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LITERACY TRAINING AND MODERNIZATION:
A FIELD EXPERIMENT

By

William A. Herzog, Jr.

Technical Report 3
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in Rural Societies

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International Development

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Department of Communication
Michigan State University
East Lansing, Michigan

PREFACE

This publication is one in a series of technical reports dealing with the diffusion of innovations in Brazil, Nigeria, and India. They describe research results from a U.S. Agency for International Development-sponsored research project, conducted by the Department of Communication at Michigan State University. Two previous technical reports, which were also published in a very limited number of copies because they are aimed primarily for a scientific audience, are:

1. Gordon C. Whiting, Empathy, Mass Media, and Modernization in Rural Brazil, Technical Report 1, Project on the Diffusion of Innovations in Rural Societies, Department of Communication, Michigan State University, East Lansing, Michigan, 1967.

2. Dharam P. Yadav, A Comparative Analysis of Communication Structure and Innovations Diffusion in Two Indian Villages, Technical Report 2, Project on the Diffusion of Innovations in Rural Societies, Department of Communication, Michigan State University, East Lansing, Michigan, 1967.

In the present report, Dr. Herzog seeks to answer two main questions: (1) are the relatively more modern peasants drawn to adult literacy training programs, and (2)

does participation in such a literacy program lead to greater modernization? While his general answer appears to be "no" to both questions, there is much more to the story.

One of the strengths of the present inquiry is its use of a field experimental approach, a kind of research design that is ideal for determining the time-order among variables. Actually, we have very few field experiments in less developed countries, and almost none that deal with adult literacy and its consequences. In fact, while volumes have been written about how to teach literacy, almost no study is focused upon scientifically probing "its meanings."

The author was associated with the Brazil portion of the Diffusion Project from its initiation until it was well along in Phase III. He is acquainted with many of his respondents, their communities, and the socio-cultural environments in which the study was done.

The present report is almost entirely based on data from Phases I, II and II-2 of the Brazil operations, and parallels closely the author's Ph.D. dissertation.

Everett M. Rogers
Professor of Communication
and Project Director

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Chapter I

THE PROBLEM IN ITS CONTEXT

The illiterate person is a weak link in the whole chain of development. He is the person who is "outside public affairs." This is not only a personal tragedy for the individuals concerned, who are not just ciphers, but men and women whose dignity and human rights must be respected; it is also, for the nations affected, an economic straight-jacket which must be shed if true progress is to be made.
(UNESCO, 1963, p. 37)

Introduction

It is not difficult to document the importance of literacy in the process of modernization and development. We are approximately at the midpoint of the time period which the United Nations declared a "Development Decade," during which governments and specialized agencies declared war on disease, hunger, ignorance, and poverty. A major target of this war is the almost 50 percent of the world's adult population which cannot read and write.*

The problem was heavily underscored by the recent Encyclical Letter of Pope Paul VI:

*The fact that UNESCO has modified its strategy, urging a selective rather than a global attack on illiteracy, in no sense indicates a diminishing of the severity of the problem; see Spaulding, 1966.

Indeed, hunger for education is no less debasing than hunger for food: An illiterate is a person with an undernourished mind. To be able to read and write, to acquire a professional formation, means to recover confidence in oneself and to discover that one can progress along with others. As we said in our message to the UNESCO congress held in 1965 at Teharan, for man literacy is 'a fundamental factor of social integration, as well as of personal enrichment, and for society it is a privileged instrument of economic progress and of development.'

(Pope Paul, 1967, p. 24)

To complicate matters, it is precisely in the areas where illiteracy rates are highest (parts of Africa, Asia, and Latin America) that development lags farthest behind the rest of the world. Here we find lowest per capita income rates, most rapid increases in population, and least developed systems of communication and transportation. Illiteracy is a part of the vicious cycle that hobbles underdeveloped nations: without literacy, special skills cannot be taught; without special skills, agriculture cannot be modernized or industry developed; without a modernized agriculture and industry, production and income will not increase; without income, there are no resources to develop education and literacy. Literacy is viewed as a possible input to alter the inertia of the system and break out of the cycle.

A campaign against illiteracy should not be something isolated, but should be integrated into a programme of continuing adult education and into the total educational programme. It should also be integrated with the development programmes of the countries concerned, since it is closely linked both to productivity and to the process of adaptation to a changing world.

(UNESCO, 1963, p. 53)

The importance of literacy is further substantiated by a growing body of empirical research. At the aggregate level, the relationships between literacy and development are impressive. Schramm, for example, compared 104 underdeveloped countries with 33 countries from the developed areas of the world. He noted that 76 percent of the underdeveloped countries have literacy rates below 50 percent while 85 percent of the developed nations rank above the 75 percent literacy level (Schramm, 1964, p. 25). High correlations are consistently found between literacy and such indices of modernization as urbanization, per capita income, and mass communication indicators.*

Problem

At the level of the individual, researchers also find significant relationships between literacy and a number of variables considered crucial to the modernization process such as empathy, achievement motivation, innovativeness, political knowledge, mass media exposure, etc.** Literacy appears to play an important role in the modernization of individuals. However, as far as the present author's literature search indicates, the research evidence

* See Banks and Textor (1963); Russett and others (1964); and Merritt and Rokkan (1966).

** Studies which have used individual literacy as the unit of analysis include Lerner, 1958; Doob, 1961; Spector and others, 1963; Mendez and Waisanen, 1964; Rogers and Herzog, 1966; Wright and others, 1967.

has been of a correlational nature, derived from ex post facto research designs. This precludes time-ordered or causal statements about the direction of the relationships. Doob (1961) acknowledged this problem in reporting his research among literate and illiterate Nigerian villagers.

With this approach [after-only design] it is not possible to determine the cause-and-effect sequence that produced the tendencies. If the guiding hypothesis is valid, then it is possible that becoming literate increases people's alertness because they have access to more media of communication and perhaps to better jobs in the Western sense; and yet it is also probable that the more alert people of the community responded to the opportunity to attend the literacy classes. Or perhaps both sequences occurred: the initially more alert became literate and, then, having become literate, they could become still more alert.

(Doob, 1961, p. 178)

The central problem, then is: what is the effect on an individual of becoming literate? As implied by Doob, this is really a two-part question: who becomes literate, i.e., what are the differences between those who enroll in literacy programs and those who do not? And, what changes occur in an individual as a result of exposure to a literacy training program?

Objectives

It is the purpose of the present study to examine the direction of the relationship between literacy and certain key modernization variables. A before-after research design will be used, with a literacy training

program providing the intervening treatment. The objectives* of the present study include:

1. Development of data on the effects of a literacy training program which will permit causal statements about the relationships between literacy and such modernization variables as:
 - a. Empathy
 - b. Achievement motivation
 - c. Cosmopolitaness
 - d. Mass media exposure
 - e. Political knowledge
2. Comparison between individuals who seek literacy and those who ignore it, when such training is made available in a community, on such modernization variables as empathy, achievement motivation, cosmopolitaness, mass media exposure, and political knowledge.

Thus we are talking about literacy in two different senses. As an independent variable, literacy means "literacy training." We ask the question, "does literacy produce an increase in individual levels of empathy, achievement

* A third type of analysis had been planned which would compare individuals who complete a literacy training program with those who "drop out" during the program. Because of delays in getting the literacy program underway, as explained in Appendix B, there was not a sufficient number of "drop outs" from the program to permit statistical testing of differences.

motivation, cosmopolitanness, mass media exposure, and political knowledge?" As a dependent variable, literacy means "literacy-seeking behaviors," i.e., whether a non-literate enrolls in a literacy training program when it is offered in the community. The question here is, "do individual differences in levels of empathy, achievement motivation, cosmopolitanness, mass media exposure, and political knowledge predict literacy-seeking behaviors?"

This reversal of independent and dependent roles for our variables leads to the question of causality. We speak of an independent variable as a "predictor" of the dependent variable. Often there is the tendency to consider the independent variable as "causing" or "forcing" the dependent variable. Blalock (1961) gave what he calls a "working definition" of a direct causal relationship.

We first assume that all other variables explicitly included in the causal model have been controlled or do not vary. Making the additional assumption about outside variables, we shall then say that X is a direct cause of Y if and only if a change in X produces a change in the mean value of Y. The notion of "all relevant variables being held constant" now has a definite meaning, since we are considering a finite and explicitly formulated list of such variables.

(Blalock, 1961, p. 19)

Blalock also pointed out that it is never possible, in the strictest sense of the word, to empirically test causal laws inasmuch as we can never be sure that we have identified all the relevant variables (1961, pp. 13-14). This problem is especially acute in the social sciences,

as human behavior is perhaps more complex and the relevant variables are more difficult to locate and define than in the biological or physical sciences.

For this reason, Zetterberg (1954) advocated speaking of "interdependent relationships," where one hypothesizes not a one-way relationship between two variables, but an interaction.

Let Δx and Δy be small increments in variables x and y respectively. An interdependent relation is present when the following conditions are met:

if x changes from x_1 to x_2 , and $x_2 = x_1 + \Delta x$, then and only then y changes from y_1 to $y_1 + \Delta y$; further, when y changes from y_1 to y_2 and $y_2 = y_1 + \Delta y$, then and only then x changes from x_2 to $x_2 + \Delta x$, etc.

Thus, in an interdependent relation, a small increment in one variable results in a small increment in a second variable; then, the increment in the second variable makes possible a further increment in the first variable, which in turn affects the second one, and so this process goes on until no more increments are possible.

(Zetterberg, 1954, pp. 72-73)

It is in this sense that we will hypothesize, for example, that persons who are high in empathy will be more likely to seek literacy training, than those who are low; these persons, as a result of literacy training, will become even more empathic. Thus for one set of hypotheses, literacy will be considered a dependent variable to be predicted by a set of independent (modernization) variables. In a succeeding set of hypotheses, literacy will be considered the independent variable, which predicts

the dependent variables. This implies causality to the extent that we consider the relationship to be interdependent.*

Methodology**

Data were collected in five rural communities of Minas Gerais, Brazil. Four of these communities had been randomly assigned to a literacy treatment and one to a control condition as part of the experimental design for a larger study of communication of agricultural information.

An interview schedule was designed and pre-tested. Pre-treatment measures on empathy, achievement motivation, cosmopolitanism, mass media exposure, political knowledge, literacy, as well as on control variables were collected in July, 1966. University students were trained in interviewing techniques and served as interviewers. Data were coded at Project headquarters in Brazil, transferred to data sheets and sent to the U.S. for computer processing. Pre-treatment measures also provided the data for comparisons

*This coincides with Lerner's position. "The theoretical basis of this paper is the proposition that modernity is an interactive behavioral system. It is a 'style of life' whose components are interactive in the sense that the efficient functioning of any one of them requires the efficient functioning of all the others. The components are behavioral in the sense that they operate only through the activity of individual human beings. They form a system in the sense that significant variation in the activity of one component will be associated with significant variation in the activity of all other components" (Lerner, 1963, p. 329).

**A more complete description of the methodology of the present thesis is contained in Appendix A.

between individuals who enrolled in a literacy program when it was offered in a community and those who did not.

Arrangements were made with the Radiophonic School, a department of the Secretary of Education of Minas Gerais to administer literacy training programs in the four literacy communities.* This was accomplished through tape recorders and taped instructional materials, with monitors supervising the classes in each of the communities. Contacts were made in each of the communities, beginning in October, 1966, for the purpose of selecting monitors and stimulating enrollment in the literacy classes. A number of problems delayed the start of the literacy classes. In February, 1967, a one-week training program was held to prepare two monitors from each community in the use of materials and administration of the classes. Classes began in the communities in late April, 1967, approximately six months behind schedule.

In June, 1967, a post-treatment interview schedule was developed and pretested. University students were again trained and used as interviewers for the data-collection. Field work was carried out during the first part of July, 1967. Interview schedules were coded and data punched into IBM cards. Data were analyzed by electronic computer at Michigan State University.

*Appendix B provides a more detailed account of the literacy training program.

Chapter II

WHAT IS LITERACY?

Literacy is not just learning to read but is concerned with comprehending a form of reality beyond immediate experience.
(Powdermaker, 1962, p. 228)

Literacy as a Capacity to Process Information

Literacy is a key which can unlock for its holder a storehouse of knowledge related to modernization. We can call this the simple, or obvious, effect of literacy. It determines input of information. If a person is not literate, he cannot process print information. In fact, we can think of the person as an information-processing system. To use computer analogy, at some branching point in the system, there is a set of instructions which reads: "If literate, go to L_1, L_2, \dots, L_n , where L_n is a finite number of levels of ability to process written information; if not literate, terminate program." In this sense, becoming literate means increasing the capacity of the system to process information. The system can handle a greater number of communication channels, or inputs.

It is at this level that we argue about the cost-benefit ratio of literacy in its economic contribution to

development (see, for example, Fliegel, 1966, Blaug, 1966). Literacy is a means of getting general information to people, increasing their productivity, facilitating technical and vocational training, etc. The cost and impact of literacy programs can be compared with other means of accomplishing these same purposes, i.e., use of change agents, radio forums, etc.

Literacy as "More than an Ability to
Read"

But it is the major proposition of this study that the increase in information-processing capacity is only one effect of literacy. We will cite a body of research and argue a theoretical position which maintains that literacy has more profound consequences for the cognitive structure and communication behavior of individuals.

Lerner (1958), perhaps most dramatically, singled out the role of literacy in the modernization process. In essence, he asked the question: What part does literacy play as people move from a traditional to a modern outlook on life? He noted that, at the national level, a joint, interacting growth in urbanization, literacy, mass media participation and political participation accompanies the change process. Urbanization moves people to the cities where literacy becomes more essential and more readily acquired. Literacy stimulates growth of the mass media, and as the media develop, there is more incentive for people to

become literate. Literacy and the mass media provide the channels through which political knowledge passes, facilitating a broad-based political participation. As Lerner speculated about this sequence, he reached two conclusions about literacy: (1) it is the basic personal skill that underlies the whole process; and (2) with literacy, comes more than "the simple skill of reading" (Lerner, 1958, pp. 63-64).

Lerner maintained that the act of learning a formal language provides training in vicarious thinking; that, beyond the ability to read and write, literacy produces a capacity to rethink one's role. It is this capacity to think of oneself in another role (Lerner's concept of empathy) which is the basic disposition toward modernization.

Lerner's views on literacy have found support from a number of other social scientists. Frey (1964) was concerned with the development of political attitudes and awareness among Turkish peasants. He noted that the strong relation between literacy and political attitudes persisted even when the effects of such variables as sex, mass media exposure and ethnocentricity were controlled. His conclusion was similar to Lerner's.

The findings suggest that perhaps the psychic impact of literacy in this political realm consists of more than merely permitting and inducing increased exposure to any or all of the mass media.

(Frey, 1964)

Lerner and Fréy's data came from samples in Near East countries. Doob (1961) found similar evidence of literacy effects among African villagers. He noted, as practical results of literacy, that (1) it removes the disadvantage which he (the African villager) finds himself in coping with the modern world and its written manifestations; (2) morale improves with the discovery that he, too, can learn to read and write; and (3) literacy produces a change in status--the ability to read is the mark of a "civilized" man (Doob, 1961, p. 174). In two separate studies, comparing male Hausa literates and illiterates, Doob found support for a hypothesis that "literacy is positively correlated with behavior, knowledge, or attitudes suggestive of alertness" (Doob, 1961, pp. 175-178). While not stated in so many words, Doob's research supports the notion that literacy has effects beyond learning to read and write.

Three research projects from Latin America offer additional confirmation for a "more than reading" hypothesis. Mendez and Waisanen (1964)* found significant positive relationships between literacy and the value of time, change orientation, levels of aspiration, ability to generalize, and attitudes toward modernity. They pointed out that one of the requirements of a modern social system

* See also Lassey and others (1965) for another report from these data.

is an ability to deal with one's environment symbolically. Whereas in a traditional social system the symbol is the master of the man, in a modern social system man has learned to master the symbol. By mastering the symbol, he is in a position to understand and re-order the system and his relationship to it. Mendez and Waisanen find themselves in agreement with Lerner that literacy is the basic skill required to master symbols.

Rogers and Herzog (1966) utilized data from interviews with farmers in five Colombian communities. They found positive relationships between literacy and a number of variables considered characteristic of a modern orientation: mass media exposure, empathy, agricultural innovativeness, achievement motivation, cosmopolitanness, and political knowledge.

Wright and others (1967), in studying the impact of a literacy program among Guatemalan Indians, developed a literacy interest test. Respondents were shown eight pictures and asked to describe what was happening in each. Responses were scored on dimensions labelled psychological functioning, empathy, and achievement motivation. Because of high intercorrelations among the three scales, they were combined to form a "psychological functioning" score. Literates performed significantly better than illiterates on the test in both experimental and control villages, as well as in overall comparison (Wright and others, 1967, pp. 99-101).

Thus from three areas of the world currently in the throes of modernization--the Middle East, Africa, and Latin America; from quite different populations of study; and from varying theoretic approaches, a common implication emerges: literacy is more than an ability to read and write. Literacy appears to have basic effects on processes which manifest themselves in more modern attitudes and behaviors.

Reading experts, in the education field, have noted the cognitive impact of literacy. Gray (1940) spoke in broad terms of the effects of learning to read in broadening one's outlook, deepening his understanding, changing his behavior, and stimulating his emotional and intellectual growth.

. . . Reading is a highly complex activity including various important aspects such as recognizing symbols quickly and accurately, apprehending clearly and with discrimination the meanings implied by the author, reacting to . . . ideas . . . and integrating them into definite thought and action patterns.

(Gray, 1940, pp. 30-31)

One is tempted to call this a "panacea theory" of the effects of literacy. Nevertheless, we believe that Gray was close to the basic meaning of literacy when he referred to the skill in recognizing, reacting to, and integrating symbols. Gates (1949) took a similar position to Gray, but again we observe an eclectic impact attributed to learning to read.

It can and should embrace all types of thinking, evaluating, judging, imagining, reasoning, and problem-solving. Indeed, it is believed that reading is one of the best media for cultivating many techniques of thinking and imagining (Gates, 1949, p. 3).

This exuberance in describing effects of reading bothered Fries (1963), a Linguist. He maintained that while such abilities as understanding, thinking, reflecting, imagining, evaluating and analyzing may be stimulated through a reading program, they are functions of the use of language itself and not just products of a reading ability. Each of these abilities can be, and has been, developed in persons who could not read. He argues that one receives oral messages through the stimulation of the nervous system by sound vibrations. In receiving a written message, the same set of language signals stimulate the nervous system except that transmission is via light vibrations through the eye.

The message is the same; the language code is the same; the language signals are the same for both "talking" and "reading".

(Fries, 1963, pp. 118-119)

The only difference, according to Fries, is that in talking, sound waves stimulate the nervous system through the ear, while in reading, light waves stimulate the nervous system through the eye.

While Fries may have valid reasons for his objections to the sweeping claims of the reading experts, we believe he errs in the opposite direction in ignoring any psychological effects from learning to read. We would argue, first

of all, that Fries errs in equating message with meaning. A message can have objective existence--a set of language signals (or symbols). One may use the same set of symbols for "talking" as for "reading." But "meaning" is the subjective interpretation of those symbols by the receiver. Thus, the meaning of a message received by the ear is not necessarily the same as a similar set of symbols transmitted through the eye for, at least, the reason that perception of sound is different from perception of sight. To the extent that the kinds of stimuli that accompany and compete with the symbols are different for sound and sight, interpretation of the message will be different. Indeed, the whole thrust of McLuhan's thesis, that "the medium is the message," argues that the psychological impact ("meaning") of a message is differentially related to the channel by which the message is transmitted (McLuhan, 1964, pp. 7-21).

A further point overlooked by Fries (nor has an adequate discussion been discovered elsewhere by the present author) is that literacy (reading and writing) more than any other type of information transfer, permits a personal adaptation in manipulation of the symbols. That is, in face-to-face communication, and more so with messages from electronic media, the receiver is obliged to receive and process symbols at a rate governed by the source. (In face-to-face communication he can ask to have a message

repeated or delivered at a slower or faster rate.) But with literacy, he best acquires a "feel" for the symbol. He can actually process it at his own pace, at a rate commensurate with his own comprehension and ability. He can, in effect, interrupt the communication process at any point for a more thorough scrutiny of the symbols involved. Or, he can scan the message rapidly, selecting out key symbols from which he decodes his meaning. So we would argue further that a written message can be processed at different rates than a spoken message and may, for that reason, have a different "meaning."

Carothers (1959), a psychiatrist, reported a psychological impact of literacy among rural African tribes. He noted that in non-literate societies, no clear distinction is made between thought and reality (a finding which parallels Piaget's research on the early stages of child development). The spoken word is much more closely identified with reality for the non-literate and has, what Carothers termed, a "magic power." What is heard and what is spoken is more important for the rural African than what is seen. The ear is the main receiving organ; the eye is more an instrument of the will. This world of "magic power" passes away when man's attention becomes focused on the more objective visual world. The effect of literacy is to stimulate a shift from an oral-dominant to a visual-dominant message receptivity. When words are written they

become part of the visual world and lose the dynamic quality of the spoken word, becoming, in effect, more impersonal.

By and large, however, it is clearly far more easy for words, when written, to be seen for what they are-- symbols--without existence in their own right.

(Carothers, 1959, p. 311)

We agree with Carothers that the ability to see a symbol in written form, and thus to be able to conceive of it as separate from its referent, has important cognitive significance.*

A somewhat similar line of argument was developed by McLuhan who speaks of literacy as an alteration of the ratio of sense inputs. The introduction of any communication technology (such as the printed word or the electronic media) brings about a change of inputs to the senses. Literacy has the effect of increasing the visual input and comparatively lowering the amount of audio input (McLuhan, 1962, p. 24).

Carothers and McLuhan seem to offer a further reply to the Fries position. Even if the effect of a given

* A separate issue is whether the word always loses its "magic power" when it appears in printed form. The studies of radiophonic literacy programs, conducted in Honduras and Salvador, indicated that new literates tend to regard anything seen in print as absolute truth. Inasmuch as the literacy programs were church-sponsored, this unquestioning acceptance may result from beliefs regarding ecclesiastical authority (Rhoads and Piper, 1963, p. 50). On the other hand, Pool observed that, in traditional societies, traditional media are more effective because "word-of-mouth is more trusted than the written word, that word-of-mouth everywhere is an essential stimulus to action, that it is more adaptable to the variations in style and manner which are so particularly important in a dual and transitional society" (Pool, 1963, p. 247).

message is similar, whether transmitted by the oral or the visual channel (which we doubt), there is still a cumulative effect on the individual and on the society when messages that have been traditionally transmitted via the oral channel are transferred to a visual channel. Furthermore, the ability to physically see the symbol has an effect on the way in which the individual perceives the symbol-referent relationship.

Literacy and Symbol Manipulation

We suggest that the underlying motif that runs through the work of Lerner, Frey, Mendez and Waisanen, Carothers, and McLuhan is that literacy alters the individual's perceptions of the symbol-referent relationship. The Sapir-Whorf hypothesis points out the fundamental relationship between language and thought (Whorf, 1956, pp. 134-159). Briefly it says that the language a person speaks, its available vocabulary, structure, etc., determines the way the person perceives his "reality." The symbols of the language structure thought, and thought involves manipulation of language symbols. Thus, we think about things by constructing mental patterns of the symbols which refer to those things.

We have cited Carothers' (1959) finding that in the non-literate society there is no clear distinction between thought and reality. As La Barre (1954) stated it, "Symbols

are always insisting that they are the essence of reality" (La Barre, 1954, p. 171). If non-literate thought patterns are such that symbols are, in effect, equated with the thing (or referent), it puts grave restrictions on the non-literate's ability to manipulate the symbols. Consequently, the extent to which the non-literate can manipulate the referents in his environment is limited. He has always done things a certain way; therefore he cannot conceive of doing them another way. For the non-literate, action precedes (or delimits) thought.

We argue that the effect of literacy is to liberate the symbol from the thing--its referent. Literacy is not the only means by which this may be accomplished, but it provides the most concrete demonstration that the symbol is independent of its referent. With the symbol liberated from the referent, it becomes possible to manipulate the symbol independently of its referent. It is now possible to conceive of relationships between symbols independent of the relationships between their referents. Even though an individual cannot do a thing, he can symbolically conceive of the possibility of its being done. Thought now precedes action. The literate manipulates the relationships of his environment symbolically, conceives of possibilities for new relationships, and is better prepared to develop and accept the new relationships which modernization brings.

Literacy Defined and Measured

One of the problems in interpreting data which relate literacy to modernization is the lack of standardization of definitions. Much of the aggregate analyses of literacy is based on census data, where definitions vary from asking the respondent whether he can read or write, to requiring six years of schooling before a person is considered literate.* A 1951 definition, proposed by UNESCO (1963), considered a person literate who could read and write a simple sentence, with understanding. A 1962 UNESCO definition was considerably more stringent and brought in the notion of effective functioning in the community, relating literacy to a set number of years of elementary schooling (UNESCO, 1963, p. 39). Of those studies in the social sciences which have defined literacy, most, if not all, have offered functional or operational definitions. de Young and Hunt (1962) defined literacy as "the ability to read and comprehend enough of what is read to pass this comprehension on to others." Rogers and Herzog (1966), defined functional literacy as "the ability to read and write adequately for carrying out the functions of the individual's role in his social system."

The point is that these definitions have been functional rather than conceptual. In keeping with the

*As the U.S. Census does in its measurement of literacy.

theoretical arguments advanced in this chapter we propose a conceptual definition of literacy which relates it to an underlying symbol-manipulative activity. We define literacy as a mastery over symbols in their written form. By this we imply more than just an ability to read and write. We follow Mendez and Waisanen (1964) in suggesting that the overt reading and writing skill is indicative of an underlying ability to manipulate symbols which is a vital ingredient of successful adjustment to a modern style of life.

The argument may be raised, "But I know illiterates who display more symbol-manipulating ability and better adjustment to a modern style of life than a lot of literates!"* We would concede that literacy is not the only means of acquiring an ability to manipulate symbols. A course in logic might have the same effect. We would further admit that, as a treatment, literacy may not always "take." Given these considerations, in some instances individual differences in personality traits such as intelligence and motivation may produce cases of illiterates with greater symbol-manipulating ability than literates. But we hypothesize that, overall, literacy is related to an increased facility in those situations where symbol-manipulation is involved.

* Rao began his book on communication in an Indian village with an interesting case study, contrasting a well-informed illiterate with a literate high school teacher, who was ignorant on world and national affairs. He stressed that they are exceptions. (Rao, 1966, pp. 3-5)

For the present study, literacy was measured by a 50-word reading test, administered during the interview. A simple paragraph was adapted from the final lesson of the first book of an adult literacy course used in Brazil. Its level of difficulty was approximately that of a newspaper. Scores ranged from 0 to 50, although the distribution tended to be polarized. Of the total sample, 37 percent could read no words, while 59 percent were able to read 40 or more words. When treated in the present study as a dichotomous variable, those who scored 0 on the test were classified as illiterates; all those scoring from 1 to 50 were classified literate.*

Summary

Social science research findings from the Near East, Africa and Latin America were cited which support the notion that literacy is more than a simple ability to read and write. Reading experts, in the field of education, were reported as confirming this position. It was argued that literacy is related to an underlying ability to manipulate symbols. The effect of literacy is to place in perspective the relation of symbol to referent and to liberate an

* Obviously, a person who scored in the lower range on the test could hardly be considered functionally literate. Nevertheless, as the purpose of the present study is to examine the symbol-manipulative effect of literacy, it was considered important to eliminate from the sample all those who were able to recognize any symbols.

individual's symbol-manipulating capacity. Literacy was defined conceptually as a mastery over symbols in their written form. In the present study, it was measured by a 50-word reading test.

Chapter III

THE CORRELATES OF LITERACY

Introduction

Past research has demonstrated relationships between literacy and a number of modernization variables.* Modernization** requires that a person be aware of a different, "newer" style of life, that he conceive of the possibility of changing his own living style, and that he actually effect changes in his behavior. To become modern, then, is a type of innovation-adoption process. We can conceive of progressive stages of awareness, knowledge and use (or participation) in a new style of life. We can also conceptualize the so-called "modernization variables" as tapping one or another of these adoption process stages. In the present study we have, in fact, selected empathy, achievement motivation, cosmopolitaness, mass media exposure and political knowledge in part because they are

* For example, see Doob (1961), Mendez and Waisanen (1964), and Rogers and Herzog (1966).

** We follow Rogers, Niehoff and Sen (in preparation) in regarding modernization as an individual process, by which a person moves from a traditional to a "more complex, technologically-advanced, rapidly-changing style of life."

representative of these three stages. Empathy and achievement motivation indicate an awareness of the possibility of moving toward a new style of life; political knowledge measures level of information about one aspect of modernization; while cosmopolitanism and mass media exposure are somewhat more behavioral indices of direct contact with a modern style of life.

In this chapter we hypothesize relationships between literacy and empathy, achievement motivation, cosmopolitanism, mass media exposure, and political knowledge, respectively, and describe the operationalization of each variable.

Empathy

In a recent summary of literature dealing with empathy, Hobart and Fahlberg (1965) trace what they term the "social-psychological approach" to George Herbert Mead, who conceived of empathy as "taking the role of the other." This approximates the Lerner notion of empathy as "the capacity to see oneself in the other fellow's situation" (Lerner, 1958, p. 50). Empathy, Lerner said, is the predominant style of a modern society. He also speaks of empathy as "a high capacity for rearranging the self-system on short notice" (1958, p. 51). Just which aspects of the self-system are to be rearranged, how drastic the rearrangement will be, and how short is "short notice," Lerner does not specify.

Using a typology of "moderns," "transitionals," and "traditionals," with the Turkish part of his Middle East sample, Lerner found that his "moderns" (with higher literacy) were better able to imagine themselves as being president of Turkey, living outside Turkey, or living in the United States, than were "transitionals" or "traditionals" (Lerner, 1958, pp. 136-144).

Frey (1966) also found a significant positive correlation between mass media exposure and an empathy-type index with a sample of over 6,000 Turkish villagers.

Rogers and Herzog (1966) utilized a five-item empathy scale which measured a peasant respondent's capacity to conceive of himself in the role of president of a village council, local extension workers, mayor of a small near-by city, national minister of education, and president of Colombia. Correlations of this measure of empathy with literacy were positive and significant in four of the five villages studied.

Empathy may be regarded as an ability to identify with and symbolically participate in a new and unfamiliar role.* The work of Lerner (1958), as well as Mendez and Waisanen (1964), suggests that empathy may be another

*This definition underscores the behavior of placing oneself not only in a different role--that of another--but that the role is "new" and "unfamiliar," that the individual is placing himself in a more modern role.

manifestation of an underlying symbol-manipulation dimension. In a traditional society not all members are willing or able to speculate about involving themselves in more modern roles. Those who can, appear to be moving toward a more modern style of life. Thinking of oneself in a more modern role may be the first step toward taking that role. Before we buy a new car, we usually imagine ourselves behind the wheel of the car. Before the traditional villager becomes a transitional urbanite, he thinks about what it might be like to be in the new situation.

H.1.1 Persons high in empathy will seek literacy training to a greater degree than persons low in empathy.

H.1.2 Literacy training will produce an increase in empathy.

We predict an interaction between literacy and empathy. High empathy individuals are more inclined to seek literacy. For an illiterate person to consider becoming literate implies thinking of himself in a new and changed role, perhaps thinking of literacy as an opportunity for obtaining a new job. Literacy training, in turn, produces higher empathy. If symbol manipulation is the dimension underlying literacy, then an increased capacity to manipulate verbal symbols should produce an increased capacity to symbolically participate in new and unfamiliar roles.

Empathy, in the present study, was measured by a four-item index:^{*} What would you do if you were (1) the mayor of the county? (2) in charge of a factory? (3) the ACAR supervisor (local extension worker)? (4) president of Brazil?^{**} Each item was coded with a range of 0 to 3 by specially trained female high school graduate coders. Coding categories ranged from "foolish response, response that shows inability to think of himself in another role" to "very specific response where the individual actually puts himself in another's role and offers good suggestions about fulfilling the obligations of that other person." Individual item scores were summed to produce a range of possible scores from 0 to 12.^{***}

Achievement Motivation

Achievement motivation, need for achievement, or n Achievement, was defined by McClelland as "a desire to do well, not so much for the sake of social recognition or prestige, but to attain an inner feeling of personal

^{*} Major responsibility for the development and coding supervision of the empathy items was carried out by Gordon Whiting, and is reported in his Ph.D. dissertation (1967).

^{**} Approximately comparable roles were asked of female respondents: inspector of education, manager of a chicken farm, ACAR home economics specialist, state legislator.

^{***} Intercoder reliability was .92 on a random sample of 80 interview schedules across three coders (Whiting, 1967).

accomplishment" (McClelland, 1963, p. 76). Implied in this definition is a comparison to some standard of professional or occupational excellence, not a response to special incentives, such as money prizes. It is the personal sense of accomplishment, not the public recognition or remuneration, which is important. Atkinson attempted to distinguish between motivation and motive, maintaining that motive is the basic disposition, that characteristic of the individual that requires the sense of personal accomplishment, while motivation includes the basic motive drive, as well as two situational factors: (1) the consequences of a particular act; and (2) the attractiveness of the goal which it offers (Atkinson, 1958, pp. 288-289).

McClelland reported efforts of several researchers to find possible differences in n Achievement attributable to different philosophies of education. Indian students in a Government Arts College, Moslem, Theosophist, Christian and Hindu schools were compared. No differences related to a hypothesized Protestant ethic effect were found between the Christian School and the others. Over-all, the effects of education on n Achievement, at least in later life, appear to be negligible.

Perhaps the difficulty with all these studies is that the educational influences which might produce higher n Achievement occur too late in life after character has already been formed. Both psychological theory and research . . . strongly suggest that the crucial period for acquiring n Achievement probably lies somewhere between the ages of 5 and 10. Perhaps exposure

to high standards of excellence and the like will have a lasting effect on n Achievement only if it occurs early in life.

(McClelland, 1961, p. 415)

While education and literacy are not exactly synonymous, these findings might be relevant to anticipated effects of adult literacy campaigns. Acquiring literacy as an adult may have little effect on n Achievement.

The only research encountered by the present author, measuring n Achievement with a mixed sample of literates and illiterates, was the work of Rogers with Neill (1966) among peasants in six Colombian villages. Correlations of n Achievement with literacy were positive for all six villages, and reached significance in four of the six (Rogers with Neill, 1966, pp. 77-78).

We conceive of n Achievement as a dynamic of modernization. To symbolically manipulate one's role may be a necessary condition for modernization, but it is not sufficient. n Achievement provides the desire, the impetus, to move from the symbolic act to the behavior. We suggest that n Achievement would impel a person to seek literacy as a means to achieve his goals. Acquiring literacy--and increased capacity to symbolically conceive of alternatives will induce further n Achievement. As Atkinson suggests, motivation is dependent on situational factors. If an individual does not perceive the possibility of "getting ahead," his achievement motive stagnates. When an alternative for "getting ahead" is presented, the achievement

motive is activated. Literacy is such an activating force.

We define achievement motivation as the desire to succeed, apart from social pressure, in order to gratify a personal need to do so.*

H.2.1 Persons high in achievement motivation will seek literacy training to a greater extent than persons low in achievement motivation.

H.2.2 Literacy training will produce an increase in achievement motivation.

An achievement motivation index was constructed from five agree-disagree items, selected by Guttman analysis procedures from an original set of ten items.** The five items yielded a coefficient of reproducibility of .87, which meets the Guttman criteria for a quasi-scale. The items were: (1) it is better to be content with the little one has than to be always struggling for more; (2) I'd like to try my hand at something really difficult, if only to prove

*The notion that the desire to achieve springs from some inner goal, or standard of excellence, rather than social pressure or competition with others is a constant tenet of McClelland's formulations (cf. McClelland, 1958, 1961, and 1963).

**The use of agree-disagree items was in part prompted by the results of a test-retest reliability check with 20 Phase I respondents. Open-ended responses consistently produced lower reliability coefficients than closed questions.

to myself that I can do it; (3) to wish to become important or to spend one's life trying to be successful is a waste of one's time; (4) no matter what I've done, I am always wanting to do more; (5) the way things are nowadays makes it discouraging to work hard. Each item was scored from 0 (low achievement motivation) to 2 (high achievement motivation). Summing the items produced a possible range of scores from 0 to 10.

Cosmopolitaness

Merton (1957, pp. 387-420), in his study of personal influence, distinguished the cosmopolite from the localite influential. The cosmopolite was characterized by a greater knowledge of and concern for affairs outside of his own community. His roots in the community were less deep than those of the localite. The cosmopolite is more willing to consider living elsewhere; he has fewer friends than localites, confining himself to those with whom he can "exchange ideas." The cosmopolite belongs to more organizations than the localite, particularly to those requiring special skills and knowledge.

Lerner (1958, p. 180) typified the cosmopolitan Lebanese as a "Westernized man." He spoke a foreign language, read foreign publications, was in contact with people from abroad, and sought every possible opportunity for contact with the West.

Elsewhere, Lerner (1964) reported that literates in a Turkish sample travelled outside of their villages more often than illiterates. Rogers and Herzog (1966) used number of trips to the city as an indication of cosmopolitanism and found positive relationships between this measure and literacy in all five Colombian villages, but with significant correlations in only two villages. Goldsen and Ralis (1957), however, found some evidence that contacts with urban culture may act as a substitute for literacy in inducing adoption of new agricultural technology, i.e., among literate farmers there was no difference in adoption rates between high and low urban contact, while among illiterates, those with high levels of urban contact adopted significantly more innovations than those with low levels.

Cosmopolitanism is defined as a positive orientation toward an urban mode of life.* Urbanization, following Lerner's paradigm is the prerequisite of modernization (1958, pp. 54-68). Modern technology and life style are most concentrated in the city. Indeed, it is in the city where it becomes necessary to modernize in order to survive. Thus, for the rural individual, contact with city life is exposure to modern ways. Through these contacts

* In developing societies, the rural sector is typically most traditional, while the urban sector provides the matrix in which modernization develops. Therefore we consider "urban orientation" a necessary component of cosmopolitanism.

the cosmopolite realizes that to succeed in the city, it is necessary to become literate. If literacy training becomes available he will seek it. Literacy will provide additional incentive for him to become more cosmopolite. With an ability to read, he will feel more confident in confronting those aspects of urban life which threaten the illiterate such as street signs, names of buses, product names in stores, newspapers, posters--the multiplicity of printed messages which make up the daily routine of the urban literate.

H.3.1 Persons high in cosmopolitanism will seek literacy training to a greater extent than persons low in cosmopolitanism.

H.3.2 Literacy training will produce an increase in cosmopolitanism.

Cosmopolitanism was measured by three items which asked about residence in a large city;* number of trips per year to a large city; and number of contacts with any relatives that live in a large city.

Mass Media Exposure

Lerner (1958, pp. 52-65) referred to the mass media as the "mobility multiplier." Mass media are responsible for opening a world of vicarious experience to large numbers

* A large city was defined as one with 40,000 inhabitants or more.

of people. In terms of our theoretical formulation, the mass media introduce new information which permits new combinations of symbols. Use of the mass media makes an individual more aware of modernity and leads him to seek literacy training. Rogers (1966) utilized his Colombia data to attempt to unravel the relationships among literacy, mass media and four other modernization variables.

He stated:

Literacy enables peasants in a developing society to attend to the mass media; this exposure, in turn, leads to various "modernization sequences" such as innovativeness, empathy, political knowledge, and educational aspirations for children.

(Rogers, 1966)

This model suggests that literacy leads to mass media exposure, which induces a number of other modern attitudes. Rogers speculated further on the meaning of literacy. He suggested that

It is more than just a facilitator of mass media exposure. Perhaps functional literacy leads to different mental abilities, such as a general capacity to deal with abstract symbols, to an interest in cosmopolite events outside of the peasant's village, and to some sort of motivation to modernize, all of which are evidently partially independent of mass media exposure per se.

(Rogers, 1966)

Lerner (1963), Deutschmann (1963), and Rogers (1966) noted that while literacy is strongly related to the use of print media among villagers (as we would expect), it also bears a strong relationship to the non-print media (radio, television, and cinema). This has been called the "centripetal effect": those who are heavy users of one medium tend

to be extensive users of other media as well. The centripetal effect may be a manifestation of an increased capacity to deal with symbols. This interpretation is suggested by Cantril and Allport's early research on use of radio.

A somewhat surprising, but fairly secure, result of our experimental work is that adults of the lower cultural level profit more by reading than they do by hearing. A good educational background quite naturally gives people an advantage in mastering both printed and spoken words, but oddly enough it gives them greater advantage with the spoken word. Untrained minds are frequently quite unable to listen intelligently to material which they could, perhaps with difficulty, understand and reproduce if they read it. In listening, their attention wanders and they cannot return to pick up lost threads as on the printed page.
(Cantril and Allport, 1935, p. 254)

A parallel interpretation would hold that acquisition of literacy increases symbol-manipulating capacity and facilitates use of the other mass media.

Mass media exposure is defined as being in the audience for messages from newspapers, radio, television, and cinema.

H.4.1 Persons high in mass media exposure will seek literacy training to a greater degree than persons low in mass media exposure.

H.4.2 Literacy training will produce an increase in mass media exposure.

Mass media exposure was measured by an index which summed number of newspapers read per month, frequency of radio listening and television viewing (e.g., never, sometimes, regularly), and number of visits per year to the cinema.

Political knowledge

Political participation is the final step in the Lerner model of modernization (Lerner, 1958, pp. 63-64). It requires relatively high levels of urbanization, literacy, and mass media participation. It implies an informed voter, in touch with the political life of his country through messages received from the mass media. Political knowledge, then, is a prerequisite for political participation. Literacy opens the mass media channels and facilitates the flow of political information to the individual.

Rogers and Herzog (1966) found positive relationships of political knowledge with functional literacy in all five Colombian villages they studied, with significant correlations in four of the five villages. Deutschmann (1963), however, found no differences between literate Colombian villagers and illiterates in political knowledge level.

Political knowledge is defined as possession of basic political information about one's region and country, so as to enable one to function as a citizen.

We hypothesize an interaction between political knowledge and literacy: political knowledge, itself an indirect measure of alertness, should lead the illiterate to seek literacy training. Literacy opens a channel through which the individual acquires additional information, and political knowledge increases.

H.5.1 Persons high in political knowledge will seek literacy training to a greater degree than persons low in political knowledge.

H.5.2 Literacy training will produce an increase in political knowledge.

Political knowledge was measured by asking the respondent to name the present governor of the state of Minas Gerais, the Latin American country to which Brazil sent troops the previous year (the Dominican Republic), the name of one of the new political parties created after the 1964 revolution, the President of Brazil deposed by the 1964 revolution, and the name of the Latin American country which turned communist a few years ago. The items are concerned with national, or cosmopolitan events, rather than local. One point was given for each correct answer and the five responses were summed to produce an index with a possible range of scores from 0 to 5.

Summary

Modernization is a process by which an individual adopts a more modern style of life. This process can be indexed, in part, by higher levels of empathy, achievement motivation, cosmopolitanism, mass media exposure, and political knowledge. Empathy is defined as an ability to identify with and symbolically participate in a new and more modern role. Achievement motivation is the desire to

succeed, apart from social pressure, in order to gratify a personal need to do so. Cosmopolitaness is a positive attitude toward an urban mode of life. Mass media exposure is being in the audience for messages from newspapers, radio, television, and cinema. Political knowledge is the possession of basic political information about one's region and country, so as to enable one to function as a citizen.

Relationships between these five indices of modernization were hypothesized, and operationalization of the modernization variables for the present study were described.

Chapter IV

FINDINGS

An eligible young man, in Ghana, offered the choice by their father, chooses the plain rather than the beautiful of two sisters because she is literate; the beautiful one promptly joins a literacy class.
(reported in Doob, 1961, p. 78)

Enrollment in the Literacy Training Program

One set of our hypotheses utilizes the modernization variables to predict enrollment in the literacy training program. Specifically, these five hypotheses state:

H.1.1 Persons high in empathy will seek literacy training to a greater degree than persons low in empathy.

H.2.1 Persons high in achievement motivation will seek literacy training to a greater degree than persons low in achievement motivation.

H.3.1 Persons high in cosmopolitanism will seek literacy training to a greater degree than persons low in cosmopolitanism.

H.4.1 Persons high in mass media exposure will seek literacy training to a greater degree than persons low in mass media exposure.

H.5.1 Persons high in political knowledge will seek literacy training to a greater degree than persons low in political knowledge.

Analysis of variance was used to test each of the five hypotheses. Mean values for the two groups on each of the five modernization variables, and the F value for difference between the means are reported in Table 1. None of the differences, for either male or female respondents, reached the .05 significance level for rejecting the null hypothesis.* Therefore, we must accept the alternative set of hypotheses which hold that persons who seek literacy training do not have higher levels of empathy, achievement motivation, cosmopolitaness, mass media exposure, and political knowledge than those who do not seek literacy training.

The five modernization variables were also used as independent variables in a multiple discriminant analysis** to predict enrollment in the literacy training program.

* It might be noted that if the less stringent significance level of .10, used by some researchers, were utilized in this case, enrollees could be considered as having significantly higher levels of empathy than non-enrollees ($p = .08$).

** Discriminant analysis is a multivariate statistical technique which uses continuous variables (in this case, empathy, achievement motivation, cosmopolitaness, mass media exposure, and political knowledge) to predict a dependent variable, which is nominally measured (in this case, enrollment or non-enrollment in a literacy training program).

TABLE 1.--Differences between enrollees and non-enrollees on five modernization variables

	Mean for Enrollees	Mean for non- Enrollees	F Value	
Male:				
Empathy	4.54	3.69	3.06	N.S.D.*
Achievement motivation	5.85	6.26	0.53	N.S.D.
Cosmopolitaness	10.00	9.57	0.01	N.S.D.
Mass Media Exposure	3.12	2.34	1.58	N.S.D.
Political Knowledge	0.46	0.52	0.08	N.S.D.
	(N = 26)	(N = 98)		
Female:				
Empathy	2.00	2.91	0.75	N.S.D.*
Achievement motivation	4.60	5.73	0.94	N.S.D.
Cosmopolitaness	2.80	11.49	0.35	N.S.D.
Mass Media Exposure	2.00	2.73	0.17	N.S.D.
Political Knowledge	0.00	0.13	0.53	N.S.D.
	(N = 5)	(N = 45)		

*Not significantly different at the 5 percent level.

For both male and female respondents, the data produce a discriminant function of .05. From this a Rao's chi-square of 5.86 is calculated for males, and of 2.17 for females. Neither chi-square is significant at the .05 level.

Neither singly, nor in a multiple equation did empathy, achievement motivation, cosmopolitanness, mass media exposure, or political knowledge predict enrollment in a literacy training program when offered in a community.

Effects of the Literacy Training Program

A second set of hypotheses deals with the effects of literacy training on individual levels of empathy, achievement motivation, cosmopolitanness, mass media exposure, and political knowledge. Specifically, these hypotheses state:

H.1.2 Literacy training will produce an increase in empathy.

H.2.2 Literacy training will produce an increase in achievement motivation.

H.3.2 Literacy training will produce an increase in cosmopolitanness.

H.4.2 Literacy training will produce an increase in mass media exposure.

H.5.2 Literacy training will produce an increase in political knowledge.

Analysis of variance was the statistical tool used to test each of these five hypotheses. Mean values for difference scores (post-measure--pre-measure) were computed for the enrollment and control groups. Mean values and the F statistic for the difference between the means, for each of the five variables, are reported in Table 2. None of the differences reach the .05 level of significance for rejecting the null hypothesis. The conclusion from these data is that participation in a literacy training program does not produce significantly higher levels of empathy, achievement motivation, cosmopolitanness, mass media exposure, or political knowledge.

Demographic, education, and intelligence measures were collected which could have been used for statistical control purposes (Tables 4 and 5). Little difference in level of living, years of formal education, or intelligence was evident between the groups. Therefore the controls were not applied.*

* In attempting to equalize communities in the sampling procedure, it was hoped to minimize differences on the demographic variables.

TABLE 2.--Mean differences of difference scores between literacy program participants (enrollees) and control group on five modernization variables

	Mean for Enrollees	Mean for Control	F Value	
Male:				
Empathy	-0.36	0.96	0.07	N.S.D.*
Achievement motivation	0.44	0.48	0.003	N.S.D.
Cosmopolitaness	10.68	0.28	1.46	N.S.D.
Mass Media Exposure	0.16	0.52	0.52	N.S.D.
Political Knowledge	0.32	0.08	0.73	N.S.D.
	(N = 25)	(N = 25)		
Female:				
Empathy	-0.20	-1.38	0.64	N.S.D.*
Achievement motivation	-0.60	-0.25	0.08	N.S.D.
Cosmopolitaness	0.60	0.38	0.03	N.S.D.
Mass Media Exposure	0.20	4.75	4.21	N.S.D.
Political Knowledge	0.00	0.25	1.41	N.S.D.
	(N = 5)	(N = 8)		

*Not significantly different at the 5 percent level

Chapter V

SUMMARY AND DISCUSSION

The reading and writing classes, however, were a great success. By the autumn almost every animal on the farm was literate to some degree . . . Benjamin could read as well as any pig, but never exercised his faculty. So far as he knew, he said, there was nothing worth reading. Clover learnt the whole alphabet, but could not put words together. Boxer could not get beyond the letter D.

(Orwell, 1946, pp. 39-40)

Summary

Previous research has demonstrated relationships between literacy and a number of modernization variables, such as empathy, achievement motivation, cosmopolitanness, mass media exposure and political knowledge. The evidence has been largely of a correlational nature and has left unresolved the question of whether individuals who are "more modern" on these variables are those who become literate, or whether literacy produces higher levels of modernity on these variables, or whether some kind of mutual interaction is at work.

The present research attempted to deal with this problem by examining initial differences between those who enroll and those who do not enroll in a literacy program

when it is offered in a peasant community. After having received literacy training, those who enrolled in the literacy program were then compared with a control group to see what differences had occurred in levels of empathy, achievement motivation, cosmopolitanness, mass media exposure, and political knowledge as a consequence of participation in the literacy program.

Data were collected in the state of Minas Gerais as part of a larger communication research program, the Diffusion of Innovations in Rural Societies. In July, 1966, 281 interviews with male respondents and 126 interviews with female respondents were completed in four rural communities which has been randomly designated to receive subsequent literacy training programs as an experimental treatment. Eighty-one interviews with male respondents and 28 interviews with female respondents were collected in a randomly designated control community. All respondents who demonstrated ability to read a functional literacy test were eliminated from the sample. The data on the illiterates who remained, both in the four treatment and one control communities, provided pre-treatment measures.

Literacy training programs were conducted in the four communities by a Radiophonic School, a department of the state Secretary of Education in Minas Gerais. Tape-recorded lesson materials were used, under the supervision of monitors who had been specially trained in the use of

materials and procedures for conducting the classes in the communities. Classes were scheduled to begin in October, 1966, but, due to numerous delays, did not get underway until late April, 1967.

In July, 1967, post-treatment measures were collected in the four literacy communities from all illiterate individuals who enrolled in the literacy training program, and on all illiterates in the control community, all of whom had been interviewed the previous year.

Five hypotheses were formulated regarding enrollment in the literacy training program.

H.1.1 Persons high in empathy will seek literacy training to a greater degree than persons low in empathy.

H.2.1 Persons high in achievement motivation will seek literacy training to a greater degree than persons low in achievement motivation.

H.3.1. Persons high in cosmopolitanism will seek literacy training to a greater degree than persons low in cosmopolitanism.

H.4.1 Persons high in mass media exposure will seek literacy training to a greater degree than persons low in mass media exposure.

H.5.1 Persons high in political knowledge will seek literacy training to a greater degree than persons low in political knowledge.

There were 98 male and 45 female non-enrollees and 26 male and 5 female enrollees for whom data were available to test these hypotheses. Analysis of variance was the statistical technique utilized. Separate F ratios were calculated for male and female respondents. As none of the F values reached the 5 percent level of significance, all of the hypotheses were rejected. Individuals who seek literacy training are no different in empathy, achievement motivation, cosmopolitanness, mass media exposure, and political knowledge from individuals who do not seek such literacy training.

A second set of five hypotheses related to the effects of participation in the literacy training program.

H.1.2 Literacy training will produce an increase in empathy.

H.2.2 Literacy training will produce an increase in achievement motivation.

H.3.2 Literacy training will produce an increase in cosmopolitanness.

H.4.2 Literacy training will produce an increase in mass media exposure.

H.5.2 Literacy training will produce an increase in political knowledge.

There were 25 males and 5 females who had participated in the literacy classes and 25 males and 8 females

in the control community on whom data were available to test these hypotheses. Separate statistics were calculated for male and female respondents, again using analysis of variance. None of the F values reached the 5 percent level of significance; all of the five hypotheses were rejected. Literacy training did not produce increases in empathy, achievement motivation, cosmopolitanism, mass media exposure, and political knowledge.

Discussion

Enrollment vs. Non-Enrollment: Who Seeks Literacy?

Our data disclosed no significant differences in levels of empathy, achievement motivation, cosmopolitanism, mass media exposure, and political knowledge between those who seek and those who do not seek literacy training when offered in peasant communities. It may be useful to speculate as to why our hypotheses were not confirmed.

First, we might note that there was little previous research on which to base our hypotheses. Those who administer literacy programs have paid little attention to attitudinal and other social psychological dimensions, either as they effect enrollment or as a consequence of their literacy programs. Researchers who have attended to the attitudinal dimension seem not to have been concerned with the enrollment aspect of literacy. We hypothesized an

interactional effect, i.e., more empathetic persons will seek literacy training; literacy, in turn, makes them even more empathetic. This line of reasoning was not confirmed by our data.

A possible explanation for our failure to support our hypotheses might be that actual differences were obscured by measurement error. One of the persistent problems with attitudinal research among rural samples in developing countries is that of the reliability of measures. We alluded to this in the discussion of achievement motivation in Chapter III. One hundred and two respondents in 20 communities, who were interviewed in our Brazil Phase I data-gathering, were also reinterviewed six months later in Phase II. A number of measures were essentially the same, and it was possible to calculate test-retest reliability coefficients. The correlation coefficients for empathy and cosmopolitanism items ranged from .14 to .34; the political knowledge index produced a coefficient of .59, while individual mass media exposure items ranged from .63 to .87.* It is quite possible that rural Brazilians are not accustomed to the kind of introspection which empathy and achievement motivation questions require, nor do they have much experience for the mental exercises such as recalling frequency of mass media useage or trips to the city.

* Further discussion on the reliability of these particular measures is presented by Stanfield (in preparation).

This measurement error is generally random and acts to depress the relationships that may exist among our concepts. Therefore it is perhaps appropriate to note that the F tests for male enrollees vs. non-enrollees on empathy and mass media exposure closely approached significance. However, with no way to correct for measurement error, we must accept our results as they stand.

It is also possible that there actually are no differences in levels of empathy, achievement motivation, cosmopolitanness, mass media exposure, and political knowledge between those who seek literacy and those who do not when it is offered in rural communities. Perhaps in the kind of communities that we studied, located in a developing nation where some opportunity to attend school exists, those who have modern predispositions have already become literate as children. Perhaps modern attitudes play their decisive role in terms of who goes to primary school and who does not, rather than who enrolls in adult literacy programs. Literacy is normally a part of the socializing process of childhood. The child brought up in a more modern home milieu will have a higher value for literacy. He will be sent to school, encouraged to continue, and to put his literacy to practice. The child in the less modern home setting may not be encouraged to attend school. There may, in fact, be family pressures upon him to leave school and to help support the family. The whole pattern of values

in such a home will suppress modernizing tendencies. Thus, predominant attitudes toward modernization may in large part be the result of childhood socialization processes. If this is so, we might expect to find no great differences among adult illiterates who enroll and who do not enroll in empathy, achievement motivation, cosmopolitanism, mass media exposure, and political knowledge. If we compare our original total male sample in the four literacy communities, we find that those who are already literate demonstrate consistently higher levels on the modernization variables than either enrollees or non-enrollees.

	<u>Enrollees</u>	<u>Non-Enrollees</u>	<u>Literates</u>
Empathy	4.54	3.69	5.29
Achievement motivation	5.85	6.26	6.84
Cosmopolitanism	10.00	9.57	19.17
Mass Media Exposure	3.12	2.34	5.35
Political Knowledge	0.46	0.52	2.61

We know that the great majority of these literates learned to read and write as children in the primary school and that the enrollees and non-enrollees had little or no childhood formal education. This suggests that the childhood socialization processes (including literacy) have produced (in the literate) a more modern adult.

There is other research which, while not focusing the same variables that we have examined, tends to

corroborate our interpretation. Roy, reporting on a UNESCO Indian field experiment in communication, noted that enrollees in a literacy program had lower levels of knowledge and adoption of agricultural and health innovations and in general did not change as much as non-enrollees (including literates) in the same villages who received information via a secondary "radiation" effect (Roy, 1967, p. 170).

Wright, studying Indian communities of Guatemala (apparently less modern than our Brazilian communities) noted that there were more "bright" illiterates in his control communities where there had been no literacy programs. In other words, where the opportunity to become literate had existed for some time in the community, the "brighter" people had already taken advantage of it (Wright, 1967, p. 15). Our data (Tables 4 and 5) indicate little difference in intelligence between enrollees and the control group, suggesting that the more intelligent individuals in our communities may already have become literate. This "funneling-off" of the more intelligent people not only means that less modern people will enroll in the literacy programs, but that the impact of literacy on those who enroll will not be as great.

This interpretation of the data suggests that enrollment in adult literacy programs is not primarily a function of predisposing modern attitudes, but might be more the result of persuasability of literacy program personnel and the attractiveness of incentives they offer to motivate

enrollment. This is perhaps an encouraging finding for literacy training agencies. An individual need not be particularly modern to enroll in a literacy program. The crucial variable to enrollment may be the perceived utility of literacy to the illiterate. If so, this variable is one over which literacy program personnel can exert some control.

Effects of the Literacy Training Program

Comparing literacy program participants (enrollees) with a control group, no significant gain was found in levels of empathy, achievement motivation, cosmopolitanism, mass media exposure, or political knowledge, attributable to the literacy program.

One factor, very relevant to this outcome, was the comparatively short length of time for which the literacy training was conducted before the data were collected. Appendix B documents some of the problems which delayed initiation of literacy training classes in the Brazilian communities. Unfortunately, it was impossible to delay the post-treatment data collection to permit further literacy training. The literacy training program was one of four experimental treatments utilized in the third phase of the Diffusion Research Project. Certain of the literacy communities were scheduled to receive, in addition to literacy training, radio forum or community newspaper treatments beginning in August, 1967. To have delayed the literacy

post-treatment data-gathering would have meant that the literacy treatment effects could have been confounded by the radio farm forums or the community newspapers. Had the literacy program started on schedule (October, 1966), a more satisfactory literacy treatment would have resulted.

Once again, previous research tells us little about the length of time needed for literacy to produce an "effect," particularly on modern attitudinal variables. UNESCO (1963) suggests that it takes four years of primary schooling for a person to reach a reading level that is self-sustaining. Literacy experts, who have developed accelerated programs, claim that this time can be reduced substantially.* This tells us little about time requirements for attitudinal effects, nor how much time is required for literacy to "take" with an adult student. Is there a maturation process following formal literacy training before we can expect behavioral and attitudinal changes to take effect? Furthermore, it is safe to predict that not all modernization variables would evidence change at the same time. We might predict that changes in levels of cosmopolitanism and mass media exposure would show "early effects" from literacy. A change in the level of political

* For example, prior to the 1964 revolution, a literacy training program had been developed in northeast Brazil by Professor Paulo Freire which claimed to be able to teach people to read and write with 40 hours of class work (Lima, 1965, pp. 173-202).

knowledge might follow closely behind. Empathy and achievement motivation might be expected to require more time to show an "effect."*

Admitting that these are post hoc hypotheses, we do see these tendencies in our data (Table 2). Cosmopolitanism and political knowledge show substantial gains for enrollees. Mass media exposure does not quite fit this sequential effect pattern, and the outcome is somewhat difficult to interpret. The two items which contribute most heavily to the variation in the mass media exposure index are print (newspaper and magazine) readership and radio listening. If we compare means for both male groups on pre- and post-measures, an interesting result emerges.

	<u>Enrollees</u>		<u>Control</u>	
	<u>Pre-</u>	<u>Post</u>	<u>Pre-</u>	<u>Post</u>
Radio exposure	2.08	1.44	1.60	1.52
Print exposure	0.72	0.44	0.48	1.16

Both groups regress on their use of radio from pre- to post-measures (enrollees more so than the control group). The enrollees also regress on print readership, but the

* We assume that one of the primary results of a literacy campaign is that people will begin to read; ergo, mass media exposure should increase. With the use of mass media, they should be better informed on current events: political knowledge will increase. An ability to read should remove the feeling of insecurity that the illiterate has in the city, surrounded by verbal symbols: cosmopolitanism will increase. Empathy and achievement motivation, as indicative of more modern attitudes, may take more time to change.

control group increases in its use of print media. The print exposure item is worded so that, for illiterate respondents, it indicates that a literate member of the family may read to them. Why this behavior should have increased in the control community is not clear.

It is also not clear why male literacy enrollees should have regressed on empathy. They scored considerably higher than non-enrollees on pre-treatment measures, so it may be that some kind of "ceiling effect" was operating.* This still leaves unexplained the increase in empathy of control group males, an increase which almost reaches the 5 percent significance level.

These outcomes suggest that we know little about the kinds of "ceiling effects" which may operate on attitudinal variables among rural people in developing countries. The "real ceiling" for a variables such as empathy may be considerably lower than the possible upper limit of our scale.

Recommendations for Future Research

The outcome of the present study, while perhaps disappointing from the standpoint of unconfirmed hypotheses, suggests a number of important leads for future research.

*By "ceiling effect" we mean that there is an upper limit to the particular variable under study. It may be either a function of the measuring instrument we are using or of the amount of this particular variable that the population under study possesses.

1. What are the important predispositions that might lead an illiterate to seek literacy training? How important are the illiterate's perceptions of the utility of literacy? What incentives or combinations of factors will motivate a person to become literate?

2. What is the "time-order" of literacy effects when measured on a number of modernization variables across the full time range of a literacy program? At what point does mass media exposure show an effect? Political knowledge? Empathy? Or do these variables increase as a result of literacy? Is there a necessary "maturation process" following literacy training before some variables show an effect?

3. On what other relevant variables might literacy be expected to show an effect? What will be the effect of literacy on an individual's aspirations for his children's education? For their occupation? If the childhood socializing process is critical, can we increase the likelihood of the child's becoming literate by teaching illiterate parents to read and write? If so, then this becomes a long-range justification for adult literacy programs.

4. What are the economic effects of literacy? What degree of literacy is needed to effect level of living? To effect income? This, of course, depends on situational factors, but we have little research evidence to show "how much" literacy is needed in which situation. At what point in the process might literacy produce an effect on agricultural

productivity and on the adoption of agricultural and health innovations?

5. The urban-rural dimension cuts across the preceding research leads, and needs careful examination. In what way are predispositions and motivations to become literate different for rural and urban populations? Do the effects of literacy show a different or accelerated time-order in an urban setting, as compared to a rural environment? Given that there is more opportunity to put literacy skills into practice in an urban setting, we would hypothesize that its effects would be accelerated. There is unanimous agreement that becoming literate has different consequences in an urban setting than in a rural, but there is little research to specify the nature of these differences.

6. A further step would be to utilize literacy as a dependent variable in a field experiment. If we increase the potential for mass media exposure by distributing radio receivers, or cosmopolitanness by instituting bus service from the community to an urban center, will this lead people to place a higher value on literacy and to seek literacy training to a greater degree if it is subsequently offered in the community?

7. There is little in the outcome of this research to support a symbol manipulation theoretical framework for literacy research. Future research might well hypothesize and test alternative frameworks. If literacy is more than

just an additional information channel, what is it? What is its effect on the way an individual perceives himself, his environment and his alternatives for action? Is there some particular cognitive capacity or skill which is particularly the result of becoming literate?

Appendix A

SAMPLING AND FIELD PROCEDURES

Background

The data on which this study is based were collected as part of a larger research effort, Diffusion of Innovations in Rural Societies.* The author was one of two North American researchers in charge of field operations in Brazil for two years. Project headquarters was located in Belo Horizonte, capital of the state of Minas Gerais. A principal reason for this location was to focus Diffusion Project research on the activities of the Association for Credit and Rural Assistance (ACAR) in Minas Gerais, reputed to be one of the outstanding agricultural extension services in Latin America.**

The ACAR system operates 175 "local offices" in Minas Gerais. These are typically located in a county seat (muni-
cipio) and each local office is responsible for extension

*The Diffusion of Innovations in Rural Societies is a communication research project, sponsored by the Agency for International Development, and carried out by the Department of Communication, Michigan State University, under the direction of Everett M. Rogers.

**Further information on the ACAR system is available in Mosher (1956) and Wharton (1958).

work in that county and, in some cases, in one or more adjoining counties. The local offices are supervised through 18 regional offices, each of which is directed by a regional supervisor. These, in turn, report to a central office in Belo Horizonte, where a staff of administrators, technical agriculture specialists, and communication and research technicians plan and coordinate the state-wide program. ACAR in Minas Gerais forms part of a nation-wide, semi-autonomous extension service, the Brazilian Association for Credit and Rural Assistance (ABCAR). ACAR was the original state organization and prototype for the 19 other state services which now compose ABCAR.

Sampling

In September, 1965, Diffusion Project personnel made a listing of all ACAR local offices which had been in operation for at least three years.* From these 78 local offices a random selection of 40 was drawn. The local supervisor in each of these 40 offices was asked to name the community within the jurisdiction of his office in which ACAR programs had had most success, and the community in which ACAR programs had experienced least success. The 80 communities thus chosen (40 "high success" and 40 "low success") formed the sample for the Diffusion Project Phase I data collection.

* Further detail is given in Herzog (1965).

Phase I sought to determine reasons for success or failure of change programs in agriculture, using the community as the unit of analysis.* Phase I data were collected via personal interviews in early 1966.

Phase II of the Diffusion Project focused on factors related to innovativeness and opinion leadership with individual farmer decision-makers as the unit of analysis. In addition, the Phase II data collection provided a baseline for a field experiment designed to compare four communication strategies for introducing change in rural communities. One of these strategies was literacy training. The Phase II sample was based on a purposive selection of 18 communities, chosen from the 80 studied in Phase I. The communities were equalized as much as possible on the basis of highway access, size of community center, distance from an urban center (Belo Horizonte, a city of 1,000,000, or Juiz de Fora, the second largest city of Minas Gerais, about 200,000), and approximate levels of literacy. Experimental and control conditions were randomly assigned to the 18 communities. Six communities received literacy training provided by the Radiophonic School of the Secretary of Education of Minas Gerais (see Appendix B). The six communities to which the literacy treatment was randomly assigned, and the ACAR local office within whose domain they fell, are:

* Phase I methodology and findings are reported more completely in Whiting and others (1967).

<u>Community</u>	<u>ACAR Local Office</u>
São João da Serra	Santos Dumont
Picada	Paraopeba
Matos	Pedro Leopoldo
Pedra	Itauna
Currallinha de Dentro	Corinto
Itamarati	Cataguases

The control community was Albertos, located under the supervision of the Formiga ACAR local office.

Two of the experimental communities were eliminated from analysis in the present study. In Itamarati, none of the persons interviewed in the Phase II data collection enrolled in the literacy program when it was offered in the community. In Currallinha de Dentro, seven Phase II respondents enrolled, but all seven were already able to read a functional literacy test.

Before describing the communities themselves, it may be useful to locate the municípios (or ACAR local office) in which each community falls. Santos Dumont is situated southeast of Belo Horizonte about three hours by bus on the Belo-Rio de Janeiro highway. However, it is only a 45 minute bus ride, continuing on the same road to Juiz de Fora. Santos Dumont is located in a predominantly hilly area of the state, with dairying the principal agricultural activity. Pedro Leopoldo and Paraopeba both lie north of

Belo Horizonte on the Belo-Brasilia highway. Pedro Leopoldo is closer to the capital city, about forty-five minutes by bus, while Paraopeba is an hour farther away. This region marks the beginning of the campo cerrado area, rolling terrain with dry soil. Beef cattle and corn are the principal products, with some dairy farming. Itauna and Formiga are located west of Belo Horizonte, both on a highway that leads to the western triangulo region of the state. Itauna is about one hour and fifteen minutes by bus from the capital, while Formiga is about two hours distant. Here the land is also rolling, and dairy farming and beef cattle raising are the main agricultural activities.

The settlement pattern in rural Minas Gerais tends toward the scattered or lineal community. In these community types the farmer lives on his land and community ecology accommodates to the natural contours of the land, structured by the location of rivers, valleys, and roads. Often individual farms are fragments of former estates or plantations. The nuclear center of the community is usually minimal; typically it may contain a store, a church, a grupo (primary school), and a football field.

In the Diffusion Project Phase I data-collection a number of descriptive measures of the individual communities were gathered. Seven of these are presented in Table 3. Population figures were estimated in each case by the ACAR local supervisor. Given the dispersed settlement pattern,

TABLE 3.--Description of literacy and control communities on seven selected measures

	São João de Serra	Matos	Picada	Pedra	Albertos (Control)
Community population	2512	800	500	400	2700
Community literacy rate	17%	21%	17%	14%	13%
Years of schooling of average farmer	3	3	1	3	3
Distance to commercial center*	18 km.	18 km.	15 km.	12 km.	18 km.
Average size of land holding	30 hc.**	75 hc.	70 hc.	100 hc.	200 hc.
Community institutional development score	9	5	5	5	5
Community external contact score	10	8	6	7	2

*Distance estimated, in each case, by the ACAR local supervisor. Commercial center was usually the county seat. 1 kilometer (km.) = .62 miles.

**One hectare (hc.) = 2.47 acres.

a larger population does not necessarily mean a larger concentration of houses and facilities in the community center. Community literacy rates are an average of estimates made by ten informal leaders in each community. The remaining measures were all estimates provided by the ACAR local supervisor. The Community Institutional Development Index was derived by scoring each community on whether it had certain facilities, such as primary school, store, government office, football field, bar, barbershop, etc. Nineteen institutions were included, providing a range of possible scores from 0 to 19. A similar index was constructed to measure contacts with the outside world. Fifteen items such as telephone service, bus service, etc., made up a Community External Contact Index, with a possible range of scores from 0 to 15.

Data were also collected on a number of demographic variables which permit comparison of enrollees, non-enrollees, and illiterates in the control community in terms of age, level of living, years of formal education, and income. These data are presented in Tables 4 and 5. Level of living was indexed by how many of 13 possible home improvement or equipment items the respondent possessed, such as a water filter, wood or tile floor, refrigerator, inside toilet, electric lighting, stove with a chimney, etc. With the exception of the age variable, male enrollees generally score slightly lower than male non-enrollees on the

TABLE 4.--Mean scores of male enrollees, non-enrollees, and control group on selected demographic measures

	S. João da Serra	Matos	Picada	Podra	Total
<u>Age</u>					
Enrollees	27.0	44.0	34.4	37.5	37.9
Non-Enrollees	44.8	42.9	45.0	52.9	47.1
Control (Albertos)					47.6
<u>Level of living</u>					
Enrollees	1.0	6.0	4.4	7.0	5.3
Non-Enrollees	8.3	6.6	5.3	8.4	7.3
Control (Albertos)					4.7
<u>Years of formal education</u>					
Enrollees	0.0	0.4	0.7	1.0	0.6
Non-Enrollees	0.7	0.6	0.6	0.7	0.7
Control (Albertos)					0.4
<u>Income (U.S. dollar equivalent)</u>					
Enrollees	225	270	540	675	405
Non-Enrollees	450	315	730	450	450
Control (Albertos)					315
<u>Intelligence</u>					
Non-verbal test					
Enrollees	(N = 13)				16.4
Control	(N = 8)				20.9
Interviewer rating					
Enrollees	(N = 25)				3.1
Control	(N = 25)				2.9
<u>(Sample size)</u>					
Enrollees	2	9	9	5	25
Non-enrollees	23	20	23	32	98
Control					25

TABLE 5.--Mean scores of female enrollees, non-enrollees,
and control group on selected demographic measures

	S. João da Serra	Matos	Picada	Pedra	Total
<u>Age</u>					
Enrollees	17.0	33.0	15.0	--	19.8
Non-Enrollees	30.3	45.7	40.6	36.5	36.6
Control (Albertos)					32.3
<u>Level of living</u>					
Enrollees	6.7	0.0	0.0	--	4.0
Non-Enrollees	6.5	3.7	3.8	5.1	5.1
Control (Albertos)					4.8
<u>Years of formal education</u>					
Enrollees	0.7	0.0	0.0	--	0.4
Non-Enrollees	0.4	0.3	0.3	0.5	0.4
Control (Albertos)					0.6
(Income data not available for female respondents)					
<u>Intelligence</u>					
Non-verbal test					
Enrollees	(N = 5)				26.0
Control	(N = 7)				18.3
Interviewer rating					
Enrollees	(N = 5)				1.0
Control	(N = 8)				2.1
(Sample size)					
Enrollees	3	1	1	0	5
Non-Enrollees	16	7	9	13	45
Control (Albertos)					8

demographic variables, but slightly higher than the male control group. Table 3 indicates that the control community (Albertos) has a slightly lower literacy rate and less external contact than the literacy communities. Overall, the control community may be somewhat less modern than the literacy communities, but the differences are slight.

The groups were also compared on levels of intelligence. Arrangements were made with the Radiophonic School to administer a non-verbal intelligence test which has been specifically designed for use with Brazilian illiterate populations.* Fourteen tests were administered to male literacy program enrollees and 8 to male illiterates in the control community. An item was included in the post-test interview schedule which asked the interviewer to rate the respondent from 1 (low) to 7 (high) in terms of intelligence displayed in the interview situation "compared to an average person in a rural Minas Gerais community." These measures are reported in Tables 4 and 5.

There were 21 male respondents for whom scores on both the non-verbal intelligence test and the interviewers' rating were available. For this group, the correlation between the two measures was .33.**

*The non-verbal intelligence test is an adaptation of the Raven Progressive Matrices Test. It was used in Brazil with a nation-wide stratified sample of almost 26,000 respondents (Weil, 1959).

**This correlation is significantly different from zero at the .05 level, but accounts for only .11% of the covariance between the two measures.

Instrument Development and Field Operations

In May and June of 1966, extensive pre-testing and a pilot study were carried out to construct the Phase II interview schedule, which included the variables utilized in the present study. While development of the research instrument was largely a team effort, the present author bore major responsibility for developing the achievement motivation, mass media exposure, and literacy measures. The main Phase II instrument was designed for use with heads of households who, in almost all cases, were male respondents. A similar interview schedule was constructed for female respondents. Largely this involved adapting certain items to appropriate form for female respondents. The female interview schedule was also field-tested before being used.

Interviewing for the Phase II data-collection was done during July, 1966. University students, on vacation during the month of July, were recruited as interviewers. They were given four days of training, including three days of orientation, class instruction and practice interviewing in Belo Horizonte, and one day of practice interviewing in a rural community. About one-quarter of the interviewers had previous interviewing experience with the Diffusion Project Phase I data collection. Interviewers were organized into six teams. Each team was composed of

three or four interviewers and a supervisor, and provided at least one jeep-type vehicle. Three teams had two female interviewers assigned to them, and all female respondents were interviewed by female interviewers.

In the four literacy treatment communities utilized in the present study, 281 interviews with males and 126 interviews with females were collected. Seventy-seven male respondents and 28 female respondents were interviewed in the control community. Male respondents were landowning heads of households. Property owner lists for each community were secured prior to data collection.* These lists were supplemented by the ACAR local supervisors and inquiries were made within the communities by the interviewing teams to determine any further landowners whose names were not on the original lists. Criteria for selection of female respondents were that they be between the ages of 15 and 45, illiterate, and live within a ten-minute walk from the center of the community. The last restriction stemmed from the notion that women living farther from the community center would be unlikely to attend evening literacy classes.

Interviews with male respondents averaged about an hour in length, and those with females ran about half that time (the female interview schedule being much shorter). There were few refusals and interviewer rapport was generally

* Lists of property owners, on file in rural Brazilian county-seats are notoriously inaccurate.

good. In part this may be because Diffusion Project interviewer teams had visited all communities (but not all respondents) five months previously during the Phase I data collection.

Interview schedules had been precoded for machine analysis, and all coding operations were carried out at Diffusion Project headquarters in Belo Horizonte. Data were transferred from interview schedules to data sheets and verified by a "read-back" procedure, then airmailed to Michigan State University where IBM cards were punched and verified.

The experimental treatment (literacy training program) was originally scheduled to begin in September, 1966 (see Appendix B).

The interview schedule for collection of post-treatment data was developed in June, 1967. Essentially the same items were used for all scales, with a slight modification of the political knowledge scale. Knowledge of participation of Brazilian troops in the United Nations peace force at the time of the Arab-Israeli War (June, 1967) was substituted for a Phase II item which asked about Brazilian troop participation in the Dominican Republic peace mission. The interview schedule was pre-tested twice during June. Interviewer training lasted three days, inasmuch as two-thirds of the interviewers (including all female interviewers) and all interviewer supervisors had

participated in the Phase II data-collection. Three interviewer teams were organized, each composed of four interviewers and a supervisor. Most of the interviews in the literacy treatment communities were conducted during the evening at the literacy class locations. Respondents were called out of the classes and interviewed individually. Those who were absent were contacted the following day and interviewed in their homes. Data collection in the literacy and control communities was accomplished during the first two weeks of July, 1967.

Group administration of the intelligence tests was conducted in the literacy treatment communities by Radiophonic School coordinators in June, 1967. In the control community they were administered individually by Diffusion Project interviewers during the July, 1967 data-collection.

Interview schedules for the post-treatment data-collection were coded in the field by the interviewers themselves. With most of the interviewing done in the evening literacy classes, daytime hours were available for the coding task. IBM cards were punched and verified at the computer center of the Federal University of Minas Gerais. Data were analyzed at the Michigan State University computer center between August and October, 1967.

Appendix B

THE LITERACY TRAINING PROGRAM

In July, 1966, the Secretary of Education of Minas Gerais agreed to carry out literacy training programs in the six communities to which the literacy treatment had been randomly assigned. This was to be done through the Radiophonic School, a branch of the state Secretary of Education. Radiophonic School personnel had developed an accelerated program to teach literacy by radio* and were anxious to have research conducted on its effectiveness. From an experimental standpoint, a radio program offered the advantage of standardizing the instructional material across all six of the communities. It was decided to use tape recorders, instead of a radio broadcasting station, because only six communities would be involved in the present study. Monitors were to be trained in each community who would be responsible for playing the program tapes, displaying visual materials, demonstrating writing

*Only one other literacy program, which used accelerated teaching methods for adults, could be located in Minas Gerais. Unfortunately, that program was in financial difficulty and finally went out of operation in early 1967.

techniques, and guiding practice periods which were to follow the taped lessons.

The original schedule called for a monitor training session to be held in September, 1966, and for the literacy classes to begin in each community in October. From the beginning, the literacy training program was beset with problems and delays. Shortly after agreement was reached with the Secretary of Education, a financial crisis arose in the state government of Minas Gerais. The Secretary of Education was unable to fund travel for Radiophonic School personnel to arrange classes and select monitors in the communities. The Diffusion Project provided funds to cover this travel, as well as purchase of the tape recorders and recording costs to produce the lesson tapes.

The monitor sessions were rescheduled for December, with the anticipation of beginning literacy classes on January 1, 1967. However, the Secretary of Education refused to authorize Radiophonic School personnel to work during December and January (the regular vacation period for Secretary of Education personnel). This resulted in a further postponement of monitor training until late February, 1967. At this point difficulties developed in

* There are certain problems inherent in teaching literacy by radio. Reading and writing are visual and tactile skills, while radio is aural. Therefore, a large responsibility is placed on the monitor in the class situation, and there is obviously the chance for between-group differences due to differential abilities and styles of the monitors.

recording and copying the taped lesson programs. The Diffusion Project had arranged for the technical work of recording and copying tapes to be done at the studio of the United States Information Service (USIS) in Belo Horizonte. Just as the recording schedule was getting underway, mechanical problems developed with the USIS equipment and it was necessary to rebuild one of the recorders and, eventually, to install an air-conditioning unit to provide adequate cooling for equipment and studio facilities. This added a further month's delay.

Between October, 1966, and February, 1967, Radio-Phonic School personnel made approximately six visits to each of the communities for the purpose of enlisting monitors and creating interest in the literacy programs. Contacts were made first with officials in the county seat, including the ACAR local supervisor, and then with formal and informal leaders within the individual communities. Posters were located in the communities announcing the forthcoming literacy classes, and stressing the importance of a knowledge of reading and writing. In general, there was high interest both on the part of county officials and community leaders. In some instances county officials offered to provide kerosene lamps for the evening classes and, in one community, to remunerate the monitors.

The monitor training course was held on the campus of a technical agriculture school near Belo Horizonte in

late February, 1967. Two monitors were selected in each community and brought to the school for the six-day program. Training was conducted by the staff of the Radiophonic School and had four major objectives: (1) to stress the importance of adult education and to motivate the monitors; (2) to acquaint the monitors with the lesson content to be presented in the taped programs, and the procedures they were to follow in supplementing the taped programs; (3) to teach the monitors how to prepare and utilize visual materials for the literacy classes; and (4) to teach the monitors the mechanics of operating tape recorders, handling enrollments and other administrative details of the literacy classes.

In five of the six communities, monitors had the equivalent of a primary education (three years). In the sixth community (Pedras) the mayor of the county hired trained teachers as monitors who travelled from the county seat to the community each evening to conduct the classes. All but one of the monitors were female, and most were in their late teens or early twenties. In all communities except Pedras, monitors were residents of the community, and were selected by Radiophonic School personnel according to the following criteria: (1) voluntary offering of their services after announcement of the literacy program and need for monitors was made in the community; (2) at least 14 years of age; and (3) completion of at least the primary education level.

While the monitor training course was held in late February, the classes did not actually get started in the communities until the end of April, 1967, due to the delays in the production of tapes.

In most of the communities, literacy classes were held in the primary school building, usually a modest structure with a seating capacity of 30 to 60 students. Typical equipment included a blackboard, visual materials prepared by the monitors and Radiophonic School personnel, a kerosene lantern (although two of the schools did have and use electric lights) and the tape recorders, which were equipped to operate either by battery or from a 110-volt power source.

The teaching of reading in the literacy program utilized a phonetic approach. In addition to training in reading and writing skills, the curriculum of the literacy program included instruction in arithmetic, social studies, health practices, home economics, agricultural practices, and religious instruction. Class sessions consisted of one hour of taped instruction and one hour of practice under the supervision of the monitors. Approximately twenty minutes of each taped hour were devoted to teaching reading and writing skills and the full practice hour was used for this purpose. In the first six weeks of taped programs, the proportion of time devoted to instruction in each of the materials was as follows:

Reading and writing skills	34%
Mathematics	15%
Health practices	15%
Social studies	14%
Agricultural practices	9%
Home economics	6%
Religious instruction	<u>6%</u>
	99%*

Between the beginning of the literacy classes, in late April, and the data collection in July, students had the opportunity to receive about one hundred hours of instruction (ten hours per week for 10 weeks). Of this total time, about twenty-six hours was taped instruction in reading and writing skills and about forty hours devoted to practice in reading and writing. Thus, at the time of the post-treatment data collection, students in the literacy program would have received about sixty-six hours of actual literacy training.

One of the problems faced in analysis of the data was the attrition in number of respondents from the pre-treatment data collection (Diffusion Project Phase II) to post-treatment data collection. Of those interviewed in July, 1966, a disappointingly small number enrolled in the literacy courses. Some of those who did enroll demonstrated

*Totals to 99% due to rounding error.

ability to read (were at least partially literate) and so were eliminated from the analysis. Table 6 indicates the number of respondents interviewed in July, 1966, in each of the communities; of those the number who enrolled in the literacy program; and of the enrollees, the number who were actually illiterate when they enrolled.

TABLE 6.--Number of Phase II respondents, number of Phase II respondents enrolled in literacy campaign, and actual number of illiterate enrolled by community and by sex

Community	Phase II Respondents	Phase II Respondents Enrolled	Actual Number of Illiterates Enrolled
Male:			
S. João Serra	82	2	2
Matos	57	16	9
Picada	75	10	9
Pedra	<u>67</u>	<u>9</u>	<u>6</u>
TOTAL	281	37	26
Albertos (Control--no campaign)	81	--	(25)
Female:			
S. João Serra	27	4	3
Matos	37	7	1
Picada	26	1	1
Pedra	<u>36</u>	<u>2</u>	<u>0</u>
TOTAL	126	14	5
Albertos (Control--no campaign)	28	--	(8)

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