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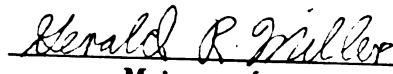
**Patron-Dependence, Communication Behavior,
and the Modernization Process**

presented by

Gustavo M. Quesada

**has been accepted towards fulfillment
of the requirements for**

Ph. D. degree in Communication


Major professor

Date 16 March 1970

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ABSTRACT

PATRON-DEPENDENCE, COMMUNICATION BEHAVIOR AND THE MODERNIZATION PROCESS

By Gustavo M. Quesada

The present dissertation deals with (a) the channels of extra-system communication, (b) a particular receiver characteristic which is here called patron-dependence, and (c) the effect (modernity) that communication brings about in the receivers. The objectives of the study were (1) to define conceptually and operationally patron-dependence (PD), (2) to analyze empirically the relationship of communication variables with PD and modernity, and (3) to determine the possible intervening effects of PD on the association between communication variables and modernity.

It was hypothesized that: (1) physical mobility, mass media exposure, cosmopolite contact, and empathy (the four extra-system communication variables), while positively associated with modernity, were negatively associated with patron-dependence; and (2) stratifying for patron-dependence (from high to low PD) will increase the relationship between the extra-system communication variables and modernity.

The data for the present study are part of a larger research endeavor dealing with the diffusion of innovations. The present dissertation concentrates on interviews from a sample of 315 Minas Gerais farmers, also called Phase 2.5 of the Brazil Difussion Project. The test of the hypotheses

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were all done at the .05 level of significance, one-tail test. The statistics used were zero-order correlations, highest-order partial correlations, and Fisher's z test for differences between two correlation coefficients.

Patron-dependence, defined as the degree to which an individual's decisions are influenced by actors occupying superior hierarchical positions in the social system, was measured with a seven-item quasi-scale. Modernity (or the ability to cope with change) was operationalized in terms of agricultural knowledge and agricultural innovativeness.

About half of the hypotheses were supported and about half were not supported. Physical mobility as measured in the present study did not correlate with the other variables in the model, while mass media exposure and cosmopolite contact contributed significantly to the variances in PD and modernity. Empathy, which is not highly related to PD, associated with the cognitive but not behavioral aspects of the modernization process. In general, the association between extra-system communication and the cognitive aspects of modernity was a sound one.

Theorywise, there are indications that patron-dependent relationships (rather than a suppressor variable) are antagonistic toward the norms and behaviors determining modern roles. In a way, patron-dependence acts as a mechanism to maintain boundaries for mentally and physically isolated social entities, while modernity is part of a mechanism acting in the opposite direction, i.e., the broadening of the reference-system boundaries of a social space

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including more heterogeneous and structurally complex reference groups. Validations with other populations and accounting for systemic differences are advocated and improvements on the conceptual and operational side are highly recommended.

PATRON-DEPENDENCE, COMMUNICATION BEHAVIOR
AND THE MODERNIZATION PROCESS

By
Gustavo M. Quesada

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY
Department of Communication
1970

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Advisance Committee

Accepted by the faculty of the Department of Communication,
College of Communication Arts, Michigan State University, in partial
fulfillment of the requirements for the Doctor of Philosophy degree.

Ernest M. Rogers
Director of Thesis

Guidance Committee: Ernest M. Rogers, Chairman
Donald C. Morrison
L. C. Sarbaugh
R. V. Farace

To:

Eugene Jacobson, for
his incomparable love
for the scientific process,

and

Patricia, who, like a
number, never had a chance
in the process.

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Five years ago, at the time I finished my Master's Thesis, I felt that this was the most unnecessary section in the entire thesis. So, in order to be fair, I acknowledged "to all of you that, either in Brazil or the United States, in one way or another, collaborated to make this thesis as it is." Today, either of two alternatives has happen: I have been socialized into the system, or the contributions to the present dissertation have been so highly commendable that I feel it is fair to cite specifically, even at the risk of forgetting someone. I rather assume the second interpretation as valid.

Observation tells me that the "primacy and recency effect" is operative even in dissertation acknowledgements. Therefore, let me proceed with the acknowledgements in a manner parallel to the time that the different phases of this dissertation were done. Financially the present study has been partially aided by the U.S. Agency of International Development, the Department of Communication at Michigan State University, the Brazilian National Research Council, the Organization of American States, and the Midwest Universities Consortium for International Affairs.

I want to acknowledge Gordon Whiting, Bill Herzog, David Stanfield, Vicente de Paula Vitor, Jose Armando de Souza, and the late Celio Nogueira da Gama, all members of the staff of the Diffusion Project in whose early contributions might have been forgotten. Interviewers and "faceless" respondents'

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contributions are also recognized. The involvement of the former and the hospitality of the latter, although loveable, made scientific impartiality much harder to achieve by the author.

Special acknowledgements go to Renato S. Lopes, Executive Secretary, and his Associacao de Credito e Assistencia Rural (ACAR) in Brazil. Without the participation of this efficient team of technicians, The Diffusion Project could never have gotten out of the planning paper stage and into field situations. To the author, they are not only competent professional colleagues, but friends as well.

Criticism to earlier versions of the present dissertation is gladly recognized. Among fellow Graduate Assistants, the interest shown by Niels Roling, Joe Ascroft, Ed Bodaken, Jerry Durlak, and John van Es was without parallel. The author is particularly indebted for editorial comments received from John Coggins, Linda Martin, Herman Struck, and Martha Jacob.

The writer expresses his thanks to Janette Swenson, the typist, and to Betty Darlington, whose mental lapses forced him to learn a great deal more than desirable about the mechanics of computer programming. Both are dedicated employees who hardly fit the definition or common meaning of bureaucrats.

Among the faculty of the Department of Communication at Michigan State University, special recognition is dedicated to Drs. D. K. Berlo, H. Kumata, V. C. Toldahl,

and B. Greenba

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and B. Greenberg. To my fellow Brazilian, Lytton Guimaraes, I extend thanks for his example, advice and companionship during all these years of graduate training.

The contributions and guidance received from the members of my Graduate Committee, Drs. Vincent Farace, Denton Morrison, and Larry Sarbaugh, is highly recognized. The chairman of this committee was Everett M. Rogers, my boss, major professor, and friend, undoubtedly the most important single contributor to the present dissertation.

A recent typology equates the property to defer gratifications with modern behavior. To my family I want to say that you have been too modern, too long. I thank Tanira, my wife, who was able to "process" three children while I "cooked" only one dissertation. To the children, one has to thank whatever inspiration is possible to be found in their smell, noises and excesses of energy.

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Chapter I

INTRODUCTION

... Indoctrinating the youth with group standards in accordance with parental interpretations of them is by nature an authoritarian mechanism.

(Barnett, 1953)

Traditionally, the communication process has been described as composed of a source, or a person or group of persons that have some reason for engaging in communication, who encodes his purpose in the form of a message via some medium or channel to an audience of decoding receivers (composed of one or more persons). Berlo (1960) calls the combination of sources, messages, channels and receivers the SMCR model. Some authors, like Rogers with Svenning (1969, p. 49), add a fifth element or component to the communication process. It is called the effect or the receivers' reaction to the stimulus from the source. The present dissertation deals with channels of extra-system communication (interpersonal contacts with cosmopolities, mass media exposure, and trips to urban centers*), a particular receiver characteristic, here called patron-dependence, and the particular effect, modernity, that this communication brings about in the receivers. The present study does not deal with sources and messages.**

*Due to their theoretical relevance for communication scholars, these concepts are kept separately in the model shown in Chapter II.

**Deutschmann (1963) suggested that independently of content, media exposure induces conversation resulting in social consensus.

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The purposes of this dissertation are: (1) conceptually and operationally define patron-dependence, (2) to study the contribution of extra-systemic channels in determining modern behavior, and (3) to study the possible intervening effects of patron-dependence on the association between extra-systemic communication* and modernity. Several researches have studied the association between mass media use and modernization,** and diffusion researchers have emphasized the role of interpersonal relations in the less developed countries. Beside the study of mass media exposure, we propose the study of cosmopolite contacts, physical mobility and Lerner's empathy in explaining modernization effects.

THE PROBLEM AND ITS RELEVANCY

Patron-dependence (PD) has been characterized, at different levels of analysis, as a family, organization, or societal trait. Kenny (1960) defines a patron as someone who is regarded, and who regards himself, as a protector, guide, a model to copy, and an intermediary in dealing with someone or something more powerful than oneself. For the purpose of this dissertation, patron-dependence is defined as the degree to which an individual's decisions are influenced by actors

*A social system is a functionally differentiated population of individuals, as it is used here, a community. Extra-system communication refers to the transfer of messages that originate outside community boundaries. These two concepts are discussed in a later section.

**For example: Lerner (1958), Frey (1966), Deutschmann (1963), Rogers (1965), and Herzog (1967a).

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occupying superior hierarchical positions.* This superior hierarchical position can be the father in a family, the bank manager in a business transaction, or the local political boss in a political decision.**

As a general trait, patron dependent relationships*** are not particular to a single culture. Rather, patron-dependence is a widespread phenomenon. The Japanese oyabum-kobum**** employer-employee relationship is a patron-dependent type of relationship, as is the Indian jajmani-kamin***** and the Latin American patron-peon relationship.*****

*Bennett and Ishino (1963, p. 224) define paternalism as "a relationship between the agents in any economic organization in which the employer acts toward his employees in a manner somewhat similar to that of a father toward his children," which conveys the idea that the hierarchical and authoritarian relationship contains formal obligations. The paternal figure (or patron) owes something to the subordinate, just as the employee is expected to give to his superior.

To compromise between the family connotation of "paternalism" and the organizational nature of "authority-dependant relationships," we prefer to use "patron-dependent relationships," which is broader in scope than the other two.

**Fals Borda (1961, p. 247) relates the importance of authority and respect for hierarchy in Colombia to the use of pronouns like Usted, or "Your Mercy" in son-father or tenant-landlord relationships.

***While patron-dependant relationships (abbreviated PDR and used by Hutchinson, 1966) refer to a link or interaction between at least two persons, patron-dependence (abbreviated as PD) describes a role characteristic of the individuals who usually engage in patron-dependent relationship. The terms (PDR and PD) are used as essentially synonymous in the present study.

****Oya-parent, ko-child, bum-status (Odaka, 1964; and Bennett and Ishoni, 1963).

*****Jajmani-patron, kamin-client (Kolenda, 1963; and Pocok, 1962).

*****Fals Borda (1961) and Freyre (1946).

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The study of patron-dependent relationships is relevant because (1) it can provide a potential for a high level of generalization in theory construction by linking together some past socio-psychological theories of social change and economic development; (2) it can provide an opportunity for using either a monadic methodology (as is the case in this dissertation), where the individual actor is the unit of analysis, or a dyadic methodology, where the linkage between actors is the unit of analysis;* and (3) it can provide insight into the relationships between communication and modernization variables, therefore contributing to the selection of adequate change strategies.

We have shown that patron-dependent relationships exist widely. Bennett and Ishino (1963) and Bennett (1968) suggest that PDR tends to occur in the isolated and less developed nations of the world. So it is important to study the intervening effects of PDR in communication and modernization behavior.

The literature on patron-dependence (basically anthropological) provides conceptual definitions, but almost no operational measures of the concept. The present dissertation provides conceptual and operational definitions of PDR. Bennett (1968, p. 473), in his summary on paternalism for the International Encyclopedia of the Social Sciences,

* A third probable methodology would be a systemic methodology where an average value for all the individuals in a social system is the unit of analysis. If results achieved by applying different independent methodologies are similar, then conclusions from these results are more generalizable than if the outcomes had been otherwise.

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says "there is no detailed survey specifically aimed at studying change (in paternalism)." By relating patron-dependence to the modernization process, we will try to hypothesize how changes in PD might be related to the process of individual or collective change.

Some of the potential contributions of the present research are:

1. To advance a more adequate understanding of the patron-dependent concept by developing an operational measure of it, and empirically testing theoretical propositions about PD.

2. To determine the role of patron-dependence in the communicative and modernization processes.

3. To determine selected characteristics of polarized categories of high and low patron-dependent individuals.

POSSIBLE LIMITATIONS

This attempt to explore the topic of patron-dependent relationships, suffers several limitations. One such limitation is that this study is limited to a Latin American population; at no point do we deal with the Japanese and German cases of PDR, for example. It seems that in these countries, contrary to what happens in Latin America, the ruling elites and institutional channels favor innovation and change, and PDR has had some positive effects on modernization.

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A second limitation, this one in the analysis and to a certain extent overlapping with the first, is the lack of concentration on the preconditions leading to PDR.

Bennett (1968, p. 476) emphasized that, in some contexts, social change encourages the decline of patron-dependence; in other cases, rapid change creates conditions exposing a proletariat to insecurity, which can create new forms of patron-dependency.

Other limitations are methodological in nature. This study is, as far as the author knows, an early attempt to measure patron-dependent relationships. The probability of measurement error is great because of the lack of past experience in the subject. As said elsewhere, the field data-collection was not done for the sole purpose of the present dissertation, so we could not include in the interview schedule as many PD items as we would have liked. Further replications of the present (and amplified) measurements of PD are highly recommended.

Another methodological limitation is the nature of our sample. The test of hypotheses assumes randomization in order to generalize to the population parameters. Complete randomization is very difficult to achieve in underdeveloped settings due to the almost complete lack of population lists. Our sample does not meet the randomization criteria, as judgment sampling was involved at certain stages of the sample design.

ORGANIZATION OF THE DISSERTATION

The first chapter of the present dissertation states the purpose of the study, the definition of the problem of inquiry, the relevancy and limitations of this problem, and concludes with a summary of the dissertation organization. The second chapter deals with the theoretical frame of reference, consisting of a review of the literature on the topic of study, the conceptualization of the variables and their constitutive linkages, the theoretical model of prediction, the theoretical hypotheses, and a summary. Chapter III, on methodology, contains a description of the geographical setting, sample, interviewing, the operationalization of the variables and the corresponding operational hypotheses, and a summary of the statistical methods used for testing them.

Chapter IV includes the presentation of the findings, the hypothesis-testing procedures, who are the patron-dependents, plus some considerations about PD and modernity. The last chapter presents a summary of the findings, a discussion of these findings, recommendations for change agencies, and suggestions for future research.

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Chapter II

THEORETICAL FRAME OF REFERENCE

A science without a theory is blind because it lacks that element which alone is able to organize facts and give direction to research. Even from a practical point of view the mere gathering of facts has very limited value. It cannot give an answer to the question that is most important for practical purposes--namely, what must one do to obtain a desired effect in given concrete cases? To answer this question it is necessary to have a theory, but a theory that is empirical and not speculative. This means that theory and facts must be closely related to each other.

(Lewin, 1936)

Having defined the purpose of the present dissertation, its relevancy and curtailments, now let us turn to the dissertation's theoretical construction. First, a review of some of the pertinent literature in the fields of communication, anthropology, sociology, social psychology, and social change will specify the state of our knowledge about patron-dependence and will help develop, later, some theoretical hypotheses.

REVIEW OF LITERATURE

Patron-dependency and modernity* can be considered as independent end-products of the process by which society socializes its new members. Patron-dependence deals with the acceptance of influence exerted by individuals occupying positions in the system that enable them to perform social control. On the other hand, modernity deals with the learning of the rationality that equips to cope with a changing society.

*Modernity is the state of becoming (more) modern, while modernization is defined as the process by which individuals learn to generate and cope with change.

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Clausen (1968, p. 6) says that socialization and social control*go hand-in-hand; they are complementary bases for social order and continuity, but they are by no means identical. In addition to the norms** that constitute moral imperatives, all societies have a variety of sanctions which tend to insure the support of the moral order. Behaviors which exemplify the norms tend to be rewarded; those violating the norms tend to bring a measure of punishment. But social norms are not monolithic, coercive imperatives. They differ according to time, place, and the characteristics of the person. They are enmeshed with the division of labor in society. The means of support or enforcement of accepted behavior include not only such highly institutionalized social forms as the religious and legal orders, but also the informal controls that operate within kinship, occupation, and local community relations. The effectiveness of social control rests on three factors: (1) the transmission of the moral norms through the socialization process, (2) the recruitment and socialization of control agents, and (3) the widespread acceptance of the legitimacy of the norms. As an underlying basis for social control, socialization efforts are designed to lead new members to adhere to the norms of the larger society or of a particular group into which they are being incorporated. The group's values are, hopefully, to become the individual's values, or at least to be recognized

*Social control denotes the means by which a person is conditioned in his actions by a social system to which he belongs.

**A norm is defined as the modal pattern of overt behavior in a given social system.

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by him as having legitimacy. The modes of social control, especially when exercised in reaction to deviance or violation of moral imperatives, help to emphasize the importance of the norms and to strengthen the commitments of individuals to those norms and to the group. Socialization prepares the individual to accept or reject change, because change is one type of normative behavior.

Several anthropological studies dealt with paternalistic relations at the societal level. Freyre (1946) talks about PD's historical origins in Latin America by referring to that continent's first "vertical settlers". These were Spanish or Portugese soldiers and colonizers that came to the Americas without their families, took Indian and Negro women as concubines, and were in a position of superiority in these new "families" (De Azevedo, 1962).

Looking for social and clique relations and their function in the achievement of vertical mobility in Brazil, Hutchinson (1966) and Leeds (1964) also studied the patron-dependent relationships at a national level of analysis, concluding that patron-dependent relationships favor a vertical type of interaction pattern rather than a more horizontal and egalitarian pattern. Willems (1955) stated that in the Latin American rural communities he studied, the greatest obstacle to the conversion from Catholicism to Protestantism was the implicit loss of the saints as paternal sources of assistance.

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Describing the patronic syndrome in traditional cultures, Galjart (1968, pp. 85-86) identified three elements that distinguish patronic relationships as deterrents to modernization:

1. The assumption that any real improvement in one's socioeconomic situation depends not so much on one's own efforts as on favors granted by secular or supernatural powers or on a stroke of luck.*

2. The disposition to seek to establish patronage relations with people who are, or in the future may be, able to do one good.

3. The absence of feelings of solidarity** toward people with whom one is not related by kinship, friendship, or patronage. This absence of solidarity is associated with a disbelief in the presence of such feelings of solidarity in others.

A few socio-psychological theories have dealt with the relevancy of the socialization process as a way of emphasizing certain personality characteristics at the individual level, which lead to economic development at the societal level. Examples are McClelland's (1961)

*The basic difference between PD, fatalism, and self-control is provided by answering the question "who has control over the environment?"

<u>Concept</u>	<u>Who Has Control Over the Environment?</u>
1. PD	Others (above me)
2. Fatalism	Fate (not me)
3. Self-control	Oneself (me)

**Solidarity is the cohesion or attraction that a group has for its members.

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"achievement motivation"* and Hagen's (1962) "creative personality".** But other than Lerner's (1958) empathy*** very little has been done to relate the effect of communication variables directly to the socialization process nor, indirectly, to development and modernization of traditional social systems.

Speaking in more general terms, we feel that, dealing with adult populations, personality characteristics (e.g., achievement motivation) help determine the communication behavior of individuals in a manner that is functional to becoming aware of, knowledgeable about, and proficient

*Achievement Motivation is the desire to do well, not so much for the sake of social recognition or prestige, but to attain an inner feeling of personal accomplishment. McClelland (1961, p. 63) says that a high level of achievement motivation predisposes society to vigorous economic activity.

**Creative personality is the type of personality that allows the individual to have a sense of world-orderliness, i.e., every phenomenon is part of a system whose operation can be understood and explained (Hagen, 1962, pp. 88-97). Hagen's theory states that in every society where individuals develop a creative personality, that society will achieve economic growth.

***Lerner's (1958, pp. 43-75) model states that a critical level of 10 to 25 per cent of urbanization or industrialization is necessary before a country can start developing "satisfactory" levels of literacy and mass media exposure. With time, literacy and mass media exposure will help to create empathy and opinionatedness, and then social, political, and economic participation.

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in fulfilling the roles prescribed by society (see Figure II-1). With time, newly-socialized roles (mainly those requiring less PD) will alter some of the more tangential beliefs (Rokeach, 1968) of the individual's belief system.* These changes will themselves have a further effect in changing other personality characteristics, communication behavior, and role fulfillment, in a continuous dynamic process of self-improvement, self-ordering of the world, and self-control over the environment (Ascroft, 1969; Roling, 1969).

CONCEPTUALIZATIONS

Before building a theoretical model, Deutsch and Krauss (1965) suggest the necessity of a stage of concept construction and construct explanation to help delineate the boundaries of the theoretical system. Operational definitions of the concepts are described in the next chapter. The present section conceptually defines each of the relevant variables in the system as well as some of their possible constitutive linkages.**

*There is, of course, undefined conceptual overlap among personality characteristics, communication behavior, role attainment, and belief systems, but for the purpose of the present discussion, they are considered as ideal types in the sense that they describe "what ought to be". Some authors, for example, prefer to see beliefs as part of personality, but we prefer to regard them as separate because while beliefs are more changeable, personality characteristics are more enduring.

**While operational linkages link terms to physical phenomena, constitutive linkages link constructs to other terms. The linkage with nature guarantees the scientist is dealing with reality. Linkages with other terms permit the scientist to manipulate his terms through symbolic activity in ways which produce assertive propositions (Berlo, 1967).

PERSONAL
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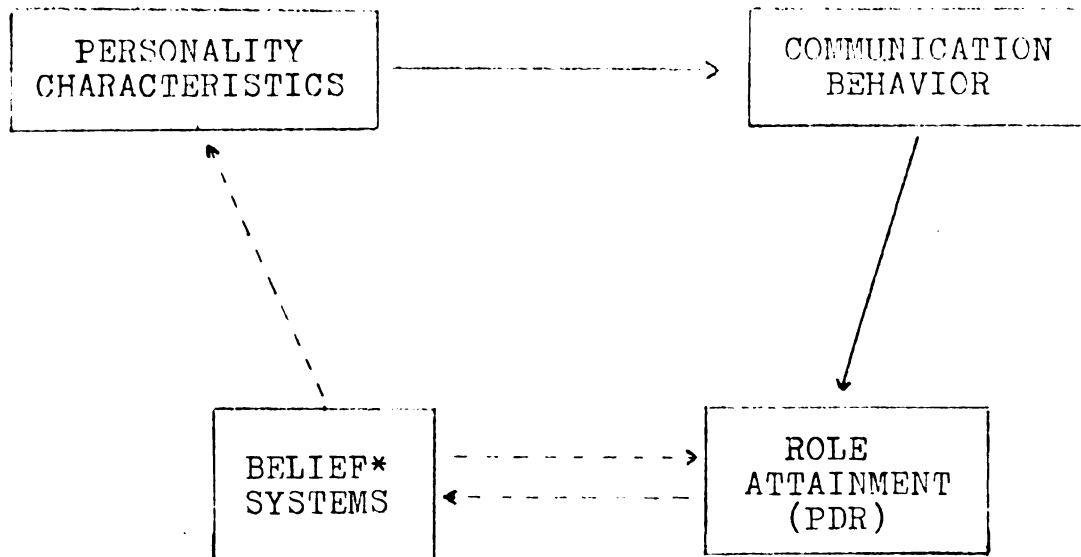


Figure II-1. Paradigm Relating Personality Characteristics to Communication Behavior Role Attainment, and Belief Systems among Adults.

*Dotted lines indicate the indirect relations with the belief systems, which are not part of the present dissertation.

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Extra-System Communication

Communication is the transfer of messages from a source to receivers. The content of these messages and the type of channel that carries them is what makes a communication event either (1) within-system,* or (2) extra-system, if they carry reinforcing notions already existing in the cognitive structure of the receivers or not, and (1) instrumental, or (2) consumatory, if they carry information that helps to perform tasks that are functional to society, or their content is purely used for entertainment and amusement.**

Being interested in the development of isolated rural social systems, let us now focus on extra-system communication, which we assume is mostly instrumental.*** Durlak (1969) says that before a person changes his norms or attitudes and behaves in a different way, he usually seeks knowledge of alternative attitudes or modes of behavior

*System is any group of identifiable interdependent elements in continuous interaction with the environment. In a social system individuals are the elements, and, in our case, a within system includes any channels that are intrinsic to the community.

**Notice that we do not infer the notion of purposiveness that Hovland and some of his disciples imply for the definition of communication (Hovland et al., 1953). In this way, one can assume that messages that were originated with a consumatory intent can become instrumental for a different social system or in a later point in time.

***The other pole of the same assumption is that within-system communication is instrumental only for the purpose of system-maintenance, therefore it reinforces local norms and boundaries against the threat of change or incongruent messages from outside. For a discussion of instrumental versus consumatory behavior, see Bordenave (1966).

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through what Waisanen (1969) calls dissociative experiences.* Then the individual evaluates the source and the content of the messages and decides to adopt the new norms or attitudes, or to overtly behave in a certain way.

The process of receiving information from other social systems (either by intentionally seeking it or accidentally obtaining it) is called extra-system communication. These communication experiences function (1) to make a person aware of behavioral and attitudinal alternatives, (2) to facilitate the process of developing meaning for alternative attitudes and behavior, and (3) to provide behavioral alternatives within the new attitudes or norms.

We will concentrate on the three most common ways of receiving information about other social systems: (1) by physical mobility,* (2) by exposure to the mass media, and (3) by contact with cosmopolites; and on a factor, empathy, influencing extra-system communication. Although physical mobility might also denote migration, for the purpose of the present dissertation physical mobility is restricted to visiting cities or towns which might represent different normative systems from the normative system at the community level. Mass media exposure and contacts with specialists such as school teachers or extension service agents are also important for gaining knowledge of other systems. Diffusion

*Also called cosmopoliteness by other authors. Rogers (1962, p. 17) refers to cosmopoliteness as an external "orientation." Here it is treated as physical mobility to avoid confusion with terms as cosmopolite contacts.

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of innovation reserachers report that the mass media are among the initial sources providing information about new ideas in farming.* However, "[other] farmers are usually sought before deciding whether to adopt innovations, and experts or commercial dealers are frequently the source for specific and technical information about how to implement innovations" (Wilkening, 1964). The relative importance of interpersonal channels, true in more developed countries, is even greater in the less developed countries.

The concept of empathy is another ingredient in the change process. Empathy is the ability to project oneself into the role of another person. It expands the ability of the individual to identify with others so that "others are incorporated [in the mental system of the subject] because I am like them" (Lerner, 1958, p. 49). Empathy leads the receiver to identify with certain parts of the message (or with different sources), thus affecting the quality of the extra-systemic experience.

Patron-Dependence

For the purpose of the present dissertation, patron-dependence (PD) is defined as the degree to which an individual's decisions, are influenced by actors occupying

*One not-always-true assumption is that the content of these communication situations is instrumental in achieving change and new ways of life, but one can infer that the larger the number of contacts with extra-system agents (or vehicles), the larger the probability of being exposed to instrumental messages of a pro-change nature.

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This definition implies: (1) that PD, as a general class, is a role prescription that limits the decision-making patterns of the individual, and (2) that the peculiar characteristic of PD is that it helps to center this decision-making process in the hands of a few privileged individuals in leadership (usually ascribed) positions. The second characteristics of PD would seem to indicate a serious problem for the development of a society as a whole. It implies that there is a large subset of citizens who participate very little in the national stream of decision making, a situation antagonistic to the politics of a democracy. If there is a series of different types of decisions which parallel the hierarchy of leadership positions in the decision-making process, then the most crucial decisions (usually those affecting the large majority) are made only by a small proportion of the actors in the social system.

What are some of the constitutive linkages of PD? In other words, how different is patron-dependence from authoritarianism, dogmatism, and other similar concepts? First, let us categorize and define these concepts, and then let us see how they are constitutively linked to PD.

*Notice that this definition allows the use of different units of analysis, as we explain elsewhere.

Authoritarianism

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Authoritarianism

In 1950, Adorno et al. published the now classic study on the authoritarian personality. They stated (1950, p. 6) that personality is a product of the social environment in which the individual develops, but, once developed personality is not an object of the contemporary environment. What has developed is a structure within the individual that is capable of acting upon the social environment. This individual characteristic, though modifiable, is frequently very resistant to fundamental change.

It has been suggested that the influence of World War II and the immediate involvement of the authors with the Nazi-Jewish conflict biased their work on the authoritarian personality toward overly emphasizing the politically extreme right. The theory of the authoritarian personality is based upon the psychoanalysis of prejudice.

Dogmatism

Rokeach (1960) criticizes the political and ethnocentric biases of Adorno et al. and suggests "dogmatism" as a psychological alternative to the authoritarian personality. He defines dogmatism as a measure of the extent to which a person's belief system is closed (1960, p. 169). The theory of dogmatism, structure-oriented rather than content-oriented, says that the ability to form new belief-systems is affected by: (1) the ability to keep in mind the new parts to be integrated, (2) the willingness to entertain new

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systems, (3) the experiences of the past, (4) the ability to present new beliefs as gradual parts of integral blocks, and (5) the degree to which there is isolation within the belief system (Rokeach, 1960, p. 398).

Role-Mastery

Stewart and Hoult (1959) authored a reinterpretation of the authoritarian personality. While Adorno and his associates attributed the cause of authoritarianism to psychological and psychoanalytical reasons, Stewart and Hoult propose that the cause is sociological. Stewart and Hoult's theory is based on the assumption that authoritarianism is negatively correlated with the number of roles that the individual has mastered (therefore authoritarianism is not a personality characteristic). They also argue that role-mastering ability is more difficult to attain in more restricted environments; therefore, people from restricted environments should be more authoritarian than people from more open environments.

Role-mastery includes both role-playing, overt behavior associated with a given position, and role-taking, the cognitive process whereby a person puts himself in the other persons' place.* Stewart and Hoult agree with Coutu (1951) that role-taking must precede role-playing, since one must know how to act before he can adequately fulfill the

*Also called empathy by Lerner (1958, p.50), as will be explained later.

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expectations of a new position. But Stewart and Hoult also say that role-playing and role-taking interact because once a person has taken a role and learned how to play it, his increased experience will facilitate further role-taking.

Nepotism

Aikin (1964) defines nepotism as the practice whereby an officer appoints one or more relatives to industry or public service, or confers on them other favors, in order to promote the family's prestige and income or to assist in building up a political machine. Aikin notes that different relationships distinguish nepotism from the broader and closely related term of patronage. Nepotism is exclusively favoritism toward family members, while patronage includes favoritism toward both kin and non-kin.

Constitutive Linkages

How are authoritarianism, dogmatism, and role-mastery, conceptually related to patron-dependence? Figure II-2 shows in diagrammatic form the theoretical constitutive linkages. Patron-dependence differs from authoritarianism because it is a role prescription rather than a personality characteristic. Patron-dependence deals with the acceptance and submission to the hierarchy of the system. Authoritarianism deals with the intensity of reaction to the content of one-sided ethnocentric messages.*

*For example: degree of agreement or disagreement with items like "in view of the present national emergency, it is highly important to limit responsible government jobs to native, white, Christian Americans" (Adorno et al., 1950, p.108).

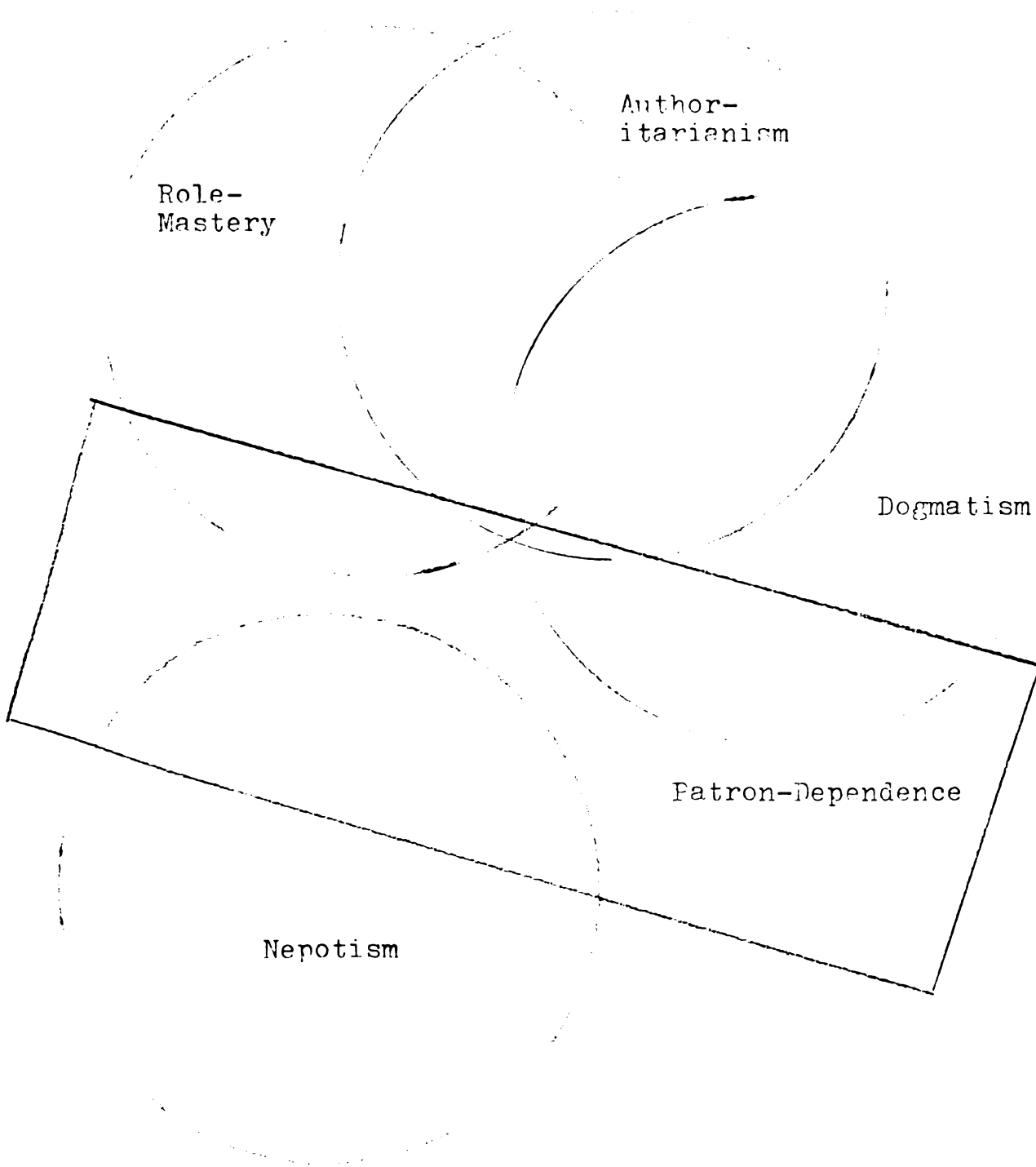


Figure II-2. Venn Diagram* of Some of the Constitutive Linkages of Patron-Dependence.

*The Venn diagram, named after the logician J. Venn, offers a helpful way to illustrate set relations. However, in no way are we indicating the precision of the shown relationship.

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Dogmatism refers to the structure of the individual's belief system. In this regard, patron-dependence partially overlans with close-mindedness (dogmatism) because both deal with the mental isolationism characteristic of individuals unable to entertain new belief systems. Yet a person might be quite dogmatic against certain ideas, objects, or individuals without necessarily relying on decisions from above.

While dogmatism refers to the close-mindedness of the individual, role-mastery stems from the restrictiveness of the social system to which the individual belongs. By definition patron-dependence also deals with individual performance within a social system. Both mastery over a restricted number of roles and patron-dependent relationships tend to originate more frequently in socially or geographically isolated and restricted environments (Bennett and Ishino, 1963).

New concepts, like patron-dependence, need to be checked for validity,* conceptually and empirically. The previous description of the constitutive linkages of PD is an attempt to validate the concept by looking at the similarities and differences with already-accepted concepts. Although the author of the present dissertation recognizes the importance of the empirical checks on the internal validity of patron-dependence, the circumstances surrounding

*Validity is the extent to which the operationalization taps the dimension that the researcher is trying to measure.

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the field research made it impossible to measure similar concepts (like dogmatism) or to attempt to operationalize PD by different independent methods that could have helped to check some of the validation processes suggested by Campbell and Fiske (1959). Nevertheless, the validity of patron-dependence should be thoroughly checked.

Modernization and Innovativeness

Different research traditions define modernization differently.* Nevertheless, all the definitions imply that modernization is a process of continuous change. For us modernization is the ability to generate and successfully cope with change. Change and a propensity to cope with change are the essence of modernization (Friedman, 1968). Change occurs in an effort to increase control over the environment.** But, as White and Lippit (1960) imply, in a complex modern world the individual must be selective about the innovations he adopts in order to cope with the ambiguities produced by continuous change.

Innovativeness is the degree to which an individual is relatively earlier than other members of his social system in adopting new ideas (Rogers, 1962, p. 20). Innovativeness has been used as a comparative measure of modernity (Salcedo, 1968). The previous definition does not take into

* These different disciplinary approaches were abstracted by Weiner (1966, pp. 3-4)

** As suggested by McIver and Page (1957, p. 500) and Ascroft (1969). Roling (1969) also refers to this type of association.

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Previous measurements of modernity by others also did not take into consideration the knowledge factor. Knowledge is defined as the degree to which an individual possesses accurate information (as defined by experts) enabling him to make more rational decisions. It is believed that by introducing (1) the discontinuance of innovations,* and (2) some measurement of agricultural knowledge, we shall obtain better single indicators of modern rational behavior than have been achieved previously, assuming that knowledge and adoption of innovations recommended by experts is a successful way of coping with change.

THEORETICAL HYPOTHESES

Before developing the theoretical rationale that will lead to the theoretical hypotheses, let us first analyze the type of possible relationships in research designs. This explanation will help the reader to understand the author's theoretical model, presented later.

Types of Relationships**

In presenting data in defense of a knowledge claim, a researcher should provide first evidence of the relationship

*The assumption here is that control over the environment is achieved by rational behavior and that, sometimes, rejecting an innovation while in possession of accurate knowledge about it might be more rational than adopting the same innovation without adequate knowledge about it, and then to have to discontinue it because of its impracticality.

**This section is heavily based upon the nomenclature and reasoning of Rosenberg (1968).

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- (1) symmetrical, when neither variable is due to the other;
- (2) reciprocal, when there is no immediate possible way to specify which is the independent and which is the dependent variable; and (3) asymmetrical, when one variable (the independent variable) may influence the other (the dependent variable). Due to its theoretical potential for determining causality, we should concentrate on the asymmetrical relationships.

Causality refers to the process by which events are linked in terms of cause and effect. Besides covariability, causality requires either (1) that one event is temporarily prior to the other, or (2) that the nature of the events allows logical inference of dependency into their relationship. In the present dissertation we are using causality in the second meaning of the word.

The cause-effect type of relationship, characteristic of experimental designs, encounters particular difficulties in survey designs due to the lack of specificity in determining pure stimuli under field conditions. Social research deals more oftenly with a disposition, a state or condition of the individual, or a characteristic, a relatively more enduring state of the individual, and a response, act or behavior.

Asymmetrical relations lead to the second requirement of research design which is to show evidence of causality. Causality is a necessary connection between two variables, but a causal relationship represents but one among a much larger number of necessary connections among variables.

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Time-order helps determine causality in experimental designs. The panel, or re-interview technique is effective in resolving the causality issue in survey design. Unfortunately, most field research gathers data only at a given point in time.* Then, how does the survey analyst determine which variable determines what on the basis of a correlation coefficient? The key criterion for understanding the direction of determination appears to be what Rosenberg (1968, p. 11) calls "susceptibility to influence".

For example, it is difficult to establish any temporal priority in the relationship between education and television viewing. During the years of education, one watched television, and during the years of watching television, one went to school. Yet the direction of determination is clear. It is logical to see how level of education may determine one's preference for certain kinds of programs, but it is much more difficult to perceive one's preference for certain kinds of programs as determining one's educational level. Therefore, susceptibility to influence connotes the difference among variables in their "fixity, permanence, or alterability" (Rosenberg 1968). By the same token, it is more logical to infer that exposure to the mass media and other extra-system communication would equip the individual with information about coping with change

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and increasing his share of control over the environment (that is his modernity), than to infer that modernity produces exposure to the mass media. For the purpose of the present study, the extra-system communication variables (physical mobility, mass media exposure, cosmopolite contact, and empathy) are considered independent variables leading to modernity, the dependent variable.

But such an assertion needs to be tested. The most important systematic way of examining the relationship between two variables is to introduce a third variable (called a "test factor" by Rosenberg) into the analysis. The introduction of test factors into survey analyses enables one to exploit some of the virtues of the experimental design (like ability to control certain variables) while avoiding the inappropriateness of experimentation (like its artificiality of social setting). The introduction of test factors into data-analysis does not overcome all the problems of correlational analysis, but it does enable the survey analyst to approach the characteristics of the after-only experimental design and to share some of the strengths of that scientific approach.

Considering "any asymmetrical relationship between two variables [as] an abstraction from a never-ending causal chain", Rosenberg (1968, pp. 30-89) characterizes antecedent, extraneous, intervening, and suppressant roles that a test factor could perform. We have

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already provided some logical reasons for considering extra-system communication as independent variables and modernity indicators as dependent variables. Now we shall introduce patron-dependence as the test factor of the present study, and analyze its logical viability in each of the intervening positions affecting the relationship between the independent and dependent variables.*

1. Antecedent Variables - A two variable relationship is a truncated segment of an extended causal sequence, and any meaningful extension of the causal sequence can only intensify our understanding of the larger process. The antecedent variable is ~~an~~ effective influence in the relationship between the independent and the dependent variables (see diagram in Figure II-3). Rosenberg (1968, p. 67) says that "the analysis can go as far as the imagination of the theorist will carry him, without ever reaching the ultimate or first cause".

Given a logical rationale for assuming an antecedent variable, the statistical requirements are:

(1) all three variables (antecedent, dependent, and independent) must be related; (2) when the antecedent variable is

*Chapter I dealt with the general relevancy of patron-dependence. The next chapters will concentrate on the relevancy of patron-dependency to a Latin American population.

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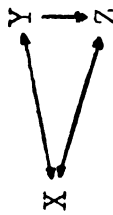


ROLES OF TEST FACTOR X	RELATIONSHIPS*	TESTS
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2. Extraneous	 (No logic for X Y and X Z)	$(X) \quad Y \text{ --- } Z$
3. Intervening	(Logic for all Relationships) 	$(X) \quad Y \text{ --- } Z$
4. Suppressor		$(X) \quad Y \longrightarrow Z$

Figure II-3. Different Roles of the Test Factor X in the Relationship between the Independent Variable Y and the Dependent Variable Z.

*Straight arrows mean substantial relationships; dotted lines mean weak relationships; and encircled variables mean control variables.

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controlled, the relationship between the independent and the dependent variable should not disappear; and (3) when the independent variable is controlled the relationship between the antecedent and the dependent variable should disappear. Patron-dependence, which is expected to be related to extra-system communication and modernity, due to its precedence in time and less alterability* could be considered as an antecedent variable to extra-system communication. Nevertheless we have reasons to believe that patron-dependence should be related to modernity even under different conditions of exposure to extra-system communication in contradiction with the previous third part of the test.

2. Extraneous Variables - An extraneous variable is a third variable producing an expurious relationship between the other two variables. After a researcher discovers a relationship between two variables, he has to prove whether the relationship is an inherent link between the independent and the dependent variables or whether it is based on an accidental (or spurious) connection with an associated variable**. If an analysis shows some statistical association one could not accept it as an antecedent or extraneous variable unless there were a logical reason for assuming so. The data are only necessary

*Patron-dependence is relatively more static than either extra-system communication or modernity.

**Rosenberg (1968, p. 39) says that before one introduces a control variable, one must have some idea of the relationship of the test factor to the independent and dependent variables.

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Assuming that there are logical grounds for considering the test factor either as an extraneous or antecedent, the resolution regarding its nature depends on a statistical test. Controlling on the test factor, if the test factor is extraneous, then the relationship between the independent and dependent variables will cancel out; if the test factor is antecedent, the relationship between the independent and dependent variables will not cancel out. Patron-dependence, as a test factor, is not expected to be an extraneous variable because increased exposure to extra-system communication, sooner or later, should lead to modernity, no matter the existing degree of patron-dependency.

3. Intervening Variables - An intervening variable is a logical consequence of the independent variable and, at the same time, a determinant or antecedent of the dependent variable. The distinction between considering a variable "extraneous" rather than "intervening" is a theoretical issue and not a statistical one. In both cases one finds a relationship between two variables, selects a test factor, stratifies the sample by the test factor, and discovers that the primary relationship is considerably reduced. A test factor is extraneous when it independently relates to both independent and dependent variables. It is intervening when it is considered

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a factor occurring between the independent and dependent variables. Therefore, to characterize a test factor as intervening, it is necessary to establish the dominant direction of influence in the three asymmetrical relationships. Rosenberg (1968, p. 65) said:

The road traveled from the independent variable to the dependent variable may (thus) pass many intellectual way stages en route, each leading to the next in an endless causal itinerary. When the survey analyst deals with intervening variables, then, he is essentially dealing with an intervening variable, not the intervening variable. The discovery of an intervening variable thus cannot serve as a complete explanation of the original explanation, but may serve as a landmark on the intellectual journey from cause to effect.

Whether a variable is intervening or antecedent depends upon which point of the causal sequence the researcher happens to tap first. The antecedent variable analysis is derived from the intervening variable analysis. If there is a relationship between Y and Z and a relationship between X and Z, to test if X is an antecedent to the Y-Z relationship, one must determine whether Y intervenes between X and Z. Controlling for the test factor (X), if the test factor is intervening, then the relationship between the independent and dependent variables should vanish, whereas, if the test factor is antecedent, the relationship should not disappear. Similar to the extraneous-variable example, patron-dependence is not the cause leading to modernity in the communication-modernity relationship.

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4. Suppressor Variables - All the three previous examples dealt with test factor effects where there was an existing strong relationship between independent and dependent variables. Suppressor variables are negatively intervening variables in "non-existing" relationships*. A suppressor variable is a variable that weakens a relationship, concealing its true meaning or strength. In some cases, suppressor variables may weaken a relationship to the point of causing its complete disappearance. But this situation is not always the case. To the extent that suppressor variables dampen or attenuate the full extent of a relationship, they can produce misleading interpretations.

Statistically, a test factor could be considered a suppressor variable if, after stratifying the sample along the test factor one finds that the weak relationship between the independent and dependent variables is considerably increased. Individuals with a high degree of patron-dependence should more likely rely on the localite communication network (rather than extra-system communication) and, therefore, could achieve certain degrees of modernity by different means than individuals with a lesser degree of patron-dependence who are more likely to rely on change messages carried out by the extra-system communication network.

*Sometimes called "zero correlations", "non-correlations", or, simply, "weak correlations".

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Patron-dependence as a whole should be negatively related to both extra-system communication and modernity, and should have an averaging or reducing effect on the association between extra-system communication and modernity. Thus, we shall test patron-dependence as a suppressor variable in the communication-modernity relationship shown in Figure II-4

* * * * *

We have just seen that, through the introduction of test factors, a systematic test of assumed antecedent, extraneous, intervening, and suppressor variables is possible. If logical and statistical criteria are met, confidence in the interpretation is increased and theoretical understanding is amplified.

Now let us develop the rationale for each of the theoretical hypotheses. Following Stewart and Hoult's (1959) and Galjart's (1968, p. 86) notions that patron-dependence is negatively associated with modernization, our theoretical rationale is that extra-system communication is negatively associated with PD, which is also negatively associated with modernity.

PD as the Dependent Variable

It is assumed that individuals who have the curiosity and motivation required to leave their own communities and visit other lesser known social systems will be among those individuals less likely to be influenced in

INDEPENDENT VARIABLES
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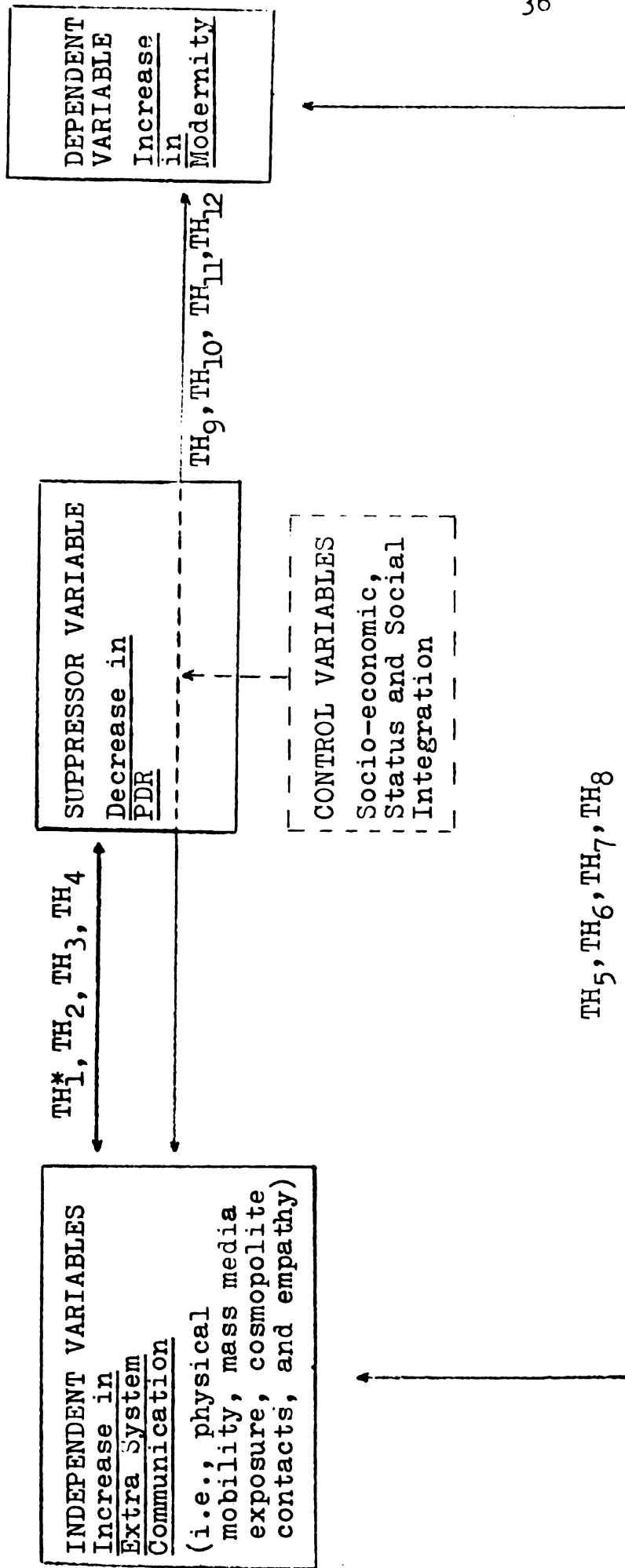


Figure II-4. Model Relating Patron-Dependent Relationships to Extra-System Communication and Modernization.

*TH stands for Theoretic Hypothesis, whose numbers follow a sequence which is explained in later pages of Chapter II

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their own decision-making by members of their own community. Of course, they could go to cities under the influence of someone else, but the fact that they went and had different experiences equips them with a broader reference system that diminishes the likelihood of future influences from the community. Therefore, our first theoretical hypothesis, TH₁* is: Physical mobility is negatively related to patron-dependence.

The mass media, including print (like newspapers and magazines) and electronic (like radio and television), carry messages from different worlds and different ways of living. Exposure to them equips the individual with a more heterogeneous base for decision-making; therefore, making him less dependent of influences from those in positions that enable them to exert such influence at the local level. TH₂ states: Mass media exposure is negatively related to patron-dependence.

Those that possess acquaintances or reference groups who live, have lived, or oftenly travel to urban centers, sooner or later will hear about their acquaintances' travels and new worlds through the channel of interpersonal communication. This awareness may influence the new knower

*TH stands for Theoretical Hypothesis, and it is used in order to differentiate this set of hypotheses from the empirical hypotheses (EH_i) presented in the next chapter.

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to shift his reference group orientations from the local community to broader, more cosmopolite, and egalitarian base. Therefore, we hypothesize (TH₃): Cosmopolite contact is negatively related with patron-dependence.

Empathic individuals, by definition, are those able to put themselves into a variety of situations by being able to assume other person's roles. They are individuals accustomed to thinking in terms of different alternatives. Such ability is similar to choosing among real alternatives in the decision-making process. This rationale leads to TH₄: Empathy is negatively related to patron-dependence.

Modernity as the Dependent Variable

The findings of Lerner (1958), Frey (1966), Deutschmann (1963), Rogers (1965), and Herzog (1967a) suggest that extra-system communication is positively associated with coping with change or modernity.

Those who are not afraid to leave their own community and travel to different places are coping with change. Change more often occurs in urban centers where greater concentration of people and competition for jobs are present. Exposure to this type of world should equip the individual with mental resources that will allow him to cope with change in his own world. TH₅ states: Physical mobility is positively related to modernity.

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The media carry some technical messages. They also usually carry messages about different and changing people and situations often happening in a more modern world than the receiver's own. Exposure to these messages can produce behaviors and attitudes in the receivers (either by imitation or learning) that allow them to create and cope with change. TH₆ is: Mass media exposure is positively related to modernity.

As in the previous case of physical mobility, contact with cosmopolites leads to dealing with persons who think and act differently. To a certain extent, cosmopolites are more modern individuals who have learned to adapt themselves satisfactorily to a changing way of life. TH₇ states: Cosmopolite contact is positively related to modernity.

Empathy, a characteristic of those able to put themselves in different and hypothetical situations, is likely to be present in more modern individuals who are constantly dealing with the ambiguities of a changing environment. Therefore, it is hypothesized (TH₈) that: Empathy is positively related to modernity.

PD as a Suppressor Variable

Individuals with a low degree of patron-dependence are, by definition, among those less dependent on a local hierarchy of influence. Low patron-dependent individuals are expected to place a high degree of

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credibility* on extra-systemic communication channels and, therefore, are among those more likely to accent pro-change messages carried by the extra-community channels. On the other hand, individuals with a high degree of patron-dependence are among those more dependent upon the selectivity, filtering, and acceptance processes of local influentials. It is expected that high patron-dependent individuals will place more credibility in messages carried by local channels than in messages carried by extra-systemic channels. On the average, it should take relatively less time for low patron-dependent individuals to acquire knowledge and adopt new ideas than for high patron-dependent individuals who have to wait for these new ideas to be incorporated into the community's way of living and social norms. The different degrees of credibility should result in different degrees of association between extra-system communication and modernity.

Since the previous rationale applies in the case of each of the four extra-system communication concepts, we opt for presenting the four related hypotheses as a group, rather than separating each one with a similar rationale.

*Credibility is the amount of trust or believability that receivers place upon channels or sources.

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TH₉: Physical mobility has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

TH₁₀: Mass media exposure has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

TH₁₁: Cosmopolite contact has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

TH₁₂: Empathy has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

* * * * *

Let us reinforce once more the notion that extra-system communication to be instrumental must carry a connotation of quality as well as quantity of contact. It is the content of the media, such as information on new opportunities for social mobility or editorial comments favorable to a political candidate from the opposition party, that provides for changes in patron dependant relationships, rather than simply the amount of mass media exposure.

SUMMARY AND DISCUSSION

This chapter presented the dissertation's theoretical frame of reference. After a short review of the specialized literature in the field of socio-psychological models of development, the author presented

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a conceptualization of the variables relevant to the study: patron-dependent relationships, modernity, and extra-system communication. In the case of patron-dependence, the main dependent variable of the study, its constitutive linkages with other concepts, such as authoritarianism, dogmatism, and nepotism, were analyzed. Finally, a theoretical paradigm was developed in which extra-system communication (physical mobility, mass media exposure, cosmopolite contact, and empathy) were treated as independent variables, patron-dependence as suppressor variable, and modernity indicators as the dependent variables. Based upon this model, the author hypothesized that extra-system communication is negatively associated with patron-dependence and positively associated with modernity; and that among low patron-dependence individuals there is a higher relationship between extra-system communication and modernity, than among high PD individuals.

The proposed conjectures allow the following possible advantages:

1. A new approach to the study of modernization, looking at it as the process through which individuals are socialized into broader social systems which provide them with a larger share of control over the environment, and therefore, a greater ability to cope with the uncertainties of change.

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2. A new integrative look at several socio-psychological theories of social change. Generic terms, such as personality characteristics, communication behavior, role attainment, and belief systems, are advocated and their use should hopefully produce more generalizable theories of social change.

3. A new conceptualization of the main dependent variable, patron-dependence (here defined as the degree to which an individual's decisions are influenced by actors occupying superior hierarchical positions in the social system), in a way that permits the use of different units of analysis in future instances. Either the individual, the communicative dyad, or the whole system can furnish the necessary elements to measure patron-dependent relationships.

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Chapter III

METHODOLOGY

Never measure the height of a mountain until you have reached the top.
Then you will see how low it was.

(Hammarskjold, in Jantsch, 1967)

This methodological chapter describes the geography of the research setting in the Brazilian State of Minas Gerais. The chapter presents the sampling procedures as well as explains the stages of questionnaire construction, pretesting, interviewing selection and training, coding, and card punching. The chapter ends with the operationalization of the variables pertinent to the theoretical model and a consideration of the problem of reliability of measurements in less developed settings, followed by the empirical hypotheses and a brief discussion of the statistical methods which were used to test them.

The data reported here came from part of a larger research project on the Diffusion of Innovations in Rural Societies.* This research was conducted by the Department of Communication at Michigan State University and financed by the U. S. Agency for International Development. The present research concentrates only on data from

*This chapter is heavily based upon the author's experience as Assistant Country Leader of the project in Brazil from November, 1965 to August 1967.

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the Brazil "Phase 2.5" of the Diffusion Project, which is a random sample of 315 farm operators from the state of Minas Gerais. The farm operators live in communities where the local extension service worked for more than four years. Interviewing was conducted during July, 1967.*

GEOGRAPHICAL SETTING

Minas Gerais was chosen over the other Brazilian states because (1) its economy is mainly dependent upon agricultural production, (2) there is an institutional infra-structure to provide institutional support for such a research endeavor, and (3) the Mineiro farmer is a man-in-the-middle between the most backward areas of the North and Northeast of Brazil and the most developed agriculture of Sao Paulo and the other southernmost states of the country.

The state of Minas Gerais (shown in Figure III-1) had a population of more than 10 million in the 1960 Census. Its area is larger than Texas and about the size of Spain, but with only a third of Spain's population. Minas Gerais extends from the Atlantic coastal range of mountains as far west as the Central Plateau to the border of the Federal District, where the recently built capital of Brazil, Brasilia, is located. Neighboring states are Sao Paulo and Rio de Janeiro to the south, Espirito Santo and Bahia to the east,

*For further information about field operations, the reader should see Stanfield et. al. (1968).



Figure III-1. South America, Brazil, and Minas Gerais.

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Bahia again to the north, and Goias, Mato Grosso and the Federal District to the west.

The agriculture of Minas Gerais is transitional. Farmers in the southern regions of the state are relatively more commercialized, producing such market crops as coffee, sugar cane, and tobacco. The more isolated northern areas of the state have primarily a subsistence agriculture based on field crops such as corn, manioc, beans, and rice. Cattle operations are of two types: beef on open ranges in the western regions, and many dairy herds in the central and southern regions nearer to the Rio de Janeiro and Sao Paulo milk markets. Many of the beef cattle are trailed from Minas Gerais for fattening in the State of Sao Paulo. Generally speaking, farming in Minas Gerais, either in terms of the type of crops cultivated or in terms of the ways of handling dairy or beef cattle, is quite similar to farming methods in the rest of Brazil.

SAMPLING PROCEDURES

Our data came from a larger research endeavor, as explained earlier. Therefore, before explaining the sampling procedures for Phase 2.5 (from which the present data are taken),* it is necessary to explain some of the rationale that orientated preceding phases of the Brazilian Diffusion Project.**

*The present data are taken from Phase 2.5 because (although there was some pretesting in Phase II with certain PD items) this was the phase that included the 10 original items measuring patron-dependent relationships.

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Phase I was a survey of the causes affecting success or failure of change programs in 76 Minas Gerais communities. In 1965 the state extension agency, Associacao de Credito e Assistencia Rural (ACAR), was working in 126 local offices,* and had worked in 78 for more than three years. Since the Phase I aim was to determine the extent of change agency success or failure, these 78 local offices were considered as the total population of study. A 50 per cent sample was randomly drawn in each of three ecological regions. Then each of the randomly-selected ACAR local offices provided the name of the "best" and the "worst" communities in which they were working. The remaining 76 communities** constituted the Phase I sample and the starting point for Phase II.

In Phase II the unit of analysis shifted from the community to the individuals living in the community. This Phase aimed at gathering initial measures of innovativeness and opinion leadership, the two main dependent variables, before the introduction of experimental treatments in the

*Roughly speaking, each local office works within the political boundaries of the município or county where it is located. The office consists of an agricultural and a home economics extension specialist, a jeep, a secretary, and a desk.

**Two ACAR offices in the Northeastern region of Teófilo Otoni were, at the time of data-gathering, working only one community each so they were withdrawn from the original sample.

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studied communities. These treatments and their "after" measurements constituted Phase III. The Phase II sample was obtained by randomly drawing 18 communities (each from a different local office) from the original pool of 76 communities. In each of these experimental communities a complete survey was performed of the population of individuals making farming decisions and the survey resulted in a Phase II sample of 1,307 farmers living in communities in which ACAR had worked for more than four years.

Phase III called for the introduction in each community of either literacy or animation campaigns (also treated as pre-treatments) followed by either radio or print forums. The intermediary survey between the pre-treatments and the media forums is called Phase 2.5.

The lists of respondents who were interviewed in Phase II were used to select respondents for Phase 2.5. Each list supposedly contained all landowners in a particular community.

Two types of samples were selected from these lists of respondents in order to cut down on interviewing costs: random and purposive.* In each of the ten

*The fact that not all the Phase II respondents were illiterates (or participants in the literacy campaign) was the cause of an "inflated" representation of literacy communities in the Phase 2.5 sample (The figures were: 3 animation communities, 6 literacy communities, and 2 control communities without exposure to either of the pre-treatments).

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purposefully-selected communities, a random sample of about 30 farmers was selected from the lists** (See Table III-1).

In the cases of death, migration from the community, refusal to be interviewed, or unavailability of a respondent, the interviewers' supervisors were instructed on replacement procedures. The interviewers were instructed to try at least three callbacks at a farm before giving up and substituting another name. Substitution was made with the help of a table of random numbers and the identification number of the respondents remaining on the list.

As is common in rural interviewing, certain respondents were extremely difficult to locate. The lack of roads, widely scattered farms, isolated locales, and people with the same or similar names made the location of respondents difficult. Night interviewing, although easier for find respondents who might be working in distant fields or at the market during day hours also had its difficulties because of the lack of electric lights and general hazardous travel after dark.

*With the exception of Corinto, where only 18 farmers were interviewed, (at the end of Phase 2.5) to increase the number of literacy participants in the Phase 2.5 sample. See Herzog (1967b) for further details.

TABLE III-1. Proportion of Phase 2-5 respondents per community.

ACAR Local Office	Community	N	%
1. Sao Joao Nepomuceno	Kochedo de Minas	33	10

Table III-1. Proportion of Phase 2.5 Respondents per Community.

ACAR Local Office	Community	N	%
1. Sao Joao Neponucemo	Rochedo de Minas	33	10
2. Santos Dumont	Sao Joao da Serra	34	11
3. Rio Novo	Goiana	30	10
4. Paraopeba	Picada	37	12
5. Pedro Leopoldo	Matos	35	11
6. Corinto	Curralinho de Dentro	18	6
7. Itauna	Pedra	35	11
8. Divinopolis	Quilombo	30	10
9. Formiga	Albertos	33	10
10. Uba	Corrego Alegre	30	10
	Total Sample	315	100*

*This sum is more than 100% due to rounding error.

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INSTRUMENT CONSTRUCTION, INTERVIEWING, AND CODING

Several questions, which had appeared in the Phase I and II instruments, were included in the Phase 2.5 instrument. Two criteria influenced the choice of these previously-used questions: (1) that there be interest in "change scores" over time for the variables, such as empathy, achievement motivation, and trust in other studies of the Diffusion Project; and (2) that there be interest in the reliability of the measures stemming from the centrality of the variables, such as innovativeness and opinion leadership.

Likewise, there were numerous new items, mainly questions that were of specific interest to a staff member, such as the questions on political identification, patron-dependence, and literacy.*

Pretesting

A community near Belo Horizonte was selected around June 1, 1967, for the first pretest. Twelve interviews in this community led to recasting some questions and eliminating others. For example, one farmer was asked to aid in formulating a question on the length of time the respondent had been making decisions in farming. He quickly rejected the previous wording and put the question into the rural vernacular.

*See the interview schedule in Appendix A which identifies the new Phase 2.5 questions.

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A second pretest was carried out in a community near Mateus Leme. Again 12 to 15 interviews helped to recast weak questions. (A respondent taking a long time to answer or showing discomfort is a good signal of a poor question.)

Interviewer Selection and Training

Selection

The project attempted to hire university students from the Federal University of Minas Gerais, who already had experience in Phase II. With this criteria in mind, the best of the available experienced students were hired (eleven men and four women). Three teams were formed from these 15 people. Each team included four interviewers and one supervisor. The supervisors were men with prior experience as interviewers.

Training

Interviewer training began July 1, 1967. It took two days to explain the purposes of the data-collection and to discuss each question and how to record the possible responses. How to use the codebook was also explained since it was planned to code in the field.

One afternoon was devoted to practice interviewing. The next morning, the 15 interviewers journeyed to a community near Betim to interview farmers. An average of two interviews was obtained by each interviewer. These practice interviews were then coded in the field as a final

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practice with the codebook. During all phases of this training, a staff member was on hand to answer questions and correct any errors made.

Special training was given to the supervisors on coding procedures, on the number of callbacks, and on replacement procedures.

A total of three days' training was given to the interviewers and supervisors. This short period proved adequate because of the experience level of most of the students involved.

The division of the total group into three teams was left to the last minute, the idea being to avoid complaints and the formation of cliques. Each team was assigned a certain number of communities. Someone on each team already had interviewed in each community.

Data-Coding

The interview schedule was precoded as much as possible. Each possible response to the closed-ended questions had a numerical code assigned. The IBM card columns were assigned to each response and listed along the right hand margins of the interview schedule. The interviewers had codebooks in the field and did the coding of the interview schedule usually the day (or night) an interview was conducted or soon after. All interviewing in a particular community had to be completed before leaving the community. Each interviewer coded his own work. This

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procedure probably reduced coding errors, since the interviewer was more intimately acquainted with the questions and the meanings of the various responses.

All coding was checked by the interviewer's supervisor in the field and a second time by the project staff in Belo Horizonte. The coding of the sociometric questions received special checkings in the central office.

Card Punching

All punching and verifying of the IBM cards was done at the Reitoria Office of the Federal University of Minas Gerais on newly-installed IBM equipment. This punching was done directly from the interview schedules, thereby eliminating the need to transfer data from the schedules to coding forms. Time was saved and, hopefully, errors were avoided.

OPERATIONALIZATION OF THE VARIABLES

This section describes the rules of correspondence between the conceptual and operational definitions for the independent variables (extra-system communication), the intervening variable (patron-dependence), the control variables (socio-economic status and social integration), and the dependent variables agricultural knowledge and innovativeness). It also treats the reliability of these variables.

Independent Variables

The four concepts related to extra-system communication are physical mobility, mass media exposure, cosmopolite contacts, and empathy.

Physical Mobility

Physical mobility denotes movement through physical space or the capacity to do so. For the purpose of the present research it has been measured as the number of times the respondent visited a city with more than 40,000 inhabitants during the year previous to the interview.*

Mass Media Exposure

Exposure to the mass media means receiving impersonalized messages that, in general, have been prepared for large and heterogeneous audiences. Here, the indicators of mass media exposure are the frequency of exposure to newspapers and magazines, radio, and television. Table III-2 shows that letter writing, not a face-to-face type of exposure to external information, is also related to the other three media. Since the frequency of exposure to newspapers and magazines was measured on a monthly basis, while exposures to radio, TV, and letter writing

*Frequency of visits to big cities intercorrelates with frequency of contact with relatives living in cities with more than 40,000 inhabitants ($r=.72$) but since the two are not independent, the former was preferred over the latter because the former referred to a broader set of dissociative experiences.

were ordinal measurements along a continuum from less to more frequency, scores were normalized for each medium-frequency and added to constitute a mass media exposure index.

Cosmopolite Contact

Contact with cosmopolites is defined as the frequency of interaction with persons not belonging to the same social system, i.e., not living in the same community. In order to build an index measuring cosmopolite contact, out of ten possible sociometric nominations per respondent, each nominee received a weight for place of residence (one to those living in the same community, two to those living in another community of the same municipio, and three to those living in another municipio. These codes were multiplied to an ordinal measurement of frequency of contact and added to the result of the same operations for the other nominees nominated by the same respondent. The result of this addition constituted then the respondent's index of cosmopolite contacts.

Empathy

Empathy is the ability to project oneself into the role of another person. Respondents were asked what they would do if they were the person responsible for some effort to improve the community: the ACAR agent, the manager of a

Table III-2. Mass Media Exposure Index Intercorrelations (N=315).

	Radio	TV	Letter Writing
Newspapers and Magazines	.14	.33	.33
Radio		.23	.28
Television			.34

Table III-3. Empathy Inter-Item Index Correlations (N=315)

	Município Mayor	Factory Manager	ACAR Agent	President of Brazil
1. C. D. Leader	.40	.34	.47	.32
2. Município Mayor		.39	.29	.30
3. Factory Manager			.37	.41
4. ACAR Agent				.35

factory, the municipio mayor, the President of Brazil.* Responses were then coded according to the degree that they indicated the respondent's ability to think of himself in the other persons' roles. Each question had three alternative codes (zero, for no understanding of the other person's role; one, for some general understanding; and two, for a very specific understanding), which were added to form an empathy index that ranged from 0 to 10. The inter-item correlations are shown in Table III-3.

Intervening Variable

Patron-dependence was defined earlier as the degree to which an individual's decisions are influenced by actors occupying superior hierarchical positions. Patron-dependence was measured in the Phase 2.5 interview schedule by a battery of ten items related to the decision-making centralization in the in-family group as well as in the out-family group. These original ten items were:

If it were possible . . .

1. Would you wish that your sons follow
an occupation:

2 -- Chosen by you? **Or

(1 -- Doesn't know)

0 -- Chosen by themselves?

*The scalability of these items was demonstrated with data from a previous phase by Whiting (1967, p. 63).

**We first present here the alternative measuring high PD and then the alternative measuring low PD. The alternatives were randomly allocated in the interview schedule to avoid response-sets. Interviewers were instructed to obtain either one of the two possible alternatives in each case and not to read the "doesn't know" option.

2. When your wife needs to buy clothes
or medicines:

2 -- She has to ask you first? Or

(1 -- Doesn't know)

0 -- She can buy and then tell you?

3. One of your daughters dating some boy
you know:

2 -- She needs a chaperone? Or

(1 -- Doesn't know)

0 -- She does not?

4. Would you allow your married sons to
smoke in front of you?

2 -- No.

(1 -- Doesn't know)

0 -- Yes.

5. On your property, what do you think it is
always better to hire:

2 -- A relative? Or

(1 -- Doesn't know)

0 -- A stranger if he is a good worker?

In an general way . . .

6. What the priest says:

2 -- Is always right? Or

(1 -- Doesn't know)

0 -- Is good to discuss it with others?

7. When you need a job, what do you think:

2 -- It is always better to accept
a position near the relatives? Or

(1 -- Doesn't know)

0 -- You should accept a better position
even if it is away from the relatives?

Do you think . . .

8. A father has always to express his opinion
about the way his daughters use their clothes?

2 -- Yes.

(1 -- Doesn't know)

0 -- No.

9. Technical help:

2 -- Is a favor that the government
does to the farmer? Or

(1 -- Doesn't know)

0 -- Is an obligation that the government
owes to the farmer.

10. A girl should marry:

0 -- Whoever she wants? Or

(1 -- Doesn't know)

2 -- **She** should first seek the advice
of her parents?*

*Some of the alternatives loose part of their mutually-exclusive condition with the translation from Portuguese to English. However pretests with the Portuguese version of the interview schedule showed that the attempted dichotomization in each case was well understood by the majority of the respondents.

The items about freedom of the wives, daughters' dating behavior, and respect for the religious sayings, were suggested by Fals Borda (1961, pp. 241-265) when he described the paternalism of the Colombian peasants. Not allowing married sons to smoke in front of their fathers was mentioned by Galjart (1968, p. 90) in his analysis of the patronic syndrome of Brazilian farmers. Kahl obtained a factor called "integration with relatives" with two items very similar with the ones about hiring relatives and desiring a job near relatives. Finally, the items about the occupation of the sons and technical help were dictated by the author's experience with cultural values in rural Brazil.

Answers indicating centralization or restraint of freedom were coded as "2" and answers showing decentralization or freedom of choice were coded as "0". The intermediate code "1", was allocated to those cases where the respondents did not understand the item or did not answer it.*

In order to build a patron-dependence index, the ten items were submitted to a correlational, a factorial, and a Guttman scalogram analysis. Criteria were established previous to each analysis to help decide whether items should be dropped from the remaining analyses. Table III-4 shows the interitem correlation matrix. It was decided that in

*Only less than two percent of the responses fit into this category.

order to survive, each item should correlate significantly at the end with the total score minus the item.* The item about the belief that a "girl should marry whoever she wants" barely correlated with any of the other nine items. It did not meet the stated criteria and was dropped.

The principal-axis factor solution in Table III-5 shows that, with the exception of item #8, all the items correlate moderately and consistently with the principal factor. With the exception of the eighth item, the item loading in the principal factor range from .35 to .57.

For the varimax-rotated factor analysis, it was established that at least two items had to "cleanly" load** on any of the rotated factors in order to attribute conceptual meaning to that given factor. Two items is probably a minimum number; three or four would be preferable. A factor on which only one item loaded would be dropped from further analysis.

The factor analytical results show that the belief that "a father has to express his opinion about his daughters' clothes" is the only one to load cleanly on factor III. The

*With a sample of about 300 respondents, a correlation coefficient larger than .11 is significantly different from zero at the .05 level.

**An item was arbitrarily considered "clean" if it had its highest loading on a given factor about .50 and if the absolute difference between the item highest and second-highest loading was larger than .20.

Table III-4. Intercorrelation Matrix of PDR Items (N=315)

Item	1	2	3	4	5	6	7	8	9	10
1. Son's Occupation*										
2. Wife's Buying	<u>.23**</u>									
3. Chaparrone	<u>.13</u>	<u>.22</u>								
4. Smoking	<u>.10</u>	<u>.21</u>	<u>.16</u>							
5. Hire Relative	<u>.11</u>	<u>.01</u>	<u>.07</u>	<u>.02</u>						
6. Priest's	<u>.09</u>	<u>-.03</u>	<u>.00</u>	<u>.08</u>	<u>.30</u>					
7. Job Reference	<u>.16</u>	<u>.09</u>	<u>.05</u>	<u>.06</u>	<u>.29</u>	<u>.17</u>				
8. Clothing	<u>.13</u>	<u>.03</u>	<u>.11</u>	<u>-.02</u>	<u>.05</u>	<u>-.02</u>	<u>.09</u>			
9. Technical Help	<u>.17</u>	<u>.12</u>	<u>.08</u>	<u>.02</u>	<u>.13</u>	<u>.12</u>	<u>.14</u>	<u>.07</u>		
10. Marriage	<u>.08</u>	<u>.11</u>	<u>.04</u>	<u>.07</u>	<u>-.03</u>	<u>-.01</u>	<u>.00</u>	<u>.08</u>	<u>-.06</u>	
Item correlations with the Total of All Other Nine Items	<u>.31</u>	<u>.25</u>	<u>.22</u>	<u>.18</u>	<u>.24</u>	<u>.19</u>	<u>.27</u>	<u>.13</u>	<u>.20</u>	<u>.06</u>

*The complete item wording was provided earlier in the present chapter

**Underlined correlation coefficients are significantly different from zero at the .05 level of significance.

Table III-5. Factor Analytical Solutions with PDR Items

Item	Principal Axis Solution First Factor Loadings	Varimax-Rotated Factor Solution		
		I	II	III
1. Son's Occupation	.57	.21	.44	.41
2. Wife's Buying	.46	-.04	<u>.73</u>	.09
3. Chaperrone	.41	-.01	<u>.58</u>	.17
4. Smoking	.35	.11	<u>.65</u>	-.38
5. Hire Relative	.53	<u>.74*</u>	-.02	.07
6. Priest's	.43	<u>.72</u>	-.02	-.18
7. Job Preference	.55	<u>.60</u>	.09	.22
8. Clothing	.26	-.04	.01	<u>.78</u>
9. Tecnhical Help	.46	.32	.17	.37
Proportion of Variance Explained	21%	19%	18%	12%

*The highest loading for a "clean" item are underlined.

other items, evenly divided, load on separate factors: one factor deals with the decision-making process in the nuclear-family group and the other factor deals with the non-nuclear family. The items about sons' occupations and technical help are not "clean" items, but since they have some loading on either of the two meaningful factors, we retain them for the Guttman analysis.*

In Guttman scalogram analysis, in order to obtain a reasonable marginal distribution** of percentages of respondents agreeing with the different items, it was necessary to eliminate the item about perfect agreement with what the priest says. The remaining seven items (shown in Table III-6) yield a coefficient of reproducibility of .85 indicating a quasi-scale according to Guttman's criteria.*** Further elimination of the next most erroneous item, the one about technical help, increases the coefficient of reproducibility to .87, which is not quite high enough to indicate a "perfect" scale. Therefore, due to the small difference between

*Schuessler (1966) shows that items found inconsistent with the factor model could fit the scale model and vice-versa.

**It is recommended to have a spread of at least five percentage points from item to item, so that each item contributes a sizable portion of its own to the coefficient of reproducibility.

***In order to have a quasi-scale, the coefficient of reproducibility should range between .85 and .90. A perfect scale would have a coefficient of reproducibility above .90.

Table III-6. Patron-Dependence Items, Their Marginals, Guttman Scaling Errors, Item to Total Scores Minus the Item Correlations, and Factor Loadings (N=315).

Item # and Name	Guttman Scalogram Analysis		Correlation of Item to Total Scores Minus the Item	Factor Loadings*
	Percent of respondents agreeing with item	# of scaling errors		
3. Dating Chaperone	77	32.5	.22	.41
2. Wife's Buying Restrictions	61	47.0	.25	.46
4. Married Sons' Smoking Restrictions	55	51.5	.18	.35
5. Hiring of Relative	48	52.5	.24	.53
9. Technical Help as a Favor	38	59.5	.20	.46
7. Job Near Relative	32	45.0	.27	.55
1. Sons' Occupation Selection by Father	26	<u>42.0</u>	.31	.57
Total Errors		330.0**		

*Values correspond to the principal-axis factor solution presented in Table III-5, which explains 21 percent of the total variance in the matrix.

**For this amount of total errors, with seven items and 315 subjects, the coefficient of reproducibility is .85.

the two coefficients of reproducibility, it was opted that the first solution was preferable as it included a larger number of items, (seven).

It should be noticed that the seven-item PD scale do not include neither individual items contributing less than six percent of the total variance, nor "consensual items"* that could have inflate the coefficient of reproducibility.

The correlation matrix (Table III-4), the factor analytical solution (Table III-5), and the Guttman scalogram analysis (Table III-6) of the PD items might be interpreted as presenting somewhat contradictory evidence for the use of a total PD index. Let us first analyze each individual piece of evidence and then, after the analysis, decide on which would be the better combination of items to represent our PD index.

The correlations of each of the nine remaining (dichotomous) PD items to the total score minus-the-item are all in the expected positive direction and all are significantly different from zero. These correlation coefficients, although not unusually high, tend to provide some evidence for clustering the individual PD items into one PD index.

*Consensual items are those with more than 79 Percent of respondents' agreement, or less than 21 percent of respondents' disagreement. These items tend to inflate the coefficient of reproducibility due to their consensual weight on the total scale.

The varimax-rotated factor analytical solution of the same nine dichotomous items seems to indicate the existence of two independent dimensions in our measurement of patron-dependent relationships. This factor analytic evidence suggests the existence of two separate dimensions; one dealing with the decision-making structure in the nuclear-family group, and the other related to the decision making structure of the non-nuclear (extended) family.

Finally, the Guttman scalogram analysis of the seven surviving PD items presents somewhat ambiguous evidence as to unidimensionality. The case rests on whether a quasi-scale coefficient of reproducibility is or is not enough evidence for unidimensionality. Nevertheless, on the basis that (1) conceptually, our definition of patron-dependence is not limited to strictly nuclear or extended family situations, (2) the factor loadings of the eight surviving PD items to the first factor of the unrotated principal factor solution are of fair (and nearly equal) magnitude,* (3) the marginal distribution of respondents agreeing with the items do not show either "consensual items" or the existence of items contributing less than five percent of the total variance (which might inflate the coefficient of reproducibility), and (4) we consider the present operationalization as only a first attempt to empirically measure the concept, we decided to add the

*The same rationale for using a single index for a concept was used by Bordenave (1966, p. 104) under similar circumstances.

seven surviving items into a single PD index. The range and the bell-shape of the unimodal distribution of PD scores, shown in Table III-7, can be interpreted as desirable qualities of our PD index. Nevertheless future research might attempt to empirically determine whether there is indeed a nuclear-family PD index and a non-nuclear family PD index. It is quite possible that these two subdimensions were suggested by the present analyses only (1) because of the nature of the present respondents, or (2) as an artifact of the ten items that were originally included in our PD index.

Control Variables

As was said in Chapter II, individuals with higher rank and greater participation in the social system should be among those who conform to the norms of the system. Therefore, indicators of socio-economic status and social participation should be controlled, i.e., the variance that they produce in PD is statistically kept constant, in order to have a "purer" patron-dependence effect on the relationship between extra-system communication and modernity.

Status

Status denotes position in a social system. Socio-economic status is the possession of physical objects, that put an individual in a higher or lower

Table III-7. Frequency Distribution of the PDR Index (0-7).

Score	Frequency*	Percentage (N=315)
0	6	1.9
1	26	8.3
2	56	17.8
3	68	21.6
4	82	26.0
5	41	13.0
6	19	6.0
7	17	5.4
		<u>100.0</u>

*The mode and median equal 4, the mean is 3.5 and the standard deviation is 1.6.

position in relationship to his peers. Respondents were asked about a set of seven household items (water filter, plumbing, electricity, radio, inside bathroom, motorized vehicle, and house in town)* that, after addition, constitute what from now on is treated as SES index. These items require economic capital to acquire them, and since these are not new to the studied communities, we perceive them closer to a measure of SES than home innovativeness.

Social Integration

Social integration is different from participating in the system. Respondents were asked about the quality and quantity of assistance that each one gave to and received from their peers in the community in terms of labor, money, tools and animals, and services in case of illness. Each respondent provided his annual frequencies (given and received) in each of the four subject-matters. Assuming that these items belong to the same conceptual universe of items, the author submitted them to a Guttman scalogram analysis (shown in Table III-8).** For each item, answers were dichotomized for "none" and "some." The items about receiving tools and services in case of illness had to be dropped in order to maintain a marginal spread larger

*These items had proven discriminatory enough in previous phases of the Brazilian Diffusion Project.

**These results are based on a random subsample of 59 subjects (roughly 20 percent of the original sample).

Table III-8. Social Integration Scale (N=59)

Mutual Aid Items	Percentage of Respondents Possessing the Item*	Scaling Errors
1. Aid Given in Case of Illness (es)	67	3.5
2. Aid Given in Tools	57	6.0
3. Aid Given in Labor	50	4.5
4. Aid Received in Labor	38	4.0
5. Aid Received in Cash Loans	32	5.0
6. Aid Given in Cash Loans	28	6.0
Total Number of Errors=		29.0

*The coefficient of reproducibility is .92.

than five percentual points from item to item. The remaining six items constitute a perfect scale with a coefficient of reproducibility of .92 and the dichotomized answers were added to form a social integration index for each respondent.

Dependent Variables

For the purpose of the present dissertation, modernity, is the expression of the modernization process at a given point in time, is measured through the concepts of agricultural knowledge and agricultural innovativeness.

Agricultural Knowledge

Agricultural knowledge is the possession of accurate information that enables the individual to make rational decisions about farming matters. This type of knowledge was measured through a battery of three to five items for each of the four Phase 2.5 recommended agricultural practices.* Each one of these four practices represent the least ambiguous practice, in a 2x2 table cell along with the cost and complexity, out of 32 practices being promoted by ACAR.**

*ACAR experts prepared these "funnel-type" questions (i.e., correct knowledge in one question implies correct knowledge in the preceding one) about "home-pharmacy," "erosion-controlling foliage," "planting machine," and "trench-silo."

**Twenty technicians Q-sorted these 32 practices along cost and complexity. Stanfield et al. (1967, pp. 6-7) report that the Spearman correlation between the mean rank for each practice on cost and complexity was .73.

Agricultural Innovativeness

Agricultural innovativeness is the degree to which an individual is relatively earlier than others in his social system to adopt new ideas or practices (Rogers, 1962, p. 159). But when innovativeness is equated with modernity, it is assumed that innovativeness corresponds to rational behavior. Rational behavior in this case means to weigh possible alternatives and check for applicabilities before adoption, in order that future discontinuances do not become economically and socially expensive. Traditionally, there have been two main ways of measuring innovativeness. Firstly, by completely ignoring the discontinuance phenomena and being concerned only with adoption behavior. Secondly, by penalizing discontinuance and being concerned only with practices or innovations presently used. Considering both methods' extremes, we propose a conciliatory third method which consists in giving a weight of "one" to the number of years of discontinued innovations and a weight of "two" to the time of use of innovations still being used at the time of the interview.

Let us compare the three methods of measuring innovativeness by analyzing the hypothetical example presented in Table III-9. The first part of the table gives the time since adoption of innovations X, Y, and Z, while the second half of the table presents the different innovativeness scores that farmers A, B, C and D will receive by method #1 (disregarding discontinuances), method

Table III-9. Example of Innovativeness Scores by Different Computational Methods

Farmer	Years since Adoption of Innovations			Innovativeness Scores by Methods		
	X	Y	Z	#1	#2	#3*
A	0	0	2	2	2	4
B	5**	3**	2**	10	0	10
C	5**	3**	2	10	2	12
D	5	3	2	10	10	20

*For a notion about the centrality and variance of the index advocated by method #3 (as well as for the other indexes measuring the other variables in the model) see Table III-10.

**Indicates discontinued innovations.

#2 (considering only the number of years of practices presently being used), and method #3 (or the proposed weighting system). Farmer A has only adopted practice Z, two years ago. Farmers B, C, and D have all adopted innovation X (5 years ago), innovation Y (3 years ago), and innovation Z (2 years ago), the only difference among them being that farmer B has discontinued all the three innovations, while farmer C still uses only innovation Z and farmer D uses all the three innovations.

Method #1 can only differentiate between farmer A and the other three farmers, the other three farmers receiving higher innovativeness scores than farmer A. Method #2 discriminates a little more than method #1, but method #2 places farmer B at the lower end of the innovativeness continuum, irregardless that he had at least tried all the three innovations. Method #2 also allocated the same intermediary score to farmers A and C, while C has tried all the three innovations and A only one. Finally, method #3 treats again farmer A as the farmer with the least innovativeness of the four, sequentially followed by farmers B, C, and D.

In order to build an agricultural innovativeness index, the respondents' years of use of reforestation, termite control, ant-killer, controlled breeding, and tick Control* were standardized and multiplied by the

*An independent set of innovations from the four used for measuring agricultural knowledge.

Table III-10. Measurements of Central Tendency and Variance of All the Variables in the Present Analysis.

Index	Mean	Standard Deviation
Physical Mobility Scores	11.5	23.8
Mass Media Exposure Scores	19.9	2.8
Cosmopolite Contact Scores	29.3	18.8
Empathy Scores	3.9	2.8
PDR Scores	3.4	1.6
Socio-Economic Status Scores	4.8	4.3
Social Integration Scores	2.7	1.8
Agricultural Knowledge Scores	4.2	4.0
Agricultural Innovativeness Scores	32.3	9.4

discontinuance factor. The addition of the five scores constituted the respondents' innovativeness index, whose measurements of central tendency and variance are reported on Table III-10.

Reliability

Reliability denotes the reproducibility of empirical results or, in other words, the degree of response stability. Stanfield (1968, pp. 162-166) calculated the test-retest reliability of the measures repeated in Phase II and Phase 2.5, measures taken six months apart with the same 215 respondents. Stanfield's reliability coefficients range from .92 for age, to .08 for an achievement motivation item. From these coefficients, those pertinent to the present dissertation (see Table III-11) range from .77 for the SES index, to .15 for the empathy question about municipio mayor. Due to lower educational levels and lesser conditionings for question-answering lower response stability is expected in less developed societies than in more developed societies. Van Es and Wilkening (1969) confirmed this expectation, but they also discovered reliability patterns across countries. In a recent study comparing the percentage distribution of response stability, mean and median values for variables used in U.S. investigations and variables from a Brazilian sample, van Es and Wilkening show that reliability decreases in both countries from demographic variables to measurements of contemporaneous behavior, to

indicators of past behavior, to evaluative items. Stanfield's list of reliability coefficients confirmed the van Es and Wilkening findings. Among the reliability coefficients reported in Table III-11, the highest ones are for socio-economic indicators (or demographic variables), followed by measures of mass media exposure (present behavior), and indicators of adoptive behavior and patron-dependence (indicators of past behavior), and, then, by some other items on PDR and empathy (evaluative items).

EMPIRICAL HYPOTHESES

Once operational definitions for all the variables in the theoretical model have been provided, it is possible to convert theoretical hypotheses into empirical hypotheses.

- EH₁: The number of annual trips to cities with more than 40,000 inhabitants are negatively related to patron-dependence scores.
- EH₂: Mass media exposure scores are negatively related to patron-dependence scores.
- EH₃: Cosmopolite contact scores are negatively related to patron-dependence scores.
- EH₄: Empathy scores are negatively related to patron-dependence scores.
- EH₅: The number of trips to cities with more than 40,000 inhabitants is positively related to agricultural knowledge scores.

Table III-11. Reliability of Some Phase II and Phase 2.5 Items.*

Concept	Question Wording	Reliability Coefficient
<u>SES</u>	Sum of items	.77
<u>Total area</u>	"What is the total area of your farm?"	.72
<u>Total no. of cows</u>	"How many cows do you have?"	.72
<u>Mass Media Exposure</u>	"Have you read (or has somebody read for you) newspapers or magazines lately? How many times a month?"	.64
<u>Contact with ACAR</u>	"How many times have you talked to the ACAR agent last year?"	.58
<u>Schooling</u>	"How many years did you attend school?"	.58
<u>Mass Media Exposure</u>	"How often do you listen to the radio?"	.44
<u>Empathy</u>	Sum of items	.39
<u>Innovativeness</u>	Percent of practices adopted	.36
<u>Empathy</u>	"If you were the ACAR agent, what would you do?"	.34
<u>PDR</u>	"When you wife needs to buy clothes or medicines... she has to ask you first or she can buy and then tell you?"	.33
<u>Empathy</u>	"If you were the person in charge of a factory, what would you do?"	.22

Continued on page 81.

*Based on Stanfield (1968).

Table III-11 continued.

Concept	Question Wording	Reliability Coefficient
<u>PDR</u>	"Would you wish that your sons follow an occupation . . . chosen by you or chosen by themselves (diff. words in T1 and T2)"	.21
<u>Empathy</u>	"If you were the President of Brazil, what would you do?"	.19
<u>Emrathy</u>	"If you were the mayor of this <u>município</u> , what would you do?"	.15

- EH_{5b}: The number of annual trips to cities with more than 40,000 inhabitants is positively related with agricultural innovativeness scores.
- EH_{6a}: Mass media exposure scores are positively related to agricultural knowledge scores.
- EH_{6b}: Mass media exposure scores are positively related to agricultural innovativeness scores.
- EH_{7a}: Cosmopolite contact scores are positively related to agricultural knowledge scores.
- EH_{7b}: Cosmopolite contact scores are positively related to agricultural innovativeness scores.
- EH_{8a}: Empathy scores are positively related to agricultural knowledge scores.
- EH_{8b}: Empathy scores are positively related to agricultural innovativeness scores.
- EH_{9a}: The number of annual trips to cities with more than 40,000 inhabitants has a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.
- EH_{9b}: The number of annual trips to cities with more than 40,000 inhabitants has a higher relationship with agricultural innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

- EH_{10b}: Mass media exposure scores have a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.
- EH_{11a}: Cosmopolite contact scores have a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.
- EH_{11b}: Cosmopolite contact scores have a higher relationship with agricultural innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.
- EH_{12a}: Empathy scores have a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.
- EH_{12b}: Empathy scores have a higher relationship with agricultural innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

Nevertheless, since Hays is talking about correlations in general, one has to be more restrictive when using a correlation statistic for descriptive and for hypothesis-testing purposes, as we are. The Pearson product-moment correlation, being a linear model, requires linearity, and an interval level of measurement (Siegel, 1956, p. 30), and that the two correlated variable, X and Y, be at least operationally independent.

Scatter-plots were performed for all the variables in the model to be tested in association with patron-dependence. None of the tests for curvilinearity*

*Using a non-linear model (also advocated by Whiting, 1967, and Herzog, 1967b) Waisanen and Kumata (1969) found it theoretically fruitful to plot years of education versus several indicators of modernity and to check for what they called the "take-off effect." Parallel to the previous tests for curvilinearity, we also divided our communication variables along standard deviation units and found the patron-dependence mean for each of these sub-groups. The plotting of these means allowed us a quick check on the take-off effect for decreases in patron-dependent relationships. The curves for physical mobility and mass media exposure did not follow the "S-shape" of the take-off pattern. On the other hand, the curves for cosmopolite contacts and empathy did show a certain take-off effect. Early shifts in reference-groups from the community to the outside world produce larger decreases in PD than later on when the individual has more contact with cosmopolites. Yet, for empathy there are the individuals ranking high in the empathy index (let us say between 8 and 10) i.e., those able to assume roles far away from their local system like being "President of Brazil", that, on the average, account for decreases in PD away from linearity. Under the present interpretation, contact with cosmopolites and empathy present theoretical consistency with Coutu (1951) conclusion that role-taking must precede role-playing.

STATISTICAL ANALYSIS

The next chapter will present the hypotheses testing procedures. It will be appropriate to finish the present methodological chapter with a note on the statistical methods to be applied in these testing procedures. The operationalization of the variables show, that we are dealing with continuous variables and the previous hypotheses are about the covariance between two or more of these continuous variables. Therefore, the Pearson product-moment correlation coefficient (zero-order and partial correlations) will be the statistic used to test Theoretic Hypotheses #1 through #8 and Fisher's z to test Theoretic Hypotheses #9 through #12.

What are some of the underlying assumptions that should be kept in mind in performing such correlational analysis? Hays (1963, p. 510) says:

It is not necessary to make any assumptions at all about the form of the distribution, the variability of Y scores within X columns or 'arrays,' or the true level of measurement represented by the scores in order to employ linear (regression and) correlation indices to describe a given set of data. So long as there are N distinct cases, each having two numerical scores, X and Y , then the descriptive statistics of correlation (and regression) may be used. In so doing, we describe the data as though a linear rule were to be used for prediction.*

*Parentheses provided by us.

(i.e., for significant differences between eta and the Pearsonian coefficient) were significant at the not-very-conservative .01 level* Also, during the process of index construction, intervality was achieved by standardizations and additions of scale-forming items. However, even if in some instances intervality was not reached, this assumption is only relevant when dealing with relatively small sample sizes. The computing procedures for the Spearman rank correlation and the Pearson product-moment correlation are identical for samples larger than 50 observations, as in our case.

Basically speaking, our data are approximately at the interval level of measurement, we have a reasonably large sample ($N=315$), the variables were measured independently, and they associate non-curvilinearly with the other variables in the model. Therefore, the assumptions for using the Pearsonian correlation coefficient in hypotheses-testing-procedures are met by the present study.

*In this particular case the .01 level is less conservative than the, for instance, .05 level because, testing if eta, (the curvilinear solution) significantly explains a better association or more variance than the linear solution (or product-moment correlation) then a larger accented value for the statistic "F" represents a less restrict test on the null hypotheses that eta is equal to the Pearsonian-r.

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The sample was stratified at the median of the patron-dependence scores allowing subsamples of 159 high patron-dependence respondents and 156 low patron-dependence respondents. Zero-order correlations between extra-system communication variables and modernity variables were obtained for these high and low patron-dependency subsamples.

The Michigan State University CDC 3600 computer facilitated the analysis of the data. Associations are tested through zero-order correlations (product moment) and partial correlation analyses. A relationship was considered as evidence in support of the hypotheses when the statistical test indicated that the association could be due to chance only in five percent or less of the cases.

Table III-12 shows the statistical method that was utilized to test each of the empirical hypotheses. With theoretic Hypotheses #1 through #8 where zero-order and partial correlations could be used for testing procedures, we opted for the highest-order partial correlation because it is a purer indicant of an association than the zero-order correlation. Besides, not knowing the degree of conceptual overlapping among the extra-system communication variables, we considered it theoretically preferable to test the associations of each of the communication variables free of the effect of the other three communication variables. In the future, when

Table 1

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Table III-12. Statistical Methods for Testing the Hypotheses.

Theoretical Hypotheses	Empirical Hypotheses	Statistical Method
I. PD as the Dependent Variable		
TH ₁	EH ₁	Third-order partial correlation
TH ₂	EH ₂	Third-order partial correlation
TH ₃	EH ₃	Third-order partial correlation
TH ₄	EH ₄	Third-order partial correlation
II. Modernity as the Dependent Variable		
TH ₅	EH _{5a}	Third-order partial correlation
	EH _{5b}	Third-order partial correlation
TH ₆	EH _{6a}	Third-order partial correlation
	EH _{6b}	Third-order partial correlation
TH ₇	EH _{7a}	Third-order partial correlation
	EH _{7b}	Third-order partial correlation
TH ₈	EH _{8a}	Third-order partial correlation
	EH _{8b}	Third-order partial correlation
III. PD as suppressor Variable		
TH ₉	EH _{9a}	Fisher's z test
	EH _{9b}	Fisher's z test
TH ₁₀	EH _{10a}	Fisher's z test
	EH _{10b}	Fisher's z test
TH ₁₁	EH _{11a}	Fisher's z test
	EH _{11b}	Fisher's z test
TH ₁₂	EH _{12a}	Fisher's z test
	EH _{12b}	Fisher's z test

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the qualitative and quantitative contributions of each of these variables have been well mapped, it might be meaningful to try to measure the degree of overall extra-system communication.

So, in conclusion, the decision criteria for considering empirical support toward a particular hypothesis was met if the highest-order partial correlation was significant at the .05 level, one tail-test due to the directionality of the hypotheses. For Theoretic Hypotheses #5 through #12, where each theoretical hypothesis corresponds to two empirical hypotheses, it was necessary to determine significance for both empirical hypotheses in order to consider whether sufficient support was present for the theoretic hypothesis.

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Chapter IV

PRESENTATION OF THE FINDINGS

Through prolonged closecontact and friction with the objects of their study, the minds of experts finally acquire a pictorial, mothlike, fiddling perfection.

(Sterne, in Jantsch, 1967)

Chapter III presented the index construction of the variables dealing with extra-system communication, patron-dependence, and modernity. The present chapter summarizes the research findings specifically dealing with (1) the type of relationship between extra-system communication and the intervening and dependent variables (PD and innovativeness), and (2) the suppressor effect of patron-dependence on the relationship between extra-system communication and the indicants of modernity.

WHO ARE THE PATRON-DEPENDENTS?

Before starting the hypothesis-testing procedures, let us summarize some of the differences among individuals scoring high and low in the patron-dependence scale. Means were obtained along several dimensions (see Table IV-1) for the highest and lowest deciles on the PD scale.*

*"Low PD" corresponds to a score of one or less, and "High PD" corresponds to a score of six or more, or, in each case, approximately ten percent of the total sample (see Table III-7).

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Table IV-1. Characteristics of High and Low PD Individuals

Independent Variables	Means on Independent Variables			t*
	Low PD Respondents (N=32)	Entire Sample Means (N=315)	High PD Respondents (N=36)	
1. Years of Age	43	44	44	0.29
2. Annual Trips to Large Cities	16	12	10	0.99
3. Years of Education	3.1	2.3	2.0	<u>2.21</u>
4. Number of Contacts with ACAR in Past Years	11	7	4	<u>2.24</u>
5. Functional Literacy Scores**	41	30	21	<u>4.19</u>
6. Farm Size in Hectares ***	78	51	38	1.17
7. Number of Cows Owned	20	12	7	<u>2.32</u>
8. Agricultural Knowledge Scores (0-16)	7	4	2	<u>4.91</u>
9. Socio Economic Status Scores (0-7)	7	5	4	<u>2.81</u>
10. Opinion Leadership Scores (0.00-1.00)****	0.16	0.06	0.01	<u>4.40</u>
11. Cosmopolite Contact Scores (0-240)	33	29	20	<u>2.61</u>
12. Mass Media Exposure Scores (0-40)	21.6	19.9	20.0	<u>1.98</u>
13. Agricultural Innovativeness Scores (0-99)	35	32	27	<u>4.21</u>

*Underlined t values (for the difference between the means of low and high PD respondents) are significant at the .05 level, one-tail test, with 66 degrees of freedom.

**Number of correct words read out of a standard paragraph containing 50 words.

***2.2 acres = 1 hectare or 10,000 square meters.

****Total number of nominations received, divided by the number of interviewees in the respondent's community.

Within our sample of Minas Gerais farmers, patron-dependent individuals are those with less education, with less contact with ACAR specialists, with less functional literacy, and fewer cows, with less agricultural knowledge and innovativeness, with lower socio-economic status and opinion leadership, and with fewer cosmopolite contacts and mass media exposure. On the other hand, age, trips to large cities, and farm size do not differentiate between individuals with high and low patron-dependence.

So, for the purpose of our sample of farmers, we generalize that the uneducated, the socially isolated, the economically powerless, and the laggards will be among those that will rely more often on the decision-making abilities of those occupying superior positions in the system.

HYPOTHESES TESTING

Basically, the first eight theoretical hypotheses deal with the types of relationships between the extra system communication variables and patron-dependence (for the first four hypotheses), and agricultural knowledge and agricultural innovativeness (for the next four hypotheses). It is predicted that extra-system communication scores are negatively related with PD scores, and positively related with the two indicators of modernity.

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Table IV-2 provides a correlation matrix (zero-order product moment correlation coefficients) of the nine variables in the model. It shows that all the correlations are in the predicted direction.

However, in order to test if the relationships are significantly different from zero, partial correlation coefficients were obtained in which for each of the extra-system communication variables, the variance contributed by the other three antecedent variables was statistically removed. The corresponding zero-order and third-order partial correlation coefficients between each of the antecedent variables and the intervening and consequent variables are shown in Table IV-3. The testing of the hypotheses follows.

PD as the Dependent Variable

TH₁: Physical mobility is negatively related to patron-dependence.

EH₁: The number of annual trips to cities with more than 40,000 inhabitants is negatively related to patron-dependence scores.

The zero-order correlation between the number of trips to cities and patron-dependence scores is $-.05$, which is less than the $-.10$ required for significance at the $.05$ level (Table IV-2).

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Table IV-2. Zero-Order Correlation Matrix of all the Variables in the Present Analysis (N=315).

Variables	1	2	3	4	5	6	7	8
1. Mobility								
2. Agricultural Knowledge	.01							
3. Socio-Economic Status	.05	<u>.39*</u>						
4. Empathy	.02	<u>.41</u>	<u>.31</u>					
5. Social Integration	.10	<u>.29</u>	<u>.09</u>	<u>.28</u>				
6. Cosmopolite Contact	.07	<u>.29</u>	<u>.14</u>	<u>.29</u>	<u>.21</u>			
7. Mass Media Exposure	<u>.20</u>	<u>.42</u>	<u>.62</u>	<u>.38</u>	<u>.22</u>	<u>.21</u>		
8. Innovativeness	.10	<u>.48</u>	<u>.43</u>	<u>.22</u>	<u>.36</u>	<u>.20</u>	<u>.37</u>	
9. PDR	-.05	<u>-.32</u>	<u>-.20</u>	<u>-.11</u>	<u>-.21</u>	<u>-.17</u>	<u>-.18</u>	<u>-.20</u>

*For a sample size equal to or larger than 300 respondents, a correlation higher than .10 is significant at the .05 level of confidence, one tail-test. Significant correlations have been underlined.

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The third-order partial correlation between the number of trips to cities and patron-dependence is $-.01$, when controlling on mass media exposure, cosmopolite contacts, and empathy, which is less than the $-.10$ required for significance at the $.05$ level (Table IV-3). EH_1 is not supported.

Therefore, TH_1 is not supported.

TH_2 : Mass media exposure is negatively related to patron-dependence.

EH_2 : Mass media exposure scores are negatively related to patron-dependence scores.

The zero-order correlation between mass media exposure scores and patron-dependence scores is $-.18$, which is greater than the $-.10$ required for significance at the $.05$ level (Table IV-3).

The third-order partial correlation between mass media exposure scores and patron dependence scores is $-.13$, when controlling on physical mobility, cosmopolite contacts, and empathy, which is greater than the $-.10$ required for the significance at the $.05$ level (Table IV-3). EH_2 is supported.

Therefore, TH_2 is supported.

TH_3 : Cosmopolite contact is negatively related to patron-dependence.

EH_3 : Cosmopolite contact scores are negatively related to patron-dependence scores.

Table IV-3. Zero-Order and Third-Order Partial* Correlations between Extra-System Communication, and PD, Agricultural Knowledge, and Agricultural Innovativeness (N=315).

	PD		Agricultural Knowledge		Agricultural Innovativeness	
	Zero-Order	Third-Order*	Zero-Order	Third-Order*	Zero-Order	Third-Order*
1. Physical Mobility	-.05	-.01	.01	-.08	.10	.03
2. Mass Media Exposure	<u>-.18**</u>	<u>-.13</u>	.42	.31	.37	.30
3. Cosmopolite Contacts	<u>-.17</u>	<u>-.13</u>	.29	.17	.20	.12
4. Empathy	<u>-.11</u>	-.02	.41	.26	.22	.06
<hr/>						
Multiple R ^{2***}	5%		28%		16%	

*Controlling for the other three extra-system communication variables.

**For a sample size equal to or larger than 3000 respondents, a correlation higher than .10 is significant at the .05 level of confidence, one tail-test. Significant correlations have been underlined.

***The total variance explained in each of the dependent variables by the four independent variables combined.

The zero-order correlation between cosmopolite contact scores and patron-dependence scores is $-.17$, which is greater than the $-.10$ required for significance at the $.05$ level (Table IV-3).

The third-order partial correlation between cosmopolite contact scores and patron-dependence scores is $-.13$ when controlling on physical mobility, mass media exposure, and empathy, which is greater than the $-.10$ required for significance at the $.05$ level (Table IV-3). EH_3 is supported.

Therefore, TH_3 is supported.

TH_4 : Empathy is negatively related to patron-dependence.

EH_4 : Empathy scores are negatively related to patron-dependence scores.

The zero-order correlation between empathy scores and patron-dependence scores is $-.11$, which is greater than the $-.10$ required for significance at the $.05$ level (Table IV-3).

The third-order partial correlation between empathy scores and patron-dependence scores is $-.02$, when controlling on physical mobility, mass media exposure, and cosmopolite contact, which is less than the $-.10$ required for significance at the $.05$ level (Table IV-3). EH_4 is not supported.

Therefore, TH₄ is not supported.

* * * * *

In general terms, the overall prediction that extra-system communication is negatively related to patron-dependence seems to be confirmed by the data. All the zero-order and third-order partial correlations between the extra-system communication variables and PD (in Table IV-3) are in the predicted negative direction. And with the exception of physical mobility, all the zero-order correlations between extra-system communication and PD reach statistical significance. Nevertheless, in terms of social significance, these correlations are not unusually high and extra-system communication as a whole accounts for only 5 percent of the variance in patron-dependence. (Table IV-3).

Modernity as the Dependent Variable

TH₅: Physical mobility is positively related to modernity.

EH_{5a}: The number of annual trips to cities with more than 40,000 inhabitants is positively related to agricultural knowledge scores.

The zero-order correlation between the number of trips to cities and agricultural knowledge scores is .01, which is less than the .10 required for significance at the .05 level (Table IV-3).

The third-order partial correlation between the number of trips to cities and agricultural knowledge scores

is $-.08$ when controlling on mass media exposure, cosmopolite contact, and empathy, which is less than the $.10$ required for significance at the $.05$ level (Table IV-3). EH_{5a} is not supported.

EH_{5b} : The number of trips to cities with more than 40,000 inhabitants is positively related to agricultural innovativeness scores.

The zero-order correlation between the number of trips to cities and agricultural innovativeness scores is $.10$, which is equal to the $.10$ required for significance at the $.05$ level (Table IV-3).

The third-order partial correlation between the number of trips to cities and agricultural innovativeness scores is $.03$ when controlling on mass media exposure, cosmopolite contact, and empathy, which is less than the $.10$ required for significance at the $.05$ level (Table IV-3). EH_{5b} is not supported.

Therefore TH_5 is not supported.

TH_6 : Mass media exposure is positively related to modernity.

EH_{6a} : Mass media exposure scores are positively related to agricultural knowledge scores.

The zero-order correlation between mass media exposure scores and agricultural knowledge scores is $.42$, which is greater than the $.10$ required for significance at the $.05$ level (Table IV-3).

The third-order partial correlation between mass media exposure scores and agricultural knowledge scores is .31 when controlling on physical mobility, cosmopolite contact, and empathy, which is greater than the .10 required for significance at the .05 level. EH_{6a} is supported.

EH_{6b} : Mass media exposure scores are positively related to agricultural innovativeness scores.

The zero-order correlation between mass media exposure scores and agricultural innovativeness scores is .37, which is greater than the .10 required for significance at the .05 level (Table IV-3).

The third-order partial correlation between mass media exposure scores and agricultural innovativeness scores is .30 when controlling on physical mobility, cosmopolite contact, and empathy, which is greater than the .10 required for significance at the .05 level (Table IV-3). EH_{6b} is supported.

Therefore, TH₆ is supported.

TH₇ : Cosmopolite contact is positively related to modernity.

EH_{7a} : Cosmopolite contact scores are positively related with agricultural knowledge scores.

The zero-order correlation between cosmopolite contact scores and agricultural knowledge scores is .29,

which is greater than the .10 required for significance at the .05 level (Table IV-3).

The third-order partial correlation between cosmopolite contact scores and agricultural innovativeness scores is .17 when controlling on physical mobility, mass media exposure, and empathy, which is greater than the .10 required for significance at the .05 level. (Table IV-3).

EH_{7a} is supported.

Therefore TH₇ is supported.

TH₈ : Empathy is positively related to modernity.

EH_{8a} : Empathy scores are positively related to agricultural knowledge scores.

The zero-order correlation between empathy scores and agricultural knowledge scores is .41, which is greater than the .10 required for significance at the .05 level (Table IV-3).

The third order partial correlation between empathy scores and agricultural knowledge scores is .26 when controlling on physical mobility, mass media exposure, and cosmopolite contact, which is greater than the .10 required for significance at the .05 level. EH_{8a} is supported.

EH_{8b} : Empathy scores are positively related to agricultural innovativeness scores.

The zero-order correlation between empathy scores and agricultural innovativeness scores is .22, which is greater than the .10 required for significance at the .05 level (Table IV-3).

The third-order partial correlation between empathy scores and agricultural innovativeness scores is .06 when controlling on physical mobility, mass media exposure, and cosmopolite contact, which is less than the .10 required for significance at the .05 level (Table IV-3). EH_{8b} is not supported.

Therefore, TH_8 is not supported.

Generally speaking, the broad prediction that extra-system communication is positively related with modernity seems to be supported by the present analysis. Table IV-3 shows that all the eight zero-order correlations between the four extra-systemic communication variables and the two indicants of modernity are in the expected positive direction. Seven of these eight correlations are statistically significant, and, in terms of social significance, these medium-size correlations account for more than one fourth of the variance in agricultural knowledge (28 percent) and about one sixth of the variance in agricultural innovativeness (16 percent).

PD as a Suppressor Variable

In Chapter II it was predicted that extra-system communication would correlate negatively with patron-dependence, which would also correlate negatively with modernity. The present section will analyze **first the second part of the afore-mentioned association which is not**

converted into a theoretical hypothesis, and then test the suppressor role of patron-dependence on the relationship of extra-system communication to modernity.

The present chapter has been dealing with the two sides of a triangle, i.e., the relationships between extra-system communication and PD, and the relationships between extra-system communication and modernity. What about the relationship between PD and modernity, the third side of our triangle?

Table IV-4 shows that, as predicted, the association is indeed in the negative direction, which means that individuals scoring higher in the PD scale tend to have less knowledge about agricultural innovations and to have adopted fewer (or done so more recently) agricultural innovations.

This negative relationship between patron-dependence and the indicators of modernity is solid enough to survive after controls for socio-economic status and social integration were introduced in the analysis.

The last four theoretical hypotheses deal with the suppressor effect that patron-dependence is expected to have in the extra system communication variables and the variables measuring modernity. It was hypothesized that the extra-system communication variables will have higher relationships with the modernity indicants among low patron-dependence individuals than among high patron-dependence individuals. The sample was stratified at the

Table IV-4. Zero-Order and Partial Correlations Between Patron-Dependence and Agricultural Knowledge and Agricultural Innovativeness (N=315).

	Patron-Dependence		
	Zero-Order	First-Order Partials	
		I*	II**
Agricultural Knowledge	<u>-.32***</u>	<u>-.28</u>	<u>-.27</u>
Agricultural Innovativeness	<u>-.20</u>	<u>-.14</u>	<u>-.13</u>

*Controlling for social integration.

**Controlling for socio-economic status.

*** For a sample size equal to or larger than 300 respondents, a correlation higher than .10 is significant at the .05 level, one tail-test. Significant correlations are underlined.

median of the patron-dependence scores and zero-order correlations between extra-system communication and modernity were obtained for the high and low patron-dependency subsamples. Table IV-5 presents the correlations between the extra-system communication variables and the modernity variables for the two sub-samples. Fisher's z was utilized to test the significance of the difference between two comparable correlations for the high and the low patron-dependents.* Support for both empiric hypotheses was required for support of any of the theoretical hypotheses.

TH₉: Physical mobility has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

TH_{9a}: The number of annual trips to cities with more than 40,000 inhabitants has a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

*The formula for computing the z score for the difference between the two z scores, representing the two correlations is:

$$\frac{z_1 - z_2}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}}$$

This z score for difference must be greater than 1.65 to be significant at the .05 level.

The correlation between the number of trips to cities and agricultural knowledge scores is $-.10$ for the high PD category and $.08$ for the low PD category (Table IV-5). The difference between these two correlation coefficients is in the predicted direction, from negative to positive. Fisher's z is 1.59 which is less than the 1.65 required for significance at the $.05$ level. EH_{9a} is not supported.

EH_{9b} : The number of annual trips to cities with more than 40,000 inhabitants has a higher relationship with agricultural innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between the number of trips to cities and agricultural innovativeness scores is $.07$ for the high PD group and $.14$ for the low PD group (Table IV-5). The difference between these two correlation coefficient is in the predicted direction, and Fisher's z is $.66$ which is less than the 1.65 required for significance at the $.05$ level. EH_{9b} is not supported.

Therefore, TH_9 is not supported.

TH_{10} : Mass media exposure has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

Table IV-5. Zero-Order Correlations of the Extra-System Communication Variables with the Modernity Indicators for High Patron-Dependents (N=159) and Low Patron Dependents (N=156)*, and Fisher's z for the Difference between the Two Correlation Coefficients.

	Agricultural Knowledge			Agricultural Innovativeness		
	High PD	Low PD	Fisher z	High PD	Low PD	Fisher z
1. Physical Mobility	-.10	.08	1.59	.07	.14	.66
2. Mass Media Exposure	<u>.17</u>	<u>.56</u>	4.19**	<u>.21</u>	<u>.53</u>	3.43**
3. Cosmopolite Contact	<u>.39</u>	<u>.20</u>	1.90**	<u>.30</u>	.06	2.27**
4. Empathy	<u>.35</u>	<u>.43</u>	.86	<u>.20</u>	<u>.47</u>	2.79**

*The original sample of 315 subjects was stratified along the PD median in two sub-samples. For a sample size equal to or larger than 150 respondents, a correlation higher than .13 is significant at the .05 level. Significant correlations have been underlined.

**A Fisher's z equal to or higher than 1.65 is significant at the 0.5 level for for an one tail-test.

EH_{10a}: Mass media exposure scores have a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between mass media exposure scores and agricultural knowledge scores is .17 for the high PD group and .56 for the low PD group. The difference between these two correlation coefficients is in the predicted direction, and Fisher's z is 4.19 which is greater than the 1.65 required for significance at the .05 level. EH_{10a} is supported.

EH_{10b}: Mass media exposure scores have a higher relationship with agricultural innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between mass media exposure scores and agricultural innovativeness scores is .21 for the high PD group and .53 for the low PD group. The difference between these two correlation coefficients is in the predicted direction, and Fisher's z is 3.43, which is greater than the 1.65 required for significance at the .05 level. EH_{10b} is supported.

Therefore, TH₁₀ is supported.

TH₁₁: Cosmonolite contact has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

EH_{11a}: Cosmopolite contact scores have a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between cosmopolite contact scores and agricultural knowledge scores is .39 for the high PD group and .20 for the low PD group. The difference between these two correlation coefficients is not in the predicted direction, and Fisher's z is 1.90, which is greater than the 1.65 required for significance at the .05 level. EH_{11a} is not supported.

EH_{11b}: Cosmopolite contact scores have a higher relationship with agricultural innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between cosmopolite contact scores and agricultural innovativeness scores is .30 for the high PD group and .06 for the low PD group. The difference

between these two correlation coefficients is not in the predicted direction, and Fisher's z is 2.27, which is greater than 1.65 required for significance at the .05 level. EH_{11b} is not supported.

Therefore, TH_{11} is not supported.

TH_{12} : Empathy has a higher relationship with modernity among low patron-dependence individuals than among high patron-dependence individuals.

EH_{12a} : Empathy scores have a higher relationship with agricultural knowledge scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between empathy scores and agricultural knowledge scores is .35 for the high PD group and .43 for the low PD group. The difference between these two correlation coefficients is in the predicted direction, and Fisher's z is 0.86, which is less than the 1.65 required for significance at the .05 level. EH_{12a} is not supported.

EH_{12b} : Empathy scores have a higher relationship with agricultural, innovativeness scores among individuals with low patron-dependence scores than among individuals with high patron-dependence scores.

The correlation between empathy scores and agricultural innovativeness scores is .20 for the high PD group and .47 for the low PD group. The difference between these two correlation coefficients is in the predicted direction, and Fisher's z is 2.79, which is greater than the 1.65 required for significance at the .05 level. H_{12b} is supported.

Therefore TH_{12} is not supported.

The general prediction that patron-dependence has a suppressor effect in the relationship between extra-system communication and modernity seems to be supported in light of the present data.

While half of the Fisher's z scores reach the significance criterion, the general tendency is that the relationship between the extra-system communication variables (with the exception of cosmopolite contact) and the two indicants of modernity is, as predicted, higher for the low PD individuals than for the high PD individuals.

Chapter V

CONCLUSIONS AND RECOMMENDATIONS

We must instill in our students the expectation of tedium and disappointment and the duty of thorough persistence, by now so well achieved in the biological and physical sciences. We must expand our student's vow of poverty to include not only the willingness to accept poverty of finances, but also a poverty of experimental results.

(Campbell and Stanley, 1963)

SUMMARY AND DISCUSSION

The present study focused upon the intervening effects of patron-dependence relationships in the communication and modernization process. The main objectives were: (1) to define patron-dependence, conceptually and operationally; (2) to analyze empirically the relationship of communication variables with PD (patron-dependence) and modernity, and (3) to determine the possible intervening effects of PD of the association between communication variables and modernity.

Patron-dependence was defined as the degree to which an individual's decisions are influenced by actors occupying superior hierarchical positions in the social system. PD was measured with a seven-item scale.* Our patron-dependence index items seem to be oriented toward the nuclear family. Out of seven items finally retained in the scale, four items deal with situations involving the

*Typical PD items are "not to allow daughters to date without a chaperone" and "to prefer to hire always a relative on respondent's farm."

nuclear-family. These nuclear family items do not correlate very highly with the non-nuclear family items, perhaps suggesting that with the inclusion in the future of a larger number of items, two or more sub-scales might emerge. Nevertheless PD (as measured in the present study with a sample of Brazilian farmers) had a reasonable range and the unimodal distribution approximated a bell-shaped distribution. The retained PD items also have equal loadings of a magnitude of .35 to .57 on the first factor of the (unrotated) principal factor solution, and item to total score-minus-the-item (positive) correlations that range from .18 to .31. Thus, the seven items in the PD index demonstrate a modest degree of common variance.

It was expected: (1) that extra-system communication variables while positively associated with modernity variables are negatively associated with patron-dependence, and (2) that stratifying along patron-dependence will increase the relationship between extra-system communication variables and modernity variables. Physical mobility, mass media exposure, cosmopolite contact, and empathy were expected to be negatively related to PD. These four extra-system communication variables were expected to be positively related to the modernity variables of agricultural knowledge and agricultural innovativeness. Lastly, we expected that among low PD individuals it would be a higher relationship between the extra-system communication variables and modernity variables than among high PD individuals.

The data for the present study come from part of a larger reserach endeavor dealing with the diffusion of innovations in Brazil. The present dissertation concentrates on interviews with a sample of 315 Minas Gerais farmers, elsewhere called Phase 2.5 of the Brazil Diffusion Project.

Table V-1 shows a summary of the hypotheses-testing procedures. Half of the theoretic hypotheses were supported and half were not supported. Nevertheless, with one exception, the direction of all the relationships in the model supports our theoretical expectatives.

There are two ways to explain these results: methodologically and theoretically. We shall now present methodological and theoretic reasons supporting the behavior of each of the independent variables.

1. Physical Mobility - The data on physical mobility do not present statistical support for any of the theoretical hypotheses (Table V-1). Nevertheless, all the relationships with physical mobility are in the predicted direction. Physical mobility was measured with a single direct question. Physical mobility was operationally defined as the number of trips to cities with more than 40,000 inhabitants. Such urban centers may be too far removed from the reference system of our respondents. At the time of the interviews, 1967, there were only four cities of such size in Minas Gerais. It could be that these cities were

Table V-1. Summary of the Hypotheses-Testing Results in the Present Dissertation.

Theoretic	Indenendent	Empirical	Denendent	Hypothesis-Testing Result	
Hypotheses	Concept	Hypotheses	Variables	Empirical	Theoretical
I. PD as the Dependent Variable					
TH ₁	Physical Mobility	EH ₁	PD	Not Supported	Not Supported
TH ₂	Mass Media Fxnposure	EH ₂	PD	Supported	Supported
TH ₃	Cosmonolite contact	EH ₃	PD	Supported	Supported
TH ₄	Empathy	EH ₄	PD	Not Supported	Not Supported
I. Modernity as the Dependent Variable					
TH ₅	Physical Mobility	EH _{5a} EH _{5b}	Knowledg. Innovativ.	Not Supported Not Supported	Not Supported
TH ₆	Mass Media Exposure	EH _{6a} EH _{6b}	Knowledg. Innovativ.	Supported Supported	Supported
TH ₇	Cosmopolite Contact	EH _{7a} EH _{7b}	Knowledg. Innovativ.	Supported Supported	Supported
TH ₈	Empathy	EH _{8a} EH _{8b}	Knowledg. Innovativ.	Supported Not Supported	Not Supported

Table V-1 continued.

Theoretic	Independent	Empirical	Dependent	Hypothesis-Testing Result	
Hypotheses	Concent	Hypotheses	Variables	Empirical	Theoretical
<u>III. PD as a Suppressor Variable</u>					
TH ₉	Physical Mobility	EH _{9a} EH _{9b}	Knowledg. Innovativ.	Not Supported Not Supported	Not Supported
TH ₁₀	Mass Media Exposure	EH _{10a} EH _{10b}	Knowledg. Innovativ.	Supported Supported	Supported
TH ₁₁	Cosmopolite Contact	EH _{11a} EH _{11b}	Knowledg. Innovativ.	Not Supported Not Supported	Not Supported
TH ₁₂	Empathy	EH _{12a} EH _{12b}	Knowledg. Innovativ.	Not Supported Supported	Not Supported

physically and perceptually so far from the farmers' communities that they traveled to them only in cases of extreme necessity, looking for certain specialized services not immediately available in the local, smaller centers. In these circumstances, the individual is so uncomfortable in the large cities that he does not look for instrumental experiences, or if he dies, they seem so intangible that their applicability to his life situation is strongly doubted.

2. Empathy - The data on empathy do not support any of the theoretical hypotheses but show support for two of the five empirical hypotheses, and all of the empirical relationships involving empathy are in the predicted direction. The frequency distribution of the empathy index is hardly bell-shaped, and this distribution may have affected the statistical results of the analysis. Previous comments (Chapter III) about the "take-off effect" of empathy in modernization imply that it is necessary to tap more roles at the national and international level. We believe that improvements in the operation would produce a more discriminating empathy index, and perhaps a more bell-shaped distribution. Whiting (1967, p. 148) in a recent study with a similar sample of Brazilian farmers found that empathy, as a predictor of modern orientations and attitudes, was less important than mass media exposure, literacy, or general intelligence. Nevertheless, our findings suggest

that empathy is a more important predictor of the cognitive aspects of modernity than of the behavioral aspects of modernity.

3. Cosmopolite Contact - Now, let us explain the behavior of cosmopolite contact in the present analysis. First, two of the three theoretic hypothesis dealing with cosmopolite contact were supported and the three corresponding empirical hypotheses when tested yielded relationships in the expected direction. Cosmopolite contact, as predicted, is positively related with modernity variables, and is negatively related with patron-dependence (Table V-1). But, contrary to prediction (and unlike mass media exposure physical mobility, and empathy) among high PD individuals there is a higher association between cosmopolite contact and modernity than among low PD individuals. It seems that low patron-dependents (the ones that travel most, read most, and with better economic resources) talk more and most often with the cosmopolites in their community (who are more like themselves), but these local cosmopolites do not seem to exert any influence or act as a source for information about new ideas for the low PD farmers. On the other hand, high patron-dependents might have some selected contacts with the local cosmopolites, regard these cosmopolites as patron figures, and are influenced by the few pro-change messages that could be exchanged in such sparse contacts.

4. Mass Media Exposure - The data on mass media exposure behaved in the predicted directions, and supported all the hypothesized relationships. These findings suggest that the content of the media is, on the average, instrumental for the modernization and development process.* Even when the mass media may not be carrying much information that could be directly considered as instrumental for agricultural development (such as information leading to the diffusion of innovations), exposure to the media seem to be teaching the farmers about the sources for such information.

POSSIBLE REINTERPRETATIONS

On the basis of the data from the present study, what are some of the possible theoretical reinterpretations and future testable hypotheses?

First, the present study seems to indicate that, in patron-dependent societies, farmers do not make farming decisions individually. It seems that in certain less developed countries social structural differences affect decisions by the individual. Hodgdon and Singh (1963), in a study of the diffusion of innovations in India, show that "external" factors are much more important in explaining

*McNelly (1964), writing about mass communication and the climate for modernization in Latin America, suggested that "much of the content in all of the media, including advertising, is informational, educational, or propagandistic in nature, designed to inform or persuade people about various kinds of modernization."

adoption than the individuals' decision to adopt or reject the recommended innovations. Rogers (1966, p. 388) shows the relative importance of patrons in adoption decisions in a particular Colombian community where 95 percent of all the arable land belonged to five large landowners. The "diffusion model" (Rogers, 1962) developed in the U.S. with U.S. samples, assumes that individual farmers should be the unit of analysis since, in this less patron-dependent society, farmers individually take adoption decisions in most cases. But what will happen in other societies where hierarchical differences may affect adoption decisions? It seems viable to hypothesize that under the previously mentioned conditions, social systems with more innovative patrons (or "elites," for national analyses) will have a faster rate of adoption than systems with less innovative patrons.

Secondly, perhaps patron-dependence is antecedent to extra-system communication and modernity, rather than intervening. There is both a logical and an empirical reason for this possibility.

1. Patron-dependence is an enduring trait of the individual PD, learned through the childhood socialization process, might be considered to temporarily precede extra-systemic communication.

2. Only one of the three theoretic hypotheses testing the suppressor effect of PD was supported (Table V-1).

Further, when PD is not partitioned (Table IV-3), seven of the eight relationships between extra-system communication variables and modernity variables are significantly different from zero. When PD is partitioned at the median (Table IV-5), 12 of the 16 empirical relationships between extra-system communication variables and modernity variables are significantly different from zero. In other words, the relationships between extra-system communication variables and modernity variables do not differ strikingly whether or not PD is mathematically present or not. Thus, we have not very convincing evidence that PD intervenes between extra-system communication variables and modernity variables.

In order to check the antecedent position of PD in the relationship between the independent and dependent variables, it would be necessary to test the hypothesis that the relationship between PD and modernity variables is reduced by controlling on extra-system communication variables.

RECOMMENDATIONS FOR RESEARCH

We now proceed to make some research recommendations that will help with the processes of knowledge creation and knowledge utilization. Based upon conclusions and evidence from the present study, we recommend the following types of research:

1. Research dealing with the validation of the present results with different populations. This type of research, aimed at providing a wider base for theoretic generalization, should also test whether the present results hold across relatively modern and traditional systems. Such analysis could provide evidence for the consistency of the present results during the sequence of developmental stages of a society.*

2. Research dealing with measurement improvement. Further validation of the present PD scale is necessary but it is also necessary to elaborate the index by including more diversified items (about non-nuclear family relationships and about patron figures outside of the immediate social systems). These items might provide insight about the possible existence of two or more PD subscales.

3. Research dealing with the amount of PD variance explained. It is possible that differences in PD could be better accounted for by intra-community variables than by extra-systemic variables. This type of study might provide evidence for further amplifications of the causal sequence proposed in the present dissertation.

*Such are the stages in economic development advocated by Rostow (1960).

4. Research dealing with the so-called "take-off" models (Perzog, 1967b; Whiting, 1967; Waisanen and Kumata, 1969) of modernization. Change agencies are particularly interested in knowing not only what the important ingredients for change are, but also the concentration and interaction of such factors in the optimal-mix recipe of planned change. For example, working with such non-linear models, planners might determine not only that mass media exposure at the community level is relevant for development, but also whether it might be more efficient to provide a few selected interpersonal contacts (outside the community) for a few leaders than to provide exposure to the media for the entire community.

5. Research dealing with the qualitative aspects of message content that produce message-acceptance by high and low patron-dependents. Change agencies, in their intermediary role between sources (scientists, planners, and politicians) and receivers (clients or citizens), need to be effective in "filtering" which messages to choose for certain audiences under specified conditions. We are yet so far from this goal.

RECOMMENDATIONS FOR CHANGE AGENCIES

The findings of the present dissertation tend to suggest that:

1. In patron-dependent societies, change agencies should work through the hierarchy of patron-figures.

Acceptance of modern practices by innovative patrons should accelerate the adoption process among those who tend to base their adoption decisions on what others (in superior social positions) have done.

2. Change agents should concentrate their efforts on high patron dependent individuals because our findings suggest such persons are especially influenced by cosmopolite contacts in the community. Change agents are local cosmopolites and able to influence patron-dependent individuals through interpersonal contacts.

While new change agents may profit in being identified as a patron figure, they should be careful with such identification in order to avoid, after their departure, being replaced by less change oriented patron figures. Change agents should encourage their clients to have contact with other change-oriented cosmopolites.

3. Change agencies should concentrate their mass media campaigns in reaching an audience of low patron-dependence individuals. It appears that low patron-dependents are more eager to accept pro-change messages carried by the media, and in the long run they should influence the less persuasible high patron-dependence individuals.

4. Change agencies should have a socio-educational approach parallel to their technological approach. Agricultural extension agents for example should not only

work to increase their clients knowledge of hybrid corn, but should also try to increase their clients' knowledge of other social roles and behavioral alternatives far removed from the immediate community. Thus attempts to increase empathy and other variables might be a long-run objective of change agencies, in addition to their shorter range objectives of diffusing innovations.

* * * * *

In conclusion: if modernization is perceived as a sequence of steps representing different reinterpretations of the world and shifts in the reference system of an individual from the family to the community, to the nation, to the planet, to the cosmos. Then what communication inputs are necessary to overcome the thresholds separating these steps becomes a question needing a priority answer.

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APPENDIX

APPENDIX A

THE CODEBOOK AND INSTRUMENT FOR THE PRESENT STUDY

IBM	Topic	Question	Question #
Column #	Code		

Card 1

1,2,3 Project Number by Phase and Country

712 - Brazil, Phase 2.5

4.5 ACAR Local Office and Community

20 -- Soa Joao Neponucemo (Rochedo de Minas)
 22 -- Santos Dumot (Sao Joao da Serra)
 24 -- Rio Novo (Goiana)
 30 -- Paraopeba (Picada)
 32 -- Pedro Leopoldo (Mates)
 34 -- Corinto (Curralinho de Dentro)
 42 -- Itauna (Pedra)
 43 -- Divinopolis (Quilombo)
 51 -- Formiga (Albertos)
 70 -- Uba (Corrego Alegre)

6,7,8 Respondent Identification by Questionnaire Type

500
 ::: -- Also interviewed in Phase I
 519

520
 ::: -- Interviewed only in Phase II
 599

Questionnaire A, Poorer Community:

600
 ::: -- Also interviewed in Phase I
 619

620
 ::: -- Interviewed only in Phase II
 699

IBM	Topic	Question	Question #
Column #	Code		

Card 1

9 Community Type - Phase 2.5

- 5 -- Animation
- 6 -- Literacy
- 7 -- Control
- 8 -- Simulation

10. Type of Respondents

- 0 -- Land-owner, male, lives in nuclear center
- 1 -- Land-owner, male, lives outside nuclear center
- 2 -- Land-owner, female, lives in nuclear center
- 3 -- Land-owner, female, lives outside nuclear center
- 4 -- Non-land-owner, male in nuclear center
- 5 -- Non-land-owner, male outside nuclear center
- 6 -- Non-land-owner, female, in nuclear center
- 7 -- Non-land-owner, female, outside nuclear center

11,12 IBM Card Number

- 01
- :: -- Card number
- 05

13,14 Age of Respondent

How old are you? (INTERVIEWER: IF THE RESPONDENT DOES NOT KNOW HIS OWN AGE ASK THE YEAR OF BIRTH)

1

IPM	Topic	Question	
Column #		Code	Question #

Card 1

00 -- Actual age
 -- " "
 --
 --
 99 --

15 Years of schooling completed by respondent

How many years did you attend school? 2

0 -- None
 1 -- one year
 2 -- two years
 3 -- "
 4 -- "
 5 -- "
 6 -- "
 7 -- "
 8 -- "
 9 -- nine years or more

17,18 Number of visits to a large city in the past year

Did you visit a large city last year?
 (One with more than 40,000 inhabitants) 4

00 -- Did not visit a large city
 past year
 01 -- Number of visits in past year
 to a large city
 -- "
 -- "
 -- "
 99 -- "

19,20 Number of contacts per year with relative living in a large city

Do you have any relative who lives in
 a large city? (More than 40,000
 inhabitants)

IBM Column #	Topic Question Code	Question #
-----------------	---------------------------	------------

Card 1

00 -- Does not have relative living
in a large city
01 -- Number of contacts per year
with relative living in large
city
-- "
-- "
-- "
99 -- "

25,26

Number of newspapers or magazines read per
month

Have you read (or has somebody read for
you) newspapers or magazines lately?
(IF YES) How many times a month?

9,9b

00 -- No or a "0" code in column
24
01 -- Number of times per month
exposed to newspaper or
magazine
-- "
-- "
-- "
99 -- "

29

Frequency of radio listening

How often do you listed to the radio?

12

0 -- Never
1 -- Almost never, doesn't know,
no answer
2 -- Sometimes
3 -- More or less an hour per day

31

Frequency of TV viewing

Do you watch TV?

14

IBM Column #	Topic Question Code	Question #
-----------------	---------------------------	------------

Card 1

- 0 -- Never
- 1 -- Sometimes sees it, in some other place, doesn't know, no response
- 2 -- More or less regularly, at home

34 Frequency of letter writing

Can you write letters? 16

- 0 -- Not able to write a letter
- 1 -- Is able, but doesn't; doesn't know; no response
- 2 -- Writes about one a year
- 3 -- Writes about one a month
- 4 -- Writes about one a week

38 Mutual aid given*

In the last year, which type of help did you give to your friends? 20a

a. help on farming, with some construction given

- 0 -- No; never; no response
- 1 -- Once a year
- 2 -- 2-6 times a year
- 3 -- 7 - 11 times a year
- 4 -- Once a month
- 5 -- 2 - 3 times a month
- 6 -- Once a week
- 7 -- 2 - 6 times a week
- 8 -- Daily

*New items not present in previous phases.

IBM	Topic	Question	Question #
Column #	Code		

Card 139 Mutual aid received*a. help on farming, with some construc- 20a
tion - received

0 -- (Same code as col. 38)
 1 --
 2 --
 3 --
 4 --
 5 --
 6 --
 7 --
 8 --

40 Mutual aid given*

b. cash loan - given 20b

0 -- (Same code as column 38)
 1 --
 2 --
 3 --
 4 --
 5 --
 6 --
 7 --
 8 --

41 Mutual aid received*

b. cash loan - received 20b

0 -- (Same code as column 38)
 1 --
 2 --
 3 --
 4 --
 5 --
 6 --
 7 --
 8 --

*New items not present in previous phases

IBM	Topic	Question	
Column #		Code	Question #

Card 1 Mutual aid given*

42 c. tools, machinery, or animal loan - 20c
 given

0 -- (Same code as column 38)

1 --

2 --

3 --

4 --

5 --

6 --

7 --

8 --

43 Mutual aid received*

 c. tools, machinery, or animal loan - 20c
 received

0 -- (Same code as column 38)

1 --

2 --

3 --

4 --

5 --

6 --

7 --

8 --

44 Mutual aid given*

 d. help in case of illness - given 20c

0 -- (Same code as column 38)

1 --

2 --

3 --

4 --

5 --

6 --

7 --

8 --

* New items not present in previous phases.

IPM	Topic	Question	
Column #		Code	Question #

Card 1 Reciprocal aid received*

d. help in case of illness - received 20d

0 -- (Same code as column 38)

1 --

2 --

3 --

4 --

5 --

6 --

7 --

8 --

47 Counter-factual behavior as responsible
for the community

If you were the person responsible for
some movement to improve the community,
what would you do? 22

0 -- Doesn't know; foolish
responses; responses that
show respondent's inability
to think of himself as another
person's role.

1 -- Very general answers that show
some understanding of the
situation and the things that
he could do but are not
specified.

2 -- Specific responses with indica-
tion that the person was
actually thinking of himself in
another person's role.

48 Counter-factual behavior as mayor the municipio

If you were the mayor of the municipio,
what would you do? 23

0 -- (Same code as column 47)

1 --

2 --

*New items not present in previous phases.

IBM Column #	Topic Question Code	Question #
-----------------	---------------------------	------------

Card 1

51 Counter-factual behavior as director of
a factory

If you were the person in charge of
a factory, what would you do? 26

0 -- (Same code as column 47)
1 --
2 --

58 Knowledge about home-pharmacy*

What is a home-pharmacy? 28

0 -- Wrong knowledge; doesn't know
1 -- First aid kit

59 Do you need something at home to take care
of the small accidents that may happen on
your property? 28a

0 -- No
1 -- Yes

60 What is necessary? 28a

0 -- Doesn't know
1 -- One right thing
2 -- Two right things
3 -- Three right things
4 -- Four right things

61 Where do you use to keep these things? 28b

0 -- Doesn't know
1 -- Some place
2 -- A particular place

*New items not present in previous phases.

IBM	Topic	Question	
Column #		Code	Question #

Card 1

66 Knowledge about erosion-controlling foliage*

What is a erosion-controlling foliage? 29

```
0 -- Wrong knowledge; doesn't know
1 -- Right knowledge (conservation-
    ist practice)
```

67 What do you know about it? 29a

```
0 -- Doesn't know
1 -- Knows
```

68 What is the distance between strings? 29b

```
0 -- Doesn't know
1 -- Knows
```

69 What is the best time to do them? 29c

```
0 -- Doesn't know
1 -- Knows
```

70 Is it necessary to redo them every year? 29d

```
0 -- Doesn't know; yes
1 -- No
```

Card 2

13 Knowledge about planting machine*

What is a planting machine 30

```
0 -- Wrong knowledge; doesn't know
1 -- Right knowledge
```

*New items not present in previous phases.

IBM Column #	Topic Question Code	Question #
<u>Card 2</u>		
14	How has the soil been prepared for the use of a planting machine?	30a
	0 -- Doesn't know	
	1 -- Knows	
15	Which part of the machine has to be changed for different types of seeds?	30b
	0 -- Doesn't know	
	1 -- The disc	
16	Where do you adjust the seedling machine?	30c
	0 -- Doesn't know	
	1 -- In a flat piece of land	
23	<u>Knowledge about trench-silo*</u>	
	What is a trench-silo?	31
	0 -- Wrong knowledge; doesn't know	
	1 -- Right knowledge	
24	What do you use to fill the trench-silo?	31a
	0 -- Doesn't know	
	1 -- Knows	
25	For how long must the trench-silo be closed before starting to use it?	31b
	0 -- Doesn't know	
	1 -- One month, more or less	

*New items not present in previous phases.

IBM	Topic	Question	Question #
Column #	Code		

Card 2

26 How wide should the "loaf" be that
you take daily from the trench-silo? 31c

- 0 -- Doesn't know
- 1 -- 15 cm., more or less

33, 34 Contact with ACAR

How many times have you talked to the
ACAR agent in the past year?

- 00 -- Never
- 01 -- Once
- 02 -- Twice
-
- 99 --

38 Counterfactual behavior as ACAR agent

What would you do if you were the ACAR
agent? 35

- 0 -- Doesn't know; foolish responses;
responses that show respondents
inability to think of himself
as another person's role.
- 1 -- Very general answers that show
some understanding of the situa-
tion and the things that he could
do but are not specified.
- 2 -- Specific responses with indica-
tion that the person was actual-
ly thinking of himself in another
person's role.

Adoption of agricultural practices

Did you ever use: 43

53 Reforestation?

- 0 -- No
- 1 -- Doesn't know; no response
- 2 -- Yes

IBM	Topic	Question	Question #
Column #	Code		

Card 2

- 54 Termite control?
- 0 -- No
1 -- Doesn't know; no response
2 -- Yes
- 55 Ant-killer?
- 0 -- No
1 -- Doesn't know; no response
2 -- Yes
- 56 Controlled breeding?
- 0 -- No
1 -- Doesn't know; no response
2 -- Yes
- 57 Tick control?
- 0 -- No.
1 -- Doesn't know; no response
2 -- Yes

Year of practice adoption

How many years since you used for the
first time:

43

- 58,59 Reforestation?
- 00 -- Never used
:: -- Year of first use
67 --
- 60,61 Termite control:
- 00 -- Never used
:: -- Year of first use
67 --

IBM	Topic	Question	Question #
Column #	Code		

Card 2

62,63 Ant-killer?

00 -- Never used
 :: -- Year of first use
 67 --

64,65 Controlled breeding?

00 -- Never used
 :: -- Year of first use
 67 --

66, 67 Tick control:

00 -- Never used
 :: -- Year of first use
 67 --

68 Do you still use:

43

Reforestation?

0 -- No
 1 -- Doesn't know
 2 -- Yes

69 Termite control:

0 -- No
 1 -- Doesn't know
 2 -- Yes

70 Ant-killer?

0 -- No
 1 -- Doesn't know
 2 -- Yes

IBM	Topic	Question	
Column #		Code	Question #

Card 2

71 Controlled breeding?

 0 -- No
 1 -- Doesn't know
 2 -- Yes

72 Tick control?

 0 -- No
 1 -- Doesn't know
 2 -- Yes

Card 3Patriarchalism*

 If it were possible . . .

19 Would you wish that your sons follow 47a
 an occupation:

 0 -- Chosen by you!
 (1 -- Doesn't know)
 2 -- Chosen by themselves?

20 When your wife needs to buy clothes or 47b
 medicines:

 0 -- She has to ask you first? or
 (1 -- Doesn't know)
 2 -- She can buy and then tell you?

21 One of your daughters dates some boy you 47c
 know:

 0 -- She needs a chaperone? or
 (1 -- Doesn't know)
 2 -- No

* New items not present in previous phases.

IBM	Code	Question	Question #
Column #	Code		

Card 3

22 Would you allow your married sons to
 smoke when you are present? 47d

- 0 -- No
- (1 -- Doesn't know)
- 2 -- Yes

23 On your property, do you think it is
 always better to hire: 47e

- 0 -- A relative? or
- (1 -- Doesn't know)
- 2 -- A stranger if he is a good
 worker

In a general way . . .

24 What the priest says: 48

- 0 -- Is right?
- (1 -- Doesn't know)
- 2 -- Is good to discuss with the
 others?

25 When we need a job, what do you think: 49

- 0 -- It is always better to
 accept a position near the
 relatives? or
- (1 -- Doesn't know)
- 2 -- You should accept a better
 position, even if it is away
 from the relatives?

Do you think . . .

26 A father has to express his opinion about
 the way his daughters use their clothes? 50a

- 0 -- No
- (1 -- Doesn't know)
- 2 -- Yes

IBM	Topic	Question	Question #
Column #	Code		

Card 3

27 Technical help: 50b

- 0 -- Is a favor that the govern-
ment does the farmers? or
- (1 -- Doesn't know)
- 2 -- Is an obligation that the
government owes to the
farmers?

28 A girl should marry: 50c

- 2 -- Whoever she wants? or
- (1 -- Doesn't know)
- 0 -- Should first seek the advise
of her parents

29 Counterfactuality as President of Brazil

What would you do if you were the
President of Brazil?

- 0 -- Doesn't know; foolish answers
without originality
- 1 -- A little bit specific responses
but without originality
- 2 -- Original and specific answers.

42,43 Functional literacy

(CODER: SUBTRACT FROM 50 THE NUMBER
OF WRONG WORDS AND WRITE THE ANSWER)

"He who cannot read is like a blind man who
has to be guided according to other people's
wishes; or then he will stumble on his way.
The illiterate man is not altogether free;
he is a slave of his ignorance. Never stop
reading something everyday and keep
learning."

- 00 -- No right word
- :: --
- 50 -- Everything correct

IBM	Topic	Question	
Column #		Code	Question #

Card 3

45,46,47 Sociometric choices for discussions, leadership and trust*

Can you give me the names of the persons with whom you talk most often about agricultural matters, such as productivity, new methods, etc.? 59a-1

Are there any other persons with whom you do talk about the same topics with less regularity? 59a-2

Who are the three individuals that are most followed by others in topics about agriculture or cattle raising? 59b

Who are the three persons from this community that you trust most on farming? 59c

000 -- No nomination

500 -- Indentification number of the first nominated person (a column field)

::: --

999 -- Person outside Phase II sample

50 First person's place of work*

Where he works?

0 -- No response

1 -- Same community

2 -- Same municipio

3 -- Another municipio

51 General meetings with first person*

How frequently do you get together?

*These questions were repeated ten times for a total possibility of up to ten nominations.

IBM Column #	Topic Question Code	Question #
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Card 3

- 0 -- Never; no response
- 1 -- 1 - 3 times a year
- 2 -- 4 - 7 times a year
- 3 -- 8 - 11 times a year
- 4 -- Once monthly
- 5 -- 2 - 3 times per month
- 6 -- Once a week
- 7 -- 2 - 4 times per week
- 8 -- Daily

Card 5

Home and farm equipment and improvements 60

13 Do you own . . .

Water filter?

- 0 -- No
- 2 -- Yes

15 Plumbing for running water?

- 0 -- No
- 2 -- Yes

16 Inside bathroom?

- 0 -- No
- 2 -- Yes

17 Electric lighting?

- 0 -- No
- 2 -- Yes

18 Radio?

- 0 -- No
- 2 -- Yes

IBM	Topic	Question	
Column #		Code	Question #

Card 5

19 Motorized vehicle?

0 -- No
2 -- Yes

20 House in town?

0 -- No
2 -- Yes

22,23,24 Size of property

What is the total area of your property? 61

000 -- No property; no response
::: --
999 -- 999 hectares or more

25,26 Number of cows

How many cows do you own? 62

00 -- None
:: --
99 -- 99 or more

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