG										
0 ⁰ :		-.090	.614	.432						
1 ⁰ :		-.150	.608	.394						
2 ⁰ :		-.149	.625	.420						
SEG										
0 ⁰ :		.297	.891	.936	.614					
1 ⁰ :		.188	.853	.913	.615					
2 ⁰ :		.134	.849	.915	.628					
RAD										
0 ⁰ :		.468	-.175	-.096	-.430	-.208				
1 ⁰ :		.622	-.002	.102	-.394	-.028				
2 ⁰ :		.451	-.244	-.189	-.612	-.255				
LAG										
0 ⁰ :		.237	-.044	.047	-.243	-.029	.699			
1 ⁰ :		.275	.006	.115	-.229	.028	.712			
2 ⁰ :		-.076	-.152	-.084	-.272	-.098	.385			
IIN										
0 ⁰ :		.502	-.092	-.007	-.405	-.120	.965	.770		
1 ⁰ :		.600	.024	.130	-.377	.001	.970	.771		
2 ⁰ :		.408	-.198	-.139	-.582	-.204	.915	.521		
ICO										
0 ⁰ :		.450	-.112	.001	-.395	-.129	.964	.758	.970	
1 ⁰ :		.376	.043	.186	-.360	.036	.962	.767	.970	
2 ⁰ :		.361	-.173	-.047	-.567	-.150	.889	.507	.914	
ISE										
0 ⁰ :		.334	-.125	.005	-.364	-.112	.920	.750	.912	.956
1 ⁰ :		.446	.022	.185	-.127	.050	.913	.757	.907	.951
2 ⁰ :		.100	-.213	-.051	-.514	-.127	.744	.483	.727	.854
POR										
0 ⁰ :		.069	.132	.258	.070	.236	.053	.241	.113	.128
1 ⁰ :		.023	.075	.221	.045	.194	.109	.258	.149	.179
2 ⁰ :		-.022	.057	.200	.050	.181	.034	.251	.103	.153
										.195

NOTE: N=100. DF=98 for zero-order, 97 for first-order and 96 for second-order correlations. $p < .05$ for zero-order and first-order correlations of at least $\pm .196$ and for second-order partials of at least $\pm .198$. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; RAD=radio per capita; LAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports.

TABLE 42

ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY) PARTIAL CORRELATIONS AMONG SOCIO-POLITICAL VARIABLES:
BRAZIL, 1960 AND 1970

	VOT	PRI	SND	COL	ILL		VOT	PRI	SND	COL	ILL
	<u>1960</u>						<u>1970</u>				
PRI 0 ⁰ :	.094					PRI 0 ⁰ :	.231				
PRI 1 ⁰ :	.083					PRI 1 ⁰ :	.134				
PRI 2 ⁰ :	-.157					PRI 2 ⁰ :	.063				
SND 0 ⁰ :	.416	.375				SND 0 ⁰ :	.438	.503			
SND 1 ⁰ :	.610	.047				SND 1 ⁰ :	.171	.544			
SND 2 ⁰ :	.258	-.355				SND 2 ⁰ :	.026	.521			
COL 0 ⁰ :	.301	-.034	.830			COL 0 ⁰ :	.418	-.148	.675		
COL 1 ⁰ :	.344	-.428	.720			COL 1 ⁰ :	.202	-.467	.256		
COL 2 ⁰ :	.087	-.688	.653			COL 2 ⁰ :	.072	-.568	.159		
ILL 0 ⁰ :	-.232	-.529	-.671	-.394		ILL 0 ⁰ :	-.337	-.445	-.690	-.335	
ILL 1 ⁰ :	-.247	-.382	-.477	-.103		ILL 1 ⁰ :	-.110	-.366	-.396	.140	
ILL 2 ⁰ :	.153	-.255	-.067	.212		ILL 2 ⁰ :	.083	-.324	-.293	.324	
SSE 0 ⁰ :	.080	.733	.689	.370	-.674	SSE 0 ⁰ :	.282	.477	.761	.360	-.756
SSE 1 ⁰ :	.068	.650	.383	-.036	-.506	SSE 1 ⁰ :	-.024	.420	.418	-.232	-.572
SSE 2 ⁰ :	-.377	.596	-.049	-.365	-.300	SSE 2 ⁰ :	-.172	.390	.352	-.364	-.517

NOTE: N=25. DF=23 for zero-order correlations, 22 for first-order and 21 for second-order partials. $p < .05$ for zero-order and first-order partial correlations of at least $\pm .400$ and second-order partials of $\pm .410$. VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 43

ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY) PARTIAL CORRELATIONS AMONG SOCIO-POLITICAL VARIABLES:
CHILE, 1960 AND 1970

	VOT	PRI	SND	COL	ILL		VOT	PRI	SND	COL	ILL
	<u>1960</u>						<u>1970</u>				
0 ⁰ :	-.122					0 ⁰ :	-.314				
PRI 1 ⁰ :	-.057					PRI 1 ⁰ :	-.274				
2 ⁰ :	-.041					2 ⁰ :	-.269				
0 ⁰ :	.687	-.131				0 ⁰ :	.557	-.173			
SND 1 ⁰ :	.434	-.042				SND 1 ⁰ :	.440	-.078			
2 ⁰ :	.456	-.065				2 ⁰ :	.444	-.086			
0 ⁰ :	.233	-.094	.561			0 ⁰ :	.077	-.172	.454		
COL 1 ⁰ :	-.183	-.022	.130			COL 1 ⁰ :	-.156	-.099	.143		
2 ⁰ :	-.182	-.026	.128			2 ⁰ :	-.159	-.094	.145		
0 ⁰ :	-.803	.101	-.716	-.430		0 ⁰ :	-.469	.526	-.644	-.433	
ILL 1 ⁰ :	-.684	-.002	-.109	.100		ILL 1 ⁰ :	-.303	.594	-.282	-.089	
2 ⁰ :	-.680	-.023	-.128	.098		2 ⁰ :	-.297	.582	-.297	-.082	
0 ⁰ :	.313	.388	.004	-.026	-.186	0 ⁰ :	.181	.117	-.168	-.024	-.185
SSE 1 ⁰ :	.326	.404	-.132	-.098	-.196	SSE 1 ⁰ :	.142	.143	-.368	-.112	-.128
2 ⁰ :	.311	.463	-.103	-.095	-.173	2 ⁰ :	.131	.186	-.369	-.126	-.083

NOTE: N=25. DF=23 for zero-order correlations, 22 for first-order and 21 for second-order partials. $p < .05$ for zero-order correlations and first-order partials of at least $\pm .400$ and for second-order partials of $\pm .410$. VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 44

ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY) PARTIAL CORRELATIONS AMONG SOCIO-POLITICAL VARIABLES:
UNITED STATES, 1960 AND 1970

	VOT	PRI	SND	COL	ILL		VOT	PRI	SND	COL	ILL
	<u>1960</u>						<u>1970</u>				
PRI 0 ⁰ :	-.151					PRI 0 ⁰ :	-.000				
PRI 1 ⁰ :	-.075					PRI 1 ⁰ :	.009				
PRI 2 ⁰ :	-.068					PRI 2 ⁰ :	.009				
SND 0 ⁰ :	.194	.187				SND 0 ⁰ :	.141	.105			
SND 1 ⁰ :	.350	.086				SND 1 ⁰ :	.154	.086			
SND 2 ⁰ :	.347	.122				SND 2 ⁰ :	.154	.087			
COL 0 ⁰ :	.093	-.340	.088			COL 0 ⁰ :	.073	-.197	.036		
COL 1 ⁰ :	-.054	-.242	.340			COL 1 ⁰ :	.050	-.159	.106		
COL 2 ⁰ :	-.084	-.174	.304			COL 2 ⁰ :	.051	-.144	.107		
ILL 0 ⁰ :	-.021	.241	-.057	-.480		ILL 0 ⁰ :	.044	-.039	-.115	-.497	
ILL 1 ⁰ :	.013	.218	-.112	-.486		ILL 1 ⁰ :	.053	-.057	-.137	-.490	
ILL 2 ⁰ :	.075	.105	.020	-.221		ILL 2 ⁰ :	.084	-.151	-.180	-.351	
SSE 0 ⁰ :	.513	-.106	-.119	.135	-.069	SSE 0 ⁰ :	.347	-.220	-.459	.037	-.077
SSE 1 ⁰ :	.443	.076	.145	-.202	-.000	SSE 1 ⁰ :	.358	-.178	-.444	-.183	-.019
SSE 2 ⁰ :	.442	.112	.122	-.319	.206	SSE 2 ⁰ :	.360	-.172	-.449	-.245	.094

NOTE: N=50. DF=48 for zero-order correlations, 47 for first-order and 46 for second-order partials. $p < .05$ for zero-order and first-order partial correlations of at least $\pm .280$ and for second-order partials of $\pm .290$. VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 45

ZERO-ORDER, FIRST-ORDER (BY RURAL-URBAN RESIDENCE) PARTIAL AND SECOND-ORDER (BY RURAL-URBAN RESIDENCE AND ETHNICITY) PARTIAL CORRELATIONS AMONG SOCIO-POLITICAL VARIABLES:
BRAZIL, CHILE, AND UNITED STATES, 1960 AND 1970

	VOT	PRI	SND	COL	ILL		VOT	PRI	SND	COL	ILL
	<u>1960</u>						<u>1970</u>				
PRI 0°:	-.300					PRI 0°:	.027				
PRI 1°:	-.336					PRI 1°:	.011				
PRI 2°:	-.319					PRI 2°:	.017				
SND 0°:	-.204	.818				SND 0°:	-.242	.264			
SND 1°:	-.271	.815				SND 1°:	-.182	.297			
SND 2°:	-.274	.792				SND 2°:	-.050	.457			
COL 0°:	-.181	.615	.878			COL 0°:	-.271	.189	.903		
COL 1°:	-.253	.594	.859			COL 1°:	-.227	.210	.898		
COL 2°:	-.281	.426	.656			COL 2°:	-.125	.326	.705		
ILL 0°:	.185	-.774	-.847	-.718		ILL 0°:	.145	-.537	-.774	-.754	
ILL 1°:	.279	-.784	-.823	-.657		ILL 1°:	.157	-.537	-.819	-.782	
ILL 2°:	.260	-.715	-.719	-.388		ILL 2°:	.040	-.696	-.636	-.547	
SSE 0°:	-.024	.759	.719	.589	-.793	SSE 0°:	.051	.564	.502	.525	-.778
SSE 1°:	-.091	.761	.669	.502	-.738	SSE 1°:	.006	.562	.591	.592	-.786
SSE 2°:	-.047	.708	.596	.320	-.675	SSE 2°:	.110	.622	.405	.408	-.719

NOTE: N=100. DF=98 for zero-order correlations, 97 for first-order and 96 for second-order partials. $p < .05$ for zero-order and first-order partial correlations of at least $\pm .196$ and for second-order partials of $\pm .198$. VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 46
ZERO-ORDER CORRELATIONS BETWEEN INDUSTRIAL-ECONOMIC AND
CONTROL VARIABLES, 1960 AND 1970

	PIN	ING	COG	AGG	SEG	RAD	IAG	IIN	ICO	ISE	POR
<u>A. Brazil</u>											
POP											
T ₁ :	.517	.441	.676	.019	.491	----	.219	.711	.737	.675	-.145
T ₂ :	.826	.645	.782	.312	.706	----	.307	.629	.510	.124	-.185
ETH											
T ₁ :	-.506	-.482	-.480	-.635	-.505	----	-.239	-.244	-.499	-.350	-.205
T ₂ :	-.586	-.485	-.479	-.643	-.511	----	-.526	-.752	-.549	.007	-.313
<u>B. Chile</u>											
POP											
T ₁ :	.675	.489	.718	-.317	.689	----	-.015	.658	.507	.805	.180
T ₂ :	.785	.535	.547	-.423	.514	----	.458	.674	.257	.612	.244
ETH											
T ₁ :	-.222	-.232	-.137	.034	-.267	----	-.010	-.236	.168	-.257	-.238
T ₂ :	-.275	-.236	-.127	.013	-.276	----	-.132	-.331	.169	-.266	-.238
<u>C. United States</u>											
POP											
T ₁ :	.320	.545	.526	.166	.524	----	.229	.243	.402	.508	.371
T ₂ :	-.092	.408	.429	.142	.452	----	.243	.418	.329	.440	.300
ETH											
T ₁ :	-.115	-.088	-.063	-.155	-.064	----	-.238	-.554	-.162	-.279	.200
T ₂ :	.070	.012	.029	-.070	.052	----	-.213	-.303	-.004	.021	.226
<u>D. Brazil, Chile, and United States</u>											
POP											
T ₁ :	.554	.378	.554	-.137	.370	.248	.263	.295	.295	.315	.205
T ₂ :	.268	.496	.510	.194	.532	-.349	-.100	-.228	-.297	-.289	.136
ETH											
T ₁ :	-.445	-.093	-.013	.053	.022	-.825	-.770	-.865	-.854	-.863	-.056
T ₂ :	-.363	.004	-.061	.097	.038	-.826	-.670	-.817	-.833	-.836	-.063

NOTE: T₁=1960; T₂=1970. Zero-order correlations between rural-urban residence and ethnicity in 1960 and 1970, respectively, are -.110 and -.387 for Brazil, -.237 and -.170 for Chile, -.037 and -.002 for the U.S., and -.212 and .298 for the combined cases. ETH=ethnicity; POP=rural-urban residence; PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; RAD=radio per capita; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports.

TABLE 47
STANDARDIZED REGRESSION COEFFICIENTS:
BRAZIL, 1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	-.243	.628	-.129	-.146	-.272	.906
ING	-.514	-.541	-.337	-.193	1.150	-.220
COG	-1.035	-1.014	.126	2.430	-.627	-.041
AGG	-.675	.121	-.531	.289	.087	-.187
SEG	1.872	1.156	.921	-1.847	-.859	.362
IAG	-.008	.475	-.130	-.469	-.807	.137
IIN	-.186	-.260	.280	.573	.129	-.112
ICO	-----	-.203	.114	.307	-.046	.125
ISE	.304	-.339	.272	.159	-.015	.074
POR	-.113	.105	-.009	-.170	.037	.033
POP	-----	.936	-.019	-.648	.085	.049
ETH	-.932	-.151	-.429	-.051	.095	.036
<u>1970</u>						
PIN	-.291	.861	.845	-.160	-.090	.928
ING	.367	-.569	-.539	-.484	-----	.147
COG	.713	-1.003	.570	1.822	.490	-1.334
AGG	.474	.404	.487	.398	-.242	-.253
SEG	-1.499	.374	-.588	-1.076	-.220	.633
IAG	.198	-.083	.039	.183	.310	-.123
IIN	-.185	.248	.212	-.060	-.717	.180
ICO	-.109	.048	-.024	-.030	-.101	.323
ISE	-.042	.299	.046	-.163	-.148	-.149
POR	.085	-.072	-.033	.112	-.101	.260
POP	.748	.170	.289	.357	-.341	.416
ETH	-.410	.143	.291	-.025	-.138	.163

NOTE: See tables 2, 8, 14, 20, 26, and 32 in text for order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; SEG=contributions of services to G.N.P.; AGG=contributions of agriculture to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 48

STANDARD ERROR OF ESTIMATE: BRAZIL, 1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	13.189	5.853	.730	.287	4.679	4.385
ING	15.205	5.136	1.125	.328	5.255	3.103
COG	14.833	5.069	1.429	.452	6.111	2.930
AGG	14.255	5.044	.811	.307	4.891	3.021
SEG	14.684	5.374	.741	.296	4.591	3.050
IAG	13.878	5.395	.818	.311	8.655	3.068
IIN	13.552	5.264	.806	.294	4.623	3.170
ICO	-----	5.908	.744	.280	5.453	2.914
ISE	13.366	5.251	1.206	.301	5.059	3.396
POR	13.223	5.530	.774	.305	4.740	2.973
POP	-----	5.015	.844	.289	5.245	3.170
ETH	13.356	5.718	.986	.322	4.801	3.284
<u>1970</u>						
PIN	9.753	7.720	2.329	.296	7.256	10.698
ING	12.004	6.850	2.090	.354	-----	8.063
COG	11.294	6.780	1.582	.460	6.828	9.352
AGG	11.615	7.423	1.644	.302	6.987	8.466
SEG	10.962	6.850	1.784	.304	7.750	8.692
IAG	9.951	7.019	1.718	.313	7.545	8.175
IIN	10.673	6.792	1.698	.312	8.498	7.985
ICO	10.175	8.236	1.787	.325	7.481	8.082
ISE	12.483	8.052	1.620	.301	7.258	8.083
POR	10.417	7.209	1.663	.292	6.917	8.945
POP	9.797	7.660	1.704	.294	6.838	7.978
ETH	9.969	7.917	1.646	.293	7.054	8.031

NOTE: See tables 2, 8, 14, 20, 26, and 32 in text for N, SS_{res} , and order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 49
STANDARDIZED REGRESSION COEFFICIENTS:
CHILE, 1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	-.061	-1.427	.057	.038	-.332	-.480
ING	-.095	1.787	-.590	-.518	.172	.748
COG	.201	-1.087	.537	-.094	-.449	-----
AGG	-.201	.081	-.391	-.509	-.043	-.115
SEG	.618	-.958	.147	.291	-.089	-.351
IAG	.028	.181	.069	.266	-.163	.088
IIN	.378	.258	.244	.173	-.164	.498
ICO	-.118	.820	-.448	-.245	.308	.056
ISE	.386	-.122	.093	.138	-.255	.059
POR	.249	.768	.048	-----	-.245	.403
POP	-.478	.841	.507	.448	-.116	-.252
ETH	.096	.151	.161	.074	-.100	-.116
<u>1970</u>						
PIN	-.681	-.016	1.049	1.009	-.277	-.364
ING	.727	.537	-.954	-1.404	.208	.912
COG	-2.009	-.456	.389	1.639	-.160	.145
AGG	-.414	-.169	-.274	-.208	-.201	.057
SEG	1.603	-.560	.391	-.177	-.394	-.527
IAG	1.037	.264	.646	-1.008	.058	-.132
IIN	-.691	-.629	-.472	.254	.020	-----
ICO	.225	.320	-.490	-.644	.081	-----
ISE	.253	-.183	.028	.511	-.350	.170
POR	.026	-----	-.247	.051	-.306	.323
POP	.408	.333	.063	-.251	-.199	-----
ETH	.070	-.135	.106	.149	-.089	-.162

NOTE: See tables 3, 9, 15, 21, 27, and 33 in text for order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 50

STANDARD ERROR OF ESTIMATE: CHILE, 1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	3.760	4.230	2.297	.701	2.601	11.778
ING	3.998	4.633	2.185	.737	2.444	12.061
COG	4.140	3.535	2.307	.754	2.405	-----
AGG	4.181	3.592	2.324	.718	2.529	12.288
SEG	4.518	4.902	2.421	.784	2.826	11.504
IAG	4.304	3.662	2.278	.696	2.755	11.705
IIN	4.232	3.529	2.275	.711	3.234	11.628
ICO	3.873	4.696	2.290	.728	2.535	13.024
ISE	3.703	3.711	2.249	.728	5.108	13.508
POR	4.369	5.321	2.330	----	4.028	11.720
POP	4.047	3.790	2.331	.779	2.638	12.598
ETH	3.731	3.508	2.284	.759	2.414	11.965
<u>1970</u>						
PIN	2.935	3.493	1.977	.758	2.394	14.570
ING	2.919	3.597	1.897	.849	2.398	14.720
COG	4.079	4.023	1.983	.800	2.722	15.921
AGG	4.300	3.611	1.876	.727	2.376	16.423
SEG	4.695	3.866	1.919	.794	3.158	15.070
IAG	3.528	3.522	2.139	.974	2.456	14.394
IIN	2.994	3.475	2.063	.745	2.536	-----
ICO	2.901	3.901	1.934	.731	2.629	-----
ISE	2.859	3.516	1.993	1.190	4.823	15.462
POR	3.013	-----	2.110	.766	3.795	14.302
POP	2.877	3.694	2.315	.896	2.780	-----
ETH	2.922	3.799	1.922	.732	2.371	14.812

NOTE: See tables 3, 9, 15, 21, 27, and 33 for N, SS_{res} , and order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 51
STANDARDIZED REGRESSION COEFFICIENTS:
UNITED STATES, 1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	.542	.354	.481	-.263	.123	.731
ING	-.449	-.399	-.693	-----	-.266	-.053
COG	.333	.271	.590	-.410	-----	.062
AGG	-.131	.081	.037	-.038	-.071	-.049
SEG	-----	-----	-----	.657	.135	.007
IAG	.272	-----	.180	.225	-.605	-.145
IIN	-.052	.271	.329	-.104	.138	.085
ICO	-.364	.088	.053	.176	-.138	-.050
ISE	.244	-.071	-.689	-.517	.102	.083
POR	-.104	-.039	-.153	-.035	.202	.122
POP	.220	-.374	-.220	.599	-.011	.292
ETH	.045	.373	-.031	-.537	.664	-.063
<u>1970</u>						
PIN	.208	-.439	-.635	-.070	.195	.594
ING	.309	.725	.141	-.218	-.228	.112
COG	-.508	-.534	-1.066	-.578	.061	.200
AGG	-.375	-.087	-----	.018	-.007	-.302
SEG	.408	-.165	.662	.984	-----	-.126
IAG	.205	-----	-.376	.505	-.508	-.056
IIN	-----	-.310	.314	-.028	-.028	.269
ICO	-.254	.558	-.030	.170	-.184	-.040
ISE	.207	.164	.306	-.549	.179	.065
POR	.114	-.107	.136	-.061	.229	.192
POP	-.043	-.249	-.320	.363	.010	.330
ETH	-.046	.035	-----	-.237	.525	-.142

NOTE: See tables 4, 10, 16, 22, 28, and 34 in text for order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 52
STANDARD ERROR OF ESTIMATE: UNITED STATES,
1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	33.444	9.161	2.413	1.493	2.063	5.902
ING	31.507	9.183	2.325	-----	2.077	4.580
COG	31.424	9.228	2.273	1.481	-----	4.639
AGG	32.002	9.318	2.347	1.497	2.076	4.485
SEG	-----	-----	-----	1.454	2.069	4.442
IAG	32.745	-----	2.286	1.471	2.180	4.426
IIN	32.491	9.117	2.350	1.471	2.074	4.457
ICO	32.299	9.421	2.319	1.463	2.076	4.526
ISE	31.395	9.526	2.529	1.475	2.071	4.418
POR	31.754	9.642	2.292	1.516	2.107	4.460
POP	31.277	9.375	2.365	1.750	2.095	4.510
ETH	32.095	9.289	2.441	1.565	3.249	4.447
<u>1970</u>						
PIN	27.909	7.206	7.380	2.676	1.515	9.302
ING	27.667	6.997	6.853	2.630	1.518	10.734
COG	28.179	6.962	7.085	2.642	1.508	5.953
AGG	28.464	7.064	-----	2.776	1.508	6.117
SEG	28.411	7.293	6.785	2.714	-----	6.021
IAG	27.826	-----	7.044	3.246	1.615	5.841
IIN	-----	7.099	6.876	2.740	1.516	6.723
ICO	27.868	7.542	6.938	2.652	1.491	6.095
ISE	27.860	6.919	7.136	2.864	1.508	5.889
POR	27.649	7.000	6.787	2.705	1.558	5.994
POP	29.095	6.940	7.227	3.112	1.527	7.693
ETH	28.744	7.151	-----	2.781	2.297	5.796

NOTE: See tables 4, 10, 16, 22, 28, and 34 in text for N, SS_{res}, and order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 53

STANDARDIZED REGRESSION COEFFICIENTS: BRAZIL,
CHILE, AND UNITED STATES, 1960 AND 1970

	Socio-Political Variables					
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	.372	.420	.167	-.122	-.403	.654
ING	-.126	-.255	-.196	-.082	.241	-.074
COG	-----	.122	.018	.001	-.506	.141
AGG	.088	.097	-.015	-.102	-.199	-.050
SEG	-----	.138	.254	.172	.184	.092
RAD	-.338	1.114	1.304	.800	-1.075	.550
IAG	.401	.094	.101	.130	-.465	-.029
IIN	-1.378	.614	.240	.080	-.576	.430
ICO	-.696	-.080	-----	.045	.609	-.412
ISE	1.397	-.779	-.786	-.386	.882	-.060
POR	-.125	-----	-.055	.010	.091	.041
POP	.093	-.160	.074	.199	-.075	-.084
ETH	-.301	.420	-----	-.312	-.031	.219
<u>1970</u>						
PIN	.422	.596	.024	-.133	-.456	.544
ING	-.192	-.325	-.017	-.072	.203	-.101
COG	-.324	-.076	.060	-.134	-----	-.052
AGG	-.109	.277	.039	-.112	-.100	-.026
SEG	.501	-----	-.039	.274	-.114	.125
RAD	-.723	.110	.842	.916	-.627	-.068
IAG	.336	.202	.084	.159	-.206	-.088
IIN	-----	1.071	.139	-.043	-.732	1.139
ICO	-.493	-.753	-.332	.161	.772	-.485
ISE	.457	.097	.223	-.337	.085	-.040
POR	-----	-.069	-.032	.004	-----	.110
POP	-.083	-.052	.005	.138	-.066	.055
ETH	-----	.746	-.035	-.247	-.042	.173

NOTE: See tables 5, 11, 17, 23, 29, and 35 in text for order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; RAD=radios per capita; IAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

TABLE 54
STANDARD ERROR OF ESTIMATE: BRAZIL, CHILE, AND
UNITED STATES, 1960 AND 1970

Socio-Political Variables						
	VOT	PRI	SND	COL	ILL	SSE
<u>1960</u>						
PIN	26.104	10.750	3.622	1.259	9.212	12.055
ING	25.229	9.386	2.743	1.250	7.741	10.647
COG	-----	9.375	2.702	1.248	8.315	10.727
AGG	25.330	9.337	2.688	1.242	7.702	10.803
SEG	-----	9.396	2.835	1.247	7.665	10.859
RAD	27.666	11.674	4.180	1.523	11.180	11.139
LAG	25.451	9.358	2.679	1.250	8.681	10.745
IIN	25.736	9.464	2.888	1.256	7.859	10.628
ICO	25.042	9.448	-----	1.270	9.069	10.682
ISE	26.776	9.838	3.181	1.260	8.072	10.920
POR	25.070	-----	2.714	1.263	7.640	10.689
POP	25.137	9.378	2.941	1.384	7.641	10.625
ETH	25.129	9.567	-----	1.296	7.706	10.870
<u>1970</u>						
PIN	21.507	10.788	6.944	2.321	7.288	15.319
ING	21.155	9.301	6.983	2.154	6.527	12.740
COG	21.275	10.281	6.823	2.155	-----	12.933
AGG	21.359	9.346	6.875	2.188	6.566	13.005
SEG	21.237	-----	6.910	2.157	6.516	12.794
RAD	21.856	9.436	6.977	2.778	6.554	12.862
LAG	21.057	9.283	6.840	2.449	6.786	12.671
IIN	-----	9.492	6.844	2.168	9.339	13.759
ICO	21.090	9.386	6.789	2.157	6.896	12.843
ISE	21.125	9.386	6.812	2.189	6.536	13.078
POR	-----	9.300	6.807	2.180	-----	12.645
POP	21.435	9.341	6.795	2.379	6.551	12.693
ETH	-----	10.087	6.788	2.264	6.566	13.139

NOTE: See tables 5, 11, 17, 23, 29, and 35 in text for N, SS_{res}, and order in which variables were entered into the equations. PIN=labor in industry; ING=contributions of industry to G.N.P.; COG=contributions of commerce to G.N.P.; AGG=contributions of agriculture to G.N.P.; SEG=contributions of services to G.N.P.; RAD=radio per capita; LAG=income in agriculture; IIN=income in industry; ICO=income in commerce; ISE=income in services; POR=ports; POP=rural-urban residence; ETH=ethnicity; VOT=voter registration; PRI=primary education; SND=secondary education; COL=higher education; ILL=illiteracy; SSE=social security coverage.

APPROVAL SHEET

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

June 29, 1978
Date

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Director's Signature