

COMMUNICATION NETWORKS,  
LOCUS OF CONTROL, AND FAMILY  
PLANNING AMONG MIGRANTS TO  
THE PERIPHERY OF MEXICO CITY

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## ABSTRACT

### COMMUNICATION NETWORKS, LOCUS OF CONTROL, AND FAMILY PLANNING AMONG MIGRANTS TO THE PERIPHERY OF MEXICO CITY

By

D. Lawrence Kincaid

The most striking phenomenon associated with the modernization of developing countries is the extremely rapid rate of urbanization. Whether from the push of rural conditions or from the pull of expected urban opportunity, the rate of rural-urban migration has reached crisis levels in many countries today. The present investigation analyzes the socio-psychological impact of modern, urban influences upon migrants to the periphery of Mexico City.

This study has three main objectives: (1) to explicate perceived locus of control over the environment in the context of urbanization and modernization, (2) to determine the intervening function of the communication network between demographic variables and locus of control, and (3) to construct a path-analytic model for locus of control and family planning activity with survey data from migrants to Mexico City. A review of the literature suggested that an individual's perceived locus of control is determined by the structure and content of his environment and the process of socialization. These two influences are operationally defined in the present study by measures of the migrant's interpersonal and mediated communication network. It was hypothesized that the migrant's basic demographic characteristics would indirectly effect his

belief in control through their effect upon his communication network, which would directly effect his perceived locus of control over the environment. The foregoing variables would then have both direct and indirect effects upon knowledge of contraceptive methods and family planning activity.

With cross-sectional survey data from an area probability sample of 197 migrants to Ciudad Netzahualcoyotl on the periphery of Mexico City, a path-analytic model was constructed for locus of control and family planning using least-squares, step-wise multiple regression analysis. The path analysis clearly showed the intervening role played by the communication network between demographic indicators of socio-economic status and locus of control. Education and occupational prestige had direct effects upon newspaper exposure and the size and occupational prestige of the migrant's interpersonal network. These three communication variables, along with age and years of urban residence, directly effected perceived locus of control. Locus of control had the strongest direct effect upon contraceptive knowledge, followed by source of information and education. Family planning activity was directly effected by family planning morality, contraceptive knowledge, number of children, age, size of childhood residence, and the residential diversity of the interpersonal network.

These findings show the utility of constructing behavioral models which include communication network variables in conjunction with social and psychological variables. The study concludes with implications for family planning policy and recommendations for future research.

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OF MEXICO CITY

By

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CHAPTER I  
THEORETICAL FRAMEWORK

Introduction

Past studies of the role of psychological variables in the process of modernization have been concerned with the following basic question: what is the main distinction between "modern man" as we know him, and the so-called "traditional man" who seems oblivious to external assistance to improve his lot? For Lerner (1958), the key variable is empathy, the ability to place oneself in the role of others. McClelland (1961) substantiates a causal relationship between achievement motivation and industrial growth. Rogers (1969) has used both of these variables, and he has added fatalism, aspiration, innovativeness, and others to the list of characteristics. Some, like Lewis (1964), have concentrated upon traditional man and the subculture of poverty. Others have attempted to describe the other end of the continuum, the characteristics of modern man (Inkeles, 1966; Kahl, 1968; Sherrill, 19; Doob, 1967; Schnaiberg, 1970). Both ends of the continuum have been used as ideal types for research (Rogers, 1969; Dawson, 1967).

Recent investigation of individual modernity has evolved from the "industrial man" thesis (Inkeles, 1960; Kerr, 1964; Parsons, 1965; and Marsh, 1963). This thesis is best described by the following quote

from Inkeles (p. 1):

Perceptions, attitudes, and values relating to a wide range of situations are shown to be systematically ordered in modern societies . . . within all modern societies the order or structure of response is the same, following the typical status ladders of occupation, income, and education . . . standard institutional environments of modern society induce standard patterns of response, despite the countervailing randomizing effects of persisting traditional patterns of culture.

The "industrial man" thesis has generated several cross-cultural empirical investigations to determine the central factor or value syndrome of individual modernity.

A recent study by Armer and Schnaiberg (1971), however, questions the validity of previous scales used to measure modernity (Smith and Inkeles, 1966; Kahl, 1968; Armer, 1970; Schnaiberg, 1970; Srole, 1956; and Middleton, 1963). After examining the intercorrelation among these scales, and these in turn with scales of anomia (Srole, 1956) and alienation (Middleton, 1963), they conclude that:

. . . the modernity measures tend to predict scores on anomia, alienation and, to a lesser extent, socioeconomic status, about as well as they predict other measures of modernity. Conversely, measures of anomia and alienation appear to measure modernity almost as well as do the modernity scales. These findings cast serious doubt on the validity of modernity scales (p. 18).

After some discussion and interpretation of their findings, they conclude that "the notion that social science has been able to develop a valid culturally universal measure of modernity appears to be false" (p. 26).

Because they try to capture all of the themes related to modernity it is not surprising to discover that these syndromes of modernity share considerable common variance with scales of alienation and anomia. It is possible, however, to identify a single psychological dimension which

tends to dominate current measures of modernity and which overlaps with concepts like anomia and alienation. In the Smith-Inkeles scale of overall modernity it is called "subjective efficacy." Kahl named the first factor in his scale "activism," defined as shaping one's own world instead of responding passively and fatalistically to it. In scales of alienation it is often referred to as "powerlessness." Together they all seem to resemble Kluckhohn and Strodtbeck's (1961) "mastery over nature" value orientation and their "doing" activity orientation.

Noting the similarity among efficacy, fatalism, competence, powerlessness, and alienation, Smith (1969, p. 589) defined "subjective efficacy" as:

. . . an individual's degree of belief and feeling that he is able to achieve goals by his own effort and that he can significantly control events and the external environment, whether physical or social, rather than being mainly or completely controlled by it. So defined, the concept of efficacy is very close in meaning to the concept of internal vs. external control, as dealt with by Rotter and his colleagues (see Rotter, 1966).

The concept of control is evident in the meaning of all of these terms, but it is much more general. From a general systems theory framework Ascroft (1969, p. 1) has defined modernization as ". . . the process by which man purposively cumulates control over change in environmental phenomena essential to his welfare." The emphasis is placed upon self-regulation and negative feedback that is inherent in "adaptive behavior." Cumulative control over nature, however, is attained through a process of self-sustaining growth in control by means of positive feedback.<sup>1</sup>

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<sup>1</sup>See Maruyama's discussion of the "second cybernetics" (1968).

Modern man does much more than merely adapt to his environment by retaining essential variables within safe limits. He purposively acts upon his environment in order to increase his degree of control. The cumulation of control over the environment is accomplished by innovation which must occur on three fronts:

1. information--which includes both the creation of new information and the purposive acquisition of information created by others.<sup>1</sup>
2. technology--the application of information to increase the efficiency and effectiveness of man's control over nature.
3. behavior--a corresponding change in man's way of doing things, including new forms of social organization.

Because these three forms of innovation are so central to modernization, communication (as the diffusion of innovations) from exogenous sources has often been treated as the prime antecedent of modernization, especially in developing nations (Rogers with Svenning, 1969).

A change or increase on these three fronts will produce growth in man's control over the environment. There is an important omission from this equation, however: What motivates man to create new information and technology, and to engage in new forms of behavior and organization? And, conversely, what effect does increased control over the environment have upon man's personality and the way that he perceives himself? For self-initiated innovation (and subsequent increase in control) to occur the individual must first believe to some degree that

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<sup>1</sup>What Morris (1968) refers to as "absolute" and "distributed" information.

he is capable of increasing his control over the environment.<sup>1</sup> It is this belief in control over the environment that has been measured by such scales as subjective efficacy, fatalism, powerlessness, and internal-external control. The increase in control over the environment that is produced by innovation has the effect of positive feedback and thus strengthens or reinforces the individual's belief that he can control his environment through his own efforts. Gradually, the individual may begin to perceive himself as one of the dominant causal forces in his environment.

The main purpose of the present study is to develop a more precise explanation of how individuals acquire a belief that they can control their environment. The specific objectives of the study are:

1. to explicate perceived locus of control over the environment in the context of urbanization and individual modernization;
2. to explore the function of the communication network as an intervening variable between the individual's demographic characteristics and his perceived locus of control over the environment, and
3. to construct a path-analytic model of control over the environment with survey data from urban migrants to the periphery of Mexico City.

The remainder of this chapter will present a formal explication of the concept of control within the framework of cognitive theories of behavior. Then the acculturation of rural-urban migrants in developing countries will be discussed as the optimal context in which to construct a model of the process by which individuals develop a greater sense of

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<sup>1</sup>In other words, his subjective probability that he can successfully increase his control over the environment must be significantly greater than zero.

internal control over the environment. Finally, a preliminary description of the model will be presented.

A description of the setting and the design of the sample will be presented in Chapter II. The data used for building our model of control was collected in a cross-sectional survey of migrants to Ciudad Netzahualcoyotl, on the periphery of the metropolitan zone of Mexico City. A description of the operationalization of the variables will be presented in Chapter III, with a discussion of the statistical methods used to construct the model. The final two chapters will present and discuss the results of the study.

#### A Cognitive Theoretical Framework

In order that we may consider the belief in control over the environment as a continuum, the term locus of control will be used to designate a point on a belief continuum--from internal to external--that represents the dominant origin of causality in the individual's environment. An individual who has a "greater" belief in control over the environment will be described as having a more internal locus of control, that is, he perceives himself as a more dominant origin of causality, or locus of control, over his environment.

There are two main advantages for employing locus of control to represent the central, psychological dimension of individual modernity. First, the concept of control is central to several cognitive theories of human behavior. And second, since control is an important component of such theories, the concept may be related to a much larger body of empirical research findings, both within and outside the context of modernization.

A cognitive theory of human behavior postulates some general cognitive mechanism as a necessary step in a stream of behavior leading from stimulus to response. Stimuli are received by the organism, information is extracted and integrated into a cognitive representation of the environment in which the individual himself is represented. Such a cognitive representation may be called a belief about the content of the environment. It becomes information only as it is integrated into some kind of representation that instigates and guides goal-directed behavior. Only the earliest and simplest forms of human learning and behavior can be explained by stimulus-response (S-R) terms which exclude mediation by cognitive factors within the organism (S-O-R). Learning through imitation and vicarious reinforcement (Bandura and Walters, 1963) suggests that learning through observation is cognitively mediated. This higher form of learning is described by George Herbert Mead (1934) as "taking the role of others," and used by Lerner (1958) as the intervening "psychic" variable in the modernization process.

The cognitive mechanism which mediates stimulus and response has both structural and dynamic qualities. The former refers to the form of interdependence among the cognitive elements, and the latter refers to the motivational, affective, attitudinal, behavioral, or cognitive consequences of the interaction among cognitive elements. Abelson and Rosenberg (1958) constructed a theory in which the cognitive elements consisted of things, concrete and abstract, to which the individual attaches verbal symbols. These elements were classified into the following three types: (1) actors--oneself, other people, groups, etc., (2) means--actions, instrumental responses, etc., and

(3) ends--outcomes. Bruner (1957) used "category" as the basic cognitive unit. Kelly (1955) used "construct," and Harvey, Hunt, and Schroder (1961, p. 11) used "concept," defined as:

. . . a system of ordering by means of which the environment is broken down and organized, is differentiated, and integrated, into its many psychologically relevant facets. In this capacity (concepts) provide the medium through which the individual establishes and maintains ties with the surrounding world. It is on the basis of the web of these conceptual ties that one is able to place oneself stably and meaningfully in relation to time, space, and other objects and dimensions of his psychological universe. It is on this basis, hence, that one's self-identity and existence are articulated and maintained. [Emphasis added]

Rotter (1968) equates the terms belief, or cognition, with a simple expectancy regarding a property of an object or series of objects and events, which is eventually labeled. That is, the individual forms concepts. When a series of objects or events has been similarly labeled, new experiences with one of these will generalize to the others. Gradually, generalized expectancies are built up, a process which is enhanced by the acquisition of verbal symbols and verbal communication from others.

What makes Rotter's formulation especially useful for the present study is that he specifies the kind of concepts most useful for predicting stable behavior--expectancies for behavior-reinforcement sequences (or means--ends relationships in Abelson and Rosenberg's terminology). Reinforcement assumes no drive state, but rather follows from an empirical law of effect. "The potential for a specific behavior directed toward a reinforcement to occur in a particular situation is a function of the expectancy of the occurrence of that reinforcement following the behavior in that situation and the value of the reinforcement in that situation"

(p. 117). Although he notes the importance of specific expectancies for predicting behavior in specific situations, it is one's generalized expectancies that give stability to an individual's behavior across situations (Rotter, 1968, p. 118):

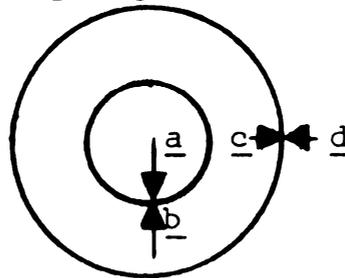
What we may think of in personality theory as stable behavioral traits or characteristics which allow prediction from one situation to another are largely a function of generalized expectancies and of reinforcement values which are relatively less situationally determined.

The important question is what generalized expectancy is most useful for explaining and predicting a broad range of human behavior. For Rotter, it is the individual's generalized expectancy for internal versus external control of reinforcement, which may be defined as ". . . the degree to which the individual perceives that reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions" (1966, p. 1). Hence, a person with a predominantly external control orientation would be apt to perceive outcomes as a result of luck, chance, fate, as under the control of powerful others, or simply unpredictable. The perception of this causal relationship is not necessarily a dichotomous distinction, but can vary in degree along a continuum from internal to external control.

Tiffany, Shontz, and Woll (1969) have developed a general model of control which (1) reformulates the controversy between freedom versus determinism of human behavior, and (2) integrates contemporary theories of personality and behavior. They posit two dimensions in place of the traditional uni-dimensional conceptualization of freedom-determinism:

(a) freedom to non-freedom (control over the environment), and (b) determinism to indeterminism (control from the environment). The inclusion of objective control through one's competence, mastery, and autonomy, and subjective control experienced as a sense of internal-external control, efficacy, powerlessness, etc., refines simple S-R learning theory by emphasizing the impotence of reinforcement in situations that the individual perceives as not dependent upon his own behavior. Both Rotter's (1966) and Lefcourt's (1966) review indicate that the phenomenal experience of control is as significant in explaining behavior as objective determinants.

The four kinds of control covered by the general control model may be represented by the following diagram:



A Conceptual Model of Four Kinds of Control  
(from Tiffany, Shontz, and Woll, 1969, p. 70)

In the above diagram, the letter a represents organismic controlling forces originating within the person. Letter b represents the control an individual has over these inner states. Letter c represents the control an individual exerts over the environment, and the letter d represents controlling forces coming from the environment. At both the internal locus (a-b) and the external locus (c-d) there are self-determining control mechanisms and impersonal forces of an other than self-determining nature. Control at b and c represent self-directed behavior, while control at a and d represent nonself-directed behavior.

This model of control allows us to compare different theories of behavior and personality. Such a comparison is summarized by the following table adapted from Tiffany, Shontz, and Woll (1969, p. 80). A complete discussion may be found in the original source.

Table 1. A Comparison of Various Personality Theories with the General Theory of Control.

Control Theory	Psycho-analysis	S-R	Self-	Social Learning Theory
a. Organ- ismic forces ↓ ↑	Id	Primary Drives	Organismic, actualizing tendencies (phenomenally perceived)	
b. Self- control	Ego	Acquired Habits	Autonomous self-structure (phenomenally perceived)	
c. Control over the environ- ment ↓ ↑	Ego (neo- Freudians)			Generalized Expectancy for Rein- forcement: Internal Ver- sus External Control
d. Environ- mental forces	Unincorpor- ated Super- ego controls, environm de- terminants	Social Stimulus Conditions	Environment as phenomenally perceived	Social Stimulus Conditions

An individual's behavior in any situation may be conceived as the outcome from a set of possible behavioral alternatives. This set of alternatives is limited by the individual's own capacities, the physical environment, and the social environment. Within these constraints, however, remains a broad range of potential choices. Excluding the possi-

bility of random behavior, the individual's potential alternative set may be further constrained by (1) selective reinforcement, and (2) ignorance. External reinforcement may increase the probability that certain alternatives will be chosen, and reduce the probability of others, thus decreasing the individual's relative amount of freedom. And finally, if the individual is unaware of what may be possible (i.e., lacks information), then his set of potential alternatives is further reduced. Innovation of technology would increase the individual's own capacities in the physical environment, while innovation of information would increase his awareness of additional alternatives.

The individual's social environment, and its organization, plays a crucial role through its capacity to control reinforcement and the flow of information. In fact, we may consider a person's behavior as determined to the extent that external agents can obtain absolute control over his reinforcements and flow of information.

In most situations, however, the individual is left with considerable behavioral option. Furthermore, an individual's cognitive structure plays a significant role regarding the efficacy of reinforcement and the acquisition of information. (Research with Rotter's scale of internal-external control has shown that internals are more resistive to manipulation from the environment if they are aware of such manipulation, while externals are less resistive (Getter, 1966; Strictland, 1970; Ritchie and Phares, 1969; Lefcourt, 1966; Crowne and Liverant, 1963; Rotter, 1966). Although some studies report no supportive evidence (Lichtenstein and Craine, 1969; Baron, 1969), it appears that if aware, (internals actively resist subtle pressure from external sources. Internals

in contrast to externals also show a greater tendency to seek information and adopt behavioral patterns which facilitate personal control over their environment (Davis and Phares, 1967; Phares, 1968; Gore and Rotter, 1963; Strictland, 1965, Gurin, et al., 1969; Seeman, 1963; Seeman and Evans, 1962; Seeman, 1967). There is sufficient supportive evidence to conclude that internal, cognitive factors as well as external factors may affect the individual's relative degree of freedom in a given situation. That is, the individual's sense of control over his environment and the degree of control he actually achieves over his environment do influence the amount of control from the individual's environment.

Various explanations have been given for the origin of one's subjective feelings of control over the environment. Kelley (1955) and Dervin (1971) have treated control as axiomatic to the human being's ongoing "stream of behavior." All behavior, by its very nature, has impact on the environment. This explanation, however, does not distinguish adequately between "adaptive coping" and more "purposive control" over the environment (Dervin, 1971). White's (1959) concept of competence is based upon "effectance motivation," whose aim is for a feeling of efficacy. Angyal (1941) proposes that "The human being has a characteristic tendency toward self-determination, that is, a tendency to resist external influences and to subordinate the heteronomous forces of the physical and social environment to its own (autonomous) sphere of influence" (in White, 1959, p. 101). Behavior resulting from competence motivation is directed and continues "because it satisfies an intrinsic need to deal with the environment."

Described in these terms the phenomena is quite similar to McClelland's need for Achievement (n Ach), defined as a tendency to strive for success in competition with a standard of excellence. It is "a desire to do well, not so much for the sake of social recognition (or special incentives like money), but to attain an inner feeling of personal accomplishment" (McClelland, 1963; 1971, p. 276). Greatly influenced by Weber's Protestant Ethic thesis, McClelland has studied n Achievement extensively as the prime internal, causative factor giving rise to economic growth (1961). It may be difficult to dispute its impact on economic growth, but it seems inconsistent (and perhaps, unnecessary) for both White and McClelland to describe their phenomena in terms of drive theory and then suggest it has no "consummatory act" or "external factor" that satisfies it.

deCharms (1968) provides a rationale to resolve the inherent weakness in a drive explanation. Explanations of behavior run along a continuum of generality-specificity. Motive concepts were developed to give a generalizable explanation to specific behaviors. Single, all inclusive concepts such as the pleasure-principle, Freud's libido, or drive-reduction theory that attempt to explain all behavior tend to be too general. Lists of instincts or motives that name every behavior we wish to explain are much too specific. A useful concept falls somewhere between these extremes, but will always fail to predict some specific behavior and never encompass all behavior.

The achievement concept aims at the general level yet attempts to deal with specific behaviors. The motive itself cannot be observed directly, but must be inferred from the imagery of the individual's

mental content as expressed in written or oral form. By using samples to measure motivation, McClelland has only provided a methodology to describe the relationship between thought and actions. The necessity to move from the "drive" itself to thought content is responsible for some of the semantic difficulties surrounding the achievement concept. If we would conceptualize achievement as a cognitive phenomena to begin with, we would no longer need to posit intrinsic satisfiers, nor drives that must be continually aroused rather than reduced. The problem of intensity versus extensity of n Ach is summarized by the following excerpt from deCharms (1968, p. 228).

Although the early conception of n Achievement derived in part from concepts of need and drive to which the notion of intensity is applicable, it should be noted that the notion of intensity . . . is now foreign to McClelland's concept of a motive as a broadly generalized associative network of ideas. The notion is not so much that an intense motive drives intense action, but that thoughts that extend into and pervade many spheres of behavior mold the direction in which the person's behavior will carry him over a period of time. It is hard to shift the emphasis from intensity when the common sense notion of motivation is so strongly prone to an intensive interpretation.

A review of the concept of motivation forces deCharms to conclude that ". . . the concept of motivation has no place in a strictly objective science of behavior . . . because, try as we may, we can never completely objectify the concept of motivation" (p. 355). No objective phenomenal reality can be identified. Like "mass," "energy," and "force," the concept of motive contributes to the theoretical level rather than to the empirical level of analysis. Nevertheless, the concept of motivation is worthy of study--as a concept.

What, then, is the basis for our concept of motivation? As the child grows he soon learns that he can do things that change the objects in his environment. The motive concept is derived ultimately from subjective knowledge of our actively causing things to happen in the world. "A being who had never made an effort would not in fact have any idea of power, nor, as a result, any idea of efficient cause" (Michotte, 1963, p. 11). This feeling of efficacy eventually becomes psychological causality, and it becomes the basis of our concept of physical causality--the causal action one object exercises on another through spatial contact (Piaget, 1969).

This line of reasoning leads us to the following basic universal of human behavior: "Man's primary motivational propensity is to be effective in producing changes in his environment" (deCharms, 1968, p. 269). Motives defined to bridge the gap between objects in the physical world, as goals of motives, and the internal satisfaction of reaching the goals are "doomed to failure." Personal causation, however, refers only to the means of attaining any objective goal; the specific goals may be different. Internal satisfaction derives from one's personal knowledge of being the agent of change in the environment, i.e., of obtaining specific goals through one's own actions.

Harvey and Schroder's (1961, 1963) development of the cognitive aspects of the self provides the best explanation for the source of one's concept of control. Their system consists of four primary conceptual stages of development that represent nodal points on a continuous dimension between hypothetical extremes of concreteness and abstractness. They view these systems as individual cognitive approaches to fate con-

trol, "the means by which an individual under circumscribed conditions develops and comes to employ to gain rewards in the best way he can in that situation" (p. 118). Studies of influenceability, conformity, information processing, role playing, attitude change, and task performance, etc., have demonstrated that more concrete subjects are dependent on external authority and control (Harvey, 1963; Harvey and Beverly, 1961; Schroder, Driver, and Streufert, 1967; Streufert and Schroder, 1965; Streufert, Suedfeld, and Driver, 1965; Suedfeld, 1964a, 1964b; Suedfeld and Vernon, 1966; White and Harvey, 1965). The individual with more abstract cognitive functioning is characterized by a well-defined self as a perceived causal agent in effecting outcomes in the environment and control of fate.

The main determinants of the developing cognitive system are the social structure and the socialization process. Structural factors interact with cognitive functioning. Complex and changing environments accentuate the differences between what have been called the more concrete from the more abstract systems. High environmental constancy and simplicity across time and tasks reduce the importance for more abstract functioning, and probably render the concrete system more appropriate. Movement from concrete to abstract functioning requires an optimal set of conditions:

A prerequisite for progressive differentiation and integration, synonymous with increased abstractness, is the openness of the system to diverse and conflicting inputs. From the resulting opposing energies and forces new alternatives or component parts are generated and the groundwork is laid for the involvement of a system possessed of the capacity to deal adequately with the changing, the different, and the adverse. Without exposure to heterogeneous and more enriched environments, a system presumably

would remain largely in a homogenous or differentiated state, able to deal with events only in terms of a paucity of different dimensions and alternatives. (Schroder and Harvey, 1963, p. 139).

The social system constitutes the essential environment in which the personality develops. Whether the social system challenges the individual and provides him with diverse and conflicting inputs is a function of his position within the structure of that system. Learning in general, and specifically changes in perceived locus of control, is dependent upon exposure to new information. Some positions within the social structure expose the individual to greater and more diverse kinds of information than other positions. Heterogeneity of people, places, and ideas stimulates cognitive change, while homogeneity may well inhibit change. Finally, certain positions within the urban social system may be characterized by substantially less control from the physical and social environment than others, and hence provide the opportunity to experience more control over the environment.

From his unique position within the urban social system the individual may change the way that he perceives his causal relationship with the environment by means of the following two learning processes:

(1) Observation of Models (Bandura and Walters, 1963) - If the individual observes and can identify with other members of society who have obtained greater control over the environment by means of their own instrumental activity, he may learn important new behavior through the process of vicarious reinforcement. Because operant conditioning can not occur until the individual elicits the behavior in question, modeling is more important initially than operant conditioning. Modeling extends

the migrant's initial behavior repertoire, thus permitting operant conditioning to function. The range of potential models to whom the individual is exposed depends upon interpersonal contact within his own communication network and contact through various forms of mass media.

(2) Symbolic Interaction (Manis and Meltzer, 1967) - The individual's perceived locus of control is one of the important components of the self-concept, which develops from social interaction with significant others (Kinch, 1963; in Manis and Meltzer, 1967). The relationship of the symbolic interaction framework to the individual's perceived locus of control is succinctly captured by the following passage from Parsons concerning the cultural system (1961, p. 171):

Meanings, looked at from the point of view of the individual, define norms governing action. This conclusion follows from the primary significance of the social object whose reaction to ego's action is the prototypical example of meaning. The meaning of ego's own actions is essentially the codification of the set of consequences for him that his own action evokes in relation to the environment. But if the objects concerned are also actors in the same social system, the meanings can be stabilized only if ego recognizes alter's expectations of action as a norm which should govern his action and vice versa. Complementarity of expectations, then, is the basis of the commonness of norms. These common norms, or values, constitute the cultural core of any system of social interaction.

These two basic forms of learning represent the processes by which an individual may be transformed and develop a greater sense of internal control, or psychological modernity. The individual who moves into a social system with more modern cultural norms passes through a series of learning experiences<sup>1</sup> whose net effect is to make him more

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<sup>1</sup>Hanson and Simmons (1968) have used the term "role path" to "trace the flow of experience producing changes in personal and related life condition variables."

modern. These experiences are a function of (1) his position within the urban social system, and (2) the symbolic interaction that occurs at that point in the social system.

### Locus of Control and the Acculturation of Urban Migrants

The individual's concept of control originates in his structural milieu and in his socialization experiences. Although one's basic personality may have been formed by the time he is an adult, some change continues throughout the life cycle, and substantial changes are not unknown. The possibility of change is greater during changes in the individual's immediate social situation. College, marriage and parenthood, occupational mobility, military service, prison, etc., may exert enough influence to change many of the individual's previously formed attitudes, values, and motivations. In the case of such crises as economic depression and war personality changes may be dramatic. Recognizing that important changes occur throughout the life cycle, Inkeles (1969, p. 630) suggests that "not only do new socialization problems and issues come to the fore, . . . but the processes of social change may transform his situation within a short space of time and require of him profound new learning within the space of a single phase of life history." The study of adult socialization has recently received greater attention (Riley, et al., 1969; Moore, 1969; Becker, 1968; Inkeles, 1969; Brim, 1971).

It seems likely that rural-urban migration and upward social mobility would thrust the individual into new situations that would require substantial changes. However, would such a generalized expectation as one's perceived locus of control be affected by these changes? Research with Rotter's scale of internal-external control indicates

that change does occur and can even be produced. Lefcourt and Ladwig (1965) report that individuals holding an external control expectancy could be altered to an internal expectancy if new goals could be cognitively linked to old successes. When informed that achievement reinforcements were available, externals become more achievement conscious, suggesting that differences are due to their being less perceptive of reinforcement opportunities than to a lack of motivation. Whitely (1969) found that an individual's sense of internal control and his subjective probability of success was subject to arousal under laboratory conditions of skill and high personal consequences.

A study of change during periods of severe personal crisis (Smith, 1970) reports that crisis patients (unlike non-crisis patients) showed a significant shift toward the internal end of the locus of control scale following the crisis resolution period. Six weeks of role playing achieved significant changes in the self-esteem and aspiration levels of low income, Negro youths, but did not significantly affect their external control orientation (Rosenberg, 1969). Although he concluded that one's sense of control is a "deeply-entrenched attitude that is related to more fundamental social conditions than ephemeral social interactions," others have found significant changes toward greater internal control following Upward Bound Programs (Hunt and Hardt, 1969) and participation in community action programs (Gottesfield and Dozier, 1966) and psychotherapy (Gillis and Jessor, 1970).

These findings suggest that the greatest amount of change in the cognitive functioning of adults would occur during a period of rapid social-structural change and purposeful adaptation to a new social system.

Just such conditions should exist for the rural-urban migrant in a developing country as he attempts to assimilate into the more modern and complex social system of the city. As Waisanen (1969, p. 8) suggest:

. . . the less time, participation, rank, and esteem in one social system (SS<sub>1</sub>, the village), the greater the possibility of physical and psychic mobility and the greater the likelihood and positive evaluation of alternative behavior modes; therefore, the greater the likelihood of change in the actor.

The individual who is raised in the city or who permanently migrates to a modern city is exposed to relatively greater sources of change. Therefore, the ideal setting in which to study the process by which the individual develops a more internal locus of control would be the urban areas of a developing country that has experienced substantial rural-urban migration.

Peterson and Scheff (1965) consider "acculturation" and "assimilation" to be synonyms which refer to situations in which either a small number of persons from a dominant group seeks to impose all or part of its culture on a subordinate population, or where a group of immigrants take on all or part of the host culture. Shannon and Shannon (1968) suggest that acculturation involves not only change in behavior, but also a change in the conception of oneself. They consider acculturation to involve change that occurs over a relatively short period of time, while the longer, more gradual process would refer to assimilation. Fabrega (1969) states that . . .

Acculturation is said to take place when an individual's life pattern undergoes a progressive and substantial change as a result of contact or exposure to a cultural

system that is significantly different . . . mobility, migration, acculturation, the importance of these processes lie in the extent to which they appear to challenge the individual by confronting him with psycho-social demands that differ from those to which he is accustomed (p. 316).

One of the serious problems with the study of acculturation has been the lack of adequate measurement of acculturation and disagreement over the characteristics that are important. Gordon (1971) has developed an extensive list of steps or stages of assimilation that differentiates several sub-processes that may occur at different rates. For our purposes his most important distinction is between intrinsic cultural patterns, such as beliefs and values, and extrinsic cultural patterns, such as dress, manner, pronunciation, etc. The present study is concerned entirely with the individual's intrinsic patterns, specifically, beliefs concerning his personal locus of control.

After their review of the assimilation of migrants to cities, Shannon and Shannon (1968) come to the general conclusion that the organization of society and the migrant's participation in that organization are probably greater determinants of how successful he is in becoming assimilated than his individual characteristics:

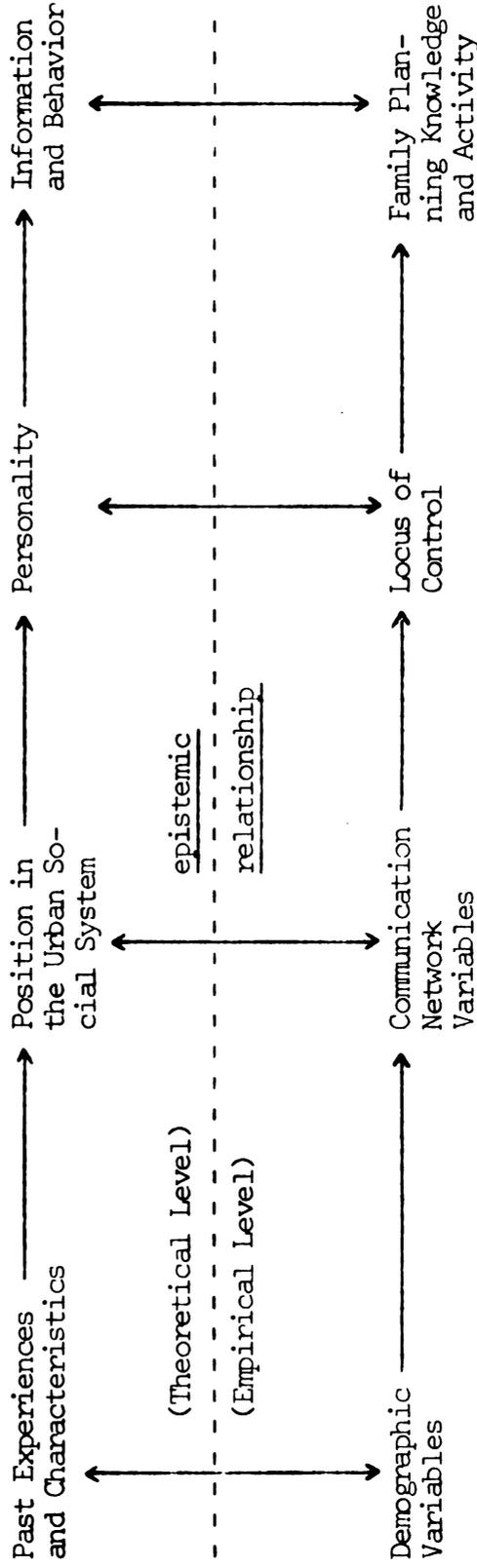
Communication is perceived . . . as something that takes place or does not take place on the basis of how people are organized in relationship to or in contact with each other. . . . The variable of major importance therefore becomes the nature of the associations likely to take place within the organization of society (pp. 68-69).

The main purpose of the present study is to construct a causal model of the modernization of migrants as they become acculturated to the complex, modern environment of the city. The variables used to construct this model are based on the foregoing theoretical framework. In general,

it may be hypothesized that the urban experience is significantly different for each migrant. It will be assumed that variation in his background (occupation, education, initial urban contact, and years of urban experience, etc.) will determine the migrant's present position within the urban social system, as measured by his own unique communication network. In other words, it is hypothesized that the migrant's basic demographic characteristics will indirectly affect his locus of control through their effect upon his present communication network, and these, in turn, will directly affect his locus of control. In order to substantiate the validity of our measure of locus of control with respect to innovation, we further hypothesize that the migrant's locus of control will directly affect his level of information, as measured by his knowledge of family planning methods, and indirectly, his actual level of family planning activity. A general model of this process may be represented by the diagram in Figure 1.

A great majority of the studies of acculturation of migrants has tried to isolate factors which help predict what groups or individuals within a group will become assimilated. Unfortunately, most of these usually present only zero-order correlations, which make it difficult to know whether or not the association would persist when other major factors are controlled. Consequently, no decision can be made as to whether the observed relationship is causal or whether the measure of association only means that the "independent variable" is another indicator of assimilation. To overcome this shortcoming, a multivariate approach will be used in the present study, and techniques of stepwise-multiple regression

THEORETIC HYPOTHESIS:



EMPIRICAL HYPOTHESIS:

Figure 1. A General Model of Locus of Control for Urban Migrants.

will be used in order to construct the best-fitting causal model of the process of modernization.

### Summary

Several authors who have used terms considered to be cognates of locus of control have been discussed in some detail. Since each author has taken a slightly different approach to the concept it may be useful to compare the various definitions that have been employed. A summary of these definitions is presented in Table 2. Although the terminology varies somewhat, there is considerable conceptual similarity among the definitions listed. Differences are mainly due to the emphasis given various aspects of control. Parsons, for instance, stresses the "rational" quality of control. All definitions, however, are concerned with man's relationship with his environment in terms of the locus of control. Most distinctions are due to the way the "environment" is treated. Some are concerned with events or forces in the physical environment, while others emphasize control from forces in the social environment. In general, however, the primary consideration is with phenomena essential to the person's welfare, the positive and negative outcomes of man's interaction with his environment.

By treating the more general term, locus of control, as a belief continuum, the cognitive foundation of the variable is maintained, and both the internal and the external ends of the continuum are considered. The term "locus" is used to indicate (1) that the belief of the individual at a given point in time falls at some point along this continuum, (2)

Table 2. A Summary of the Cognates of Locus of Control.

Author	Definitions in Chronological Order
Angyal (1941)	<u>Self-determination</u> is the tendency to resist external influences and to subordinate the heteronomous forces of the physical and social environment to its own (autonomous) sphere of influence.
Parsons (1949)	The critical component of Weber's <u>Protestant Ethic</u> as rational mastery over the world versus rational adaptation to the world.
White (1959)	<u>Competence</u> is the organism's capacity to interact effectively with its environment.
Harvey & Schroder (1963)	<u>Abstract (versus Concrete) Cognitive Functioning</u> is characterized by a well-defined self as a perceived causal agent in effecting sought outcomes in one's environment and control of his fate.
Rotter (1966)	<u>Internal-external control</u> is the degree to which the individual perceives that reward is contingent upon his own instrumental activity or attributes versus forces outside of himself and independent of his own effort.
Inkeles (1966)	<u>Efficacy</u> is the belief that man can learn to dominate his environment in order to advance his own purposes and goals, rather than being dominated entirely by that environment.
Kahl (1968)	<u>Activism</u> is man's attempt to shape his world instead of passively and fatalistically responding to it.
deCharms (1968)	<u>Personal causation</u> is man's primary motivational propensity to be effective in producing change in his environment.
McClelland (1969)	<u>Efficacy</u> is the extent to which an individual thinks of himself as a person who is able to have an effect on the world.
Smith (1969)	<u>Efficacy</u> is a belief and feeling that one is able to achieve goals by his own effort and that he can significantly control events in the external environment.
Kincaid (1973)	<u>Locus of control</u> may be defined as a point on a belief continuum--from internal to external--that represents the dominant origin of causality in the individual's life. An individual who is characterized by a more internal locus of control perceives himself as a more dominant origin of causality, or locus of control, over his environment.

that the individual's locus may change over time, and (3) that differences exist across individuals. This allows us to consider one individual as having a greater belief in control than another to the extent that his locus of control is more internal than the other's locus of control.

After the concept of locus of control was proposed as the central dimension of individual modernity, the concept was related to cognitive theories of human behavior. The relationship between freedom, determinism, and locus of control was discussed, and it was proposed that a belief in internal control is as important a determinant of human behavior as external determinants. Self-control over internal impulses, internal control over the environment, and control from the environment were differentiated by comparing psychoanalytic, stimulus-response, self-actualization, social learning, and control theories of personality.

The source of one's sense of control was discussed. While it was noted that control over the environment is necessary for survival and inherent in the individual's on-going stream of behavior, other sources of learning were identified in order to account for individual differences in locus of control. Review of developmental theories of control underscored the need to consider both situational and socialization factors as determinants of the individual's locus of control. Although previous theory and research have suggested that early socialization has a substantial and enduring influence upon one's personality dispositions, additional research indicated that substantial change in one's expectancy for control can occur in adulthood, especially following substantial changes in one's life situation. For this reason, it was suggested that the optimal context in which to study change in locus of control would be

rural-urban migration in a developing nation.

From this theoretical framework a general model of locus of control was formulated for the present study. In order of causal priority and time-order, it was hypothesized that the migrant's basic demographic characteristics would determine his position in the urban structure, as reflected by his current communication network, which in turn would directly determine his current locus of control. And finally, it was hypothesized that the migrant's locus of control would directly determine his level of knowledge about family planning methods, and indirectly his current level of family planning activity.

## CHAPTER II

### THE SETTING AND DESIGN OF THE STUDY

The data used for the analysis in this study were collected in a field survey in June of 1972, in Ciudad Netzahualcoyotl, within the metropolitan zone of Mexico City. The purpose of this chapter is to provide a background for the study of the modernization of migrants to Mexico City and to present a detailed description of the site for the study and the methods used to collect the data in the field--questionnaire development and pretesting, sampling procedures, and questionnaire administration. In addition, the sample drawn for this study will be described and evaluated through comparison with larger samples of Ciudad Netzahualcoyotl and the metropolitan area of Mexico City.

#### Population Growth and Migration to Mexico City

One of the major problems facing the world today is overpopulation and the rate of population growth. In spite of recent declines, the population growth rate for the world is still increasing. It is estimated that the world population will increase by 2.04 percent from 1970 to 1975, as compared to 1.98 percent for the previous five year period (Nortman, 1972). This increase will be due more to the decrease in the mortality rate than an increase in the birth rate. Nevertheless, it is the world's present age structure which will determine continued growth into the next century. If couples were to begin immediately just reproducing themselves . . . "population would continue to grow because

the relatively high proportion of persons currently in and entering the reproductive ages would produce more births than the total population produces deaths" (Nortman, 1972, p. 2).

With a growth rate of 2.04 percent the population will double in 34 years. When the less developed and the more developed countries are compared, however, the difference is startling. As a group the developed countries are growing at a rate of one percent per year, while the developing countries are growing at 2.5 percent per year. And because of its lower death rate, Latin America is growing at an estimated 2.9 percent per year. If this rate continues the population of Latin America will double in 24 years.<sup>1</sup> Only a substantial decline in fertility will reduce the growth rate and decrease the pressure upon plans for economic development and modernization.

The rate of population growth in Mexico leads the list of developing countries. With a population of 48.4 million in 1970, Mexico has a rate of natural increase in population between 3.2 and 3.5 percent. In 1970 the birth rate was 4.3-4.5 percent while the death rate was only 1-1.2 percent. Mexico's projected population for 1980 is 71.4 million.

Is anything being done to reduce this population growth rate? As late as 1972, of the dozen or so countries in the world with growth rates of 3 percent or more only three did not have official government policies to support or reduce the population growth rate--Algeria (3.2-3.4 percent), Brazil (3.1 percent), and Mexico (3.2-3.5 percent). Mexico will initiate its first government program on January 1, 1973.

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<sup>1</sup>For Africa the figures are 2.7 percent per year, doubling in 25 years, and for Asia, 2.3 percent and 30 years.

The Catholic Church may have impeded governmental action until now, but statements by government officials often sound similar to Algeria's position that family planning may distract it from its primary concern with economic development to raise levels of living (Nortman, 1972, p. 32). Governmental opposition, or indifference, does not necessarily reflect the desires of the people. In 1966, 71.5 percent of a sample of women in Mexico City stated that they desired to limit the size of their families, but as many as 42 percent did not know of one method to do so.

What does the current population look like? At least 50 percent are under the ages of 15 years or over the age of 64 years. However, out of this potential work force of 24.2 million, only 12.9 million are economically active.<sup>1</sup> In other words, 26.9 percent of the total population are supporting the remaining 73.1 percent (19 percent of this work force are women). It should also be noted that a portion of this work force is probably underemployed.

Approximately 60 percent of the population live in cities of over 2500 to 5000 inhabitants, while 39 percent live in cities of 100,000 or over. This high proportion of urban population is a reflection of vast migration from rural areas to towns and cities since World War II. The rate of urbanization for the Republic of Mexico and ten selected states may be found in Table 3. As these figures show, one of the main results of Mexico's rapid growth rate has been a dramatic increase in urbanization over the last thirty years. Over 41.9 percent of the population now lives in cities of 15,000 or more inhabitants, as compared to just 19.8

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<sup>1</sup>From "Perfil Demográfico de Mexico," Secretaría de Educación Pública de Mexico, 1971, pp. 38-40.

Table 3. Urbanization of the Mexican Republic by Federal Entities.<sup>1</sup>

Federal Entity <sup>3</sup>	Average Annual Rate of Increase			Percent of Total Population <sup>2</sup>			Economically Active Population <sup>4</sup>				
	1940	1950	1960	1940	1950	1960	Active %	Economic Sector <sup>4</sup>			
	1950	1960	1970	1940	1950	1970		Agri-culture %	Industry %	Commercial %	Service %
REPUBLIC OF MEXICO	6.5	5.5	5.0	19.8	28.1	35.7	41.9	26.9	39.5	32.1	22.6
*Federal District	6.8	4.8	3.5	90.1	99.9	100.0	100.0	32.6	2.2	50.6	43.2
*State of Mexico	2.0	6.9	22.0	3.8	3.8	5.4	20.2	25.9	30.3	30.0	20.8
Nuevo Leon	6.0	6.7	4.8	34.4	45.0	59.3	60.2	29.0	17.3	49.1	28.6
Jalisco	6.1	7.9	5.0	17.7	26.0	39.8	48.0	27.3	34.1	37.8	22.0
Coahuila	5.4	4.6	2.9	35.9	46.4	57.7	62.3	26.0	29.6	38.9	25.2
Veracruz	5.3	5.0	6.7	12.1	16.1	19.6	26.8	26.2	53.1	24.6	16.5
*Puebla	3.8	4.4	4.4	13.3	15.4	19.5	23.6	27.1	56.0	24.9	14.3
*Michoacan	6.9	6.6	6.5	6.8	11.0	16.0	23.9	23.4	58.9	21.1	12.4
*Guanajuato	6.7	4.8	5.2	16.3	24.5	34.3	39.4	24.8	49.0	30.4	14.0
*Oaxaca	4.8	7.0	9.4	2.4	3.3	5.3	10.4	25.9	71.6	12.0	8.4

<sup>1</sup>Adapted from "Perfil Demográfico de Mexico," Secretaría de Educación Pública de Mexico, 1971, p. 57 and p. 89.

<sup>2</sup>Urban population is defined as those living in localities of 15,000 or more inhabitants.

<sup>3</sup>The top six states have 79 percent of industrial production, 77 percent of all capital investment, and 53 percent of the establishments that employ 68 percent of all industrial personnel (Secretaría de Recursos Hidráulicos de Mexico, 1969); the states with an asterick contribute 76 percent of the migrants to Ciudad Netzahualcoyotl (based on estimate from the sample used in the present study).

<sup>4</sup>Percentages in each economic sector do not sum to 100 percent because non-specified jobs have been excluded from the table.

percent in 1940. The most drastic change has occurred in the State of Mexico which surrounds the Federal District of Mexico City. A majority of the growth observed in the State of Mexico has occurred within the metropolitan zone of Mexico. The Federal District itself became fully urbanized between 1950 and 1960, at which time the process began to spill over into the surrounding State of Mexico. The largest and most rapid area of growth outside of the Federal District has been Ciudad Nezahualcoyotl. From a mere 65,000 people in 1960 it had reached approximately 651,000 inhabitants by 1970, representing an annual increase of a phenomenal 26 percent.

There are several "push-pull" factors which may have stimulated an estimated 2.4 million persons to migrate from rural to urban centers from 1950 to 1960, and as many more in the last decade (Cabreria, 1967, p. 357). Many left to search for greater occupational and educational opportunities in the cities, others because of intolerable living conditions and population pressure on deleted land. Modern technology has reduced the need for labor in some rural areas. The increase in health services, concentrated in the cities, has been another attraction. Most persons probably have had mixed motives for migrating. Although such rapid urbanization undoubtedly has alleviated problems in the rural sector, the industrial sector of urban centers has not had the capacity to absorb such a rapid increase of population. The result has been extreme pressure upon housing and urban improvement programs, education, and social services (Urquidi, 1971, p. 5). It is ironic indeed that any improvement in such services may only result in even greater rates of migration.

The three cities that have absorbed the greatest number of migrants have been Mexico City, Guadalajara, and Monterrey. Mexico City is the most important city, not only in terms of its economy, but also from a cultural and political point of view. It has the largest urban area, quantity and type of services, the largest labor market, and the largest supply of capital and consumer goods (Muñoz, Oliveira, and Stern, 1971).

Some of the reasons for migration to these centers may also be inferred from Table 3. The first six federal entities in the list account for 53 percent of the establishments that employ 68 percent of Mexico's industrial personnel. The largest growth rate among these six has occurred in the State of Mexico, where the 22 percent growth rate since 1960 reflects the expansion of the metropolitan zone of Mexico City into the surrounding state. And finally, within this area the greatest growth has been in Ciudad Netzahualcoyotl. From the sample gathered for the present study, over 76 percent of the migrants to Ciudad Netzahualcoyotl came either from the Federal District, other parts of the State of Mexico, or from the last four states listed in Table 3. Metropolitan Mexico City is the nearest industrial area to these latter states; Nueva Leon and Coahuila are far to the north, Jalisco to the west and Veracruz to the east.

Additional information about the states contributing migrants to metropolitan Mexico City may be found in the description of the economically active population in Table 3. With 32.6 percent of its population between the ages of 12 and 65 economically active, the Federal District is almost 6 percentage points higher than the Mexican

Republic as a whole. All of the states which supply the majority of migrants to Ciudad Netzahualcoyotl except Puebla are below the national percentage.<sup>1</sup>

In the last four states 56-71 percent of the economically active population are in agriculture, compared to 39.5 percent for the country as a whole. The two entities with the highest percentage economically active, the Federal District and Nueva Leon, have almost half of these within the industrial-commercial sector. The 43.2 percent in the service sector of the Federal District, gives some indication of the type of job that the unskilled laborer from the predominantly rural states may have to look forward to when he arrives in Mexico City.

Despite the seemingly harsh conditions and intense competition facing the rural-urban migrant in Mexico, the available evidence suggests that his situation is better than before migration. Even though migrants are more likely to have "marginal" economic status than city-born residents, this difference decreases substantially with years of residence (Munoz, Orlandina, and Stern, 1970). A majority of rural-urban migrants expect to improve their economic situation, and after four years as many as 80 percent definitely intend to remain in the city (Cornelius, 1969). Even for those on the bottom economically . . . "city life brings satisfactions of a non-objective nature (e.g., opportunities for individual ownership of a homesite on the urban periphery) which help considerably to offset perceptions of relative deprivation and hold promise of future betterment" (Cornelius, 1969, p. 843).

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<sup>1</sup>In the present study, 72 percent of the sample from Ciudad Netzahualcoyotl work in the Federal District.

It appears as if a majority of the most recent migrants are heading for the urban periphery--where large cities have emerged in as little as ten years. An analysis of the rate of urbanization of the largest cities in Mexico reveals the extent to which the State of Mexico within the metropolitan zone of Mexico City has grown relative to others (see Table 4). Very little difference exists between the population of the Federal District and the metropolitan zone of Mexico City until about 1960. From 1950 to 1970 the annual rate of increase accelerated for the State of Mexico, while that of the Federal District declined. During this last 20 year period one can see the birth of four cities in the State of Mexico with populations of 200,000 or more. The largest of these, Ciudad Netzahualcoyotl, has exploded from 65,000 in 1960, to 651,000 in 1970, and has become Mexico's fourth largest city (behind Monterrey). During the latter part of the 1960's, it was estimated that as many as 10,000 people were moving into this area every month. Such rapid growth is unrivaled anywhere in Latin America.

#### Ciudad Netzahualcoyotl: A Modern Urban Phenomenon<sup>1</sup>

Many of the first migrants to Mexico City after World War II began to settle on the dry bed of the ancient lake of Texcoco. This lake bed was first called San Juan Pantitlan after it was drained in 1930. Some began taking advantage of the situation by obtaining permission to subdivide the area. As a result, land which was once

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<sup>1</sup>Most of the material comes from two sources: (1) "Estudio de Factibilidad Técnica, Financiera, Económica, y Social para la Instalación de los Obras de Alcantarillado en el Municipio de Netzahualcoyotl," Secretaría de Recursos Hidráulicos, México, D. F., 1969; and

Table 4. Population Dynamics of Selected Mexican Cities.<sup>1</sup>

	Thousands of Inhabitants				Average Annual Rate of Increase		
	1940	1950	1960	1970	1940-50	1950-60	1960-70
<b>METROPOLITAN ZONE OF MEXICO CITY</b>							
Federal District	1741	3034	4846	6933	6.8	4.8	3.5
<u>State of Mexico<sup>2</sup></u>	86	134	380	1882	4.0	10.9	17.6
Netzahualcoyotl	-	-	65	651	-	-	26.0
Naucalpan	14	30	86	392	8.0	11.1	16.4
Ecatepec	11	15	41	221	3.8	10.4	18.4
Tlalnepantla	15	29	105	377	7.1	13.8	13.6
<b>OTHER MAJOR CITIES OF MEXICO</b>							
Guadalajara (Jalisco)	229	378	737	1194	5.1	6.9	4.9
Monterrey (Nueva Leon)	186	333	597	858	6.0	6.0	3.7
Ciudad Juarez (Chihuahua)	49	123	262	407	9.6	7.9	4.5
Puebla (Puebla)	138	211	289	402	4.3	3.2	3.3
Leon (Guanajuato)	74	123	210	365	5.2	5.5	5.7

<sup>1</sup>Data is from Luis Unikel, "La Dinámica del Crecimiento de la Ciudad de México," 1972, pp. 12-13, and from "Perfil Demográfico de México," Secretaría de Educación Pública de México, 1971, p. 58.

<sup>2</sup>Other cities in the State of Mexico within the Metropolitan Zone of Mexico City were deleted from the table if less than 100,000 inhabitants.

communal and later federal, has come into the hands of private interests. Lots which sold for five pesos per square meter in 1945, sold for over \$165 by 1968. Although the Land Subdivision Law of 1958 stipulated that subdividers were obligated to install services of (1) water, (2) drainage, (3) electricity, and (4) streets, this was never enforced in this area. By 1963 it had gained municipal status as Ciudad Netzahualcoyotl, after the ancient Indian chief of Texcoco.

The city is located north of the federal highway to Puebla, to the south of Lake Texcoco, and to the east of Mexico City's International Airport. Its present area is approximately 70 square kilometers. Much of its early growth concentrated along this highway. Consequently, the area lacks the normal, centralized urban structure. Urban services and markets tend to be spread over the whole area. Most of the dwellings are one-story, two-room houses constructed of adobe, some metal sheets, wood, and brick. Besides the homogeneity of construction, one is most impressed by the endless nature of the city--it just seems to continue for mile after mile.

Since its beginning the most serious problem has been lack of potable water, followed by lack of suitable drainage. Where there are bathrooms, they are usually located outside with neither running water nor drainage. Public tap water is provided in all colonies, but it is frequently contaminated with sewage. The residents feel that pavement, water, and drainage are the main problems. Approximately 84 percent lack bathing or sanitary facilities, 58 percent lack water, and 54

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(2) "Netzahualcoyotl City: An Imposing Social Phenomenon," Banco de Mexico, 1970.

percent lack adequate drainage.<sup>1</sup>

Approximately 59 percent lived in the Federal District previously, and 41 percent said that ownership of their own house was the major reason for change. The majority have been successful in achieving ownership (78 percent). Those that do rent pay almost 30 percent less rent than before. Some 69 percent have permanent employment--almost half say their present occupation is better than before, only 9 percent say it is worse. Average monthly family income is 34 percent higher than that authorized by the National Commission of Minimum Salaries. Over half of all family income is spent on food. Since a majority work in the Federal District, Netzahualcoyotl may be classified as basically as a "bedroom" community. The shortage of electricity and water, along with the saline soil, have prohibited industry which could be established there. Since only middle and small commerce exists, the majority both work and shop in the Federal District.

#### Sample Design

The site chosen for this study was Ciudad Netzahualcoyotl, which has been described above. This particular city on the periphery of Mexico City was chosen for theoretical and practical reasons. Because of its rapid growth over the last ten years it was obvious that a large majority of the residents had to be rural-urban migrants. This made it possible to avoid over-sampling to insure an adequate number of migrants

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<sup>1</sup>Numerous public bathhouses exist, and much bottled water is trucked into the city.

or the alternative procedure of searching for migrants.<sup>1</sup> The influx of such a large number of migrants from rural areas offered the ideal setting in which to study the impact of urban influences upon levels of social-psychological modernity and family planning.

Sampling of male heads (number of household) was accomplished during the month of June, 1972. Basically, the sampling was done in four phases: (1) selection of the sampling frame, (2) selection of the primary sampling units (blocks), (3) selection of secondary sampling units (households), and (4) selection of tertiary sampling units (male heads of household).

One of the obvious problems with such a rapidly growing, highly mobil population is that of obtaining complete and adequate information with which to establish an initial sampling frame.<sup>2</sup> Ciudad Netzahualcoyotl is much too large to conduct advance census for defining the population. Fortunately, it was possible to obtain an aerial photograph of all but a small portion of Ciudad Netzahualcoyotl taken as recently as November of 1971.<sup>3</sup> Since most of the buildings were one-story

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<sup>1</sup>Seventy-seven percent of the sample were born outside of Mexico City, and 73 percent lived outside until at least age 12.

<sup>2</sup>Although the Direccion General de Estadistica was able to estimate the total population of the area in the 1970 census, no information regarding the population of tracts or blocks was available for sampling.

<sup>3</sup>The photograph obtained from Aerocartografia de Mexico, S.A., was blown up to a scale of 1:20,000, or 1 centimeter per 200 meters. Additional information was obtained from maps published by Guia Roji.

households, it was possible to trace block divisions of approximately the same number of households. Underdeveloped areas, blocks with only a few houses, and industrial areas were excluded from the sampling frame. The remaining 2,000 block units comprised the sampling frame and defined the population of study.

Block units consisting of city blocks, half-blocks, (if too large), and multiple blocks (if too small) were traced from the aerial photograph onto a separate sheet and then individually numbered. Because of cost limitations it was necessary to set the minimal sample size at 276 respondents. With the maximum expected completion rate at 75 percent, this would yield 207 completed interviews. The decision to draw additional replacement blocks was postponed until the actual completion rate was determined. Since it was eventually possible to complete 197 interviews through extra visits, a replacement sample of blocks proved unnecessary.

Since a maximum of eight households were desired from any one block, it was decided to select 35 blocks using a table of random numbers. A complete census was conducted of each of these blocks and lists of individual households, and their addresses were obtained.<sup>1</sup> Vacant lots and unoccupied houses were skipped. A total of 1656 houses were listed and enumerated. Dividing the number of houses by the desired sample size, 276, yielded a skip interval of six. After a random start, every sixth house on the list was designated as part of the secondary sample.

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<sup>1</sup>The census was done by Investigación de Mercadotecnia y Comunicación, a private research company in Mexico City.

This procedure yielded the following overall sampling fraction:

$$\begin{aligned} \frac{1}{F} &= \frac{1}{f_a} \times \frac{1}{f_b} = \frac{35 \text{ Block Units}}{2000 \text{ Block Units}} \times \frac{276 \text{ Households}}{1656 \text{ Households}} \\ &= .0175 \times .1667 = .0029 \end{aligned}$$

Subsequent analysis of each block unit census showed an average of 47.3 houses per block unit, but the actual range varied from 21 to 97 houses per block (with a standard deviation of about 15). Interviews were eventually completed in 71.4% of the households sampled. The number of households in which interviews were eventually completed ranged from 1-12 households per block unit, with a mean of 5.6 households per block (standard deviation of 2.6).

The tertiary sampling unit was the respondent from each sampled household. The interviewers first task after contacting a household was to determine if it contained an eligible male head of household. Eligible respondents were defined as : (1) the male, "jefe de casa" (head of household), (2) between the ages of 18 and 65, (3) with or without a wife under the age of 50, and (4) who was a major provider for the household ("sosten de casa"). In cases where the eldest male was no longer economically active, or his wife was over-age, the interviewers were allowed to substitute the eldest son, or relative, living in the same household and contributing to its economic support. Only if a house was vacant, or if no male head of household existed, were interviewers allowed to substitute the next house on the list. No other substitutes were permitted; a minimum of two return visits were required, and in some cases more than two were made. This selection procedure

obviously favored older respondents who were employed.

The only possible additional check upon the quality of the actual sample was a comparison of various demographic variables with similar variables from a larger sample of the same area, and from another sample of migrants to Mexico City in general. Table 5 presents a comparison of equivalent variables from the present sample to a larger one conducted in 1968. The major difference appears between the percent of respondents in each sample who were originally from the Federal District. This might indicate that a relatively larger number of persons from the Federal District have moved to Ciudad Netzahualcoyotl since 1968. The difference, however, is small enough to fall within the range of sampling error. A much larger percentage in the present sample also report having lived first in the Federal District (85 percent as compared to 59 percent from the 1968 sample). Although only a few variables could be compared (some of these were defined somewhat differently) Table 6 presents a comparison of the present sample with a sample of migrants to Mexico City in general. A much larger percentage of the latter sample were born in cities of less than 2,500 inhabitants, but in general the two samples are similar on the variables listed. The similarity of the present sample to these two previous samples increases our confidence in the former.

#### Instrument Construction and Data Collection

The questionnaire, or interview schedule, was developed in April and May of 1972, in Mexico City. It was designed to measure the primary dependent variables, modernity and family planning, and a broad range of demographic and communication network predictor variables. The

Table 5. Comparison of Demographic Characteristics of the Sample to a Previous Sample of the Population.<sup>3</sup>

Variable	1972 Sample <sup>1</sup> N=197	1968 Sample <sup>2</sup> N=816
<u>State of Origin</u>		
Federal District	27%	18%
State of Mexico	11	13
Puebla	10	8
Guanajuato	10	14
Michoacan	10	9
Oaxaca	8	11
Others	24	27
<u>Years of Study</u>		
None	11%	8%
1 to 6 years	69	79
7 to 9 years	9	10
10 to 12 years	9	2
13 years or more	1	2
<u>Previously Lived in the Federal District</u>	85%	59%
<u>Economically Active Men</u>	93%	86%
<u>Radio Ownership</u>	86%	88%
<u>Television Ownership</u>	61%	50%

<sup>1</sup>Area probability sample of blocks with systematic sample of households after random start; 7% error at .05 level.

<sup>2</sup>Area probability sample of blocks with systematic sample of inhabited lots; 4.5% error at .05 level.

<sup>3</sup>Data from this sample are from a study published by the Secretaría de Recursos Hidráulicos, México, D. F., entitled, "Estudio de Factibilidad Técnica, Financiera, Económica, y Social para la Instalación de los Obras de Alcantarillado en el Municipio de Netzahualcoyotl," 1969.

Table 6. Comparison of the Size of Original Residence of the Sample to a Sample of Migrants to Mexico City.

Variable	Netzahualcoyotl N=197	Mexico City <sup>1</sup> N=1062
<u>Size of Birthplace</u>		
Less than 2,500	31%	45%
2,500-20,000	37	21
Over 20,000	32	34
<u>Size of Place Where Raised<sup>2</sup></u>		
Less than 2,500	29%	37%
2,500-20,000	34	20
Over 20,000	37	43
<u>Occupational Prestige<sup>3</sup></u>		
Unskilled, General Laborer (Lower Manual, Unskilled)	44%	50%
Specialized Laborer with Skills (Upper Manual, Skilled)	45	41
Office Employees and Supervisors (Lower Non-Manual)	10	8
Professionals and Executives (Upper Non-Manual)	1	1

<sup>1</sup>From a representative sample of migrants to the Mexico City Metropolitan Zone including a subsample from Ciudad Netzahualcoyotl (from W. Cornelius' doctoral dissertation, 1971).

<sup>2</sup>In the Netzahualcoyotl sample, place where raised extended to age twelve, whereas in the Mexico City sample this age was extended to fifteen.

<sup>3</sup>Category names in parentheses refer to the Mexico City study.

questionnaire was first written in Spanish and then submitted to three types of pretests: (1) expert evaluation, (2) a small pretest of migrants, and (3) a preliminary check of the final version in the survey itself.<sup>1</sup>

The first draft of the questionnaire was submitted to a class of graduate students of agricultural diffusion at the National School of Agriculture at Chapingo. These students were experienced, professional agronomists and agricultural engineers with much previous contact with rural farmers. Their experience in communicating with individuals similar to those who have migrated to Ciudad Netzahualcoyotl made them an excellent source of correction and re-wording of the first draft in order to make it suitable for its intended population.

The corrected draft was then submitted to a small sample of selected migrants from Ciudad Netzahualcoyotl itself (N=21). The wording was again evaluated and corrected with the help of the interviewers who conducted the pretest. The frequency distribution of all of the variables was checked and an item analysis was performed on the scale of psychological modernity with the use of an abac (Guilford, 1954, p. 429). Items that were not correlated with the total score were eliminated and some re-wording was again performed. Since the total interview required over an hour and a half, several items had to be dropped for the final version.

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<sup>1</sup>Much assistance with the Spanish translation was given by Josep Rota at Iberoamericana University.

The final version was sent to the field for one week, after which all interviewing was suspended until a final check could be done on the first 28 completed interviews. The only additional corrections consisted of improvements in the instructions to the interviewers.

The interviews were conducted by two groups of professional interviewers.<sup>1</sup> Training of each group of interviewers was done by their respective supervisors and the author. The final version of the questionnaire required about one hour and ten minutes to administer. Although each group was supervised in the field by personnel from their respective company, it was only possible to re-check the interviews of one group. In this case, part of 20 percent of the interviews of each interviewer were repeated by the supervisor. No major discrepancies were found to exist. In order to reduce the degree of bias introduced by having three females interview male respondents about family planning, each was given a checklist of family planning methods to hand to the respondent to read himself. Although it is difficult to establish the exact degree of bias introduced, the three women reported no more difficulty with respondents than the men did.

Most of the questions were closed-ended and pre-coded. The author checked and coded all the questionnaires as they arrived from the field. Trained personnel already familiar with types of jobs in the Mexican economy did the coding for occupational prestige. Key punching onto cards for computer analysis and verification were done later by

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<sup>1</sup>Nine men from Investigaciones de Mecadotecnia y Comunicación, and seven men and three women from International Research Associates of Mexico City.

the Computer Laboratory at Michigan State University.

## CHAPTER III

### OPERATIONALIZATION OF THE VARIABLES AND ANALYTICAL PROCEDURES

The general theoretical rationale for the selection of variables with which to construct a causal model of modernization was presented in Chapter I. The main purpose of this chapter is to present a detailed description of the procedures used to measure the variables and the statistical procedures used to estimate the parameters of our path-analytical model. The variables will be presented in hierarchical order corresponding to the multistage, multivariate model to be developed.

#### Stage I: Demographic Variables

In an effort to determine the most relevant demographical variables related to the modernization of the urban migrant, the author has taken advantage of recent literature reviews from several social science disciplines. Seigel (1966; 1969) has provided two very comprehensive reviews of social and cultural change in general. Peterson and Scheff (1965) and Shannon and Shannon (1968) have contributed more specific reviews of acculturation and assimilation of migrants. Rotter (1966) and more recently Joe (1971) have reviewed the rapidly growing body of research concerning internal-external control. An exhaustive bibliography of research concerning internal-external control has been compiled by Throop and MacDonald (1971).

The main criterion for selecting demographic variables was whether or not they were expected to determine the migrant's current position within the urban social system, and therefore, his degree of integration into the more modern, urban culture.

### 1. Education

Education is well established as perhaps the most important influence upon the individual's level of assimilation (Peterson and Scheff, 1965) and modernity (Inkeles, 1969; Kahl, 1968; Rogers, 1969). According to Waisanen (1971, p. 192), education is (1) a social system rooted in and representative of the core of modernity, and (2) a powerful mechanism of inter-systemic linkage and a vital component in the idea diffusion process.

The respondent's level of education was measured by asking him how many years he had attended school. His answer was then classified according to the following scale:

Table 7. Measurement of Education.

Scale Value	Definition	Percent N=197
0	No. years of formal education	11%
1	1-2 years of primary school	16
2	3-4 years of primary school	26
3	5-6 years of primary school	27
4	1-2 years of secondary school	9
5	Secondary school completed	5
6	Some preparatory or vocational	4
7	Incomplete university study	1
8	University study completed	1
		<u>100%</u>

## 2. Occupation

Socioeconomic status (as a combination of education, occupation, income, etc.) is positively related to modernity (Inkeles, 1969; Kahl, 1968), and to a more internal locus of control (Battle and Rotter, 1963; Lefcourt and Ladwig, 1966; Coleman, et al., 1966; Scott and Phelan, 1969; Shaw and Uhl, 1971; and Milgram, et al., 1970). The work of Kohn (1969) differentiates the components of social class that contribute to the person's expectation for self-direction (a cognate of internal control). Education is important because it either provides, or fails to provide, the capability for self-direction, while occupation provides, or fails to provide, the opportunity of exercising self-direction in an important part of the individual's life.

To measure the respondent's occupational level he was first asked if he currently had a job which paid him money. Then he was asked to name his occupation, and to describe his principal task. Previous schemes for ranking occupational prestige in Mexico were used to devise the scale in Table 8 (Kahl, 1968; Wilkerson, 1967; Fromm and Maccoby, 1970):

## 3. Occupational Mobility

Each respondent was also asked to name and describe the first job that he ever had. Using the occupational prestige scale described above, the difference between his present and first job defined his degree of mobility. The distribution of occupational mobility may be found in Table 9.

Table 8. Measurement of Occupational Prestige.

Scale Value	Category Name	Examples	Percent N=197
1	Unskilled Manual ( <u>Obrero General</u> )	Street cleaners, garbage collectors, doormen, stevedores, <u>campesino</u> (non-ejiditatorios)	6%
2	Manual Laborer with some skills ( <u>Obrero</u> )	Mechanic's assistant, service station attendant, bricklayer, painter, factory worker (without personnel), ejiditario/farmer (without personnel)	39
3	Skilled Manual ( <u>Obrero Especializado</u> )	Taxi driver, mechanic, barber, baker, TV repairman, factory worker (with less than 5 personnel) ejiditario/farmer (with less than 5 personnel)	45
4	Non-Manual ( <u>Empleados</u> )	Office worker, salesman, teacher, nurse, factory supervisor (with 6 or more personnel), farmer (with 6 or more personnel)	10
5	Executive and Semi-Professional ( <u>Ejecutivo y Semi-Profesional</u> )	Managers of factories, government officials, accountants, bank functionary, cattleman, or large commercial farmer	0.5
6	Professionals ( <u>Profesionales</u> )	Doctor, university professor, engineer, architect, lawyer.	0.5
			<u>101%</u>

#### 4. Job Location

According to Sjoberg (1965), urban areas on the periphery of large cities, such as Ciudad Netzahualcoyotl, perform three functions for migrants: (1) orientation to a new and complex environment, (2) maintenance of ties with rural conditions, and (3) transmission of industrial-urban lifeways back to villages. He questions whether internally integrated subcommunities foster change or resistance to the cultural norms of the industrial-urban order. Migrants who are systematically segregated

Table 9 . Distribution of Occupational Mobility.

Scale Differences		Percent N=197
-1	Downward mobility	3%
0	No mobility	47
1	Upward mobility	31
2	Upward mobility	15
3	Upward mobility	2
	(Don't know)	(2)
		<u>100%</u>

residentially may assimilate less because of a lack of contact with the host population (Lieberson, 1961). Margulis (1968) found that migrants to Buenos Aires tended to conserve norms of the local community. "In the city, migrants limit their participation, their level of aspiration, and their mobility as soon as these could threaten their personality system and integration of the ingroup" (p. 195). Waisanen (1970) also found a significantly lower level of modernity among "callampos" residents of Santiago de Chile than among residents of the city proper, even when controlling for education and level of income. Similar studies attest to the existence of both rural and urban traits in urban areas (Kenny, 1961; Aldous, 1962; Halpern 1965; Sweet, 1960; Lewis, 1965; Friedl, 1959; Halpern, 1963; Bruner, 1961).

How much time the migrant spends in the periphery where he lives should effect his degree of exposure to the more diverse, heterogeneous, and modernizing influences found in the Federal District. Whether the migrant works in the Federal District was used as a rough measure of his

time spent there. Dichotomized, it was found that 72 percent worked in the Federal District, while the remaining 28 percent work in Ciudad Netzahualcoyotl itself, or outside of the urban zone.

#### 5. Size of Childhood Residence

The present study is based upon the assumption that there is a distinction between the rural, more traditional culture and the modern, urban culture of the large city. The length of time and exposure to each social system is expected to affect the individual's level of modernity. The effect of previous exposure was measured by asking the respondent the size of the place where he lived for the most time before he reached age 12. It was assumed that the socialization that occurred where the migrant was raised would be more important than the size of the place where he was born.

Table 10. Size of Childhood Residence.

Scale Value	Size of Population as Estimated by Respondent	Percent N=197
1	2,500 or less	29%
2	2,501 to 20,000	34
3	20,001 to 500,000	8
4	500,001 or more	2
5	Federal District of Mexico City	27
		<u>100%</u>

#### 6. Total Years of Urban Exposure

In addition to the size of the place where the respondent was raised, an estimate of the total number of years of urban exposure was

made. Each respondent named all of the places he had lived for one year or more. Then he estimated the size of each place and the number of years he had lived there. Any place with population of 20,000 or more was considered urban. The number of years he had spent in cities of this size or greater was summed to attain his score for total years of urban exposure. Since all respondents had lived in the metropolitan area of Mexico City the scores for urban exposure ranged from 1 to 66 years. The average years of exposure was 18 years, with a standard deviation of 10.3 years (N=197).

## 7. Age

The studies reviewed by Peterson and Scheff (1965) confirm that the relationship between age and assimilation is generally inverse: younger migrants are more assimilated (Warner and Srole, 1945; Sewell, 1961; Roy, 1962). Since younger migrants are more open to change and less committed to their home culture it may be easier for them to adopt new beliefs and behavior. Each respondent was merely asked to state how old he was. Ages ranged from 18 to 75, with an average age of 36.4 (S.D.=10.2).<sup>1</sup> By asking the year that they first migrated to metropolitan Mexico City it was also possible to determine their ages at the time of migration. Excluding those born in the Federal District or raised there, the average age at migration was 22.3 (S.D.=9.4). All migrants--both rural and urban--were asked when they migrated to Ciudad Netzahualcoyotl. Over 50 percent arrived

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<sup>1</sup>One respondent of age 75 was defined as eligible because he was the major provider and his wife was still of childbearing age. The next oldest respondent was 63.

after 1966, and 20 percent migrated after 1970. Only 9 percent had moved there prior to 1960.

#### 8. Number of Children

The number of children that the migrant has at present should influence his behavior regarding family planning, which is currently one of the most relevant control behaviors and consequences of individual modernity. Using data from Smith and Inkeles (1966) Six-Nation study of modernity, Williams (1970) found that the individual's number of living children and his sense of efficacy predicted his degree of favorability toward family planning. Therefore, each respondent was asked how many children he had. The distribution ranged from 0 to 13, with a mean of 4.1 children (S.D.-3.1).

#### 9. Social Independence

The degree to which the migrant receives assistance from, and becomes dependent upon, friends and relatives when he first arrives should ease the transition from the rural to the urban environment, but may inhibit contacts with more diverse kinds of individuals and prevent him from developing a greater sense of internal control by solving problems "on his own" (Choldin and Trout, 1969). Mixtec migrants from Tilantongo in Mexico City tend to settle in the same areas and maintain close ties with relatives and friends from home (Butterworth, 1970). On the other hand, Solien de Gonzales (1965) found extremely rapid and successful adaptation by Black Caribs to Guatemala City (and the Ladino culture) due primarily to their initial independence from home influences. Respondents were asked to estimate how far their first and current residence in Mexico

City was from relatives or former friends.

Table 11. Measurement of Social Independence.

Scale Value	Definition	Percent (N-197)	
		First	Current
1	With former relatives or friends	54%	14%
2	Near former relatives or friends	4	17
3	Far from relatives or friends	5	32
4	No former relatives or friends live here	14	23
	(Born or raised in Federal District) or don't know	(23) <u>100%</u>	(14) <u>100%</u>

#### 10. Hometown Independence

Migrants whose hometowns are not far away are more likely to return for short visits, which in turn increases the likelihood of some financial commitment to relatives who have remained behind. Since these would tend to decrease the migrant's independence and contact with urban residents, they would impede the migrant's rate of acculturation in the city. Each respondent was asked to estimate how frequently he returned home for visits during his first year in the city, and during last year.

#### Stage II: Communication Network Variables

The demographic characteristics of the migrant are expected to have an indirect effect upon the migrant's current locus of control. Occupation per se does not cause a person to perceive himself as a more dominant locus of control in the urban environment. The background characteristics mentioned in the first stage of variables function

Table 12. Measurement of Independence from Former Home.

Scale Value	Definition (frequency of return visits)	Percent (N=197)	
		First Year	Last Year
1	Once every week	3%	1%
2	Every 15 days	2	2
3	Every month	4	1
4	Every 3 months	6	3
5	Three times per year	6	8
6	Twice a year	2	3
7	Once a year	34	25
8	Never	20	34
	(Born in Federal District)	<u>(23)</u> <u>100%</u>	<u>(23)</u> <u>100%</u>

primarily to provide the occasion for change to occur. More specifically, we expect the demographic variables to perform the following functions:

- (1) Provide the initial capacities and skills for the social interaction that is necessary for new learning (language skills, education, prior urban experience, etc.).
- (2) Determine the individual's initial and present position within the urban social system (age, occupation, residence, etc.).

After a study of rural cultivators and urban factory workers in East Pakistan, Schuman, Inkeles, and Smith (1967) concluded that education alone does not shock an individual into recognizing that not everyone thinks the way he does. His outlook is determined by his "actual daily experience in significant roles." In the present study, the migrant's present communication network will be used to represent the structure of his experiences in the urban social system. It will serve as a rough

measure of his exposure to modernizing influences.

"Social system" has been defined by Ruesch (1956, p. 328) as "the actual habitual network of communication between people." If we can measure the patterns of communication among sets of individuals, and if differences can be found, ". . . we have demonstrated that the individuals are in different cultures, psychologically" (Jacobson, 1967, p. 9). Conceptually, we may define communication network as the individual's unique set of communication linkages with other members of society. For purposes of organization the migrant's total communication network will be classified into three substructures: (1) the interpersonal network, (2) the mass communication network, and (3) the formal organizational network.

#### The Interpersonal Network

The interpersonal network is comprised of the set of individuals with whom one has face-to-face communication on an informal basis. Linkages mediated by mass media and those that occur within the formal organization are excluded. This definition, however, is much too broad for the specific purposes of this study. One has face-to-face contacts with many individuals during the course of one day or longer time intervals. Not all of one's contacts will be important influences upon one's locus of control, nor will everyone serve as significant models of internal control or modernity. And finally, the number of individuals included in a network must be limited for efficient analysis. Therefore, two methods have been used to elicit networks potentially useful for this study: (1) the instrumental communication network, and (2) the friendship communication network. The same network indices were then constructed for each type. The questions used to measure networks may be found in Appendix C.

The migrant's instrumental network was elicited by asking him a series of questions related to problems of personal control. The respondent was first asked to relate any control-related problems he has experienced, how often these occur, and how important they are for him to control. He was then asked to name the persons (1) that he has talked to about these problems, and (2) that he knows have solved such problems (models). The same series of questions was then repeated for two specific control-related problems, improving one's standard of living and limiting the number of children one has. The migrant's friendship network was elicited by asking him to name the five friends with whom he most frequently communicates. The first control-related problem each respondent mentioned was classified into a general problem area. The frequency that each area was mentioned may be found in Table 13.

Table 13. Control-Related Problem Areas of Urban Migrants.

Rank Order	General Area	Percentage (N=197)
1	Economic problems	26%
2	Health problems	12
3	Community services	8
4	Family relations	7
5	Work relations	6
6	Housing problems	6
7	Problems with neighbors	2
8	Other	4
9	None	30
		<u>100%</u>

For both networks elicited from the respondent, a set of network indices was constructed.

### 11. Network Size

The size of each network was used as a measure of the support available to the migrant with which to solve personal problems--an indication of his interpersonal resources. That this varies across individual's is evident from Table 14.

Table 14. The Measurement of Network Size.

Number	Percent (N=197)	
	Instrumental Network	Friend Network
0	14%	11%
1	12	4
2	15	6
3	19	5
4	12	8
5	12	67
6	3	
7	4	
8	2	
9	7	
	<u>100%</u>	<u>101%</u>

Every effort was made to assure the respondent that the names he mentioned would not be used for any other purpose, nor contacted later. Only first names and initials were used, and the purpose of using names was explained before beginning. Nevertheless, small networks (and empty networks) may be interpreted as lack of trust in the interviewer, as well

as a low number of interpersonal resources. Some respondents did insist, however, that they never talked to anyone outside of their own home. Surprisingly the degree of overlap between the two networks was relatively small: 49 percent had no one named to both networks, 33 percent had only one or two, and 17 percent had three to five persons in both networks.

## 12. Frequency of Communication

How often the respondent talked to each person in his two interpersonal networks was used as an indication of his level of gregariousness. The intervals used were: (1) rarely, (2) once in a while, (3) frequently, (4) very frequently. The mean for the respondent's network was then used as his score for frequency of communication. The mean for the friendship network, 3.1 (S.D.=.79), was higher than that for the instrumental network, 2.8 (S.D.=.84).

## 13. Network Density

Density refers to the extent to which the members of the network are interconnected (Mitchell, 1969; Banton, 1966). Network cohesiveness (Guimaraes, 1970) and dispersion (Bott, 1955) have also been used to refer to this concept, which may be operationalized with the following formula:

$$D = \frac{a}{n(n-1)/2}, \text{ where } a = \text{actual number of links} \\ n = \text{number of persons in the network}$$

When this proportion is high the network is more interconnected, and there should be more informal pressure to maintain existing group norms (Bott, 1957). When most of the people a person knows do not interact with one another (low density), then social control is likely to be more fragmented, less consistent, and there will be more variation in norms. The migrant

who has such a network would have a greater diversity of contacts, and more potential for change.

The five names from each network with whom the respondent had most frequent communication were transferred to two circles, respectively. The respondent then designated which pairs in each circle knew each other. The interviewer drew a line between the pairs that knew each other. The total number of lines drawn over the possible number of such combinations defined the respondent's density score for each network. The mean density for the instrumental network was .66 (S.D.=.34), and .77 (S.D.=.30) for the friend network.

### Network Diversity

The individual with a diverse interpersonal network is one whose contacts show variety. They would more often not be relatives or neighbors, persons with the same educational and occupational background, nor from the same home town. His contacts would cover a wider geographical spread, and his conversations would more likely cover a wider range of topics. In other words, the more diverse network allows for more variety in informational input which may be useful for increasing control (Dervin, 1971, p. 17). Mitchell (1969, p. 19) uses the term, "range," to refer to the social heterogeneity of the person's network. Rogers and Bhowmik (1969) have used "homophily" to refer to the degree to which pairs of individuals who interact are similar in certain attributes, like beliefs, values, education, social status, etc.

Traditional social systems tend to be more homophilous (Rogers and Bhowmik, 1971). Diversity of informal groups increases with social class

(Calderon, 1963). An individual who is high on internal control shows greater interpersonal attraction for strangers who are also high on internal control (Phares and Wilson, 1971). Among Chicago ghetto dwellers family planning ideas are shared with others of similar social status, age, marital status, and family size. This would probably decrease the input of new information and ideas. In summary, it is hypothesized that changes in beliefs, attitudes, and behavior are more likely to occur in diverse interpersonal networks.

Network diversity was measured by three indicators with the following information about each member of the person's two networks:

#### 14. Diversity of Interpersonal Relationships

Whether the person named was (1) a member of the family, (2) a friend, (3) an acquaintance, or (4) a professional (doctor, lawyer, etc.) was checked for each network member. The mean of these scores became his own score for diversity of relationship. The mean score of relationship diversity for the instrumental network was 1.8 (S.D.=.55), and for the friend network the mean was 1.9 (S.D.=.35).

The standard deviation of relationships within each respondent's network was also used as an indicator of diversity. The mean of standard deviations of the instrumental networks was .25 (S.D.=.30), and for the friend network the mean was .15 (S.D.=.22).

#### 15. Diversity of Occupational Prestige

The job of each person named to the networks was coded for occupational prestige (see variable number 2). The respondent received the mean score of occupational prestige for each network. The mean for the

instrumental network was 2.8 (S.D.=.86), and for the friendship network it was 2.5 (S.D.=.75).

The standard deviation of occupational prestige within each respondent's network was used as an additional measure of occupational diversity. The mean of standard deviations for the instrumental network was .37 (S.D.=.51), and for the friend network the mean was .26 (S.D.=.37). As expected, there is less diversity (lower mean standard deviation) in the friendship network than the instrumental network.

#### 16. Occupational Prestige Discrepancy

A person's interpersonal network was considered as more diverse to the extent that its mean occupational prestige differed from his own occupational prestige. An index was formed by subtracting the respondent's own score from the mean score of his network's occupational prestige. The index ranged from -2 to +2. The positive mean for the instrumental network (.21, S.D.=.89) indicated a higher occupational prestige for the network. The negative mean for the friendship network (-.06, S.D.=.81) indicated an approximately equal occupational prestige for this network.

#### 17. Residential Diversity

The migrant's interpersonal network was considered more diverse (1) the greater the distance of their residence from his, (2) the closer their residence to the Federal District, and (3) the farther their residence from the urban area. The following scale was used to operationalize the concept:

1. Outside of the city.
2. In the same neighborhood as the respondent.
3. In other parts of Ciudad Netzahualcoyotl.

#### 4. Within the Federal District.

The mean residential diversity for the instrumental network was 2.0 (S.D.=.86); for the friendship network the mean was 1.8 (S.D.=.90). The standard deviation of residential distance within each respondent's network was also used as an indicator. The mean standard deviation of residential distance for the instrumental network was .48 (S.D.=.50), and for the friendship network the mean was .47 (S.D.=.51).

### 18. Network Durability

The interpersonal network may be considered as the group whose frame of reference is used by the migrant to organize his experience. According to Shibutani (1955, p. 169):

. . . all forms of social mobility, from sudden conversions to gradual assimilation, may be regarded essentially as displacements of reference groups, for they involve a loss of responsiveness to the demands of one social world and the adoption of the perspective of another.

A change in the person's network over time is expected to affect his belief system.

Network durability was measured by asking the respondent how many years he had known each person named to each network. The mean number of years he has known each network divided by the number of years the respondent had lived in the metropolitan zone of Mexico City was used as the principal score for durability. If an individual has not known his interpersonal network for very many years relative to the number of years he has lived there, then his network is relatively new. More than likely this would represent changes in the network since migration.

The durability scores for the instrumental network ranged from .03 to 17.3, with a mean of 1.13 (S.D.=1.99). The range for the friendship

network was .03 to 12.4, and the mean was .73 (S.D.=1.12).

### The Mass Communication Network

"Mass communication is message transfer via such mass media as newspapers, magazines, film, radio, and television, which enable a source of one or a few individuals to reach an audience of many" (Rogers with Svenning, 1969, p. 116). Although some forms of mass communication are available in the rural areas, the quantity, the diversity, and the potential for exposure is expected to be greater in the city. Lerner's (1958) model of modernization which treats mass media exposure as an intervening variable, has been supported by path analysis of aggregate data (McCrone and Crude, 1967). Rogers with Svenning (1969) tested the intervening effect of mass media exposure between literacy and political knowledge, educational aspirations, empathy, and agricultural innovativeness in rural settings. Controlling for mass media exposure, the partial correlations were lower in all cases, and significantly lower for political knowledge.

Because of the content of most mass media, however, their effect upon a person's locus of control may be limited. Dervin (1971), for instance, suggests that black urban ghetto residents in the United States are exposed to abundant information about outcomes, or goals (consumatory information), because of high television usage, but they are exposed to insufficient information about ways and means of reaching these goals (instrumental information). Greater exposure to instrumental information should increase the individual's expectation that he can solve his own problems, and hence give him a more internal locus of control.

The major forms of mass communication exposure have been measured for the present study. A factor analysis was done with the items from

all types of mass media studied. The four-factor, vari-max rotation corresponded to the variables presented below. Factor loadings for each item on the factor representing the variable are presented below.

19. Radio Exposure

A composite measure of radio exposure was constructed by summing three highly correlated indicators: ownership, recency of exposure, and hours of last exposure. The combined score had a mean of 8.5 (S.D.=3.1). A description of each item may be found in Table 15.

Table 15. Measurement of Radio Exposure.

Scale Value	Definition	Factor Loading	Percentage (N=197)
	<u>Ownership</u>	.75	
1	No		14%
2	Yes		86
			<u>100%</u>
	<u>Recency of Exposure</u>	.84	
0	Almost never		11%
1	Over week ago		7
2	5-7 days ago		2
3	3-4 days ago		7
4	Day before yesterday		13
5	Yesterday		60
			<u>100%</u>
	<u>Length of Last Exposure</u>	.63	
	(hours)		
0			15%
1			44
2			20
3			11
4			3
5			3
7-9			4
			<u>100%</u>

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20. Television Exposure

Items similar to those used to measure radio exposure were used for television. The combined score for television exposure had a mean of 7.2 (S.D.=3.0). A description of the items is presented in Table 16.

Table 16. Measurement of Television Exposure.

Scale Value	Definition	Factor Loading	Percentage (N=197)
	<u>TV Ownership</u>	.73	
1	No		39%
2	Yes		61
			<u>100%</u>
	<u>Recency of Exposure</u>	.85	
0	Almost never		20%
1	Over a week ago		9
2	5-7 days ago		5
3	3-4 days ago		13
4	Day before yesterday		9
5	Yesterday		44
			<u>100%</u>
	<u>Length of Exposure</u>	.72	
	(hours)		
0			16%
1			39
2			33
3			7
4			2
5			2
6			1
			<u>100%</u>

21. Film Exposure

Although there are plenty of movie theaters in both Mexico City and Ciudad Netzahualcoyotl with prices from 3-12 pesos (U.S. \$.24 to \$1.50), attendance does not appear to be very frequent among the population studied. Respondents were asked when they last went to a movie.

The mean value was 1.7 (S.D.=1.1).

Table 17. Measurement of Film Exposure.

Scale Value	Definition	Percentage (N=197)
1	Almost never	61%
2	Over 1 month ago	23
3	2-3 weeks ago	5
4	Last week	7
5	This week	<u>3</u> 99%

## 22. Magazine Exposure

Two questions were used to measure magazine exposure. The respondent first was asked how recently he had read a magazine, then the name and type of magazine. Interviewers assisted the respondent in coding the magazine as either (1) cultural or informative (e.g., Readers Digest), or (2) pastime (e.g., Casos de Alarma). Because of the large percentage who never read magazines, these measures were combined according to their expected impact upon locus of control.

Table 18. Measurement of Magazine Exposure.

Scale Value	Definition	Percentage (N=197)
0	Does not read magazines	46%
1	Reads pastime magazines	28
2	Reads cultural-informative magazines	<u>25</u> 99%

### 23. Newspaper Exposure

Each respondent was asked how often he read a newspaper. The results are found in Table 19. The mean value was 4.2 (S.D.=1.97).

Table 19. Measurement of Newspaper Exposure.

Scale Value	Definition	Percentage (N=197)
1	Never	16%
2	Once in a while	15
3	Every 15 days	2
4	Once a week	7
5	2-3 times per week	19
6	Every day	41 <u>100%</u>

### Formal Organization Network

The work of Smith and Inkeles support the proposition that social class, and more specifically, urban-industrial work experience, is significantly related to psychic well-being and efficacy (Inkeles, 1960), to efficacy (Smith, 1969), and to overall modernity (Smith and Inkeles, 1969). The relatively low correlations found between industrial experience and efficacy, however, may be due to the weakness of the measures of the individual's industrial experience. A factory job that allows the individual little control over the work process and which is characterized by substantial control from the environment would have a negative effect upon his perceived locus of control.

The industrial organization is only one type of organization found in the city. One of the positive characteristics of the city is the

greater specialization of institutions and the greater variety of social groupings compared to the traditional, rural system. Throughout history there is evidence that minority migrant groups have formed voluntary associations to protect their own interests and facilitate the adjustment of new arrivals (Fallers, 1967). Previous research has studied the antecedents and effects of migrant participation in voluntary organizations (Smith, 1966; Zimmer, 1955; Eames and Schwab, 1964; Hunt, 1970). As Gutkind (1966, p. 41) suggests:

It [the urban world] is a world whose people shape their universe, very assuredly, yet who have only limited control of its influence over them. To many observers-interpreters, this influence is highly undesirable: an influence away from the ordered small-scale world to the bedlam and anarchy of the urban jungle. But this alleged jungle has many adaptive and supporting characteristics as the kin group or small-scale urban voluntary association.

According to Little (1965), these voluntary organizations serve to mediate the migrant's transactions with urban institutions, introduce him to useful contacts for jobs, housing, and even teach him new roles useful in other contexts. In Mexico City, migrants from the State of Oaxaca may join the Coalición de Pueblos Mixtecos Oaxaqueños, that have been organized to protect their interests. Butterworth (1962) found that not all migrants from this area take advantage of this organization, however. It may be that enough public and private institutions exist to assist the migrant with these kinds of problems. Work organizations, voluntary organizations, and service organizations represent the migrant's main experience with formal, urban organizations.

24. Work Autonomy

In order to overcome the shortcomings of using factory work experience as a predictor of control, several items were constructed to measure the migrant's degree of control from and over the environment in the work situation. Is he allowed any participation in decision-making on the job? Does he have close supervision, and does he supervise personnel dependent upon himself? And finally, how often does he discuss and coordinate his work with his supervisor. A description of these variables and their factor loadings may be found in Table 20.

Table 20. Measurement of Work Autonomy.<sup>1</sup>

Scale Value	Definition	Factor Loading	Percentage (N=197)
	<u>Position in Work Hierarchy</u>	.81	
1	Dependent without personnel		49%
2	Dependent with personnel		22
3	Independent without personnel		6
4	Independent with personnel		22
			<u>99%</u>
	<u>Closeness of Supervision</u>	.82	
1	With much attention		23%
2	With some attention		18
3	With little attention		9
4	Without any attention		11
5	Does not have supervisor		39
			<u>100%</u>
	<u>Type of Decision-Making</u>	.81	
1	Only the supervisor		52%
2	With supervisor's approval		12
3	With fellow workers		5
4	Only myself		30
			<u>99%</u>

<sup>1</sup>The sum of these three items had a mean of 7.4 (S.D.=3.5).

## 25. Voluntary Organization Participation

In order to give the respondent a clear idea of the type of organizations the question called for, the following list of organizational types was read by the interviewer. The respondent was asked to name any organization to which he belong corresponding to each type.

Educational Groups	Political Groups
Neighborhood Organizations	Labor Unions
Civic Associations	Professional or Commercial Organizations
Religious Organizations	Protective Associations of Migrants
Clubs	Other
Sport Clubs/Teams	
Cultural Groups	

The most frequently mentioned organizations were sport groups, neighborhood groups, and commercial organizations. Since so many respondents did not belong to any type of organization (67%), only the number of memberships was used. The mean number of memberships was .48 (S.D.=.86).

## 26. Organization Utilization

To a great extent purposive control in the urban setting, as opposed to the rural setting, depends upon one's use of public and private institutions, government bureaucracies, etc. "The prime characteristic of these bureaucratic resources is that they bring together in one location information about a variety of opportunities" (Hanson, et al., 1969). The use of public and private organizations would be expected to increase the individual's sense of internal control over the environment to the extent that he successfully uses these organizations.

To measure organization utilization, the respondent was asked to name any organization that he, or people from his neighborhood, had used to solve personal problems, or community problems, such as transportation,

pavement, health, water, sewers, etc. For any organization named he was then asked if his contact was direct or indirect (through a third party), and whether the organization was much help.

Like organizational membership, very few people actually used available institutions and governmental agencies. The most frequently named organization was the municipal government of Ciudad Netzahualcoyotl, and those who tried it received little, if any, assistance. The number used varied from zero (54 percent) to only 3. The mean was .55 (S.D.=.69).

### Stage III: Locus of Control

It has been hypothesized (Chapter I) that demographic variables will directly effect the communication network of the migrant, and that these will directly effect the migrant's locus of control. Is it not possible that migration to the urban environment would cause problems of adjustment, anxiety, and feelings of greater external control for some migrants?

Goldhamer's (1953) study of personal breakdown produced only fragmentary evidence suggesting that urbanization does not produce breakdown. At the same time Lewis (1952) was also concluding that urbanization did not necessarily lead to breakdown (in Mexico City). Rotondo's (1961) comparison of mental health problems in an urban slum of Lima and a rural village near Lima revealed some differences, but the anxiety level was high for both groups. Chance's (1965; 1966) studies of personality adjustment during modernization provide one explanation for differential effects. In both Taiwan and Alaska he found that personality disorders result when there is role-identification with Western society without knowledge and understanding of that society.

The available evidence suggests that it probably depends upon the degree of exposure to the new system, the adoption of features of the new system, degree of identification with the new system, and access to the means of achieving any of the newly acquired goals of the new system (Fabrega, 1969). Because of its relation to anxiety (Platt, et al., 1971; Smith, 1970; and Gillis and Jessor, 1970), we may use external control as a rough indication of the individual's level of personal adjustment to the urban environment. Whether the migrant develops a greater sense of internal control or external control will depend upon his degree of integration into the urban social system. Communication network variables have been used in the present study to measure his current level of integration.

### 27. Locus of Control

Locus of control was operationalized with items from several sources: (1) Rotter's scale of internal-external control (1966), (2) Smith and Inkeles' scale of subjective efficacy (1966), and (3) Kluckhohn and Strodtbeck's (1961) scales for mastery over nature. The wording of most of these items was somewhat changed to make them more appropriate for the population of interest. Additional items were also created to measure the belief in control over fertility and control from God. To control for acquiescent response set, two statements for each item (topic area) were read to the respondent--one with an internal control orientation, the other with an external control orientation. The direction was altered from item to item to control for the effect of order. The respondent was asked to repeat in his own words the statement with which he agreed most. This was to prevent the respondents from merely replying, "the last one," or "the first one," without really

listening to them.

Twenty-one items were used in the final form of the scale. These were submitted to factor analysis with varimax rotation, but the sub-factors had little conceptual value. The seventeen items which loaded above .25 on the principle axis solution were finally selected to form the scale for locus of control.<sup>1</sup> The internal reliability of this scale was .65, as measured by Cronbach's Alpha.<sup>2</sup> This moderate degree of homogeneity may be due to the variety of items in the scale. The addition of common factors that are also in the criterion variable improves the validity of a test, but often lowers its internal consistency (Guilford, 1954, p. 389). In order to reduce the effect of variance that was specific to individual items, factor scores from the final seventeen items were created for each respondent. A complete list of these seventeen items, along with their degree of difficulty and factor loading on the principal axis solution, may be found in Appendix A.

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<sup>1</sup>The simple sum of these seventeen items ranged from 18 to 34, with a mean of 27.7 (S.D.=3.0).

<sup>2</sup> $(N/N-1) \left[ 1 - \frac{\sum V_i}{V_T} \right]$ , equivalent to the Kuder-Richardson formula

20 for dichotomously scored items (Guilford, 1954, p. 385).

## 28. Family Planning Morality

McWilliam's (1971) study of family planning in urban Ghana obtained a Beta Weight of .43 between the morality of using birth control (right) and contraception. Because of the tremendous influence of Catholicism on the Mexican people, we would expect the individual's moral position toward birth control to affect his knowledge and practice of birth control. Since family planning knowledge and activity were used as criterion variables for modernity, morality was utilized as an additional predictor variable, and as a control for modernity.

Family planning morality was measured with four questions dealing with the following topics (from McWilliam, 1971):

- (1) his attitude if his wife suggested using a birth control method,
- (2) whether a husband and wife ought to limit their family to provide better for existing children,
- (3) whether it is moral or bad to take a birth control pill to prevent pregnancies if no harmful side effects would occur,
- (4) whether the people should follow the advice of government if they promoted and taught family planning.

Responses were pre-coded as either (1) bad, (2) don't know, or (3) good.

Internal reliability was .71, as measured with Cronbach's Alpha.

## 29. Family Planning Information Source

In order to control for the respondent's direct source of information, he was asked where he had learned about methods of family planning. Over 83 percent had learned about them from either friends or relatives, and only 17 percent had learned about them from doctors. Scores were

dichotomized, with a zero value for friends and relatives, and 1 for doctors, under the assumption that more knowledge would be available from doctors.

#### Stages IV and V: The Effects of Locus of Control

Research concerning internal versus external control has shown that internals show greater initiative to control their environment (Phares, 1965 ; Seeman, 1963; Seeman and Evens, 1962), greater information seeking (Seeman and Evans, 1962; Seeman, 1963; Davis and Phares, 1967; Phares, 1968; Whiteley, 1970), greater responsiveness to occupational improvement programs (Bickford and Neal, 1969; Peters, 1969), and practice of birth control (MacDonald, 1970). Although Simmons (1970) did not include a specific measure of locus of control, his study of migrants to Bogota, Colombia, did show an indirect effect of urban residence upon visual-media, schooling, and work complexity, which in turn had a direct effect on contraceptive knowledge. Knowledge of contraception then had a direct effect upon the practice of family planning (Beta Weight = .62).

Because of the growing concern for overpopulation in Latin America, in general, and especially in the cities of Latin America, the present study has been limited to the effect of modernity upon family planning. We would expect the migrant to Mexico City to become dramatically aware of managing his own family in the urban environment. However, we would not expect him to increase his knowledge of birth control unless he first perceived the possibility of his controlling events in general, and more specifically, the birth of additional offspring. If he develops a belief in the urban setting that he can control this important aspect of his

personal environment, then he would be more receptive to information about contraception if he is exposed. In short, those with a more internal locus of control are expected to have greater knowledge of family planning methods. The more knowledge that he has of family planning, the more likely he will successfully practice some method of family planning. The first effect of modernity is increased acquisition of knowledge (Stage IV), and then new behavior which will increase his control over the environment (Stage V).

### 30. Family Planning Knowledge

Level of knowledge was measured by asking the respondent to name any method that he knew about that a husband and wife could use to prevent or delay pregnancy. The interviewer then checked the methods named on the following list:<sup>1</sup>

1. Withdrawal
2. Rhythm
3. Vaginal douche
4. Jelly, foam, etc.
5. Diaphragm, ring, etc.
6. Condom
7. Intrauterine device (I.U.D.)
8. Oral pill
9. Sterilization
10. Other (abortion, etc.)

After the test of recall, the list was read (or shown) to the respondent, and he was asked which additional methods he recognized. Since the list of methods was rank ordered according to effectiveness, the best method named served as a measure of the quality of his information.<sup>2</sup> The total number of methods recalled was correlated at .51 with the best method recognized; their sum was used as the measure of family planning knowledge.

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<sup>1</sup>From Simmons (1970, p. 138).

<sup>2</sup>Number 10, "others," such as abortion were not considered as part of the ordinal measure.

### 31. Family Planning Activity

After questions concerning the respondent's knowledge, he was asked which methods he had used himself. Only 19 percent had actually used a family planning method. Therefore, a new scale was constructed that measured more than actual usage. Since some respondents may have been waiting until after having more children to practice family planning, each respondent was asked whether they planned to use any method in the future, or whether or not he had talked to his wife about using a family planning method. Points were given for affirmative responses to each question. A description of the final scale may be found in Table 21. The mean score was 2.2 (S.D.=1.0).

Table 21. Measurement of Family Planning Activity.<sup>1</sup>

Rank Order	Definition	Percentage (N=197)	Cumulative Percentage
5	Use of pill or better	6%	6%
4	Use of any family planning method	6	12
3	Planning for future use	19	31
2	Discussion of family planning with wife	46	77
1	No type of family planning activity	23	100

<sup>1</sup>The following criteria for Guttman scaling were met: coefficient of reproducibility = .96; minimal marginal reproducibility = 65%; improvement over chance (homogeneity) = .89.

### Summary: Toward a Path-Analytic Model of Locus of Control

Both theory and previous empirical studies of control, modernization, migration, and acculturation have been used to generate a set of poten-

tially useful variables with which to construct a more parsimonious causal model of locus of control and family planning behavior. The variables have been presented in a series of stages in which the variables at each stage have direct, causal effect upon the variables in the subsequent stage. A summary of the relevant variables at each stage is presented in Table 22.

We expect the demographic variables to have no direct effect upon the individual's present locus of control, only indirect effects through the effect of the individual's communication network. The individual's locus of control, and previous variables, will directly effect the amount of knowledge that he has of family planning methods, which in turn directly effects family planning activity. Family planning has been selected for the present study because it is one of the most relevant behaviors concerning the individual's control over his personal environment.

Cross-sectional survey data of migrants to the periphery of Mexico City have been collected with which to construct the model. If we probe for empirical evidence of causation as did Hume (see de Charms, 1968, p. 7) we will find that it lies in (1) concomitant covariation, (2) temporal sequence, and (3) necessary connection, so that cause can be assumed to produce the effect observed. Hume found no empirical referent for a necessary connection, and hence attributed this to an inference process resulting from "habit." He interpreted this by saying that causes do not exist, but ". . . even he started with the assumption that cause is a phenomenological given; we do attribute cause and this is useful for science" (de Charms, 1968, p. 7).

Table 22. A Summary of the Determinants of Locus of Control and Family Planning,<sup>1</sup>

Stage I	Stage II	Stage III	Stage IV and Stage V
Demographic Variables	Communication Network	Locus of Control	The Effects of Locus of Control
1. Education	11. Size	27. Locus of Control	31. Family Planning Activity
2. Occupational Prestige	12. Frequency of Communication		
3. Occupational Mobility	13. Density		
4. Job Location	14. Diversity of Relationships		
5. Size of Childhood Residence	15. Occupational Prestige		
6. Years of Urban Exposure	16. Occupational Discrepancy		
7. Age	17. Residential Diversity		
8. Number of Children	18. Durability		
9. Social Independence	19. Radio Exposure		
10. Hometown Independence	20. Television Exposure		
	21. Film Exposure		
	22. Magazine Exposure		
	23. Newspaper Exposure		
	24. Work Autonomy		
	25. Voluntary Organization Participation		
	26. Organization Utilization		
		28. Family Planning Morality	
		29. Family Planning Information Source	
		30. Family Planning Knowledge	

Control Variables for Family Planning:

- 28. Family Planning Morality
- 29. Family Planning Information Source

<sup>1</sup>The organization of this table corresponds to the general model of locus of control found in Figure 1.

The experimental method has been used by social scientists to show the production of effects. By controlling for confounding variables, and randomizing the effect of the remaining extraneous variables, they can demonstrate the effect on a dependent variable produced by the manipulation of an independent variable. Even in the laboratory, however, these "ideal" conditions are never obtained. As Blalock (1964, p. 26) reminds us :

. . . no matter how elaborate the design, certain simplifying assumptions must always be made. In particular, we must at some point assume that the effects of confounding factors are negligible, but the plausibility of this particular kind of simplifying assumption is always a question of degree. We wish to underscore this fact in order to stress the underlying similarity between the logic of making causal inferences on the basis of experimental and nonexperimental designs.

Since the introduction of additional variables can yield equally correct predictions, we cannot establish any given model as the single correct one. Hence, we may resort to selecting the most "adequate" model based on the criteria of (1) theoretical relevance, (2) parsimony, and (3) explanation of the greatest proportion of variance in the dependent variable. Using Blalock's definition of causality, we will say that one variable is a direct cause of another if and only if a change in the mean value of the first produces a change in the mean value of the second, assuming that all other variables explicitly included in the causal model have been controlled or do not vary. If a system is isolated or if there are no other variables operating, then a change in A produces a change in B (Blalock, p. 13).

Blalock suggested the use of partial correlation to test different theoretical structures. Duncan (1966) pointed out the similarity between his approach and that of Wright (1934) and suggested the use of stepwise

regression analysis. Each time a postulated relationship is not found, the causal link is eliminated from the model and a re-analysis is conducted. Using path coefficients,<sup>1</sup> this would correspond to a stepwise regression analysis where nonsignificant or trivial coefficients are deleted and the model rerun. The stepwise regression analysis used in the present study is capable of both the addition of significant variables in order of magnitude and simultaneous deletion of insignificant variables. This procedure overcomes previous disadvantages. Variables are added one at a time until no significant variables remain. A variable added early in the analysis, however, may be deleted later if it becomes insignificant after controlling for variables added later. The .05 level of significance has been used as the criteria for addition and deletion.

The use of path analysis is based upon the following set of assumptions (Land, 1969, p. 33):

1. Internal scale measurement<sup>2</sup>
2. Linear relationships
3. Independence (additive effects)
4. No correlation between residual variables
5. Direct asymmetrical relationships

---

<sup>1</sup>A path coefficient is equivalent to the "least squares estimator for the standardized partial regression coefficient or standardized beta coefficient" (Land, 1969, p. 14) and measures the fraction of the standard deviation of the variable for which it is directly responsible.

<sup>2</sup>Boyle (1970) has demonstrated the practical utility of using ordinal measures in path analysis.

The assumption of a clearly defined causal scheme is based upon the (1) **time-order** of effects within a given time interval, (2) existing **experimental** or case study results, or (3) the theoretical assumptions of the **model**. The essential idea of the causal model is the ". . . construction of an oversimplified model of reality in the sense that the model considers only a limited member of variables and relations out of the **universe** of social reality" (Land, 1969, p. 3). The final model is **represented** by a path diagram which is isomorphic with the algebraic and **statistical** properties of the postulated system of relationships. The **statistical** procedures used to arrive at the final path model and the **structural** equations corresponding to this model may be found in Appendix B.

## CHAPTER IV

### RESULTS

The purpose of this chapter is to analyze the results of data collected from a sample of migrants to the periphery of Mexico City, with respect to the last two objectives stated in the first chapter:

- (2) to explore the function of the communication network as an intervening variable between the individual's demographic characteristics and his perceived locus of control over the environment, and
- (3) to construct a path-analytic model of control over the environment with survey data from urban migrants to the periphery of Mexico City.

Since 23 percent of the sample were migrants from the Federal District to the periphery, we will begin our analysis by observing the major differences between rural and urban migrants. The degree of selectivity of rural migrants will be evaluated with a description of cohorts of migrants from different time periods.

The second phase of analysis will present the zero-order correlations among locus of control and (1) the demographic variables, (2) the interpersonal communication network, (3) the mass communication network, and (4) the organization communication network. Finally, the inter-correlation among the family planning variables, locus of control, and selected communication variables will be considered. In the final phase, path analysis models for locus of control, family planning

knowledge, and family planning activity will be presented.

### Rural-Urban Differences and the Problem of Selectivity

The reason for studying migrants to the urban periphery in a developing country was based upon the assumption that greater psychological change--locus of control--would occur over a shorter period of time in this context. A relatively homogeneous population from a more traditional, rural environment should experience differential rates of change due to variation in the quantity and quality of their exposure to the more modern social system of the city. This same population may also be compared to their urban counterparts who have had the opportunity for longer exposure to modernizing experiences.

The use of cross-sectional data from one point in time to analyze the direct effects of the migrants' experience in the urban social system may be seriously undermined by the concurrent process of migrant selectivity. Migrants who have been in the city longer may not have attained a greater belief in internal control during that time period. They may have had a more internal locus of control before they migrated, and those with a more external locus of control may have returned to rural areas. Thus the mean locus of control for an earlier cohort would be higher because of the loss of those with a more external locus of control over the years. If initial locus of control is responsible for the "survival of the fittest" then those who are more external may not be able to adapt to the urban environment.

The only way to determine if this alternative process is operating with certainty is to interview a subsample of former migrants who have

returned to their places of origin.<sup>1</sup> The expense of finding such a sample from the regions which supply migrants to Mexico City is prohibitive. Nevertheless, we can examine cohorts of migrants from different time periods and see to what degree selectivity is operating. Education probably prepares the migrant for urban adaptation more than any other variable. Table 23 presents the means of education and locus of control for cohorts of migrants at ten-year intervals with those of the urban migrants.

Table 23. Mean Levels of Education and Locus of Control for Four Cohorts of Rural Migrants and Urban-Born Migrants.

Variable	Time Period <sup>1</sup>				Urban Born (N=58)	Total (N=197)
	1963-72 (N=41)	1953-62 (N=64)	1943-52 (N=30)	1942 or earlier (N=16)		
Education	2.27	2.34	2.10	2.06	2.98	2.40
Locus of Control	26.6	27.6	27.7	27.9	29.0	27.7

Rather than steadily increasing from recent to earlier arrival periods, education seems to peak from 1953-1962 and then decline. Locus of control increases for this time period too, and then seems to decrease. The apparent differences between the two most recent cohorts are not statistically significant, however ( $t=.25$  for education and  $t=1.61$  for locus of control). The linear correlations between arrival date and education ( $r= -.06$ ), and arrival date and locus of control ( $r= -.0$ ) are

<sup>1</sup>Simmons (1970) was able to do this in his study of migrants to Bogota, Colombia. He found no evidence to suggest that return migrants to rural areas had failed in the city. Return migrants had higher status and rather high overall levels of schooling.

not significant at the .05 level.

Although this provides some indirect evidence against the alternative process of selectivity, it ignores the possibility that education in general, and therefore, locus of control, has improved over the last forty years in rural areas. This has undoubtedly occurred, but its effect could only be evaluated by comparing each migrant's level of education with the average education of others from his point of origin at the time he migrated. It cannot be inferred from the available data whether improvements in rural education has been strong enough to obscure an otherwise significant degree of difference between rural and urban migrants on several variables (Table 24).

Table 24. Differences between Means of Selected Variables for Rural and Urban-Born Migrants.

Variable	Rural Migrants $\bar{X}$ (S.D.)	Urban Migrants $\bar{X}$ (S.D.)	Differ- ence	Students' t
Locus of Control	27.1 (3.2)	29.0 (3.0)	-1.9	-3.75*
Education	2.2 (1.5)	3.0 (1.5)	- .8	-3.20*
Occupational Prestige	2.6 ( .79)	2.8 ( .79)	- .2	-1.78
Occupational Mobility	.76 ( .86)	.45 ( .75)	.31	2.44*
Family Planning Activity	2.1 ( .89)	2.6 (1.3)	- .5	-3.39*

\*The t-value is greater than the 1.96 (d.f.=195) required for significance at the .05 level.

These data highlight several interesting points. In general, urban-born migrants have higher levels of education, a more internal locus of control, and they engage in more family planning activity.

There is no significant difference between their respective level of occupational prestige, probably because of the significantly greater degree of occupational mobility among rural migrants.<sup>1</sup> Furthermore, the difference between the two groups in locus of control is due mainly to the most recent cohort of migrants, where the difference is -2.4 (see Table 24). This suggests that (1) most rural migrants obtain a degree of internal control comparable to urban-born migrants within less than ten years, and/or (2) most of the effect of migrant selectivity has occurred during the first ten years. More than likely both processes have a joint effect upon the migrant's perceived locus of control.

#### Intercorrelation with Demographic Variables

The analysis that follows is based on the full sample of 139 rural-urban migrants and 58 migrants from the Federal District of Mexico City. This procedure will yield an overall model of control for migrants to the periphery of Mexico City. It assumes that variables acting in the urban environment to determine locus of control and family planning behavior are similar for both groups of migrants. The urban migrants would have had longer exposure, however, and would be expected to have higher values on most of the variables considered.

An analysis of the intercorrelation among the demographic variables and locus of control (Table 25) reveals that three variables are completely uncorrelated with the remaining variables--job location, social and hometown independence. It remains to be seen whether any of

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<sup>1</sup>Since many rural-urban migrants began at the bottom of the occupational prestige scale (hired farm hands), they had a greater possibility for occupational mobility just by moving to the city.



Table 25. Intercorrelation of Demographic Variables and Locus of Control.<sup>1</sup>

Variable	2	3	4	5	6	7	8	9	10	11
1. Education	.47	-	-	.29	-	-.34	-.19	-	-	.39
2. Occupation Prestige		.58	-	.15	-	-	-.14	-	-	.32
3. Occupational Mobility			-	-.17	-	-	-	-	-	-
4. Job Location Size/Childhood			-	-	-	-	-	-	-	-
5. Residence Years of Urban Exposure					.42	-	-	-	-	.30
7. Age						.59	.28	-	-	.22
8. Number of Children							.57	-	-	-
9. Social Independence								-	-	-
10. Hometown Independence									-	-
11. Locus of Control										-

<sup>1</sup>Correlation coefficients greater than .14 are significantly different from zero at the .05 level; only statistically significant correlations are reported (N=197).

these is related indirectly to control through their effect upon the communication network, or whether their effect has been suppressed by other variables. In general, migrants with a greater sense of internal control have:

- (a) more education ( $r=.39$ ),
- (b) higher occupational prestige ( $r=.32$ ),
- (c) a larger childhood residence ( $r=.30$ ),
- (d) and more years of urban exposure ( $r=.22$ ),

than migrants with a greater sense of external control.

As would be expected, the size of one's childhood residence is more related to education and occupation than is the overall number of years of urban exposure. Occupation is strongly related to both education and occupational mobility. Those who have more children are older, have less education, and lower occupational prestige. The fact that those with more urban exposure have more children is due entirely to the relationship of age to years of urban exposure ( $r=.59$ ). Controlling for age, the first-order partial correlation between years of urban exposure and number of children is not significantly different from zero ( $r_{12.3} = -.08$ ). Once the stronger relationship of education and occupation to locus of control have been controlled, we would expect years of urban exposure to be the next most important demographic variable because it is unrelated to either of the former.

Age also tends to suppress the relationship between total years of urban exposure and locus of control. Older migrants obviously have a greater opportunity for more urban experience. Controlling for age, the first-order partial correlation coefficient between years of urban

exposure and control is .37. Along with the usual indicators of socio-economic status, it appears that length of exposure to urban influences does effect the degree to which the individual believes that he can control his environment through his own efforts.

#### Intercorrelation with Interpersonal Communication Network Variables

Measurement of the interpersonal communication network variables was hindered by methodological problems in the field. For 41 percent of the respondents, the questions used for the instrumental network elicited either no names or else less than three (the minimum number with which density was computed). Another 6 percent did not answer the questions at all. In contrast, the cases lost through low response and no response for the friendship network was 14 percent and 6 percent, respectively, for the measure of density. Missing data for the remaining interpersonal network variables ranged from 7 to 25 percent for the instrumental network and 7 to 15 percent for the friendship network. In subsequent analysis, the means for each variable were substituted for observations with missing values.

In general, the data (see Table 26) show that migrants characterized by a more internal locus of control have an instrumental communication network that has . . .

- (a) more members ( $r=.23$ ),
- (b) a higher level of occupational prestige ( $r=.27$ ),
- (c) a more distant residence ( $r=.16$ ), and
- (d) been known for less time relative to the length of time they have lived in the city ( $r= -.25$ ).

The size of the network is positively related to both education and

Table 26. Intercorrelation of the Instrumental Interpersonal Network Variables, Locus of Control, and Selected Demographic Variables.<sup>1</sup>

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Size	-	-	-	.26	-	.24	-	.28	-.16	-	.23	.16	-	.17	-
2. Frequency	-	-	-	-	-	-	-	-	-	-.17	-	.19	-	.20	-
3. Density	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Diversity</u>															
4. Relationship ( $\bar{X}$ )	-	-	-	-	.18	-	.25	-	-	-.27	-	-	-	-	-
5. Relationship (S.D.)	-	-	-	-	-	.22	-	.38	-	-	-	-	-	-	-
6. Occupation ( $\bar{X}$ )	-	-	-	-	-	.19	.15	-.16	.54	-	.27	.34	.22	.34	-
7. Occupation (S.D.)	-	-	-	-	-	-	-	.20	-	-	-	-	-	-	-
8. Residential ( $\bar{X}$ )	-	-	-	-	-	-	-	-.17	.16	-.18	.16	-	-.21	.18	-
9. Residential (S.D.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Occupational Discrepancy ( $\bar{X}-X$ )	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11. Durability	-	-	-	-	-	-	-	-	-	-	-.25	-.61	-.34	-.18	-.38
12. Locus of Control	-	-	-	-	-	-	-	-	-	-	-	.32	-	.39	.22
13. Occupation	-	-	-	-	-	-	-	-	-	-	-	-	.58	.47	-
14. Occupational Mobility	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15. Education	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16. Years Urban Experience	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>1</sup>Correlation coefficients greater than .14 are significantly different from zero at the .05 level; only statistically significant correlations are reported (N=197).

occupation. The network variable that is most strongly related to control, occupational prestige ( $\bar{X}$ ), is also more related to the basic demographic variables: occupational prestige ( $r=.34$ ) and mobility ( $r=.22$ ), and education ( $r=.34$ ). Those with higher occupational mobility have an instrumental network whose members live relatively nearer to themselves. Those with less durable networks (i.e., newer networks) tend to have more education ( $r=-.18$ ) and more years of urban exposure ( $r=-.38$ ). They have more contact with this network, the network itself is more distantly related ( $-.27$ ), and its members tend to live farther away from them ( $r=-.18$ ).

Besides the interrelationship among themselves, the measures of diversity based upon the standard deviations within the network are not related to other variables except size. Undoubtedly, the small size of some of the networks reduced their possibility of having larger standard deviations. In fact, 37 to 42 percent of these networks had zero standard deviations for the three measures of diversity. The low variance of these variables tends to depress their correlation with other variables.

Table 27 presents the intercorrelation among the same variables for the friendship network. There are no significant shifts in the direction of the relationships among any of the variables, only in the degree of some relationships. The mean residential distance is not significantly related to control in the friendship network. Mean occupational prestige of the friendship network, however, has a higher relationship to control ( $r=.37$ ), to occupation ( $r=.42$ ), and to education ( $r=.43$ ).



The most interesting finding is the relationship between the density of the friendship network and all three measures of diversity based on the standard deviations within the networks. Less interconnected friendship networks (lower density) show a higher degree of relationship diversity ( $r=.17$ ), occupational diversity ( $r=-.30$ ), and residential diversity ( $r=-.22$ ). The greater its degree of interconnectedness, or density, however, the greater the frequency of communication ( $r=.26$ ).

The degree of occupational discrepancy between the migrant's own occupational prestige and the mean occupational prestige of his interpersonal network was not significantly related to locus of control in either type of network. It was expected that individuals whose network's occupational prestige was higher than their own would have acquired a greater sense of control over their environment. Because of a ceiling effect, however, individuals with high occupational prestige would have less possibility of having a network with higher prestige than themselves. A similar effect would occur at the lower end of the scale. When the individual's own occupational prestige is controlled, however, the partial correlation with locus of control is .18 for the occupational discrepancy of the instrumental communication network, and .28 for the friendship communication network.

#### Intercorrelation with Mass Communication Variables

The next set of variables measure the migrant's degree of exposure to various forms of mass communication (Table 28). The most salient feature of the intercorrelation matrix is the insignificant degree of correlation among the various types of media, compared to the large

Table 28. Intercorrelation of Mass Communication Variables, Locus of Control, Family Planning Knowledge, and Selected Demographic Variables.<sup>1</sup>

Variable	2	3	4	5	6	7	8	9	10	11
1. Radio Exposure	-	.17	-	-	.14	-	.19	.18	-.15	-
2. Television Exposure				.38	.25	.23	.22	.15	-.21	-
3. Film Exposure				.16	-	.16	.19	-	-.30	-
4. Magazine Exposure				.25	.26	.17	.27	.30	-.15	.26
5. Newspaper Exposure					.37	.31	.45	.24	-.18	.22
6. Locus of Control						.42	.39	.32	-	.30
7. Family Planning Knowledge							.34	.22	-	.22
8. Education								.47	-.34	.29
9. Occupation									-	.15
10. Age										-
11. Size/Childhood Residence										-

<sup>1</sup>Correlation coefficients greater than .14 are significantly different from zero at the .05 level; only statistically significant correlations are reported (N=197).

number of significant relationships among mass communication and the selected demographic variables. Besides radio and film exposure ( $r=.17$ ), only newspaper exposure is related to other forms of mass media. Those who read the newspaper more frequently also tend to watch television more often ( $r=.38$ ), go to movies more often ( $r=.16$ ), and read more informative magazines ( $r=.25$ ).

Newspaper exposure, in fact, is related to every type of mass media exposure except radio. Individuals who read newspapers more frequently have more years of education ( $r=.45$ ) and higher occupational prestige ( $r=.24$ ). They were raised in cities with larger populations ( $r=.22$ ), and they are younger ( $r=-.18$ ). Those who have greater newspaper exposure have a more internal locus of control ( $r=.37$ ), and they have more knowledge of family planning methods ( $r=.31$ ). The newspaper appears to play an important role in this process. If the migrant reads a newspaper often, he is more likely to watch television and read more informative magazines. These latter variables are also correlated with control ( $r=.25$  and  $.26$ , respectively), and family planning knowledge ( $r=.23$  and  $.17$ , respectively).

In general, most of the mass communication variables are related to the demographic variables selected. The only other interesting pattern in the data concerns the size of childhood residence. Migrants raised in larger cities have greater exposure to both print media--newspapers and magazines, but no greater exposure to radio, television, or films. Growing up in larger cities may have provided a greater opportunity for exposure to print media, and the reading habit may have been acquired at an earlier age. Part of this relationship may be due to the

effect of education which is also higher for those raised in larger cities.

### Intercorrelation with Organizational Communication Variables

An analysis of the organizational communication network variables may be found in Table 29. As expected, the low variance in organizational participation has made it virtually inoperable as a variable. Organizational utilization, however, is related to locus of control ( $r=.21$ ), in spite of this same handicap. It also appears as if those with longer urban exposure are more likely to use available organizations to solve their problems ( $r=.21$ ).

Table 29. Intercorrelation of Organizational Communication Variables, Locus of Control, and Selected Demographic Variables.<sup>1</sup>

Variable	2	3	4	5	6	7	8	9
1. Work Autonomy	-	-	-	-	-	-.46	.17	.15
2. Voluntary Organization Participation		-	-	-	-	-	-	-
3. Organizational Utilization			.21	-	-	-	-	.21
4. Locus of Control				.39	.32	-	-	.22
5. Education					.47	-	-.34	-
6. Occupation						-	.15	-
7. Job Location							-	-
8. Age								.59
9. Years of Urban Exposure								

<sup>1</sup>Correlation coefficients greater than .14 are significantly different from zero at the .05 level; only statistically significant correlations are reported (N=197).

Contrary to our expectations, work autonomy is not significantly related to locus of control. The fact that it is also unrelated to education and occupational prestige casts doubt upon its validity as a

measure of autonomy. An alternative explanation for this outcome may be provided by analyzing job location, which has a relatively strong negative correlation with work autonomy ( $r = -.46$ ). Migrants that work within the federal district of Mexico City are characterized by a lower degree of job autonomy. In other words, they are more likely (1) to be in a dependent position in the work hierarchy, (2) to receive close attention from their supervisors, and (3) to have supervisors who make most of their job-related decisions for them. Since most of those working in Ciudad Netzahualcoyotl itself were rather precariously self-employed (e.g., as street vendors), it appears as if work autonomy is measuring whether or not the migrant had a supervisor. Work in the federal district is more likely to involve supervision. Most respondents reported that they were satisfied with their present supervision even if they were given little autonomy. It is easy to speculate that in an authoritarian, paternalistic culture like Mexico, and within the socioeconomic range sampled in the present study, that job security and a dependent relationship with a supervisor are more important than work autonomy. The questions raised by this problem certainly merit further research.

#### Intercorrelation with Family Planning Variables

The relationship among the family planning variables, locus of control, and selected demographic variables is presented in Table 30. It may seem odd to use number of children as a causal influence upon family planning activity, considering that the use of birth control methods directly reduces the number of children. The direction of causality, however, depends upon the range of the variable studied.

Table 30. Intercorrelation of Family Planning Variables, Locus of Control, and Selected Demographic Variables.<sup>1</sup>

Variable	2	3	4	5	6	7	8	9	10
Family Planning									
1. Activity	.39	.37	.38	-	.29	-	.29	.24	-
2. Knowledge		.18	.34	-	.42	-	.34	.22	-
3. Morality			-	-	-	-.16	.15	-	-
4. Information Source				-	.22	-	.20	-	-
5. No. of Children					-	.57	-.19	-	.28
6. Locus of Control						-	.39	.30	.22
7. Age							-.34	-	.59
8. Education								.29	-
9. Size of Childhood Residence									.42
10. Total Years Urban									

<sup>1</sup>Correlation coefficients greater than .14 are significantly different from zero at the .05 level; only statistically significant correlations are reported (N=197).

For the present sample we would not expect birth control to have significantly effected the number of children because . . .

- (1) only 19% have actually used any method of birth control,
- (2) only 8% have used the more reliable methods (pill or better), and misuse and inconsistent use would further reduce the effect,
- (3) birth control requires a relatively long period of use to significantly effect one's family size.

In short, we would not expect family planning activity to increase until the growing size of the family became perceived as a salient problem.

The results show that there is no zero-order correlation between the number of children a migrant has and his knowledge of family planning or level of activity. Once again, the high correlation between age

and number of children suggests that it may be suppressing this relationship. As expected, the first-order, partial correlation between number of children and family planning activity increases to .25 when controlling for the effects of age. Controlling for number of children, the partial correlation between age and family planning activity increases to  $-.25$ .

Knowledge, morality, and source of information are all about equally related to family planning activity. Locus of control is the next best predictor of family planning activity ( $r=.29$ ). The next best predictors are education ( $r=.29$ ), and the size of childhood residence ( $r=.24$ ). Locus of control is more highly correlated with family planning knowledge ( $r=.42$ ), than is education ( $r=.34$ ).

So many variables intercorrelated at about the same level suggests the possibility of confounded relationships or intervening variables. Investigation of the more complex relationships among the variables represented in this study will be the major task of the path analysis to follow.

#### The Causal Model for Locus of Control and Family Planning

The preceding discussion of zero-order correlations among the variables provided a basic assessment of the effects of the antecedent variables upon locus of control and family planning behavior. However, to really understand the relative effect of each antecedent variable upon the subsequent variables at each stage of our conceptual model, we need to unravel the complex relationship among these variables. The previous analysis, for example, revealed that 19 of the 44 variables used were significantly related to control. The use of partial correlation has

already revealed that some of the insignificant variables may also be related to control when the effects of other variables are controlled.

Multiple regression is the most efficient method for assessing the relative effects of a large set of variables. Where the causal sequence is made explicit, direct path coefficients may be estimated with the standardized regression coefficients (Beta Weights) obtained with this technique. According to Wright (1934), a path coefficient measures:

. . . the fraction of the standard deviation of the endogenous variable for which the designated variable is directly responsible in the sense of the fraction which would be found if the factor varies to the same extent as in the observed data when all other variables (including residual variables) are constant (p. 162).

In the path diagram for locus of control (Figure 2), the straight arrows represent the direct effect of the respective antecedent variables, controlling for all other variables having a direct effect upon that variable. All the curved arrows represent zero-order correlation coefficients. Since a stepwise regression procedure was used (capable of both addition and deletion), we know that the addition of any previous variables in the causal sequence would be insignificant (.05 level), and that any variable remaining in the final solution would have been deleted had its effect dropped to an insignificant level (.05 level) after controlling for the other variables in the final solution. The path coefficient for  $R_a$  represents the direct effect of a hypothetical residual variable as estimated by the coefficient of alienation. The structural equations for the entire model may be found in Appendix B.

The multiple regression coefficient for the five variables which directly effect locus of control is .58. The strongest direct effect is

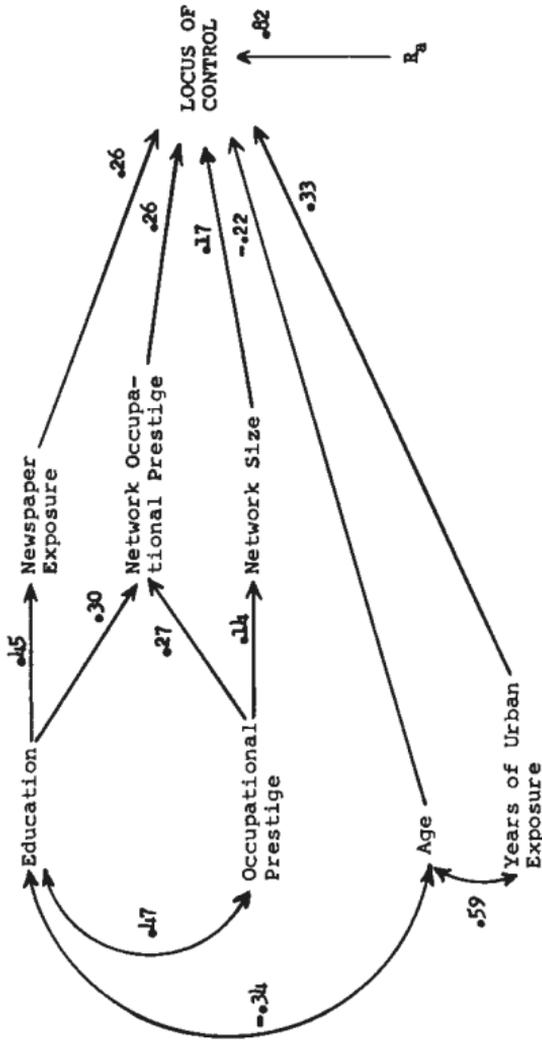


Figure 2: Path Diagram for Locus of Control<sup>1</sup>

<sup>1</sup>The direct path coefficients corresponding to each straight arrow were estimated with standardized regression coefficients; curved arrows represent zero-order correlation coefficients.

produced by years of urban exposure ( $P=.33$ ). Urban exposure is more strongly related to locus of control after controlling for the effects of the other four variables in the system, including age, which is negatively related to control ( $P=-.22$ ). Newspaper exposure and the occupational prestige of the friendship network have equally strong direct effects ( $P=.26$ ). The remaining variable with significant direct effect upon locus of control is the size of the friendship network ( $P=.17$ ).

This path model clearly shows the intervening role played by the communication network between the usual demographic indicators of socioeconomic status and locus of control. As the path diagram shows, education effects locus of control indirectly through its direct effect upon newspaper exposure ( $P=.45$ ) and the occupational prestige of the friendship network ( $P=.30$ ). Its indirect effect upon control may be represented by the sum of the products of the direct paths leading to it. The indirect effect of education upon control is considerable  $[(.45 \times .26) + (.30 \times .26) = .20]$ . The indirect effect of the migrant's occupational prestige may also be observed in the diagram  $[(.27 \times .26) + (.14 \times .17) = .07]$ .

A summary of these estimates may be found in Table 31, which compares the correlation coefficient, the direct path coefficient, and the indirect path coefficient for each variable in the model. The percentage of the variance explained with each variable deleted is also shown. Every variable that remains in the final model has considerable direct or indirect effects upon locus of control.

The variables that remain in the model explain 33 percent of the variance of locus of control, while residual variables not included

Table 31. Locus of Control as Directly and Indirectly Effected by Anterior Variables in the Causal Sequence.<sup>1</sup>

Anterior Variable <sup>2</sup>	Correlation Coefficient	Direct Path Coefficient	Indirect Path Coefficient	R <sup>2</sup> with Variable Deleted
1. Years Urban Experience (6)	.22	P27, 6 = .33		.27
2. Newspaper (23)	.37	P27, 23 = .26		.27
3. Network Occupational Prestige (15)	.37	P27, 15 = .26		.27
4. Network Size (11)	.23	P27, 11 = .17		.31
5. Age (7)	-	P27, 7 = -.22		.31
6. Education (1)	.39		P27 (23) 1 = .12 P27 (15) 1 = .08	
7. Occupational Prestige (2)	.32		P27 (11) 2 = .02 P27 (15) 2 = .05	
-----				
Multiple Correlation Coefficient: R = .58				
Coefficient of Determination: R <sup>2</sup> = .33				
Coefficient of Alienation: $\sqrt{1 - R^2} = .82$				

<sup>1</sup>Correlation coefficients above .14 are significantly different from zero at the .05 level (N=197). All direct path coefficients are significantly different from zero at the .05 level (N=197).

<sup>2</sup>Variable numbers in parentheses and those attached to path coefficients (P) correspond to the summary of variables in Table 22.

account for the remaining 67 percent. The model states explicitly that education directly effects the migrant's exposure to newspapers ( $P=.45$ ), and the mean occupational prestige of his friendship network ( $P=.30$ ). The migrant's own occupational prestige determines the size ( $P=.14$ ) and the occupational prestige that his friendship network will have ( $P=.27$ ). It is the migrant's exposure to newspapers and his interpersonal communication network, in conjunction with his age and years of urban exposure, that determine his perceived locus of control over the environment.

The path model for family planning knowledge is presented in Figure 3. The strongest predictor of family planning knowledge is locus of control ( $P=.30$ ), followed by the migrant's source of information about family planning ( $P=.24$ ), and education ( $P=.17$ ). As Table 32 shows, education also has considerable indirect effect upon level of knowledge through source of information [ $.20 \times .24 = .05$ ], newspaper exposure and control [ $.45 \times .26 \times .30 = .04$ ], and through the occupational prestige of the friendship network and control [ $.30 \times .26 \times .30 = .02$ ]. The total indirect effect of education in the model is .11 [ $.04 + .05 + .02 = .11$ ].

The remaining indirect effect in the model occurs through locus of control. As Table 32 shows, the indirect effects of the communication network variables are .05 and .08. Those who become more modern and attain a more internal locus of control over the environment know of more and better methods of family planning. Such information is more salient for a person, the more he believes he can control events in his environment.

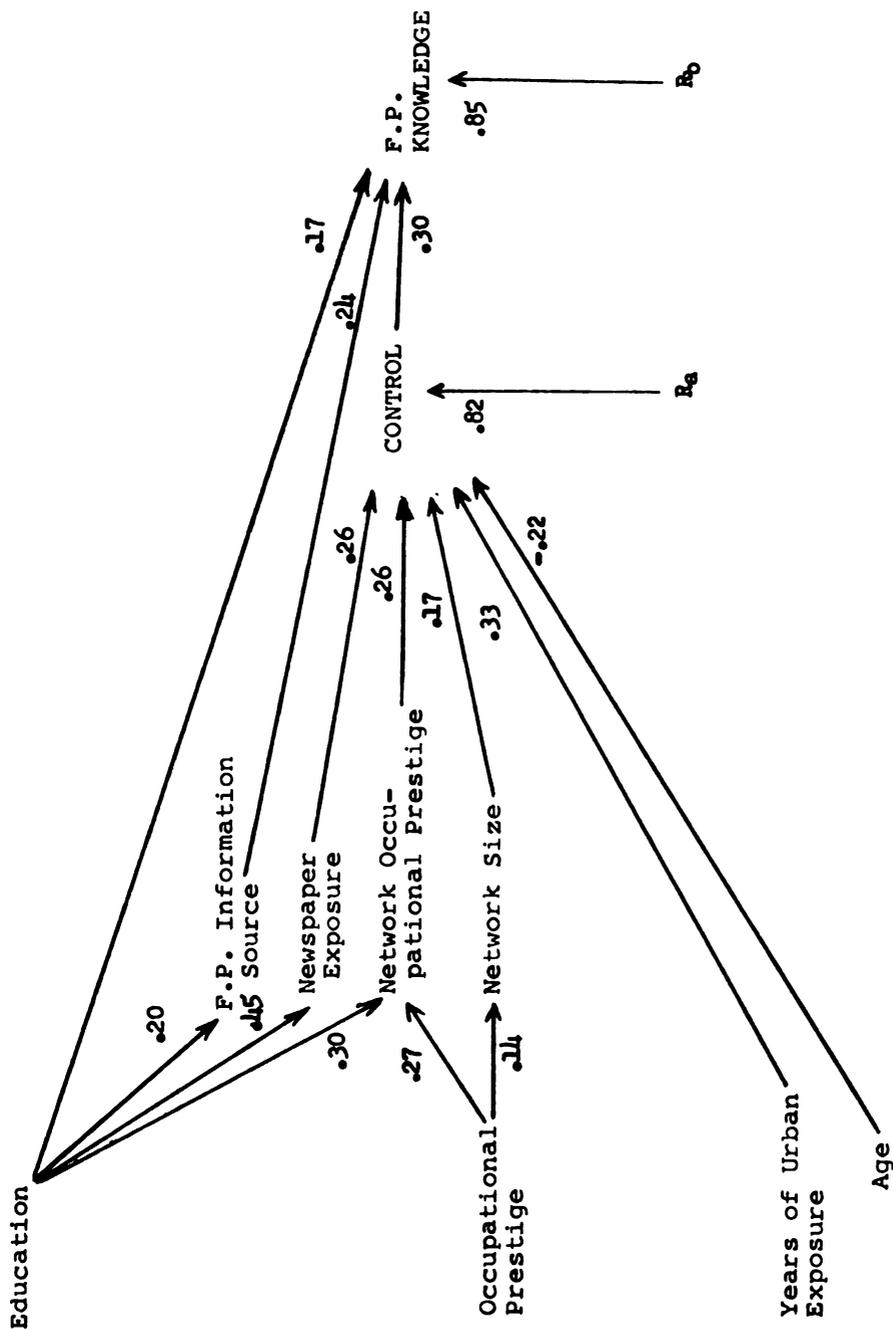


Figure 3: Path Diagram for Locus of Control and Family Planning Knowledge<sup>1</sup>

<sup>1</sup>The direct path coefficients corresponding to each straight arrow were estimated with standardized regression coefficients. Zero-order correlation coefficients have been omitted because of limited space.

Table 32. Family Planning Knowledge as Directly and Indirectly Effected by Anterior Variables in the Causal Sequence.<sup>1</sup>

Anterior Variable <sup>2</sup>	Correlation Coefficient	Direct Path Coefficient	Indirect Path Coefficient	R <sup>2</sup> with Variable Deleted
1. Locus of Control (27)	.42	P30, 27 = .30		.19
2. Family Planning Information Source (29)	.34	P30, 29 = .24		.22
3. Education (1)	.34	P30, 1 = .17	P30 (29) 1 = .05	.24
4. Age (7)	-.02		P30 (27, 23) 1 = .04	
5. Years of Urban Exposure (6)	.08		P30 (27, 15) 1 = .02	
6. Newspaper Exposure (23)	.31		P30 (27) 7 = -.07	
7. Network Occupational Prestige (15)	.17		P30 (27) 6 = .10	
8. Network Size (11)	.07		P30 (27) 23 = .08	
9. Occupational Prestige (2)	.22		P30 (27) 15 = .08	
			P30 (27) 11 = .05	
			P30 (27, 15) 2 = .02	
			P30 (27, 11) 2 = .01	
-----				
Multiple Correlation Coefficient: R = .52				
Coefficient of Determination: R <sup>2</sup> = .27				
Coefficient of Alienation: $\sqrt{1 - R^2} = .85$				

<sup>1</sup>Correlation coefficients above .14 are significantly different from zero at the .05 level (N=197). All direct path coefficients are significantly different from zero at the .05 level (N=197).

<sup>2</sup>Variable numbers in parentheses and those attached to path coefficients (P) correspond to the summary of variables in Table 22.

The multiple regression coefficient for family planning knowledge is .52, signifying that 27 percent of the variance of this knowledge is explained by control, education, and source of information. The direct effect of the residual variable on knowledge is .85.

The path diagram for family planning activity (Figure 4) is rather cumbersome, due to the large number of variables for which path arrows must be drawn. Therefore, the zero-order correlation coefficients among the variables in each stage have been omitted. This diagram represents the combined path model for modernity, family planning knowledge, and family planning activity.

The diagram reveals that locus of control has no direct effect upon family planning activity when the effect of other variables are controlled. When locus of control is added to this final set of predictors of family planning activity, it is only significant at the .14 level of significance. The main contribution of control is its indirect effect through family planning knowledge [ $.30 \times .27 = .08$ ], as shown in Table 33.

It is not surprising that the morality of family planning would have the greatest direct effect upon family planning activity in a predominantly Catholic country like Mexico ( $P = .31$ ). Knowledge becomes the next best predictor of family planning activity ( $P = .27$ ), followed by the number of children the migrant has ( $P = .26$ ). Age has a negative direct effect upon family planning activity ( $P = -.20$ ). The size of the migrant's childhood residence directly effects family planning activity ( $P = .15$ ), while total years of urban experience only operates indirectly through modernity and family planning knowledge [ $.33 \times .30 \times .27 = .03$ ]. And finally, those migrants whose friendship network's residences are further away and closer to the Federal District tend to engage in more family planning activity. The direct effect is small ( $P = .12$ ) but significant at the .039 level.

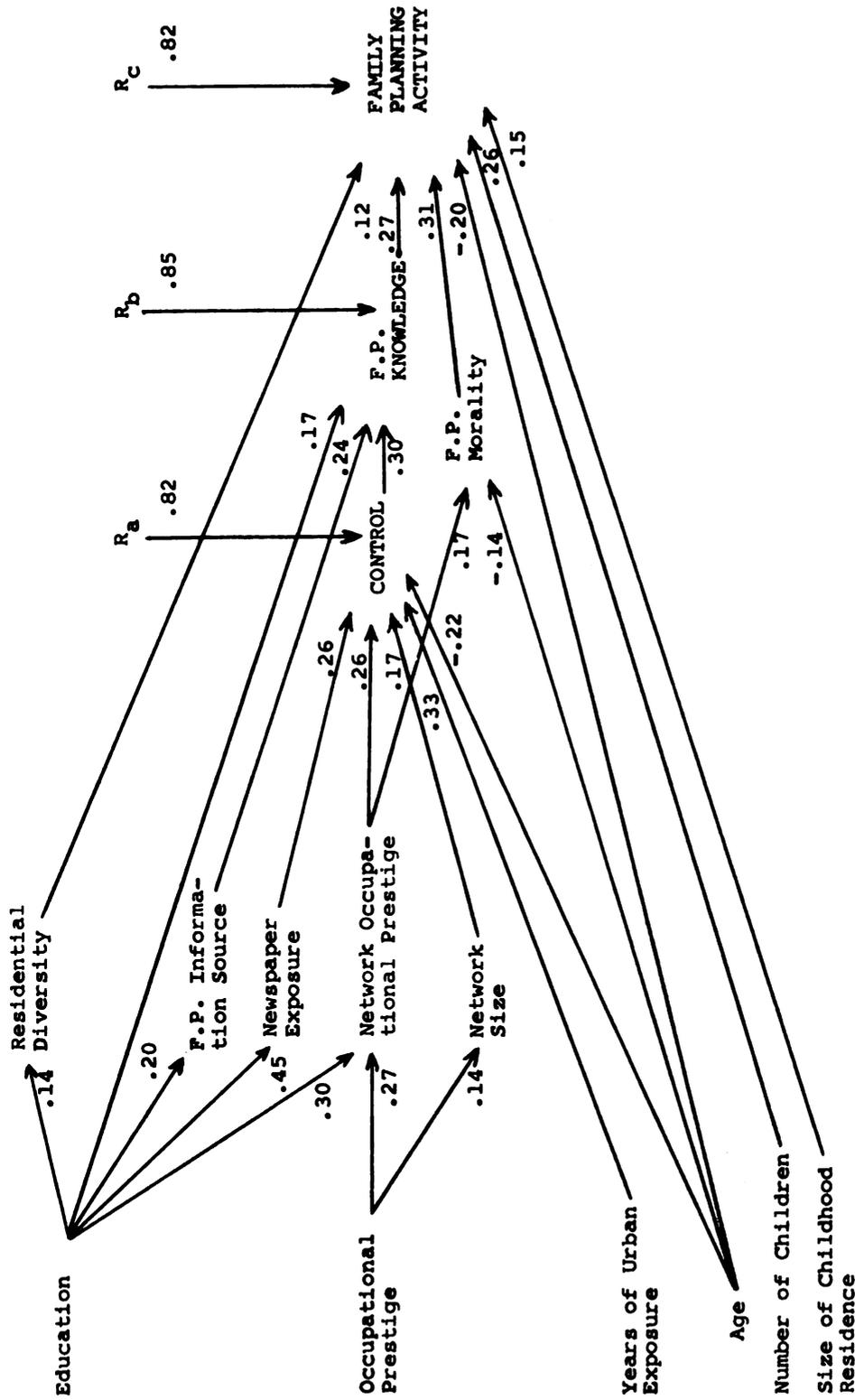


Figure 4: Path Diagram for Locus of Control, Family Planning Knowledge, and Family Planning Activity<sup>1</sup>

<sup>1</sup>The direct path coefficients corresponding to each straight arrow were estimated with standardized regression coefficients. Zero-order correlation coefficients have been omitted because of limited space.

Table 33. Family Planning Activity as Directly and Indirectly Effectuated by Anterior Variables in the Causal Sequence.<sup>1</sup>

Anterior Variable <sup>2</sup>	Correlation Coefficient	Direct Path Coefficient	Indirect Path Coefficient	R <sup>2</sup> with Variable Deleted
1. Family Planning Morality (28)	.38	P31, 28 = .31		.24
2. Family Planning Knowledge (30)	.39	P31, 30 = .27		.27
3. Number of Children (8)	.13	P31, 8 = .26		.29
4. Age (7)	-.13	P31, 7 = -.20		.31
5. Size of Childhood Residence (5)	.24	P31, 5 = .15	P31 (28) 7 = -.03	.31
6. Residential Diversity (17)	.11	P31, 17 = .12	P31 (30) 27 = .08	.32
7. Locus of Control (27)	.29		P31 (27, 30) 6 = .03	
8. Years of Urban Exposure (6)	.08			
9. Family Planning Information Source (29)	.38		P31 (30) 29 = .06	
10. Education (1)	.29		P31 (30) 1 = .05	
			P31 (17) 1 = .02	
			P31 (30, 29) 1 = .01	
11. Newspaper Exposure (23)	.21		P31 (30, 27, 23) 1 = .01	
12. Network Occupational Prestige (15)	.19		P31 (30, 27, 12) 1 = .01	
13. Network Size (11)	.10		P31 (30, 27) 23 = .02	
14. Occupational Prestige (2)	.12		P31 (30, 27) 15 = .02	
			P31 (30, 27) 11 = .01	
			P31 (30, 27, 15) 2 = .005	
			P31 (30, 27, 11) 2 = .002	
-----				
Multiple Correlation Coefficient: R = .58				
Coefficient of Determination: R <sup>2</sup> = .33				
Coefficient of Alienation: $\sqrt{1 - R^2} = .82$				

<sup>1</sup>Correlation coefficients above .14 are significantly different from zero at the .05 level (N=197). All direct path coefficients are significantly different from zero at the .05 level (N=197).

<sup>2</sup>Variable numbers in parentheses and those attached to path coefficients (P) correspond to the summary of variables in Table 22.

Removal of this last variable reduces the percentage of variance of family planning activity that is explained by the model by 1 percent from 33 to 32 percent). The direct effect of residual variables is .82; the multiple regression coefficient, representing the combined effect of the six variables with significant direct effects upon family planning activity is .58.

Considering how far removed it is from family planning activity in this model, the combined indirect effects of education upon family planning activity are substantial. The sum of all of its indirect effects is .10 (see Table 33). Besides control, the remaining indirect effects of any size are due to the source of family planning information [ $.21 \times .27 = .06$ ], and age [ $-.14 \times .31 = 1.03$ ].

The complete diagram in Figure 4 was constructed with cross-sectional survey data of migrants to the periphery of Mexico City. It represents the best-fitting, causal model for locus of control and family planning behavior based on the theoretical paradigm presented in Chapter I. Different causal schemes would lead to the construction of alternative models with these same data. The method of path analysis cannot perform the impossible task of deducing causal relations from the values of the correlation coefficients. It is merely an extension of the usual verbal interpretation of statistics.

The data do provide support, however, for the intervening role of communication between basic demographic variables and locus of control. This function of the communication network was explicitly stated in the causal scheme of our theoretical model. The final model also clarifies the role of locus of control in the acquisition of knowledge about family planning methods and in activities leading to, and including, the use of contraceptive methods.

CHAPTER V  
SUMMARY AND DISCUSSION

Summary

The general purpose of the present study was to construct a more precise explanation of how rural-urban migrants in a developing country develop a greater sense of internal control over their environment, and the subsequent impact of this change upon their level of innovation. The specific objectives of the study were: (1) to explicate perceived locus of control in the context of urbanization and modernization, (2) to explore the intervening function of the individual's communication network, and (3) to construct a path-analytic model of control over the environment with survey data from migrants to the periphery of Mexico City.

Locus of control was defined as a point on a belief continuum--from internal to external--that represents the dominant origin of causality in the individual's environment. Actual growth or accumulation of control over the environment requires successful innovation on three levels: (1) information, (2) technology, and (3) behavior. Excluding the possibility of random variation and compulsory change, one of the necessary prerequisites for innovation to occur is the belief that greater control over the environment can be achieved through one's own efforts.

The review of various theories and previous research related to the concept of control suggested that one's locus of control is determined by (1) the structure and content of the environment, and (2) the socialization process. A more internal locus of control results from, and is a requirement for, exposure to complex and changing environments characterized by diverse and conflicting inputs. If the belief in internal control is normative within a given social system, one's locus of control is also determined by the process of socialization. Although most socialization occurs in childhood, substantial change is expected to occur in adulthood under conditions of rapid social-structural change and adaptation to a new social system. Under these conditions socialization would occur through (1) the observation of significant others as models of adaptive behavior and beliefs, and (2) the process of symbolic interaction that occurs at a given point in the social system.

Cross-sectional survey data were collected from migrants to Ciudad Netzahualcoyotl on the periphery of Mexico City. The selection of urban migrants for this study was based upon the previous theoretical framework. Their adaptation to the complex, urban environment, and their socialization within a new social system presented the ideal, natural laboratory in which to identify the factors which effect locus of control. These conditions were expected to be especially prevalent in a developing country like Mexico, which is experiencing rapid industrialization and urbanization. The selection of family planning as the specific area of innovativeness was due to: (1) its practical implications for Mexico, which has one of the most rapid rates of population increase in the world, and (2) its applicability to families in urban, as well as rural, areas.



The results of this survey were presented in the form of zero-order correlation among the variables, and in the form of a path-analytic model based upon the causal sequence of effects specified in our general theoretical paradigm. Theoretically, we posited a recursive chain of effects in which basic demographic characteristics determine position in the urban social system, which then determines exposure to influences upon locus of control. The resulting belief in control over the environment then determines knowledge and practice of family planning.

Using this causal scheme, the path analysis of the data revealed that:

1. Locus of control is directly effected by . . .
  - a. newspaper exposure,
  - b. occupational prestige of the friendship network,
  - c. size of the friendship network,
  - d. years of urban exposure, and
  - e. age,

and indirectly effected by . . .

  - f. education, and
  - g. occupational prestige.
2. Family planning knowledge is directly effected by . . .
  - a. locus of control,
  - b. source of family planning information, and
  - c. education,

and indirectly effected by . . .

  - d. education, and
  - e. variables which directly or indirectly effect locus of control.
3. Family planning activity is directly effected by . . .
  - a. family planning morality,
  - b. family planning knowledge,
  - c. number of children,
  - d. age,
  - e. residential distance of the friendship network, and
  - f. size of childhood residence,

and indirectly effected by . . .

- g. age,
- h. education, and
- i. variables which directly or indirectly effect family planning knowledge and locus of control.

These findings show that certain variables representing the communication network intervene between the demographic characteristics of the migrant and his locus of control. Newspaper exposure and the occupational prestige of the interpersonal network intervene between education and locus of control; the size and occupational prestige of the interpersonal network intervene between occupational prestige and locus of control. The model also indicates that younger migrants have a more internal locus of control than older ones. And finally, the longer the migrant is exposed to the city, the greater his belief in internal control over the environment. Relative to the other factors, length of urban exposure has the strongest direct effect upon the individual's perceived locus of control.

#### Discussion and Interpretation

The model which explains family planning activity presents two unexpected relationships. In general, we would expect age, number of children, and the knowledge and morality of birth control to effect one's activity, or lack of activity, related to family planning. Nor is it unexpected that older migrants would have more children and a greater feeling that birth control is immoral. What is surprising is that the size of the migrant's childhood residence would have any direct effect.

Does some characteristic of larger cities impress upon the child the necessity to limit his family's size? Perhaps the greater necessity for large families in the rural areas continues to inhibit the rural

migrant even though he now lives in the city. The normative family size in larger cities may be smaller than in rural areas. The migrant from these cities would develop the expectation for a smaller family early in life. He may have come from a smaller family himself than those from more rural areas. The number of siblings that each migrant had was not measured, but this may provide one reasonable interpretation.

The model also shows that the farther away, and the closer to the Federal District, that the migrant's friends live, the more likely he is to engage in family planning activity. If family planning is more prevalent in the Federal District, this could mean that the migrant has had contact (through his friends) with others who sanction, or who are more active in family planning themselves. Areal analysis of the distribution of families who practice family planning would provide additional evidence for this interpretation.

The model for family planning knowledge was highly predictable. Those with more years of schooling know of more methods of family planning, and since they are also more likely to have gotten their information from doctors, their knowledge of methods is probably better than others. And finally, we have confirmed that those who have a general belief that they can control events in their environment, including the birth of their children, tend to have acquired more and better knowledge of methods to control fertility. Locus of control is the strongest predictor of contraceptive knowledge, even when controlling for level of education.

Although the model for locus of control has supported the intervening function of the communication network, it is not at all evident

from the diagram exactly how this occurs. The theoretical paradigm stated explicitly that variables like education, occupation, and length of urban residence would move the migrant into a certain position in the urban social system. Where he enters this system then determines the direction and amount of influences to which he is exposed. From the perspective of the migrant, it is his communication network that comprises his linkages to others in that social system. These linkages may occur through either interpersonal or mediated forms of communication. Although we have measured the amount of exposure and can infer the direction of influence, we have no direct measure of the messages which actually flow through this network.

Education, for example, increases the migrant's exposure to newspapers, which in turn, increases his belief in a more internal locus of control. This could mean that the content of newspapers directly teaches the belief that man can control his environment, or that it indirectly sanctions this belief through various themes represented there. It could also mean, however, that the newspaper provides instrumental information that the migrant can use to make decisions and solve problems. The enhanced capacity to solve his problems would then lead to a greater sense of internal control.

Print media would be expected to have more instrumental information than other types of mass media. Dervin (1971) found that black urban ghetto residents who read newspapers more frequently have better information and they are more able to use that information for purposes of control. How newspaper exposure fosters internal control can only be answered with more specific research concerning (1) the content of newspapers, and (2) how the individual uses the newspaper.

Occupational prestige presents more difficult problems of interpretation. Research in several cultures has shown that individuals with higher occupational prestige have greater subjective efficacy (Smith and Inkeles, 1969) and more internal control (Rotter, 1966). It is natural then to expect that having friends with higher occupational prestige would influence one's own belief in control. This is supported by the data. In fact, the prestige of the friendship network is a better predictor than one's own occupational prestige. Controlling for this influence, the effect of one's own prestige level becomes insignificant. And finally, when controlling for the individual's own occupational prestige, those whose friendship network's occupational prestige is higher relative to their own tend to have a more internal locus of control. This suggests that the members of higher prestige networks may . . .

- a. have a more internal locus of control themselves,
- b. exert influence on the individual's own stated beliefs,
- c. represent models who actually have more control over their environment, and/or
- d. provide more mutual assistance to one another to solve control-related problems.

In the path-analytic model of control that has been constructed with the present data, the effect of socioeconomic status as measured by education and occupational prestige have been accounted for by the intervening function performed by newspaper exposure, and the size and occupational prestige of the individual's friendship network. This research was not able, however, to identify the significant variables that intervene between length of urban exposure and locus of control. Urban exposure is a more global variable which should only effect the migrant's degree of exposure to modern influences which in turn would

directly effect his belief in control over the environment. The fact that no mediating variables were discovered suggests that: (1) time itself, or length of exposure, may have direct bearing on one's belief in control, and/or (2) the important intervening variables were not included in the present study. Length of exposure taps some general quality of the urban environment that distinguishes it from the rural environment. Its effect may simply be due to environmental press--the city, by its very nature, forces the rural migrant out of his old patterns of behavior and coerces more adaptive, innovative behavior. The longer this occurs, the more obvious it becomes that one can achieve greater control through one's own efforts.

An alternative interpretation is suggested by Harvey and Schroder's (1963) theory of abstract cognitive functioning discussed in the first chapter. The prerequisite for such functioning, of which internal control is an important dimension, is exposure to heterogeneous and more enriched environments. When this quality of the city is combined with the decreased amount of control from external sources and increased environmental stability (compared to the rural environment), the outcome over a long period of time is the development of a greater capacity to deal with diverse and conflicting inputs, and eventually a greater sense of internal control.

Longer urban exposure, of course, means that the migrant is more likely to have been exposed to the city at a younger age when he would supposedly be more open to change. Age is the only other demographic variable with direct effect upon locus of control. Younger migrants are more likely to believe that they are a significant locus of control over their environment than are older migrants. Some of this effect may

be attributed to the higher levels of education of younger migrants. Education and openness to new experience and influence seem to be more plausible interpretations than the alternative interpretation that older migrants may become more pessimistic and less able to control their environment the older they become.

#### Alternative Models of Locus of Control

The path analytic model of control and family planning that has been derived from the present data represents an oversimplified model of the actual process. The main purpose for constructing the model was to explore the function of the communication network in the process of change in locus of control, and to verify the effect of locus of control upon family planning behavior. Step-wise, linear multiple regression analysis allowed us to eliminate those variables with relatively unsubstantial effect and to clarify the relationship among those variables which did have a substantial effect in the process. The model itself is susceptible to the following limitations:

- (a) only moderate measurement reliability for some of the variables,
- (b) the use of quasi-interval variables, some of which were skewed,
- (c) the existence of curvilinearity among some variables,
- (d) the possible confounding effects of extraneous (residual) variables not specified in the model, and
- (e) the possibility of reciprocal interaction among some variables.

There was a slight, but significant, curvilinear relationship between education and locus of control.<sup>1</sup> For some reason, the three respondents who said they had some university education were only slightly above the mean of control. This, plus a slight drop in the mean of those who had some education beyond secondary school accounted for the curvilinearity.

Several of the interpersonal network variables also had significant curvilinear relationships with locus of control: the density of the friendship network, relationship diversity (S.D.) of the instrumental network, and the relationship diversity of the friendship network (both  $\bar{X}$  and S.D.). This means that there was some relationship among these variables and modernity that cannot be described by a simple linear function. These relationships could not be described with multiple, linear correlation techniques. Future research involving the use of network indices such as these should attempt to deal with more complex relationships than the linear one assumed in this study.

In some instances a more complex model that allows for reciprocal relationship among some of the variables in our model would be preferable. Because family planning knowledge is so specific we would not expect it to have much reciprocal influence on control, which is conceptualized as a general expectancy for control over the environment. A higher level of knowledge in many control related areas, however, would

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<sup>1</sup>McNemar's (1969) F-test for curvilinearity:

$$F_3 = \frac{(\eta^2 - r^2)/(G-2)}{(1 - \eta^2)/(N-G)}$$

be expected to have substantial reciprocal interaction.

In some instances it might be possible to show that locus of control is reciprocally related to newspaper exposure. More internally oriented individuals would be expected to search actively for information in the newspapers, because this has proved successful for solving problems in the past. The present model assumes a recursive relationship because it was expected that most migrants from rural areas would not have had the internal locus of control nor sufficient exposure to newspapers for this mutual interaction to begin. In other words, it was assumed that newspaper exposure would have a more dominant effect upon locus of control at this stage in the process for this particular population. This assumption would be much more tenuous in settings with better rural newspaper distribution and readership. Future studies should attempt to determine how people use the newspaper, how control themes are transmitted through newspapers, and whether sufficient information about means as well as ends is available in newspapers with which to solve control-related problems.

There were several problems surrounding the measurement of the interpersonal communication network variables. Future research should include case studies of respondents in order to obtain a more concrete picture of how one's interpersonal network functions to effect his basic belief systems. It appears that many of the indices used in the present study were too crudely constructed to describe their rich, complex role in the process of adult socialization. A more intensive study of network characteristics would perhaps uncover the significant qualities of interpersonal networks related to locus of control and family planning activity. Future studies would also be enhanced by gathering data

from all members of the communication network either through a complete census of a well-defined geographical area, such as the urban "barrio," or through snowball sampling techniques.

In addition to improved measurement of communication network variables for survey data collection, it would be useful to include complementary data from participant observation. This optional form of data collection would provide more detailed information about how the new migrant utilizes members of his interpersonal network to gather information and to solve control-related problems. A good example of this strategy is Plotnicov's (1967) study of migrants in Jos, Nigeria. The migrant's personal history of control-related problems in the city and the degree to which he was responsible for solving them (especially if contrasted with his rural experiences) would also contribute much to the explanation of the variance in perceived control over the environment.<sup>1</sup> The cost of undertaking (1) an improved survey with a census or snowball sample, (2) content analysis of related mass media, and (3) corroborative participant observation would require a substantial amount of time and financial resources.

The present study has determined which variables are directly and indirectly related to locus of control and family planning activity, and has substantiated the intervening function of communication. The next important step for research is to develop alternative models, or extensions of the one developed here, with improved methods in order to

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<sup>1</sup>Our attempts to measure resolution of past problems with a few short questions were largely unsuccessful in this study. Respondents were reluctant to divulge such information in the span of one, relatively short interview.

account for how exposure to the urban communication system effects the basic belief systems of rural-urban migrants.

### Implications for Family Planning Agencies

Government officials who are responsible for the planning and operation of family planning programs often express an aversion to research which "merely" describes or explains what is happening, but does not tell them exactly what to do to achieve their objectives. By "doing something" we mean knowledge about the points of access where one can intervene in the process to accomplish desired changes. This requires that variables be identified that officials can directly or indirectly manipulate in order to achieve planned objectives.

The present research design was not experimental, so we cannot say that by manipulating variable X (family planning knowledge) we have accomplished an increase in variable Y (family planning activity).<sup>1</sup> The path model does suggest, however, that if family planning knowledge did increase in this population, then there would be a subsequent increase in family planning activity. What the path model contributes is better knowledge about possible points of intervention and a guide for planning strategies for family planning campaigns. The main advantages of path analysis are (1) the estimation of the direct effect of each variable while controlling for the effect of other variables, (2) the specification of antecedent and intervening variables, and (3) the elimination of

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<sup>1</sup>In the discussion that follows it should be remembered that only male respondents were interviewed and that family planning activity was defined as a series of steps: (1) discussion of family planning with one's wife, (2) planning for future contraception, (3) use of contraceptive methods, and (4) use of more effective contraceptive methods, such as the pill or sterilization.

a large number of variables which do not significantly effect the process. Future family planning programs and campaigns should be designed to test experimentally the effects of variables in the model which are amenable to direct or indirect manipulation.

The model for locus of control and family planning activity that we have constructed with data from migrants to the periphery of Mexico City should be useful to anyone who plans to use the communication process to promote family planning practices in developing countries similar to Mexico. The results of this study are generalizable to a large proportion of the population of metropolitan Mexico City (the population of Ciudad Netzahualcoyotl is over 700,000). Furthermore, it is this type of sub-population of rural-urban migrants, swelling the cities of underdeveloped countries, that represents the greatest problem for population planners, and the greatest challenge to those responsible for family planning programs. The results of this study can probably be applied with some confidence to similar populations in other developing countries.

The main reason that communication receives so much attention by those who are responsible for solving the problems of over-population is that it represents something that they have some degree of direct control over and which can be used to accomplish changes in other factors related to fertility. The family planning official cannot do much about the demographic characteristics of his population, except perhaps over a very long period of time. Nor can he directly increase the population's knowledge about contraceptive methods or change the morality of birth control. He can, however, directly effect the communication process in order to provide greater information about family planning methods and to persuade the population that family planning is moral.

Specific policy recommendations based upon our model of family planning activity may be derived from each stage of the variables in the process. The demographic variables, for instance, are most useful for identifying target audiences. The path model suggests that promotional activities would have maximum impact upon two groups of potential family planning acceptors: (1) young people still in school who are more open to new ideas, and (2) older people who have already had the number of children that they desire. Perhaps the best strategy for young people would just be to keep them in school longer. The indirect effects of education upon all of the other important variables is indeed profound. Education directly effects the amount of knowledge about contraceptive methods. It is quite possible that a certain minimal level of education is necessary before some of the newer methods of family planning can be understood adequately. It is encouraging to note that once the indirect effect of age through family planning morality and number of children has been controlled that age actually has a direct negative effect upon family planning activity. In other words, once the effect of older migrants who already have larger families is removed, there is a tendency for younger migrants to engage in family planning activity. Once again, this effect may be due to the fact that younger migrants have better education today than do their older counterparts.

Three variables--family planning knowledge, morality, and size of childhood residence--suggest the specific themes that should be designed for communication campaigns. Basic knowledge of family planning and contraceptive methods is necessary before any method can be used properly. More educated migrants, possibly because of their greater knowledge and trust in modern medicine, are more apt to have learned of

contraceptive methods from doctors. The majority, however, have had to rely upon their friends and acquaintances for information (83 percent). The results show that this source of information is highly inadequate. The use of clinic field workers, or outreach workers, would greatly augment the medical profession as a source of family planning information. Poverty, tradition, and lack of trust probably will continue to discourage migrants themselves from getting more accurate information from doctors.

The fact that mass media played such an insignificant role in disseminating family planning information reflects the low level of public activity in family planning that currently exists in Mexico. Our data show that radio and television would reach the greatest number of people in this population. Eighty-six percent own radios, and at least sixty-one percent own televisions. Seventy-three percent of our sample had listened to the radio within the last two days, and sixty percent had listened the day before. Forty-four percent had watched television the day before the interview. These are encouraging figures considering that the respondents are male, and not at home during most of the day. Further studies should be undertaken to learn where receivers listen to the radio, and at which hours of the day. In metropolitan Mexico City, at least, family planning officials have the mass media available to reach a large proportion of their target audience with accurate information about family planning.

Although older migrants with more children might be more receptive to family planning at their stage in the life-cycle, whether or not they think birth control is moral will have a direct effect upon their decision to act. The morality of family planning should be one of the central themes for persuading this population to accept family planning.

Information campaigns should employ highly credible sources to counteract messages that question the morality of family planning. This might be done with an appeal to a higher level of morality, such as the responsibility for providing adequate care for children already born. The "responsible parenthood" theme used in the PATER campaigns of El Salvador is an example of this approach. It is imperative, however, that counter-attitudinal messages be used to overcome deep-rooted feelings of guilt that may be associated with birth control, and to provide an alternative set of values with which to support their efforts to control the conception of children.

An additional message for information campaigns is suggested by the direct relationship between size of the migrant's childhood residence and family planning activity. Something about urban childhood residence is conducive to family planning, and conversely, something about rural childhood residence discourages family planning. In our discussion we speculated that migration to, and residence in, urban areas was not enough to overcome earlier learning concerning the need for larger families in the rural economic sector. It may take a generation for the need for large-family security to disappear. Family planning communication might be able to change this attitude with messages designed to teach the economic structure of the city (versus the farm) in relation to the family. Specific themes would emphasize the greater utility (current market value and future security) in developing the skills and knowledge of a smaller number of children as opposed to increasing one's "army" of unskilled laborers. Many of these may only become a burden on the family in the city.

After all of the above variables have been considered, the promoter of family planning is faced with the fact that present knowledge of family planning methods is relatively poor in the population studied. The path model shows that the migrant's belief in internal control is one of the major factors effecting his acquisition of knowledge about contraceptives. Large public campaigns to promote family planning might prove futile if once exposed to information about family planning the migrant does not retain, or even attend to, the information because he just does not believe that he personally is capable of controlling the birth of his children. Specific themes related to the ability to control conception might have some effect, but it is the generalized belief in control over the environment that effects his level of information. The dissemination of this belief would enhance all efforts of national and personal development where individual action and responsibility is required.

Research should be undertaken to determine how education and newspaper exposure combine to foster a greater belief in internal control. Two possibilities were suggested: by creating and reinforcing this belief with specific themes, and by providing the individual with better conceptual tools and greater knowledge of the environment. This suggests that it would be advisable to stress internal control at lower levels in public education, and in radio and television. At the same time, both radio and television should go beyond their primary entertainment function and provide more instrumental information with which the receiver can solve control-related problems--jobs, housing, health, food, as well as family planning. The extent to which the individual believes that he can control his environment ultimately depends upon how well he actually

does control events in his environment that affect his welfare.

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APPENDIX A

APPENDIX A

Table 34. Items Used to Measure Locus of Control.

Paired Statements (Spanish Equivalent)	Difficulty Factor (% Correct)	Loading
1. Many of the bad things in life are due to bad luck. (Muchas de las cosas malas de la vida se deben a la mala suerte.) *Misfortune is due to the errors that people make themselves (Las desgracias se deben a los errores que ellos mismos cometen.)	86%	.35
2. Getting a good job depends upon good luck. (El obtener un buen trabajo depende de la buena suerte.) *Getting a good job depends upon hard work, luck has little to do with it. (El obtener un buen trabajo depende de que se trabaje mucho, la suerte no tiene nada que ver.)	80%	.54
3. It is not worthwhile to plan ahead because many things will obstruct them. (No vale la pena hacer muchos planes porque muchas cosas los estorban.) *With a lot of work we can accomplish the plans that we make. (Con mucho trabajo podemos llegar con seguridad a cumplir los planes que hacemos.)	79%	.30
4. *An intelligent person will get others to do what he wants. (Un tipo inteligente logrará que los demás hagan lo que él quiere.) Only a lucky person will get others to do what he wants. (Solo un tipo con suerte logrará que los demás hagan lo que él quiere.)	76%	.49
5. *What happens to one is due to oneself. (Lo que le pasa a uno se debe a uno mismo.) Sometimes we don't have enough control over what happens in life. (A veces no se tiene bastante control sobre lo que le pasa a uno en la vida.)	55%	.30

Table 34 (cont'd.)

<p>6. In order to progress in life, it is necessary to have influence with influential people (Para progresar en la vida, el tener influencia con las personas influyentes es necesario.)</p>	<p>67%</p>	<p>.21</p>
<p>*Progress is almost always obtained through one's own means and hard work. (El progreso casi siempre se consigue a base de medios propios y trabajar mucho.)</p>	<p>25%</p>	<p>.40</p>
<p>7. *Luck really doesn't exist. (La suerte realmente no existe.) For the most part people don't realize to what extent their lives are controlled by luck. (La mayor parte de la gente no se da cuenta hasta que punto sus vidas están controladas por la suerte.)</p>	<p>73%</p>	<p>.61</p>
<p>8. *The impossible can be obtained if one works hard enough. (Lo "imposible" puede lograrse si uno trabaja lo suficiente.) The impossible can only be obtained if one is very lucky. (Lo "imposible" solo puede ser logrado si uno tiene mucha suerte.)</p>	<p>42%</p>	<p>.43</p>
<p>9. To have a child is a thing of luck or God's will. (El tener un hijo es cosa de suerte o de la voluntad de Dios.) *Parents can control the birth of their children and plan when they are going to have them. (Los padres pueden controlar el nacimiento de los hijos y planear cuando los van a tener.)</p>	<p>90%</p>	<p>.45</p>
<p>10. *Above all, accidents on the job are due to careless actions. (Los accidentes en el trabajo se deben sobre todo al mal cuidado.) Above all, accidents on the job are due to bad luck. (Los accidentes en el trabajo se deben sobre todo a la mala suerte.)</p>		

Table 34 (cont'd.)

11.	Many times when one has a good opportunity to progress something gets in the way. (Muchas veces cuando uno tiene una buena oportunidad para progresar, algo se lo impide.)	59%	.36
	*When one has a good opportunity to progress nothing can get in the way. (Cuando uno tiene una buena oportunidad para progresar, nada se lo impide.)		
12.	*When great disasters occur, such as floods, draughts, or diseases, God can do very little, only man can do anything about it. (Cuando ocurren grandes desastres, como sequía, inundaciones, o enfermedades es muy poco lo que Dios puede hacer, sólo el hombre puede hacer algo.) When such disasters occur only God can help. (Cuando ocurren tales desastres solo Dios puede ayudar.)	38%	.43
13.	It is impossible for us to improve our situation . . . we can only keep things from getting worse. (Para nosotros es imposible mejorar nuestra situación . . . sólo podemos tratar de evitar que las cosas se vuelvan peor.) *We can improve our situation, even though sometimes we are not sure of achieving it. (Podemos mejorar nuestra situación aunque a veces no estemos seguros de lograrlo.)	77%	.29
14.	*It is important to plan ahead in life and not just accept what happens. (Es importante hacer planes para la vida y no solamente aceptar lo que venga.) To make plans only brings unhappiness, because plans are always hard to realize. (Hacer planes solamente trae infelicidad, porque los planes siempre son difíciles de realizar.)	71%	.40
15.	*If people paid attention to new medicines and good foods, they would surely live longer.	36%	.20

Table 34 (cont'd.)

(Si la gente le hace caso a las nuevas medicinas y alimentos buenos seguramente vivirían por más años.)

Each person has a designated time to live and when the time comes there is nothing that can be done to prolong his life.

(Cada persona tiene un tiempo destinado para vivir y cuando su momento llega no hay nada que se pueda hacer para prolongar su vida.)

16. \*I like to have a job in which I often have to make difficult decisions. .49

(Me gusta tener un empleo en el que muchas veces tengo que tomar decisiones difíciles.)

I like to have a job in which it is not necessary to make difficult decisions.

(Me gusta tener un empleo en el que no es necesario tener que tomar decisiones difíciles.)

17. What God does is going to determine what is going to happen and there is little man can do to control things.

(Lo que Dios hace determina lo que va a pasar y es muy poco lo que el hombre puede hacer para controlar las cosas.)

\*What God does does not determine all of what happens, therefore man can do a lot to control things too.

(Lo que Dios hace no determina todo lo que pasa, y por eso los hombres pueden hacer mucho para controlar las cosas también.)

50%

.38

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\* Items beginning with an asterick are oriented toward a more internal locus of control and received a score of 1; the others received a score of 0.

Note: The above statements were translated into English again by Ruben Jara, Department of Communication, Michigan State University.

## APPENDIX B

APPENDIX B: The Structural Models

The general theoretical model (see Figure 1) and the causal relationships which are made explicit for locus of control and family planning (see Table 22) may also be presented in formal, mathematical equations. Classical statistical techniques of multiple regression were used in the present study to estimate the parameters of the model. The resulting set of equations for the causal model is referred to as the structural model, and it is isomorphic with the path diagrams discussed in Chapter IV.

For purposes of illustration we can combine the variables used in the present study into five sets corresponding to the five stages in our hierarchical, causal model. It was assumed to be a recursive model in which the demographic variables (Stage I) are considered "exogenous," that is, predetermined. By letting the demographic set of variables be represented by  $X_1$ , the communication network variables by  $X_2$ , locus of control by  $X_3$ , family planning knowledge by  $X_4$ , and family planning activity by  $X_5$ , we obtain the following set of equations:

$$X_2 = b_{21}X_1 + e_2 \quad (1)$$

$$X_3 = b_{32}X_2 + b_{31}X_1 + e_3 \quad (2)$$

$$X_4 = b_{43}X_3 + b_{42}X_2 + b_{41}X_1 + e_4 \quad (3)$$

$$X_5 = b_{54}X_4 + b_{53}X_3 + b_{52}X_2 + b_{51}X_1 + e_5 \quad (4)$$

It can be shown that the path coefficients are identical to the partial regression coefficients (the b's) when the variables are measured in standardized form, or  $Z_i = (X_i - M_i) / \sigma_i$ , where  $X_i$  denotes

the  $i$ th variable in raw score form with mean,  $M_i$ , and standard deviation,  $\sigma_i$ .

Since no variable will ever be completely determined by its respective independent variables (if only because of measurement error), the concept of a residual (error) variable must be introduced.<sup>1</sup> In the model expressed in multiple regression form (equations 1-4), this source of variation is explicitly represented by "e." In the structural equations, or the path-analytic model, the residual variable may be represented by "R," and its path coefficient computed by using the coefficient of multiple determination:

$$P_{ia} = \sqrt{1 - R^2} \quad (5)$$

Using path coefficients corresponding to the standardized partial regression coefficients (standardized b's, or beta weights, and residuals corresponding to the error terms (the e's), the structural model for the path diagram can therefore be written as:<sup>2</sup>

$$Z_1 = p_{ia} R_a \quad (6)$$

$$Z_2 = p_{21} Z_1 + p_{2b} R_b \quad (7)$$

$$Z_3 = p_{32} Z_2 + p_{31} Z_1 + p_{3c} R_c \quad (8)$$

$$Z_4 = p_{43} Z_3 + p_{42} Z_2 + p_{41} Z_1 + p_{4d} R_d \quad (9)$$

$$Z_5 = p_{54} Z_4 + p_{53} Z_3 + p_{52} Z_2 + p_{51} Z_1 + p_{5e} R_e \quad (10)$$

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<sup>1</sup>See Chapter III for the discussion of residual variables in causal models.

<sup>2</sup>In the path diagrams of Chapter IV,  $R_a$  and  $R_b$  as shown in equations 6 and 7 were omitted, and the last three residuals were re-lettered consecutively, beginning again with a.

To estimate the parameters for the structural model and path diagram, the stepwise least squares program (LSSTEP) available at Michigan State University's Computer Institute for Social Science Research was used. In the first phase of analysis, family planning activity ( $Z_{31}$ ) was regressed upon all variables at previous stages in the conceptual model ( $Z_1$  to  $Z_{30}$ ). The LSSTEP program chose for inclusion in the equation only those variables which seem to be most significant. To obtain the "best" relationship (i.e., "best" set of predictors), the set of independent variables is divided into three groups:

- (a) Independent variables which the user requires to be included in the final equation,
- (b) Independent variables which should begin in the equation, but which may be deleted by the LSSTEP if they become statistically insignificant after the inclusion of other variables, and
- (c) Independent variables which do not begin in the equation but which may be added by the LSSTEP program.

For the analysis of the data from the present study, the first group (a) of independent variables was empty. Hence, no variable was automatically retained in the equation. Only locus of control ( $Z_{27}$ ) was initially included in the second group (b), because of its central importance to the general theoretical scheme. However, if after the inclusion of other variables locus of control became statistically insignificant at the .05 level, it would be removed from the equation (group b) and placed in group (c). This procedure is adequately described by the LSSTEP program description:<sup>1</sup>

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<sup>1</sup>From the LSSTEP Program (part 12), Preliminary Documentation,

The LSSTEP program calculates the significance probability of the F statistic for the least squares coefficient of a variable to determine whether or not it should be deleted from or added to the equation. The variable in group B with the largest significance will be deleted if its significance is greater than or equal to a user specified significance level . . . If deleted, the variable would then be considered part of group C.

If no variable in group B is selected for deletion in a particular step, LSSTEP looks at the variables in group C. The variable in group C with the smallest significance will be added to the equation if its significance is less than a user specified significance level . . . If added, the variable would then be considered part of group B.

The above process is repeated at each step. The step-wise procedure is terminated when no variables in group B meet the deletion criteria and no variables in group C meet the addition criteria.

Thus, the existence of a path arrow in the path diagram means that the relationship between the two variables was significant at the .05 level, controlling for the effect of all other variables which also lead directly into the same variable. Where only one independent variable was significantly related, the corresponding path coefficient is equivalent to the zero-order correlation coefficient.

The final structural model was developed by regressing each variable upon all variables at previous stages in the hierarchy (see Table 22). The communication network variables (Stage II) were excluded from further analysis if they were not found to be significantly related to locus of control (Stage III), or family planning variables (Stages IV and V). Such relationships were not considered relevant to the

primary task of constructing a model for locus of control and family planning.

This procedure eventually yielded the following structural model, isomorphic to the path diagrams presented in Chapter III:

Stage I: The Demographic Variables<sup>1</sup>

$$Z_1 = P_{1j}R_j \quad (11)$$

$$Z_2 = P_{2j}R_j \quad (12)$$

$$Z_5 = P_{5j}R_j \quad (13)$$

$$Z_6 = P_{6j}R_j \quad (14)$$

$$Z_7 = P_{7j}R_j \quad (15)$$

$$Z_8 = P_{8j}R_j \quad (16)$$

Stage II: The Communication Network Variables

$$Z_{11} = .14Z_2 + .99R_j \quad (17)$$

$$Z_{15} = .27Z_2 + .30Z_1 + .87R_j \quad (18)$$

$$Z_{17} = .14Z_1 + .99R_j \quad (19)$$

$$Z_{23} = .45Z_1 + .89R_j \quad (20)$$

Stage III: Locus of Control

$$Z_{27} = .26Z_{23} + .26Z_{15} + .17Z_{11} - .22Z_7 - .33Z_6 + .82R_a \quad (21)$$

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<sup>1</sup>Variable numbers correspond to those used in Table 22, and the letter "j" refers to residual variables, 1 to 12, which were omitted from the path diagrams for lack of space.

Control Variables for Stage IV and Stage V

$$Z_{28} = .17Z_{15} - .14Z_7 + .97R_j \quad (22)$$

$$Z_{29} = .20Z_1 + .98R_j \quad (23)$$

Stage IV: Family Planning Knowledge

$$Z_{30} = .24Z_{29} + .30Z_{27} + .17Z_1 + .85R_L \quad (24)$$

Stage V: Family Planning Activity

$$Z_{31} = .27Z_{30} + .31Z_{28} + .12Z_{17} + .26Z_8 - .20Z_7 + \\ .15Z_5 + .82R_C \quad (25)$$

## APPENDIX C

APPENDIX C. Questions Used to Measure the Interpersonal Communication Network Variables

SECCION III

1. A veces todo simplemente parece ir mal de repente en la vida de una persona. Parece como si uno no tuviera bastante control sobre lo que pasa. A todos nos pasan cosas desagradables que a veces no podemos evitar. ¿Qué tipo de cosas como esas le han pasado a usted?

ENTREVISTADOR: SI NO LE ENTIENDE, NI RESPONDE, ENTONCES LEA LOS EJEMPLOS SIGUIENTES:

Por ejemplo, tiene problemas en el trabajo o en la casa. Las cosas van mal en la casa o con la familia. Otras personas pueden hacerle a uno cosas que uno realmente no quisiera hacer. ¿Qué cosas como esas le han pasado a usted? Quisiera que me señalare los principales problemas de ese tipo que usted tiene o ha tenido.

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2. ¿Con qué frecuencia le pasan a usted cosas (problemas) como esas (esos)?

Siempre	1
Frecuentemente	2
De vez en cuando	3
Raras veces	4
Nunca	5

3. ¿Qué tan importante es para usted el poder controlar cosas (problemas) como esas (esos) en su vida, para que pueda evitarlas (os)?

Ninguna importancia	1
Más o menos importante	2
Muy importante	3

ENTREVISTADOR: SOLO LOS NOMBRES, NO SE NECESITAN APELLIDOS--SON MAS CONFIDENCIALES. ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16

4. ¿Ha platicado usted con algunas personas, con el fin de conseguir consejo o información que le ayuden a resolver estos problemas?

SI	1	
NO	2	S. A P. 5

SI CLAVE "1", PREGUNTE:

4a. ¿Con quiénes? ANOTE NOMBRES EN LA HOJA NUM. 16

5. ¿A quién conoce usted que haya logrado controlar con éxito problemas o cosas como esas, para evitar que pasen?

ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16

6. ¿Qué tan importante es para usted el mejorar su nivel de vida... por ejemplo, tener una mejor casa, mejor trabajo, etc.?

Ninguna importancia	1
Más o menos importante	2
Muy importante	3

7. ¿ Con quién ha hablado sobre como puede mejorar su nivel de vida?

ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16

8. ¿Conoce a alguien que haya tenido éxito en mejorar su nivel de vida con su propio esfuerzo? ¿A quién?

ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16

9. ¿Cuál cree usted que sea el número ideal de hijos que un matrimonio deba tener?

Número _____	1
No sé	2
Los que vengan	3

10. ¿Qué tan importante es para usted el planificar el tamaño de su familia, es decir controlar el número de hijos que va a tener?

Ninguna importancia	1
Más o menos importante	2
Muy importante	3

11. ¿Ha platicado con su esposa alguna vez sobre planificación familiar?

SI	1
NO	2

12. ¿Con quién ha platicado sobre planificación familiar, aparte de su familia?

ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16

13. ¿A quién conoce usted que haya sabido controlar con éxito el número de hijos que quieren tener?

ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16

14. ¿Quiénes diría usted que son los 5 amigos con los que usted platica más frecuentemente?

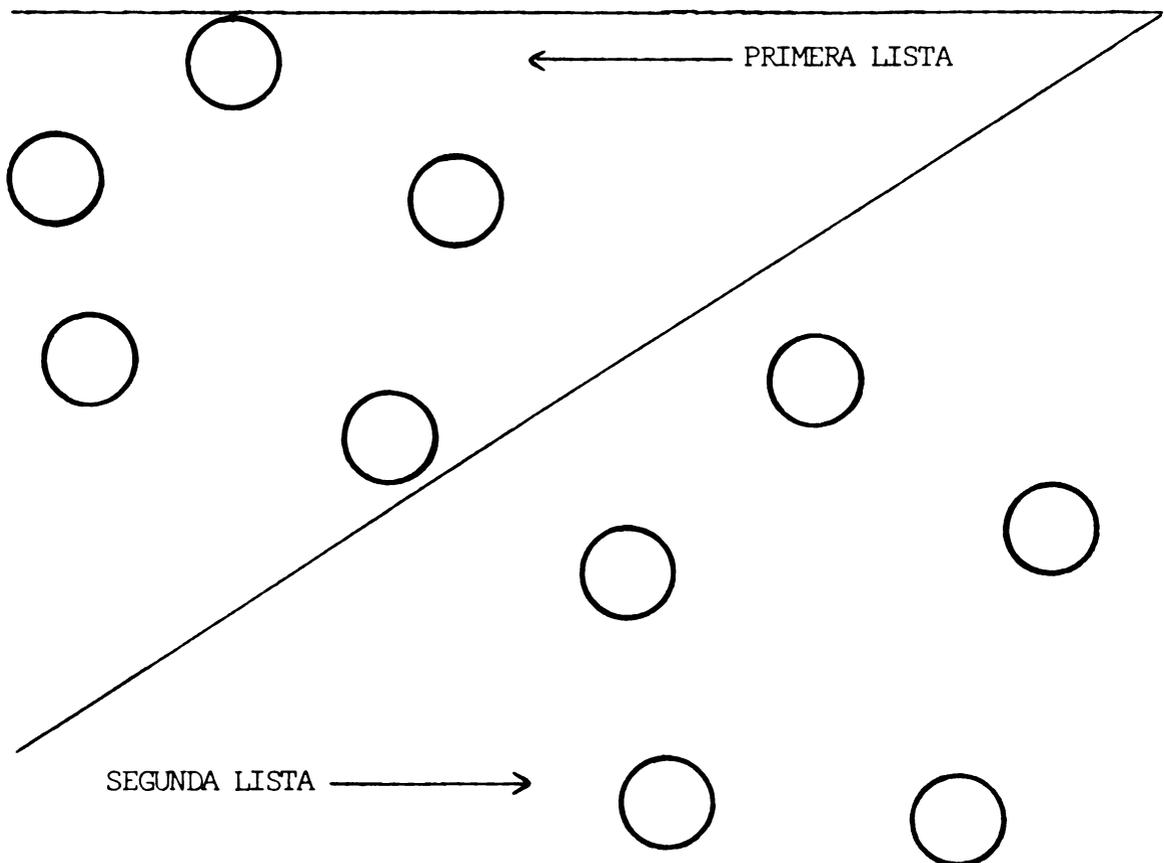
ESCRIBA LOS NOMBRES EN LA HOJA NUM. 16 SEGUNDA LISTA



RELACION DE PERSONAS CON QUIENES HABLA  
EL ENTREVISTADO

## INSTRUCCIONES:

1. De la primera lista de personas, anote los 5 nombres con quienes el entrevistado habla más frecuentemente. (Hoja Núm. 16)
  - 1a. Anote los nombres de la segunda lista de la Hoja Núm. 16 en la segunda tabla de círculos.
2. Uno por uno, pregúntele si cada persona en el círculo:
  - a) Es buen amigo de los otros.
  - b) Conoce a los otros, ó.
  - c) No conoce a los otros.
3. Sí ...
  - a) Dibuje una línea sólida entre los dos.
  - b) Dibuje una línea punteada entre los dos.
  - c) Deje en blanco.



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