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# Communication in Brazil: Experiments in Introducing Change



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COMMUNICATION IN BRAZIL: EXPERIMENTS IN  
INTRODUCING CHANGE

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Diffusion of Innovations Research Report 14

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## ABSTRACT

The first chapter of this report contains a general introduction to purposes and design of our field experiment. In addition some basic demographic data is used to describe the residents of the communities in our experimental design.

Chapter two contains a detailed description and evaluation of two experimental community development techniques: animation and literacy. Animation apparently led to some cooperation in solving community problems. Literacy training showed few positive results although classes were favorably received in the communities.

Chapter three describes and evaluates the two communication treatments: Radio forums and community newspapers. A number of recommendations for improving these treatments are presented. Selection of four innovations - trench silos, mechanical planters, soil conservation, and household pharmacy - for the content of the communication treatments, is described in detail.

The latter part of chapter III includes an analysis and discussion of the three treatment groups - radio forum communities, newspaper communities, and control communities. It appears the newspaper communities were less developed socially and economically than either the radio forum or control communities. Such initial inequality is an obstacle to the accurate evaluation of the treatments, since any lack of effect might be the result of this inequality rather than the weakness of the communication treatment.

Chapter IV reports some of the apparent effects of the communication treatments. The first part of the chapter examines indirect effects on such variables as urban contact, contact with ACAR supervisor, media exposure, and media credibility. Increases in urban contact could not be attributed to the communication treatments. The radio forums apparently motivated farmers to contact the ACAR supervisor, while the newspapers did not. Only radio forum communities showed much of an increase in exposure to the medium serving them in the experiment. Newspaper exposure

increased in the newspaper communities but this evidence was not conclusive. The credibility of the media apparently changed as a result of the experiment: newspaper credibility increased in the newspaper communities and radio credibility increased in the radio communities.

The latter part of chapter IV examines the direct treatment effects on information and attitudes. Only the radio forums appeared to be effective. In the radio forum communities there was an increase in information levels concerning the four innovations and an increase in favorable attitudes toward the innovations. Newspaper communities did not show such an increase. On the basis of this evidence, we concluded that radio forums are an effective means for communicating with farmers.

Appendix A presents some figures on the relative costs of radio forums and community newspapers. While both demand large amounts of time and money, the forums are less than half as expensive as the community newspaper. Since the radio forums were more effective as communication medium further support is given to the use of radio forums.

## ACKNOWLEDGEMENTS

There are certainly many co-authors of this report. ACAR, the state extension service in Minas Gerais, cooperated at every stage of the research especially during the field experiments. At least two individuals within ACAR should be especially thanked: Rodrigo Pries de Rio Neto, who recorded the radio programs and wrote the newspaper articles, and Miguel Alfonso Neto, who acted as our Project liason with ACAR and showed us how to get things done.

Luiz Fonseca came to us from ICA, and helped with the final experimental phase. He worked rapidly to procure a preliminary report written in Portuguese from the Phase III data. This earlier report reached essentially the same conclusions as does the present report.

Other individuals participated actively in this third phase of the project. Lytton Guimaraes helped with the data analysis at Michigan State. Helvio Ordones Pena, Luis Fernando Barbosa, Jose Madueira Vasconcelos, and Luiz Antioniox de Andrade all helped with the experimental treatments and final data gethering. Many inter-viewers worked long and dusty hours finding their respondents, drinking innumerable cups of coffee, and completing the interviews.

The Radiophonics School provided a contrast with ACAR in terms of organiza-tional efficiency, but they did help with the literacy classes. CONTAPE financed part of the animation training. Radio Inconfidencia donated air time for the radio forums. The computer center of the Federal University of Minas Gerais furnished the card punching and preliminary data analysis. Mr. Stephen Helderman created the design for the front cover.

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Introduction

This report examines the third phase of a broad project designed to study rural communication and the adoption of agricultural innovations in the state of Minas Gerais, Brazil. Phase III was composed of two complementary parts: (1) a field experiment that manipulated two different communication techniques and two different community development techniques; (2) the collection of data that allowed us to evaluate the effects of the experimental treatments. In general, the principle objective of this report is to describe and evaluate the effectiveness of the community development and communication techniques for the Brazilian extension service.

At the present time, the agricultural extension service (ACAR)\* operating in Minas Gerais, Brazil, communicates with farmers primarily by means of direct personal contact between the local supervisor or agent and his clients. The agent typically shows farmers how new ideas apply to their farms, how they could make their farming more efficient, or what particular solution exists for a particular problem. For example, if the farmer is plagued with ants, the agent can recommend and describe the use of an ant killer. If the farmer wants to expand his milk production the agent can suggest how to make that expansion most productive. While personal contacts are often quite effective they are limited because of

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\* Associacao de Credito e Assistencia Rural

their essentially face-to-face character.

ACAR is interested in amplifying the effectiveness of the individual agent. One possible amplifier is mass communication. With mass communication a single individual, such as an extension supervisor, can send messages by some mechanical process to a large audience spread over a large geographical area. This report describes and evaluates two mass communication techniques that could be used by the extension service for communicating new ideas: The radio forum and the community newspaper. Ideally, both of these mediums allow a change agent to reach a large number of farmers with information about agriculture or other matters of interest. As such they represent communication techniques that are much more efficient than traditional, face-to-face contact.

In Brazil, as in many countries, rural areas are much less socially and economically developed than are urban areas. Consequently, community development is also of interest to the extension service. ACAR, for example, helps farmers obtain credit to build new homes or make farm improvements. This report also examines two community development techniques, "animation"\*and "literacy training", in order to evaluate their potential contribution to community development programs.

A field experiment, by its very nature, is a complex undertaking, involving many different considerations and decisions. Because these factors often effect the results of the experiment they must be fully described and evaluated. In the remainder of this chapter the main features of the experimental design are discussed in detail.

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\* Animation is a method of training community leaders to attack community problems; its exact nature is discussed later in the report.

### Phase III Experimental Design

Both the field survey and the field experiment study individuals or groups in natural settings, in places where the respondents live and work. The field survey, however, gathers data about respondent's attitudes and activities at one particular moment in time. These data are then used to describe the respondents in terms of what ever variables were measured with the survey. Furthermore, analysis usually consists of relating one variable or characteristic to another. Reports from Brazil Phase I\* and II\* used data from field surveys: they described respondents in terms of age, education, mass media exposure, and adoption of agricultural innovations, and related these variables to one another with correlation coefficients and regression equations. While field surveys provide extensive data on the nature of the respondents and the relationships among variables they do not indicate which variables cause other variables to occur.

Field experiments enable researchers to examine cause and effect relationships. In more practical terms, field experiments allow researchers to control the time-order of events and thereby pinpoint the impact of one factor on another. "Time-order" and "impact" are central to what we call "cause and effect". In this experiment, for example, we were initially interested in the impact of the experimental treatments - radio forums and community newspapers - on farmer's knowledge of various agricultural practices. We tried to order the events in time so that the treatments preceeded changes in knowledge. Increased knowledge

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\* Whiting, G. C., Herzog, W. A., Quesada, G.M., Stanfield, D.J., and Guimaraes, L., "Innovation in Brazil: Success and Failure of Agricultural Programs in 76 Minas Gerais Communities." Diffusion of Innovations Research Report 7, Department of Communication, Michigan State University, East Lansing, Michigan, 1968.

\*\* Herzog, W.A., Stanfield, D.J., Whiting, G.C., and Svenning, L., "Patterns of Diffusion in Rural Brazil," Diffusion of Innovations Research Report 10, Department of Communication, Michigan State University, East Lansing, Michigan 1968.

about agriculture, then, could be linked to the treatments and we could safely say that either one or both treatments caused the change. This is not possible with a field survey because only one particular moment in time is considered.

The Experimental Design

Radio Forums were started in six communities, and community newspapers in six other communities. Another set of six communities were designated as controls, and did not receive either communication treatment. In this situation, there were really three types of experimental treatments, one involving radio forums, another community newspapers, and the third, no special treatment at all.

This three-category design was complicated, however, by the two community development pre-treatments that preceded the communication treatments. These pre-treatments, consisting of literacy training and animation, cut across the radio forum, newspaper, and control groups. In essence this amounts to having another three-category experimental design laid on top of the first design. This rather complicated plan is illustrated by the 3 x 3 table shown in Figure 1-1. This Figure shows how the treatments and pre-treatments were combined. It also indicates how the counties (municipios) were assigned to the various combinations. Divinopolis in cell-1, for example, received animation and radio forum; Cordisburgo, in cell 3, experienced neither pre-treatment but received a radio forum.

Figure 1-1: Phase III Experimental Design Utilizing 18 Municipios in Brazil

Pre-Treatments	Communication Treatment		
	Radio Forums	Community newspapers	Control
Animation	1. Divinopolis Bicas	4. Sao Joao Nepomuceno Sao Joao Del Rei	7. Tocantino Uba
	Literacy	2. Itauna Pedro Leopoldo	5. Santos Dumont Cataguases
Control		3. Tres Coracoes Cordisburgo	6. Formiga Sete Lagoas

The selection of the 18 communities was influenced by requirements of the communication treatments. All communities had to be within the range of a single radio station. All communities required a nuclear center where literacy classes could meet. All communities had to be relatively accessible, since numerous trips were to be made to each community in the course of the experiments and actual data collection. Furthermore, in order to avoid taxing the resources of any one local ACAR office no more than one community was chosen from the area of a single office. This also avoided the possibility that communities would be able to interact with each other while the treatments were proceeding.

In addition to locational restrictions we were also somewhat restricted by the limitations of Phase I and II. For example, we wanted to utilize the knowledge gained from Phase I, as well as work in communities familiar to ACAR so our efforts would provide the maximum amount of useful information. Consequently, the 18 communities had to come from the 76 communities studied in Phase I. These 76 Phase I communities were selected originally by drawing a stratified random sample of 38 ACAR local offices from a population of 131 such offices and then selecting the two communities where ACAR was most and least successful in diffusing new practices. Originally, the Phase III design was to include this successful-unsuccessful distinction. However, since the Phase I analysis showed this distinction, made by the ACAR supervisor himself, to be of little value for distinguishing\* among communities, this third level was not included in the present design.

In summary, the sample of 18 communities was restricted to those:

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\* We calculated various indices based on our data and found few pronounced differences between the "low success" and "high success" communities.

1. Within the Phase I sample;
2. Within the range of a single radio station;
3. With a nuclear center of some sort
4. Where no other community in the local district was in the experiment.

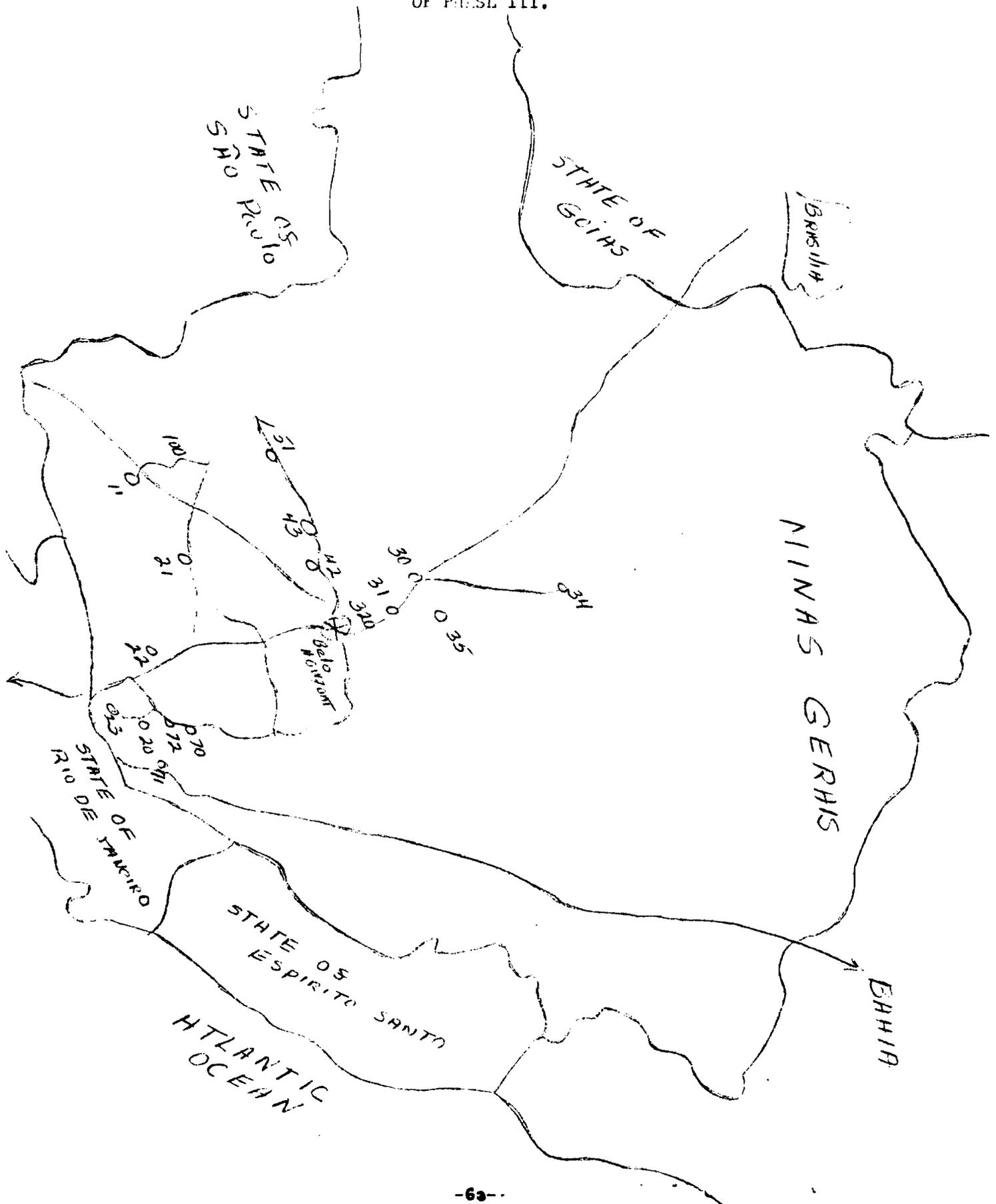
Once the 18 communities meeting these criteria were selected, they were assigned at random to the experimental treatment and control groups. Randomization, of course, allows us to make generalizations about the treatments, given that effects are detected. It could be argued that earlier criteria for selecting the communities make generalizing to all the communities of Minas Gerais, or Brazil, difficult, even though communities were randomized to treatments. This argument can be partially rejected by the fact the communities do represent varying geographical regions and different styles of agriculture. In addition, because they come from a random selection of ACAR local offices generalizations are even more tenable. A map of the state and the location of the communities is shown in Figure 1-2.

#### Overall Organization of Research

As mentioned previously, Phase I was devoted to a study of 76 Brazilian communities. Phase II followed and was an intensive study of the 18 communities chosen for the field experiment. This phase had two main objectives: (1) To determine the factors differentiating the early adopter of innovations from late adopters, and opinion leaders from non-opinion leaders; and (2) To clearly specify the antecedent conditions before the experimental treatments.

Animation and Literacy pre-treatments immediately followed the Phase II data gathering. A small number of interviews (315) were completed at the end of the pre-treatments to detect any changes caused by these community development techniques. This "Phase 2.5" data collection also attempted to determine the degree

FIGURE 1-2: MAP OF MINAS GERAIS, NUMBERS IDENTIFY THE 18 COMMUNITIES OF PHASE III.



to which several practices were known and accepted prior to the communication treatments. A large scale data collection followed the completion of the Radio forum and community newspaper communication treatments. Analysis of this data enable us to identify any changes produced by these treatments. Figure 1-3 illustrates the time-order of the various treatments and data gathering in the Brazilian research.

Figure 1-3; TIME-ORDER DESIGN OF THE BRAZILIAN RESEARCH

Time 1 - June, 1966
Phase II data gathering, interviewing with 1,199 farm operators in the 18 experimental communities.
Time 2 - August, 1966 to May, 1967
Pretreatments of animation and literacy training applied to 12 of the 18 communities.
Time 3 - June, 1967
Phase 2.5 data gathering, interviews with 315 farmers in 10 of the 18 communities to determine (1) the effects of the pre-treatments, and (2) the knowledge and attitude levels before the treatments began.
Time 4 - September to December, 1967
Communication treatments, radio forums and community newspapers, applied in 12 of the 18 communities.
Time 5 - January, 1968
Phase III data-gathering, interviews with 1177 farm operators to determine the effects of the communication treatments.

#### Characteristics of the Phase III sample

The Phase II report\* dealt exclusively with the "typical" farmer in our sample and hoped to be somewhat reflective of the "typical" farmer in Minas Gerais,

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\* Herzog, op cit.

if not beyond the borders of that state. To give some additional insight about the kind of farmers in Phase II and III a number of questions were asked on the Phase III interview schedule about the production and sale of major crops.

Data-Gathering Methodology in Phase III

The methods used in Phase III to obtain the data were quite similar to those utilized in Phase II. A questionnaire was constructed and thoroughly pretested in rural areas. The farmers to be interviewed were those who had already been interviewed in Phase II. The broad purpose of the data gathering was to measure the impact of the various experimental treatments of Phase III on these respondents. Some additional farm operators were included beyond the Phase II respondents in order to include all of the opinion leaders of the communities in the sample as well as those who were especially involved in the treatments, such as the radio forums, but were missed in the Phase II interviewing. There were 76 of these "new" respondents added to the Phase III sample.

As in any panel study where the same individuals are to be re-interviewed, some could not be located, some died, some moved away, and some simply refused to be interviewed again. Table 1-1 shows the extent to which the Phase III interviewing was affected by various types of sample loss.

Table 1-1; INTERVIEWS OF PHASE II RESPONDENTS NOT OBTAINED IN PHASE III

<u>Reason not Interviewed</u>	<u>Number</u>	<u>Percent of Phase II Sample (N=1,199*)</u>
1. Moved away from community	46	3.8%
2. Not able to locate in community, since traveling or in hospital, etc.	24	2.0%
3. Died	16	1.3%
4. Refused interview	<u>12</u>	<u>1.0%</u>
TOTAL	<u>98</u>	8.2%

\* The sample size in Phase II was 1307, but this number included two communities not in the experimental design, n=108. This leaves 1199 in the 18 experimental communities.

As in Phase II, the Phase III data were gathered primarily by student interviewers. However, in Phase III extensive effort was made to secure and train agricultural college students who presumably had a more profound understanding of rural life than their city-bred counterparts. Four teams of four or five male interviewers per team were formed. Two teams were agricultural students from the Rural University at Lavras. Two other teams were composed of students from Belo Horizonte, the capitol of the state. Many of the members of these latter two teams participated in earlier phases of the Project and were well trained in the techniques of interviewing. All interviewers received three days of instruction in personal interviewing and one day of actual practice in a rural community near the training center.

The interviewers were also trained to code and transfer responses to the spaces allotted on the margin of the questionnaire: Once the interviewing began all coding was completed in the community before the interviewer left. Thus, any missing information could be readily acquired with a callback. This method of coding in the field lengthened the total interviewing time but made it more adequate since each interviewer knew he would be responsible for making sense out of all the responses.

When the coding was finished the team supervisor checked each interview for response and coding error. Each questionnaire was also checked in the project office for illegal codes and interviewing errors. IBM cards were punched directly from the questionnaires in Belo Horizonte. There were 1,177 interviews, each filling 8 IBM cards of 80 columns each. Computer checks revealed very few errors (approximately .001 percent of the punches were in error).

#### Principal Crops Grown by Farm Operators in the Phase III Sample

In order to get some idea of the nature of the Phase III sample in terms of farm productivity, we asked each respondent what his three principal crops were,

how many hectares of each crop he planted, and how many kilograms of produce came from these hectares. For comparison with our data, we also located state-wide productivity averages for the major crops calculated in 1965 by the Brazilian Institute of Geography and Statistics (IBGE). Data from our sample and the comparative, state-wide figures are shown in Table 1-2.

In nearly every case, our sample showed substantially less productivity than the state average. This could mean that our sample was not overly representative of the state of Minas Gerais, or else that the state-wide data were not accurate. Probably both possibilities have some element of truth. It must be remembered that our sample contained many farmers operating at the subsistence level who rarely participated in the national economy. On the other hand, state productivity data usually excludes these farmers. The state maintains an agent in nearly every county whose job is to record productivity figures. Typically, he just talks to the farmers and reports his impressions. Thus, the data are not collected rigorously and subsistence level farmers are usually excluded from the sample. By definition subsistence level farmers plant few hectares and get a low yield; when such farmers are included in the calculation of productivity figures, as in our sample, the overall average naturally drops.

Of course there is the possibility that our respondents simply lied systematically, misrepresenting their production and sale of crops in the interview. However, such misrepresentation should be operating just to the biases introduced by selective sampling. If our figures are nearer to the truth they show the need for systematic data gathering in rural areas to develop a more accurate picture of land use and productivity. Efforts at introducing planning into the state and national economy would seem to require the most accurate information possible.

TABLE 1-2: PRINCIPLE CROPS;  
 (1) PERCENT OF SAMPLE CULTIVATING;  
 (2) CULTIVATED AREA; AND (3) YIELD.

CROP	Farmers planting crop		CHARACTERISTICS OF SAMPLE		YIELD FOR ALL MINAS GERAIS, 1965* (KGS PER HECTARE)
	NUMBER	PERCENT	HECTARES PLANTED (AVERAGE)	YIELD FOR SAMPLE (KGS. PER HECTARE)	
Corn	1,011	85.72%	5.81	725.40	1,417
Rice	794	67.37%	5.11	424.59	1,457
Beans	543	46.04%	3.90	99.35	591
Coffee	83	7.05%	15.19	296.37	476
Sugar Cane	203	17.08%	4.36	**	30,547
Manioc	139	11.80%	2.57	2,123.26	15,989
Tobacco	69	5.86%	4.68	212.65	609
Garlic	156	3.05%	4.33	536.14	**
Bananas	42	3.56%	1.36	71.58(100)	1,418
Tomatoes	10	0.84%	1.60	2,762.50	12,923
Cotton	2	0.16%	5.00	890.00	474
Oranges	5	0.42%	2.50	437.36(doz. )	**
Onions	2	0.16%	2.00	2,625.00	2,833
Other Crops	18	1.52%	2.11	1,054.79	**

\* These comparative data come from Anuario Estatístico do Brasil - 1966, published by the Brazilian Institute of Georgraphy and Statistics (IBGE), the National Council of Statistics.

\*\* Information not available.

#### Community vs Individual Analysis

Because of the variety of data we gathered we were faced with several possible ways of analyzing the impact of the experimental pretreatments and treatments. One method would have compared individuals who were exposed to the experimental manipulations with those who were not exposed. This is called participant-non-participant analysis. The other method is called community analysis. This method compares whole communities to one another. Although community analysis was chosen as the best method for our purposes, it will be useful to examine the features of both methods more closely.

Participant - non-participant analysis was used by both Spector\* and Neurath\*\* for the analysis of data from field experiments. If we had chosen this method, we would have compared the farmers who attended animation training with those who did not; the literacy class members with non-members; those who attended radio forum and those who received newspapers to those who were not exposed to these two media. This type of analysis was not chosen for several reasons. First, the extension service was interested in large scale group changes rather than individual change. Second, comparing participants with non-participants assumes a lack of interpersonal communication within the group (community). The extension service, of course, was very interested in this type of information. Basically we wanted to answer questions like: "If the extension service sets up radio forums and or community newspapers, what effect will these techniques have on the community as a whole?" "Can the readers of the newspapers learn about new practices, and then pass their learning on to others in the community?" Such central questions would have been ignored by participant - non-participant analysis. Finally, while it probably would have been easier to achieve significant results with this type of analysis, the results would have been of limited applicability.

We chose to compare whole communities with one another. In particular we wanted to see how radio forums and newspapers helped to diffuse information and change attitudes about agricultural practices. This method treats the communication

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\* Spector, P., Torres, A., Lichtenstein, S., and Preston, H.O. "The role of Mass Communications Media in the Adoption of Innovation", Paper presented at the IX th Congress of the Interamerican Society of Psychology, Miami Beach, Florida, 1964.

\*\* Neurath, P.M. "Radio Farm Forum as a Tool of Change in Indian Villages". Economic Development and Cultural Change, 10, 1962, pp. 275-283.

techniques as needles that inject information and attitudes into the communities. The communities then react to this injection and either absorb it into the mainstream of the community life or let the injection dissipate and disappear. Presumably the type of media and the strength of the injection influence what happens to the information once it pierces the community's protective skin.

This method was chosen for this report in order to reach general conclusions about the effectiveness of the experimental manipulations. We shall consider communities as a whole and compare experimental cells containing these communities to identify experimental effects. Perhaps future analyses could further explore these relationships using a participant - non-participant analysis.

## Chapter II

### COMMUNITY DEVELOPMENT PRE-TREATMENTS: ANIMATION AND LITERACY TRAINING

Before the radio forums and community newspapers were started in the sample communities, two new community development programs were conducted: animation and literacy training. This chapter describes and evaluates these pretreatments in some detail. The accomplishments of animation and literacy training are analysed both in terms of their primary objectives and in terms of their contribution to the communication treatments.

#### Animation

The actual practice of animation training was first introduced in Africa\* as a promising method of stimulating change in traditional societies. Essentially, the goal of animation training is to motivate community leaders to attack community problems using community resources.

#### What Animation Meant in Brazil

Since animation involves the motivation of community leaders, the first step in our experiences with animation was to locate the community leaders. Data from Phase II pertaining to opinion leadership allowed the preparation of lists of leaders for each community. These leaders were asked to attend a three-day conference on problems facing rural communities. Some effort was made to get the younger leaders from each community since previous experience suggested they would be most responsive to the training.

Five to eight leaders from each of the six communities were invited in August, 1966, to an experimental farm and agricultural college. Some of these leaders and others who did not attend the first conference were invited to a second conference

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\* Hapgood, David, "Rural Animation in Senegal," International Development Review, Vol. 6, No. 3, 1964, 15-18.

in February, 1967. The state extension service, ACAR, and various agricultural specialists from agricultural colleges in Minas Gerais provided technical assistance for the conference.

The first morning of the conference was largely devoted to acquainting the participants with one another and getting everyone settled in the accommodations located on the experimental farm. During the first afternoon the participants toured the farm and were introduced to the latest methods and machinery for the cultivation of crops common to the state. This tour was designed to acquaint the participants with a wide variety of farm practices. Later, the participants were encouraged to discuss ways to acquire these new practices.

The second activity of this first afternoon was the creation of community discussion groups. The participants from each community discussed (with each other) the principal problems facing their communities and prepared a listing of these problems, more or less in the order of their importance. Discussion served to define the community's problems clearly in the minds of the participants as well as create a consensus about which problems were most important within the communities.

On the second day, the conference began with a report from each community deriving from the discussion of community problems the previous day. The problems proved to be quite common across communities: lack of money, prevalence of disease, crop-destroying insects (especially ants), and illiteracy. By observing the commonality of problems, the participants developed a common basis for discussions. This process of defining problems and seeing how other communities were afflicted with the same maladies provided the basis for the next stage, the discussion of possible solutions to these problems.

The third stage of the conference consisted of discussion between the participants with occasional assistance from the agricultural technicians. An attempt was made to encourage discussion and debate among the participants with

a minimum contribution from the technicians. This approach was not easy, however, since the technicians wanted to be heard and the participants expected to hear them. Once these expectations were modified the farmers were able to develop a significant capacity for solving their own problems without relying on the technicians.

The final day of the conference was devoted to the detailed specification of community plans. These plans were designed to solve the most pressing problems facing the community. Each community discussion group reformed as in the first day of the conference and prepared its plan. Again, agricultural technicians were present at these individual community meetings, but only in an advisory capacity.

Plans from each community were then presented in a plenary session of the conference and subjected to group criticism. Suggestions for improvement from participants in other communities were submitted. At the end of the conference these plans contained a written statement of what the participants hoped to accomplish upon returning to their respective communities. Having agreed upon a plan, the community leaders as a group were prepared to put it into effect with some show of cooperation and mutual aid. In no case was much reliance placed on organizations outside the community. Instead, community resources were to be the primary source for community improvement.

Contrary to expectations, the conference proved to be only the first phase of the animation treatment. Upon returning, the leaders did not, in fact, put their well-laid plans into effect. They merely treated the conference as an interesting exercise with no particular implications for their communities. Subsequent visits by the project staff, however, stimulated some of the leaders to attack community problems. In one community, after a series of meetings with farmers, an ant-killing campaign was started. Over \$400 was contributed by individual farmers to purchase the insecticide necessary to kill the ants in the immediate area. In another community efforts were made to inaugurate a cooperative. In yet another community a parent-teachers committee was formed to solve difficulties with the community's

school. In a fourth community some efforts were made to democratize the local milk cooperative. Unfortunately, in the remaining two communities intra-community conflicts overwhelmed efforts at mutual self-help. It is notable, however, that in at least three of the six communities substantial efforts were made to solve community problems.

#### Recommendations for Future Animation Training

Although animation training was somewhat successful, a number of improvements could be made. For example, in other countries training usually lasts for a longer period of time with re-exposure to ideas more than once. In our case, the conference only lasted three days. A longer conference with re-exposure would help to stabilize the concepts of problem definition and mutual self help in the minds of participants.

The acquaintance of the participants with agricultural innovations was somewhat limited at our conferences. Perhaps more exposure to new ideas and improvements both in the home and on the farm would stimulate efforts to achieve these innovations. Building the detailed observation of innovations into the course would also help to tie these innovations to the degree of self-help necessary to acquire them.

#### Literacy Training

In July, 1966, the secretary of education in Minas Gerais agreed to start literacy training programs in six of our sample communities. The training occurred in classes developed and taught by Radiophonic school personnel, a branch of the Minas Gerais Secretary of Education. Tape recorders were used for the main part of each lesson. Special class monitors or the regular community teachers were responsible for playing the program tapes, displaying visual materials, and guiding practice periods following the taped lessons.

A series of problems resulting from the Radiophonic School's lack of facilities and material caused a delay in the start of actual classes from the target date of October, 1966 until March, 1967. During this time the Radiophonic School personnel made visits to each community to enlist monitors and create 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. 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 pay a small amount to the monitors.

Initially, the monitors were volunteers, usually connected in some way with the local community school. Two monitors were selected in each community and trained for two weeks. Most monitors were young women with the equivalent of a primary education (three years).

Students were taught to read and write with a phonetic approach. Class sessions included one hour of taped instruction and one hour of practice under the supervision of the monitors. Sessions were usually held every weekday evening.

Although the classes were open to all adults the students tended to be somewhat younger and poorer than the community's population. On the average the enrollees were 37 years old, while the non-enrollees averaged 47 years of age. The level of living index (number of home and farm improvements for enrollees was 5.3, while the non-enrollees averaged 7.3. Enrollees earned an average of \$405. per year and the non-enrollees \$450.

Due to the many difficulties in the execution of the program and the creation of program tapes, the literacy training did not proceed as quickly and smoothly as planned. The Secretary of Education, as is common in many countries, was experiencing a shortage of money and could not carry through commitments as well as desired. The recruitment and training of monitors proved to be more

difficult than previously imagined. Not only were there few people in the community to perform these specialized tasks, but they were understandably reluctant to work every evening without pay in many cases, and without significant pay in all cases. Most individuals competent enough to teach school were either overworked in ordinary classroom activities or were not planning to stay in the community for long.

### Results of Classes

In spite of the many difficulties, the communities were quite receptive to literacy classes. A great deal of enthusiasm was generated and many adults journeyed far to attend classes. The final stages of the training were in large part supported financially by the counties in which the classes were held, a tribute to the importance the people themselves attached to literacy.

For a much more detailed discussion of the variables related to literacy, the literacy training program, and its results, see the technical report: Literacy Training and Modernization: A Field Experiment, by William Herzog, Department of Communications, Michigan State University, 1967. Unfortunately this study was able to detect few effects due to these classes, at least over the limited period of time the classes ran. The high cost of literacy training make it a difficult program to begin and maintain; however, its long term effects may be extremely important and may not have been detected in our experiment

### Future uses of Literacy Training

Literacy classes are often broadcast over the radio, as would have been the case in this experiment if there were more communities involved. The use of tapes and tape recorders while increasing the logistic difficulties over the usual radio classes, were more advantageous because they could be stopped and replayed if the class did not understand the program content. If such classes were broadcast

over the radio, program content would have to be pretested to avoid possible confusion. Further, the class monitors, who proved vital in this experience with literacy training, would have to be especially well trained because fewer opportunities would be available to explain the program.

In future uses of literacy training via radio or tape recorders, extensive evaluation of existing organizations and facilities should be made to see if commitments could be met. The teaching of literacy is a long and difficult process, especially in rural areas where students may not be able to attend every class because of demands of the farm. The program, therefore, has to exist for a long period of time, even if only one set of students are to be trained. Once having programs taped, as was not initially the case in our experiment, monitors must be chosen and trained. Sufficient funds should be available to pay these monitors without whom the program would not be possible. The time they spend in these adult classes is probably even more tiring and deserving of pay than ordinary school classes, since they are dealing with their peers and not children.

#### Evaluation of Pretreatments

Some of the effects of the animation and literacy pretreatments have already been discussed. Animation produced an ant-killing campaign, a parent-teacher school organization, and efforts to improve the local milk cooperative. Literacy classes did not result in many observable changes in the lives of the people who participated in them, but there was a significant amount of enthusiasm generated in the communities, so we conclude that the classes were at least filling some need felt by the communities' inhabitants.

These "effects" of the community development pre-treatments, however, are based on judgments of outside observers, and not on the thoughts and activities of the residents themselves. We propose to examine briefly some of the indices of these thoughts and activities as reflected in the interview data to see if any

other effects of the pre-treatments can be isolated.

In addition, as the name "pre-treatments" implies, these community development activities preceded in time the communication treatments discussed in Chapters III & IV. We want to see if these activities paved the way for introducing innovations via radio forums and community newspapers. To determine this, we shall see if knowledge and attitudes pertaining to the four practices used in the communication treatments increased more for one pre-treatment group than another.

First, Phase II must be compared to Phase 2.5 to see if animation and literacy effected the sample. Secondly we will compare animation, literacy, and control groups on variables measured only in Phase 2.5 to see how one group compared to another on critical indices.

#### Phase II - Phase 2.5 Changes

One effect to be expected from a series of literacy classes, assuming they functioned long enough, would be an increase in literacy and newspaper reading. Literacy might also function to increase awareness of the outside world. In this case we might find residents in the literacy communities taking more trips to the city. We would also expect that the animation training would increase contact with ACAR, since animation stressed community development activities directly of concern to ACAR. Unfortunately, our expectations were not confirmed. Figures 2-1 and 2-2 present data on changes in levels of literacy and newspaper exposure. Figures 2-3 and 2-4 show changes in contact with ACAR and trips to the city.

In Figure 2-1 we see that newspaper exposure actually decreased in all three experimental groups, but with the least decrease in the literacy communities. Because the variance was so large within the three treatment groups the differential changes were not statistically significant. There is some reason to believe, however, that literacy classes did have an effect; at least the general decrease in newspaper reading did not progress as far in the literacy communities.

A more direct measure of the effects of literacy classes is the literacy level of the three groups. Figure 4-2 shows that the literacy levels of the control communities, which received neither animation nor literacy classes, rose more than the two pre-treatment communities. We conclude, simply, that the literacy classes did not effect literacy levels. The delay in classes plus the fact that learning to read and write requires more than a few classes could explain this lack of a direct effect.

As Figures 2-3 and 2-4, show contacts with ACAR and trips to the city were also somewhat contrary to our expectations. While in both pre-treatment communities, contact with ACAR and trips to cities increased in contrast to decreases in the control communities, the literacy communities showed a greater increase in contacts with ACAR, and the animation communities showed a greater increase in urban contact. Therefore, we can argue for an experimental effect in both variables since the change in the pre-treatment communities was large and positive while the change in the control communities was actually negative. The control communities had less contact with ACAR and fewer trips to cities in the Phase 2.5 data collection than they did in Phase II while the pre-treatments had more contact and more trips.

Still, this finding was counter to our expectations. We expected animation to increase contact with ACAR and Literacy Training to increase urban contact. Apparently these two pre-treatments did not function as we expected; or, perhaps the data are inaccurate. We are relatively certain the experimental differences are statistically reliable in that such differences occur by chance very rarely (less than once in a thousand trials). Because it is difficult to determine how these changes occurred further research is necessary and advisable before any firm conclusions are reached.

Phase 2.5 Data Only: Participation in Community Improvement and Mutual Aid.

A number of variables were measured in Phase 2.5 that were not measured in

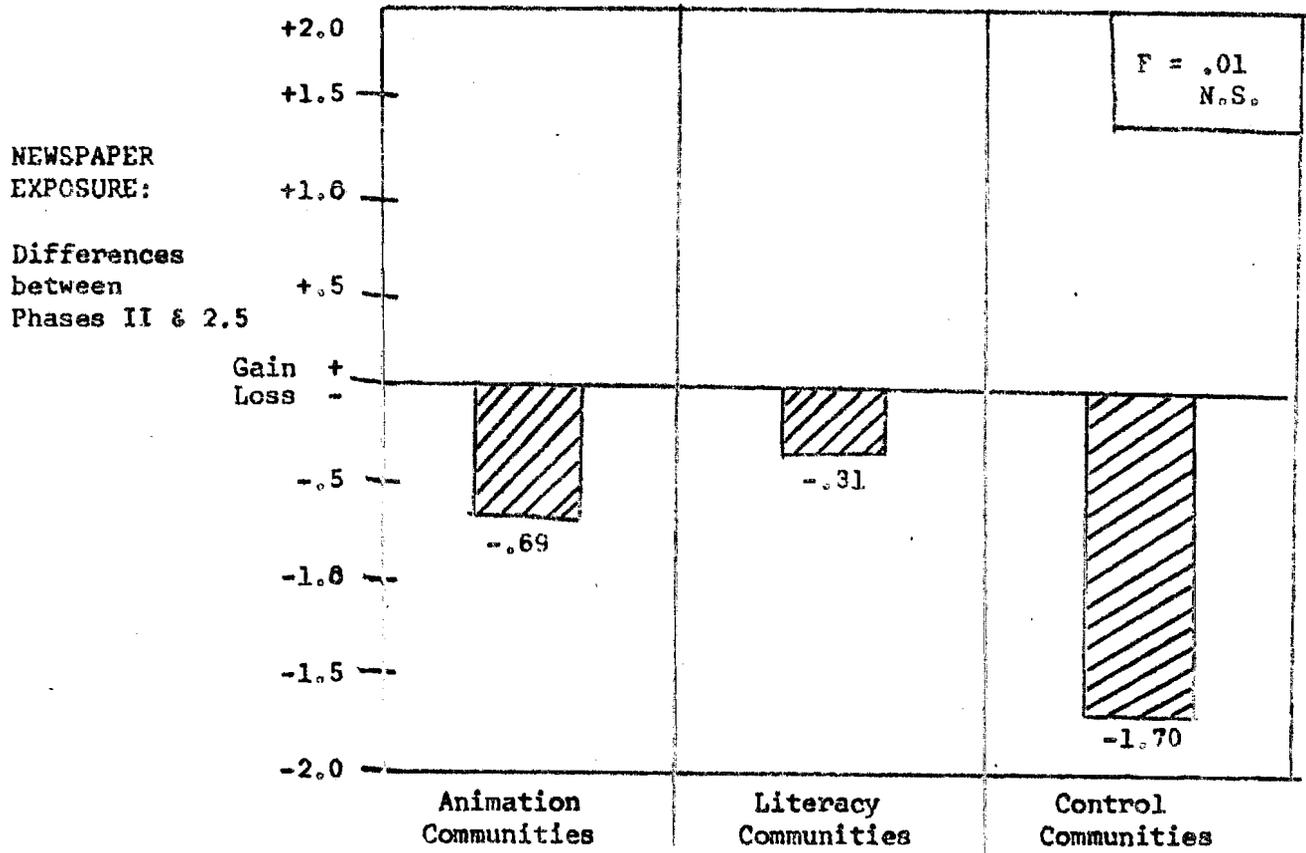


FIGURE 2-1 - Change in Newspaper Exposure between Phases II and 2.5

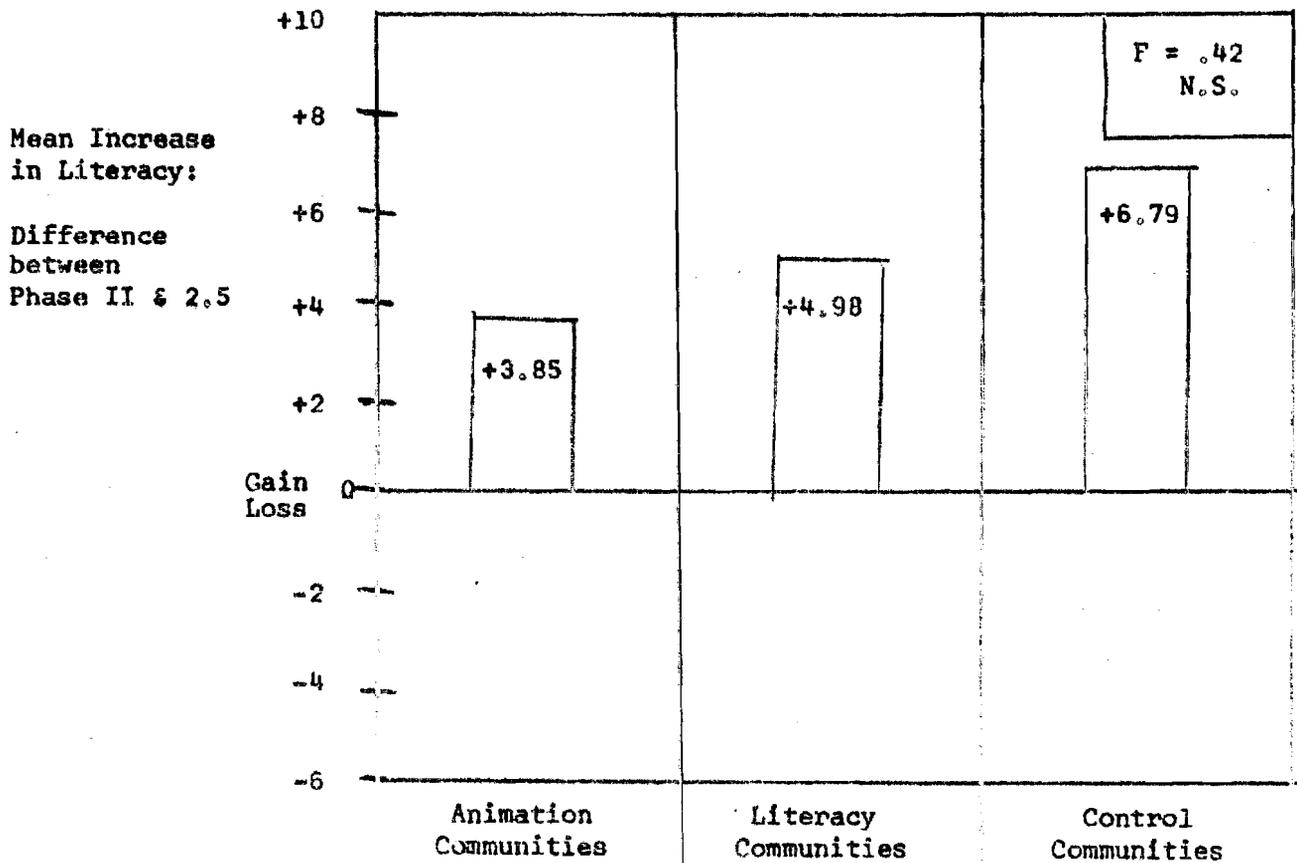


FIGURE 2-2 - Increase in Literacy Level between Phases II and 2.5

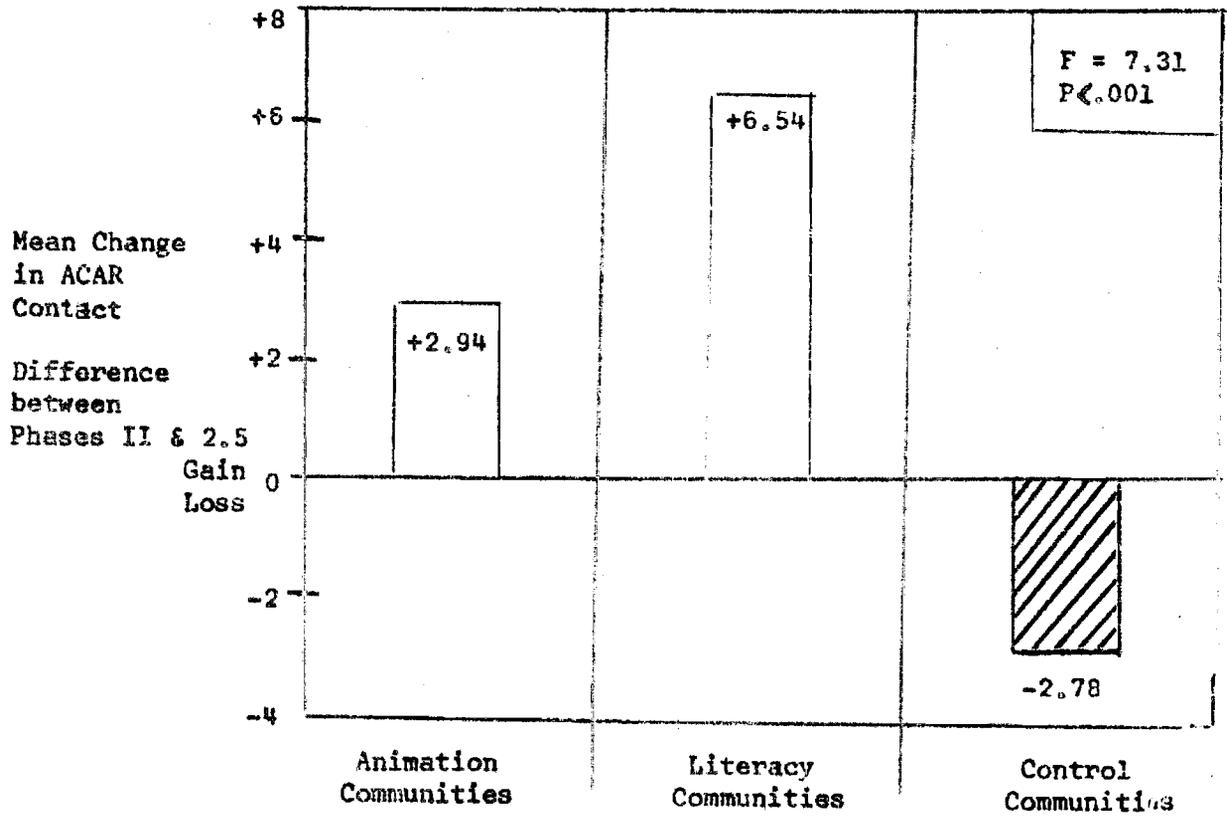


FIGURE 2-3 - Change in Contact with ACAR in Phases II and 2.5

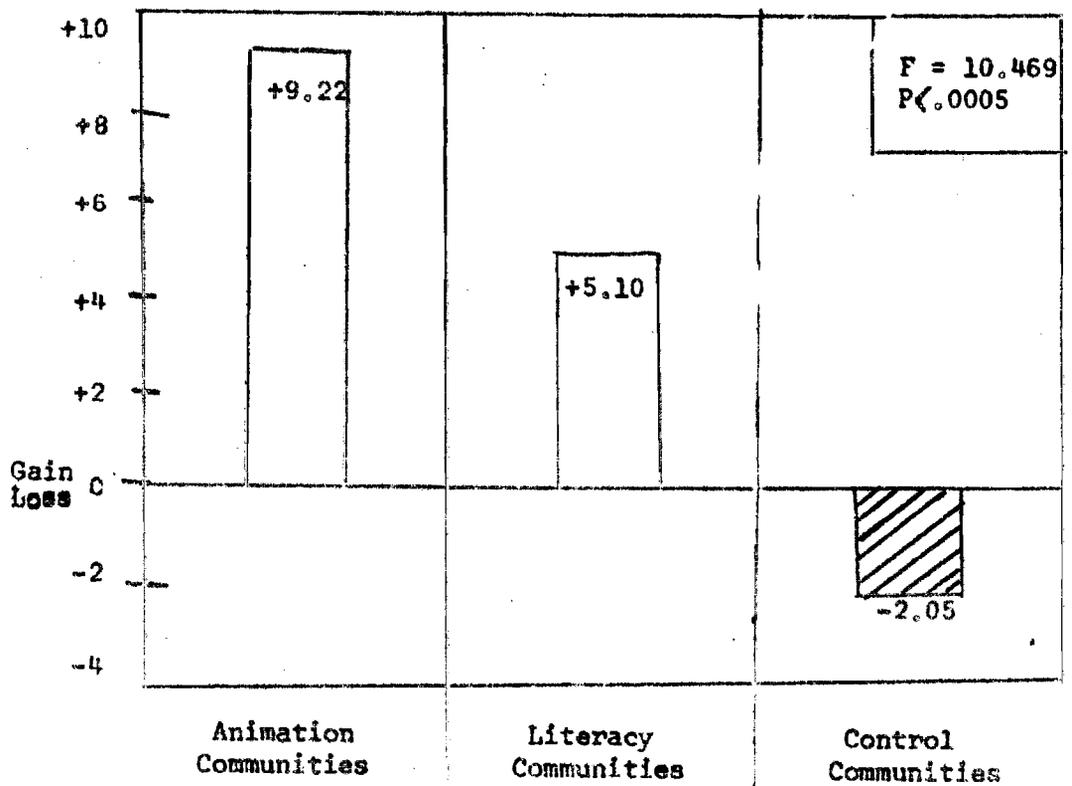


FIGURE 2-4 - Increase in Trips to Cities between Phases II and 2.5

Phase II. Three such variables of particular interest are : (1) Participation in and capacity to devise self-help plans; (2) Giving aid to neighbors; (3) Receiving aid from neighbors. Because these variables were only measured after the pre-treatments and we don't know what they were like before animation and literacy we can not be as sure about what actually caused the differences between groups.

The question measuring participation in community improvement activities asked each respondent if he heard of any community improvements and, if so, if he participated in any. Figure 2.5 shows that the literacy training communities were somewhat aware of community improvement project and participated in them. Animation communities were a little less aware but ranked close behind. Both pre-treatments exceeded the control group, leading us to conclude that animation and literacy training were effective. They both produced awareness of and participation in community development activities. Perhaps the literacy communities ranked slightly higher than the animation communities because of the popularity of the literacy classes. While also popular, animation training involved only a small portion of community leaders.

Figure 2-6 shows the results of a second question which asked the respondent what he would do if responsible for a community improvement project. Since this was the topic of discussion in much of the animation training, we wxpected animation communities to show a greater capacity for hypothetical thinking than the literacy communities. Indeed the animation group does rank higher with an average of .80, but the other two groups are so close as to make the differences statistically non-significant. Perhaps future analysis of animation participants alone would illuminate this relationship.

Another variable investigated in Phase 2.5 was "Giving aid to neighbors" Figures 2-7 and 2-8 show the relative amount of help neighbors gave one another. Help was defined in terms of money and tools loaned, labor donated, or help given in time of sickness. In each case the literacy communities gave more mutual aid.

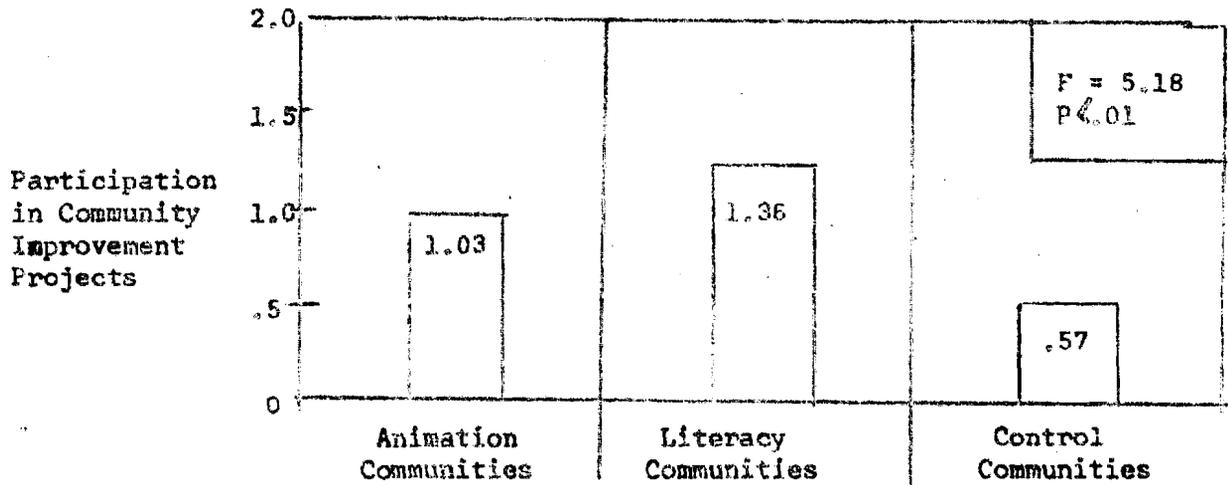


FIGURE 2-5 - Participation in Community Projects

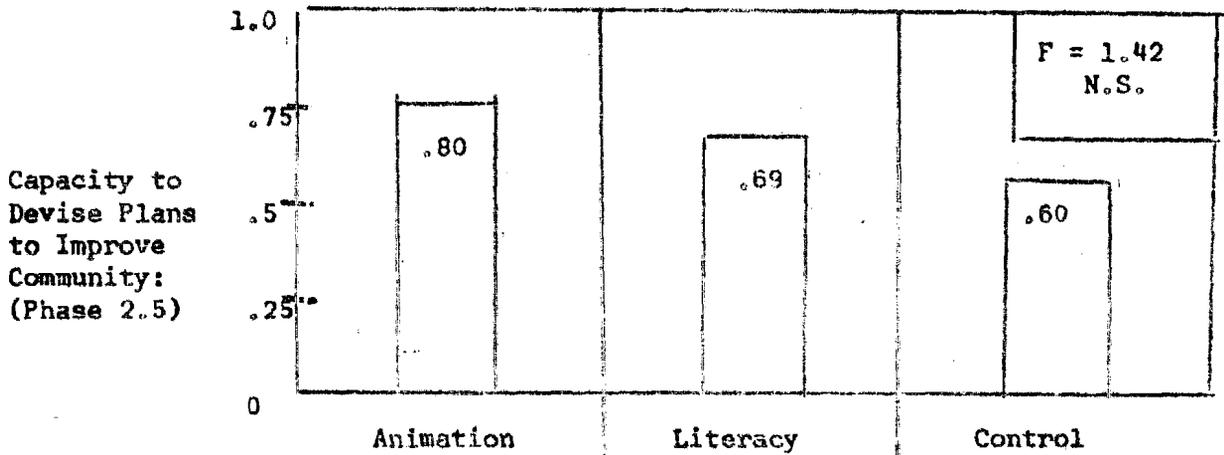


FIGURE 2-6 - Capacity to Devise Plans to Improve Community

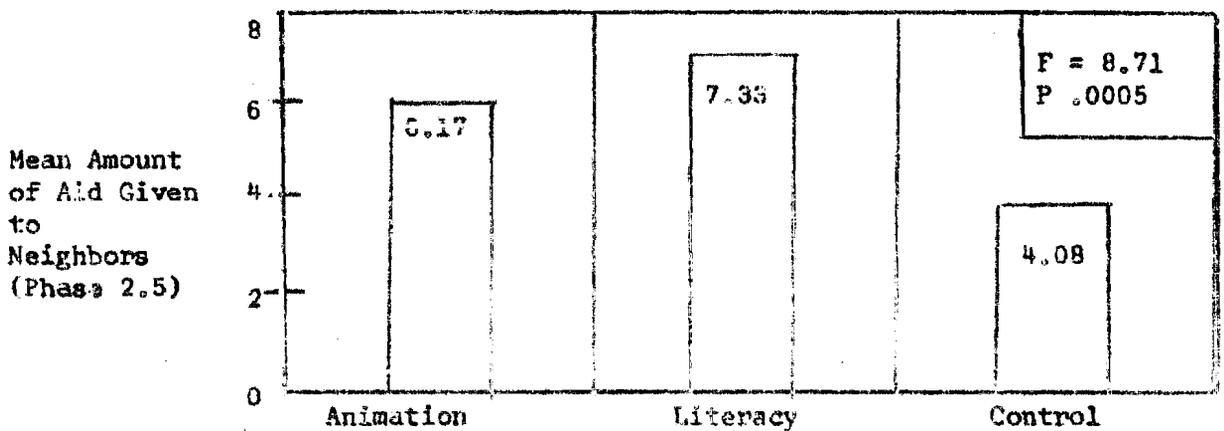


FIGURE 2-7 - Aid Given to Neighbors: Phase 2.5

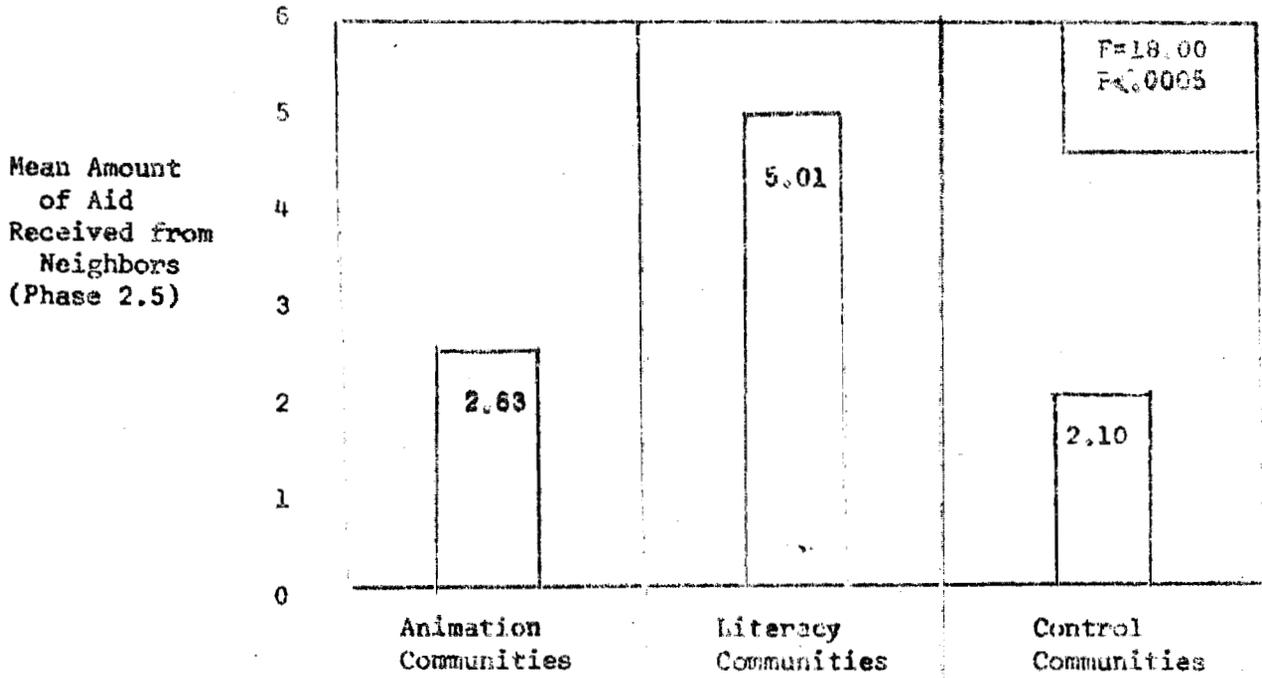


FIGURE 2-8 - Aid Received from Neighbors: Phase 2.5

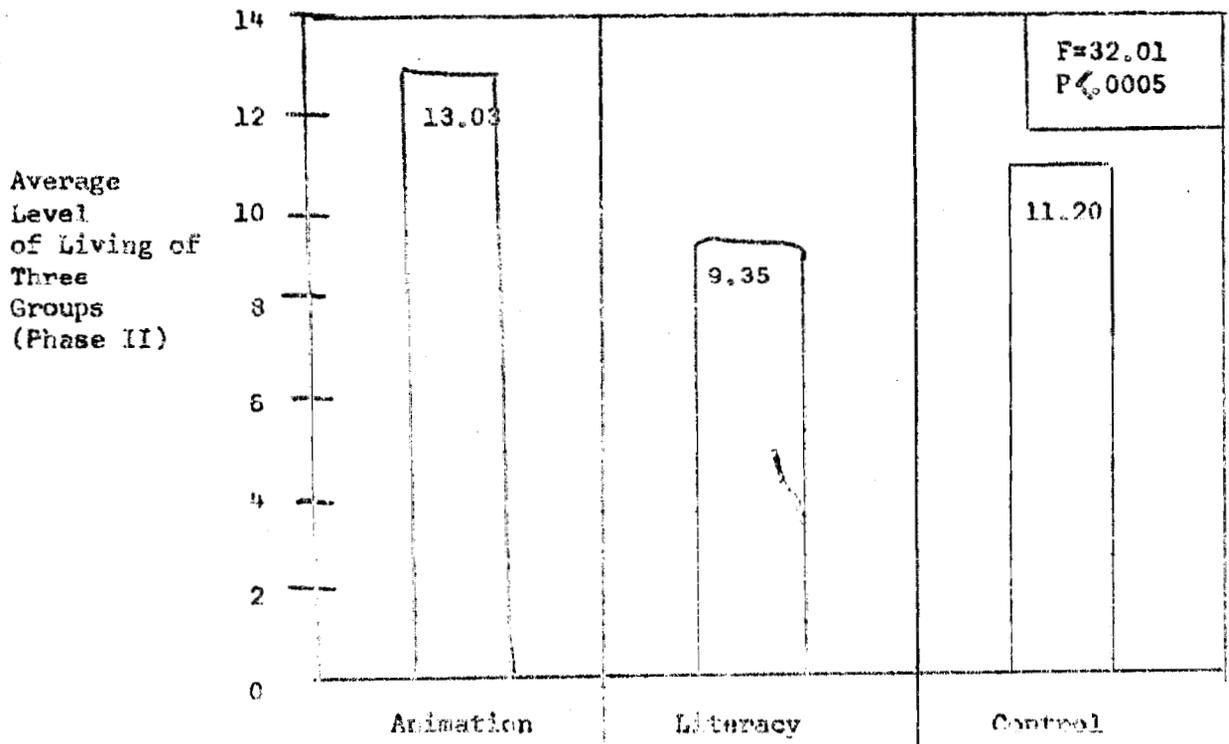


FIGURE 2-9 - Average Level of Living for Three Groups: Phase II

The animation communities also exceeded the control group communities in mutual aid, although not to the extent of the literacy communities.

It is difficult to understand how literacy training could lead to more mutual aid since the classes had little to do with working together. In fact, it might be more reasonable to explain the relationship in terms of the level of living index. As Figure 2-9 shows the literacy communities rank well below the other communities in terms of home and farm improvements. Because they were relatively poor, people in the literacy communities may have been forced to rely on one another to a greater extent. Whatever the reason, the differences among the three groups are large and invite further research.

#### Pre-treatments as Preparation for Communication Treatments.

Did the pre-treatments contribute to the effects of the Radio forums or community newspapers? Figures 2-10 and 2-11 summarize our findings concerning knowledge and attitudes toward four new practices (see chapter III for more information about the practices used). From this data it is clear the pre-treatments had little, if any, effect, while the control communities showed a pronounced gain in knowledge and favorable attitudes. This finding indicates the extension service would gain little by setting up animation training or literacy classes as preparation for radio forums or community newspapers. Despite the apparent good logic of doing some organizational work like animation before setting up the forums, or teaching people to read before starting community newspapers, they failed to have the desired effect. Our data seem to imply that resources should not be allotted to animation and literacy training as means to prepare for the diffusion of innovations via radio forums or newspapers.

Increase in Knowledge Level on Four Practices

(Phase III, Phase 2.5)

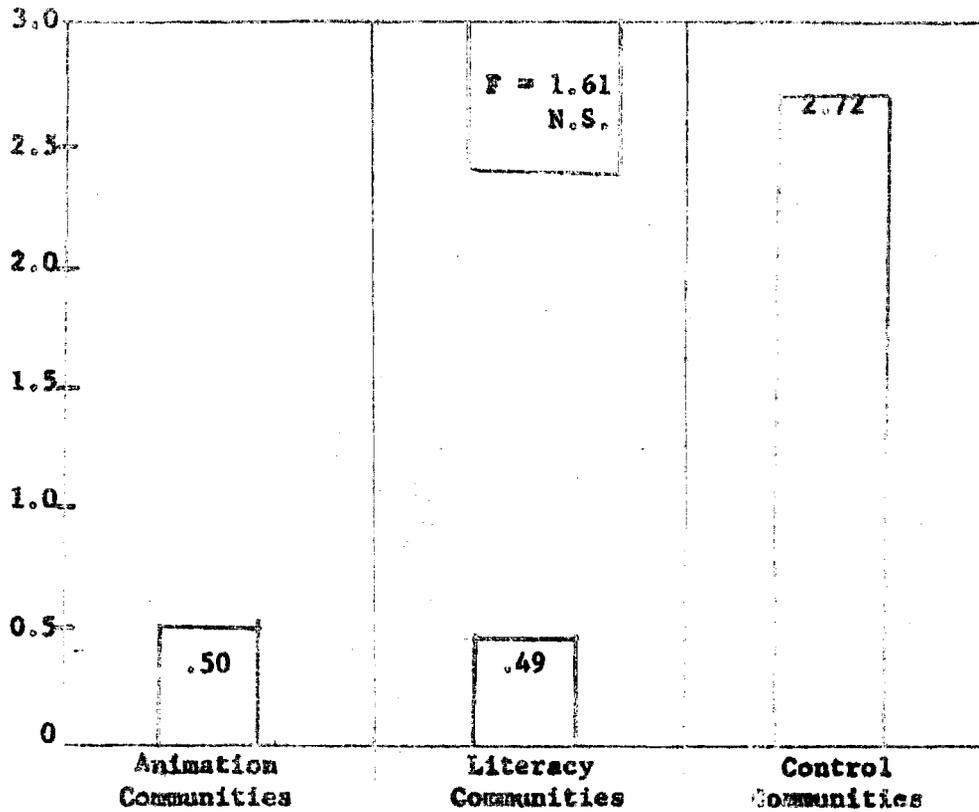


FIGURE 2-10 - Increase in Knowledge about Four Practices - Phase 2.5 & III

Change in Attitude Level over Four Practices

(Phase III, Phase 2.5)

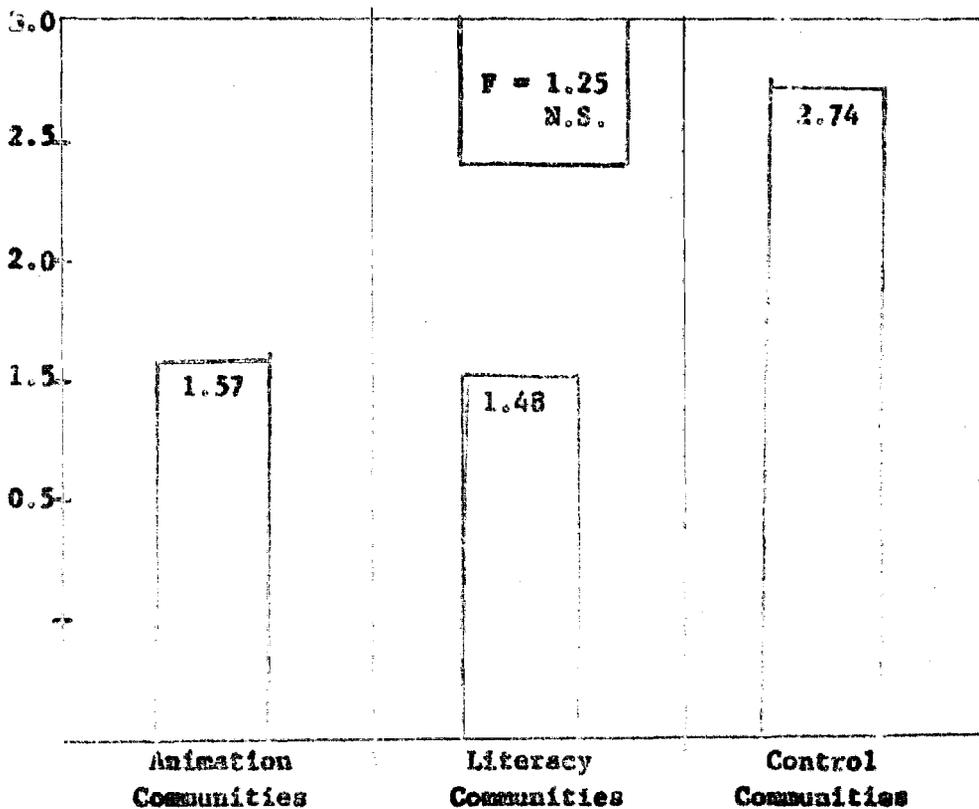


FIGURE 2-11 - Increase in Favorable Attitudes Toward 4 Practices - Phase 2.5 and III

### Conclusions

In this chapter we examined the relative effectiveness of animation and literacy training in rural communities. We concluded that animation did induce some efforts at community improvement, such as an ant killing campaign and parent-teachers organization. Animation also seems to increase community residents' urban contact, contact with the ACAR supervisor, participation in community improvement activities, and the amount of aid given to one's neighbors. Literacy training was enthusiastically received in several communities. There is some slight evidence that literacy seems to favorably affect exposure to newspapers, trips to large cities, contact with the ACAR supervisor, and the amount of aid given to and received from neighbors, although the significance of these latter findings are clouded by the fact that the literacy communities are also the least well off economically.

Finally, we conclude that these two pre-treatments may have little value as preparation for large scale communication techniques like radio forums and community newspapers. The change induced by these communication techniques seems to be larger in communities where these pre-treatments did not exist.

### Chapter III

#### COMMUNICATION TREATMENTS: RADIO FORUMS AND COMMUNITY NEWSPAPERS

After the completion of the two community development pre-treatments two new mass communication techniques were introduced in the sample communities: radio forums and community newspapers. As mentioned in Chapter I the main objective of this part of Phase III was to see how well these media could transmit information about new practices to large audiences.

This chapter describes and evaluates each of the treatments in detail. In addition, the crucial economic and social characteristics of each treatment group are reported. Together these characteristics provide a necessary background for the discussion of actual treatment effects discussed in chapter IV.

#### Selection of Innovations

Before we could initiate our communication treatments we had to choose some innovations for the content of our radio forums and community newspapers. Our first step, then, was to secure from the ACAR specialists a list of 32 practices that would be fairly new in the rural areas of Minas Gerais. From this list we had to choose at least four practices for detailed discussion over the radio and in the newspapers.

Although there were many criteria we could have used to select practices from the list, we chose only two, cost and complexity. We felt these two characteristics would cause significant variations in the audience's behavior. For example, a highly complex practice would be more difficult for the audience to understand and evaluate than a simple practice. For a highly expensive practice it would be more difficult to maintain interest because it would be out of most farmers reach; a cheap practice would not suffer this disadvantage. Varying the innovations in terms of complexity and cost also allowed us to see if one media was more successful than the other, depending on the characteristics of the innovation.

We asked 20 ACAR supervisors to help us determine the cost and complexity of the original list of 32 new practices. There were several reasons for using "experts" for this task instead of a sample of farmers. First, because we had chosen "new", relatively unknown practices it would have been difficult to find a sample of farmers familiar with all 32 practices. Secondly, a precise ranking of practices from the farmer's viewpoint was not needed. We only wanted a general idea of the relative cost and complexity. Finally, having the supervisors make their judgements "from the point of view of the farmer" was still quite representative; the 20 supervisors had extensive field experience and a detailed knowledge of the farmer's viewpoint.

To rank the costs of the 32 practices the 20 supervisors were asked to sort 32 cards, each card containing the name of an innovation. First they sorted the innovations into two groups, those relatively expensive and those relatively cheap for farmers to adopt. Then they sorted each of these groups separately into three more piles according to their relative expensiveness and cheapness. At this point each supervisor had six piles of cards. Each practice was re-examined to make sure the supervisor was sure of his ranking.

After finishing his sorting of cost, the cards were reshuffled and sorted into two piles of relative complexity. These two initial piles were each sorted into three piles, yielding, as before six piles of cards reflecting the supervisor's ranking of the 32 practices by their relative complexity.

After each sorting we assigned a number to each practice reflecting its relative cost or complexity in the eyes of the supervisor doing the sorting. Consequently, we were able to average the judged cost and complexity of each practice across the 20 supervisors. The 32 means of cost and complexity allowed us to rank the practices on these two attributes.

To simplify matters we divided the set of practices into high and low cost and high and low complexity by dividing at the median value for each characteristic.

There was a definite correlation (.73) between cost and complexity, with complex practices being judged relatively more costly, and simple practices relatively more cheap. Even with this correlation we were able to categorize the 32 practices into four types: (1) high cost and high complexity; (2) high cost but low complexity; (3) low cost but high complexity; and (4) low cost and low complexity. The correlation between the two attributes indicates that the bulk of practices are either type 1 or type 4. However, there are a few representatives of the other two types, since the correlation was not perfect.

We used the standard deviation of the cost and complexity judgement for each practice as an index of ambiguity. Since the standard deviation indicates how similar the rankings were for all 20 supervisors, it is an indicator of how ambiguous the cost or complexity of a practice was in the eyes of the supervisors. The cost standard deviations ranged between .51 and 1.82 and the complexity deviations ranged between .30 and 1.51. In no case did this index of ambiguity reach the 2.5 upper limit, indicating that the sorters' judgements of cost and complexity were relatively similar.

With information about the cost and complexity of the 32 practices, we applied the following criteria to select eight innovations for possible use in the experimental treatments:

- (1) They had to be applicable to agricultural life in all 18 communities.
- (2) They had to be available in all communities; that is, they could be purchased in or near our sample communities.
- (3) The innovations had to be fairly visable; that is, they could be easily identified by the farmer and the interviewer, given that the farmer knew about the practice.
- (4) They had to be amenable to technical questions in an interview designed to secure the degree to which a farmer was acquainted with the practice;

- (5) The innovation had to be somewhat controversial so that attitude questions could be meaningful and provide a distribution of farmers with favorable and unfavorable attitudes toward the practices.

Using these five criteria, further discussion with ACAR specialists about the 32 candidate innovations yielded two innovations for each of the four types.

	<u>Cost</u>	<u>Complexity</u>	<u>Type</u>
1. Trench silos	High	High	1
2. Reforestation*	High	High	1
3. Cultivator or Planter	High	Low	2
4. Termite eradication	High	Low	2
5. Contour farming**	Low	High	3
6. Strip farming	Low	High	3
7. Controlled breeding	Low	Low	4
8. Household first aid (Pharmacy)	Low	Low	4

Of these eight practices, reforestation and contour farming were judged ambiguously by the supervisors, so we were left with only six practices. In order to keep an equal emphasis on each of the four types, we selected the following four practices for special emphasis in the experimental treatments:

- Type 1: Trench silos
- Type 2: Cultivator or Planter
- Type 3: Strip farming (soil conservation)
- Type 4: Household pharmacy

#### Radio Forums

In this experiment, a "radio forum" consisted of a group of farmers meeting in a rural community to listen to and discuss the information broadcast on a radio program. The program described various new agricultural practices. The listening group varied in number from four to twenty farmers who attended the meeting in order to internalize, through discussion, the facts presented on the radio program.

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\* Judged ambiguously on the complexity dimension.

\*\* Judged ambiguously on complexity and cost.

The use of the radio forum to diffuse information in rural areas derives mainly from experiences in Canada and India. The Canadian forum groups began as an experiment in adult education in 1941. They were set up by specific organizers; written guides containing information on the weekly radio program were distributed in advance of the forum meetings; regular reports containing a summary of the group discussion and questions about the program were sent from the groups to the program broadcasters.

These features of the radio forum reappeared in the Indian experiments on forums conducted by Neurath\*. Government organizers set up and maintained the forums; the listening group met each week, and the secretary of the group kept written records of discussions and questions which were later sent to the program broadcasters.

The forums in our Brazilian field experiment also followed this general pattern. The six forums were organized by an official of the state extension service, ACAR.

This ACAR specialist travelled to the six communities, spoke with the local extension agent about the forum, and helped the local agent gain a commitment from farmers to attend the weekly meetings.

The local ACAR agent, who best knew the community, supplied names of farmers who would be interested in the forum. These initial members of the forum usually were those farmers who had participated in the ACAR programs in the community and were, for this reason, somewhat accustomed to group meetings. In each community a list of 15-20 names was drawn up, an initial meeting called, and commitments secured from these individuals to attend the weekly forum meetings. Meetings were held in each of the six communities during which ACAR officials explained the idea of a forum to the interested farmers. A secretary and local coordinator were selected for each forum. The coordinator was responsible for calling the meeting, deciding on

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\* Neurath, P.M. "Radio Farm Forum as a tool of change in Indian Villages," Economic Development and Cultural Change, Vol 10, 3, 1962, P. 275-283.

a place for the meeting, and maintaining order in the discussion following the program. The secretary noted questions arising during the discussion of the radio program. These questions were to be sent to the program broadcasters.

The radio programs were written and taped for transmission by a specialist in communication from the state headquarters of ACAR. Basic information about the characteristics of four agricultural innovations and their advantages comprised most of the content of the programs. Three types of content programming were utilized: (1) a simple lecture about the practices, how to use them, and why they should be used; (2) a simulated interview with a farmer discussing the problems that might be encountered with the innovations and what might be done to avoid these difficulties; and (3) interviews with agricultural technicians possessing special knowledge concerning the innovation under discussion. The actual program lasted for approximately 15 minutes with five additional minutes devoted to answering questions sent in by the forums.

Each week the same procedure was followed. The ACAR communication specialist wrote and taped the program in ACAR's recording studios. The forum broadcast was then linked with "The Farmer's Hour", a program of music and general market information having a long and successful history of acceptance among farmers. A single radio station broadcast the forum one evening out of the six weekly evenings devoted to "The Farmer's Hour". The forums met during this broadcast time, listened to the radio program, and discussed the content, sending any questions that arose to ACAR for discussion on the next program.

An effort was made by our staff to visit each forum at least every two or three weeks. The local ACAR agent also aided in the observation and encouragement of the forums; however, he was instructed not to concentrate his efforts in the community any more than usual, since we wanted the pure effects of the forums and not the effects of increased activity by the local extension agent. Also, in contrast to the Canadian and Indian experiences, no written guides or explanations

were sent to the communities prior to the forum broadcast. Rather, the program itself contained "discussion" questions that the secretary and president used to help guide the discussion. Again, we did not send written materials because we wanted to measure the effects of the radio forums alone. By reducing the forum procedure to a minimum we also hoped to facilitate its future application by the extension service. If questions arose during the discussion that were too technical to be treated on the radio, written information was sent to the community requesting the elaboration.

The broadcasts began the first week of September, 1957, the beginning of the rainy season. This time of year, corresponding to the late winter months in the U. S., is a period when little cultivation occurs, and activity is centered around preparing for the spring planting season. This period seemed optimal for considering new practices to be used during the next crop year.

As might be expected the broadcasts and forum meetings met with some difficulties. About a month after the forums began, the radio station switched the time of "The Farmer's Hour", and thus our broadcast, without notifying our staff. Confusion in the communities about what was expected of them was compounded by this unannounced change in program time. The negotiation of a new time with the radio station emphasized the difficulty of relying on "donated" time and raised the specter of substantial new financial expenditures. Soccer matches requiring prime evening time occupied by our program also threatened to cancel several forum broadcasts.

Aside from these technical difficulties of acquiring a time for the program and assuring that it would be broadcast weekly at its appointed hour, a more fundamental problem of farmer motivation plagued the forums. In the typical Brazilian rural community, one farm is widely separated from other farms. There is rarely a community center like the village in India where most of the farmers reside. The distances, coupled with poor roads, make attendance at meetings quite difficult.

In the face of these difficulties, what did the forum offer the farmer as a reward for his attendance? Theoretically, the program offered information about new agricultural practices. Practically, the forum offered some facts that might or might not be new to the individual, some socializing with other farmers, and, perhaps, some attention from the extension service and the foreigners doing the study. As far as hearing about the new practices, the farmer could do as well by sitting at home listening to his own radio, since radio possession is quite widespread in rural areas. To merely socialize with the neighbors did not seem very appealing, especially when it was raining, and not even a jeep could get to the forum meeting place. Probably the main motivating force bringing the farmer to the meeting was the desire to comply with the wishes of the extension service. Depending on his evaluation of the extension service and acceptance of their competence, this motivation might or might not have much appeal. Of course there was the possibility that the individual's community might be mentioned on the radio, but again this could result from any program's policy of reading and answering letters from listeners. The novelty of the forum idea provided some initial appeal, but quickly wore off, especially for those with better things to do with their time. This was particularly true of the richer more established farmers. Our attempt to balance the slender advantages of the forums against some of the physical disadvantages noted above was only partially successful.

All six forums did function at least intermittently, with two communities showing a great deal of enthusiasm for the idea. Four of the communities, however, did need substantial guidance and attention to convince the residents of the value of the idea.

With the advantages and disadvantages of the forums in mind we make the following seven recommendations for future forum organizations in Minas Gerais:

1. That the forum be linked with existing organizations, perhaps those already functioning under the direction of ACAR;

2. That forum meetings be held less often (once every two weeks) in order not to strain travel resources and motivation;
3. That the forums be limited to a specific time of the year such as the interm period between harvest and planting season;
4. That the local ACAR supervisor attend most meetings as part of his work in the community;
5. That the forum radio broadcast be lengthened from 15 minutes to at least a half-hour to make attendance worth the time and effort of getting there;
6. That the radio broadcasts be specific and as technical as possible utilizing experts on the various topics;
7. That the programs be regionally relevant and broadcast over regional radio stations.

#### Community Newspapers

Like the radio forum, community newspapers are a means of getting information to a large number of farmers. In contrast to the radio, however, the newspaper requires that the individual or someone in his family be able to read. Furthermore, the newspaper is an individual experience, while the radio forum combines the radio with a group discussion.

The community newspaper derives from experiences in Africa but has been tried in Guatamala, Peru, Brazil, and other countries in Latin America\*. This type of newspaper is best described as a mimeographed newsletter, is reproduced on a silk-screen in relatively limited editions of two to three hundred. Community newspapers are as the name implies, written, typed, and reproduced within the communities

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\* See UNESCO Reports and Papers on Mass Communication, No. 46, "Rural Mimeo Newspapers", written by Robert DeT. Lawrence, U. S. Agency for International Development, Washington, D. C.

they serve.

In our experiment the newspapers contained two main sections. One section contained community news, announcements of weddings and birthdays, appeals for new and better roads, telephone service, and support for the local school. The second section was a "technical page" containing technical information about agriculture and written in the ACAR central office in the state capitol. This part was duplicated in the community and joined with the community news to form the whole newspaper.

Creation of the newspapers required a good deal of initial organization. In August of 1967 a series of discussions were held with community leaders to obtain initial acceptance of the newspaper idea as well as to select an editor and staff. The most enthusiastic acceptance of the idea usually came from the local school teachers who saw in the idea a way to get their students interested in communicating with the printed word. In our six newspaper communities most editors were fairly young, in their teens or early twenties and connected in some way with the local school. The editor in the community that developed the strongest newspaper, however, was a fairly shy young man who had not completed the second grade, indicating that the school connection was not necessary, though common.

After the editor and his one or two assistants were selected they attended a week long training session held in the state capitol. Journalism students from the Federal University actively participated in this training session. They took the skills they were learning for application in large city newspapers and translated them into the skills the community editor and his staff would need. Basically, the editor and his staff were taught to gather material, write articles, physically organize the layout of the paper and sell advertisements and subscriptions.

After the training session, the editors returned to practice the skills they had so recently learned. The first edition of the six community newspapers was released in September, 1967. As might be expected the editors encountered numerous

difficulties. To combat these problems, the journalism students who originally conducted the training sessions visited the communities and helped write articles and reproduce copies. After about six weeks of this personal supervision the newspapers became fully independent with only token aid from our project, in the form of paper and ink, continuing for another month.

The newspapers ran concurrently with the radio forums and presented basically the same information about the same practices, only in written rather than audio form. The same communication specialist responsible for the radio programs wrote the bulk of the weekly technical sheets for the community papers. Essentially, the same facts were presented as in the radio program, but with visual aids included where ever possible. These visual aids were usually drawings of the innovation under discussion and how to use it, or some indication of increased production that could result from the innovation.

We encountered two major problems with the community newspapers. First, there was a general lack of competent local personnel with interest enough to maintain them through the long hours necessary to put out the paper. Secondly, community support for the papers, while plentiful in the planning stages, waned when financial assistance was needed in the form of subscriptions or advertisements. Without money to pay for the editor's time and effort, editor interest was doubly hard to maintain. Some of the editors did secure secondary rewards, however. In one community, for example, the editor experienced a distinct status change, moving from a part-time laborer to a secretary for the local development committee.

The communities in which we worked were fairly small, the largest with a population of 100 or so families. Such a small base makes financial independence hard to obtain, even if significant support did exist. In one community the literacy rate was also quite low, which certainly cut into the population base necessary to maintain a paper. The literacy problem was not overly serious in most communities,

however. In fact, since the paper had news of interest to most residents of the community, there was significant motivation to spend time reading the paper, thereby utilizing literacy skills that might become rusty over the years.

Community newspapers seem to be a potentially useful media for communicating with farmers. Perhaps the difficulties of maintaining a paper in each community could be reduced if the following recommendations were adopted:

1. That the newspaper take the form of a newsletter put out by the local ACAR office;
2. That "reporters" in each community be trained to provide local news to the supervisor for inclusion in the newsletter.
3. That innovations relevant to the region be discussed, utilizing drawings and illustrations wherever possible, as well as technical information contained in ACAR bulletins but made relevant to the communities;
4. That the newsletter be a means for discussing local problems, with its columns open to debates about local conditions, such as roads or the school.
5. That the newsletter be bi-weekly or monthly, consisting of six to eight mimeographed pages.

#### Economic Characteristics of Farmers in the Three Experimental Groups

Before we can discuss the actual impact of the communication treatments it is first necessary to examine some of the background information we have on our sample communities. The following two sections of this chapter deal with social and economic characteristics. The objective of our examination will be to determine how similar the communities were and to locate any differences that may have affected the experimental treatments.

Figure 3-1 shows the average daily milk production\* as determined in Phase II and III. The Phase II measure shows that the radio communities had the highest average milk production, the control communities the next highest average, and the newspaper communities the lowest average production. The Phase III measure, while indicating generally lower production of milk for all three groups of communities, retains the ordering of the groups; radio communities were highest, control communities followed, and newspaper communities were the lowest. Figure 3-1 shows that the differences were especially large in Phase III.

For those interested in statistical reasoning, a small table is also included in Figure 3-1. This table shows the significance of the F statistic, a measure that compares the three means and variances within the groups as well as between them to see if the differences between means are larger than would be expected by chance. In this report, we take the .05 level of significance to be critical in any conclusion we make about whether groups are different from one another. For example, in Table 3.1, the Phase II differences yielded an F of 2.53, which is not significant at the .05 level; in Phase III the F was 4.83, which is highly significant at the .05 probability level. We conclude there was a trend in Phase II, but we must consider the Phase III differences before we can say there were real differences among the three groups in terms of average milk production.

Since milk is a common farm product responsible for a large portion of farm

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\* Questions taping average daily milk consumption were not identical for Phase I and II, which makes direct comparisons difficult. However, having two different sources of information on milk production makes any comparison of the three treatment groups somewhat more reliable. In Phase II the question was, "What is your average daily milk production in the rainy season?" and in Phase III the wording was, "What was your milk production yesterday?" One question requires the respondent to summarize his milk production in some statement of average production. The Phase III measure was much simpler to answer, requiring the respondent only to remember the production of milk on the previous day. Of course, this "yesterday" measure will be off in individual cases, where the production might be more or less than the average production; however, the error should balance out over a large number of respondents.

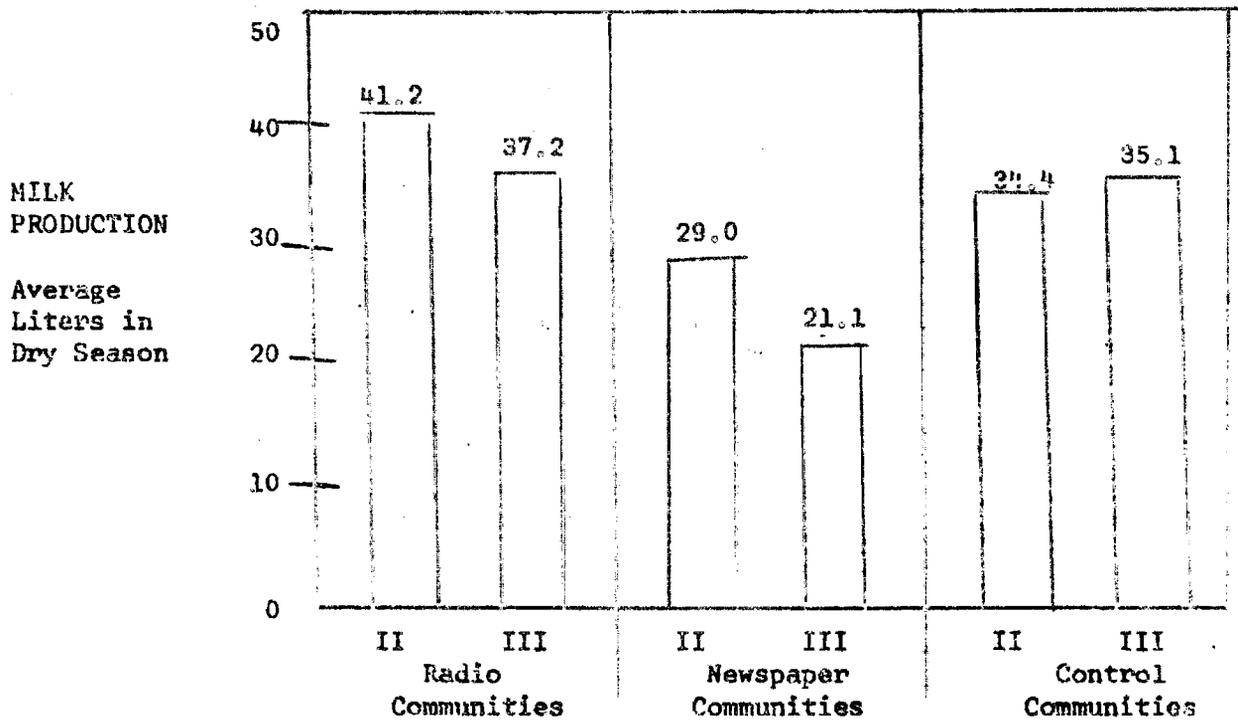


FIGURE 3-1 - Milk Production in Phases II and III\*\*

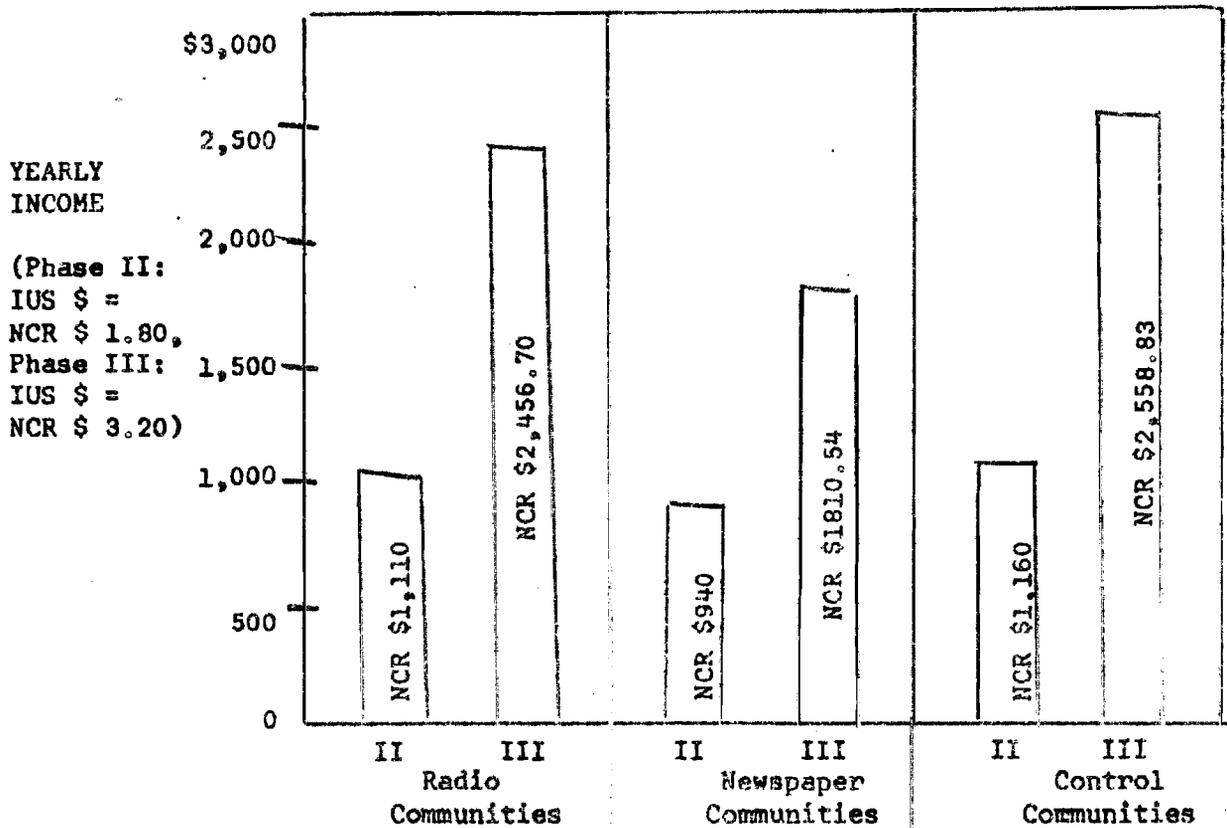


FIGURE 3-2 - Yearly Income in Phases II and III\*\*\*

\*\* F for Differences Among Three Groups, P .01

\*\*\* F for Differences Among Three Groups, P .005

income in Minas Gerais, these differences among the treatment communities could mean the three groups differ in general economic well being. Such a possibility is explored in Figure 3-2, which deals with the average yearly income\* as reported in Phases II and III. The differences among the three treatment groups follow along the lines suggested in the average milk production figures, although not completely. Again the newspaper communities ranked the lowest economically; but the control communities reported the highest average income with the radio communities close behind. The F statistic shows the Phase III differences to be substantial, meaning the three treatment groups appear to be truly different from one another in terms of average yearly income. It should be noted that the differences would not have been detected if we used only the Phase II data resulting from a much more general question than in Phase III.

The impression from the milk production and income figures is somewhat contradicted if we look at the level of living index, used in Phases II and 2.5. This index was constructed by asking each respondent if he possessed various agricultural and home improvements. Figure 3-3 shows the relevant data on level of living. Using the Phase II data, which is most stable because of a sample size of 1,307 as compared to 315 from Phase 2.5, the three treatment groups do not appear to be different from one another. The 2.5 data on the other hand, indicate that the newspaper

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\* Again the questions were different in the two Phases. In the first data gathering, the question was, "All sources considered, what was approximately the total cash income of your family last year?" The responses were grouped into eight categories from "less than NCr \$500" to "more than NCr \$10,000." In Phase III, the questioning was much more detailed: the questions were, "We would like you to give us some information about your income in the last year . . . how much did you make from the sale of agricultural produce? . . . from the sale of animals? . . . sale of animal products? . . . work off the farm? . . . other income?" These five income figures were added together to get the respondents' total income in the previous year. The measures from Phase III should certainly be more accurate for estimating actual farmer income than the general question used in Phase II, it remains to be seen however if the ranking of farmers in the sample is altered.

communities had the highest level of living, with the control communities following and the radio communities coming in last.

In an effort to resolve this issue, we present Figures 3-4 and 3-5 pertaining to the average farm size and average number of milk cows in the three treatment groups. While there were differences in the average size of farm with the control group generally having the larger farms, the variance is so large that little can be said about overall differences. The number of milk cows appears to be highly different between Phases, and may reflect real increases in herd sizes throughout the state. It is more likely the differences result from different questions used in the two Phases. Nonetheless, the radio and control communities again rank higher in average number of cows than the newspaper communities.

Although the data is somewhat complicated, it appears the newspaper communities were less well off economically, had smaller farms on the average and fewer cows than the radio forum and control communities. In terms of income, the control communities had the highest average income of the three treatment groups, but on other indices the control communities appear to follow the radio communities in economic well-being.

These economic characteristics are important to the degree they influence the diffusion of information about and attitudes toward the innovations in our experiment. If the seeds of information we drop via the radio and newspaper fall on fertile economic ground, they should quickly take root. If they fall on barren ground few will sprout. If the newspaper communities were relatively poor economically then lack of acceptance for the information we disseminated could be due to the poor terrain rather than the inability of newspapers to get the seeds of information into the ground. In the relatively rich control communities there may be many new stalks of information at the end of the experiment only because these communities tap other sources of information than our treatments. In this case it would be

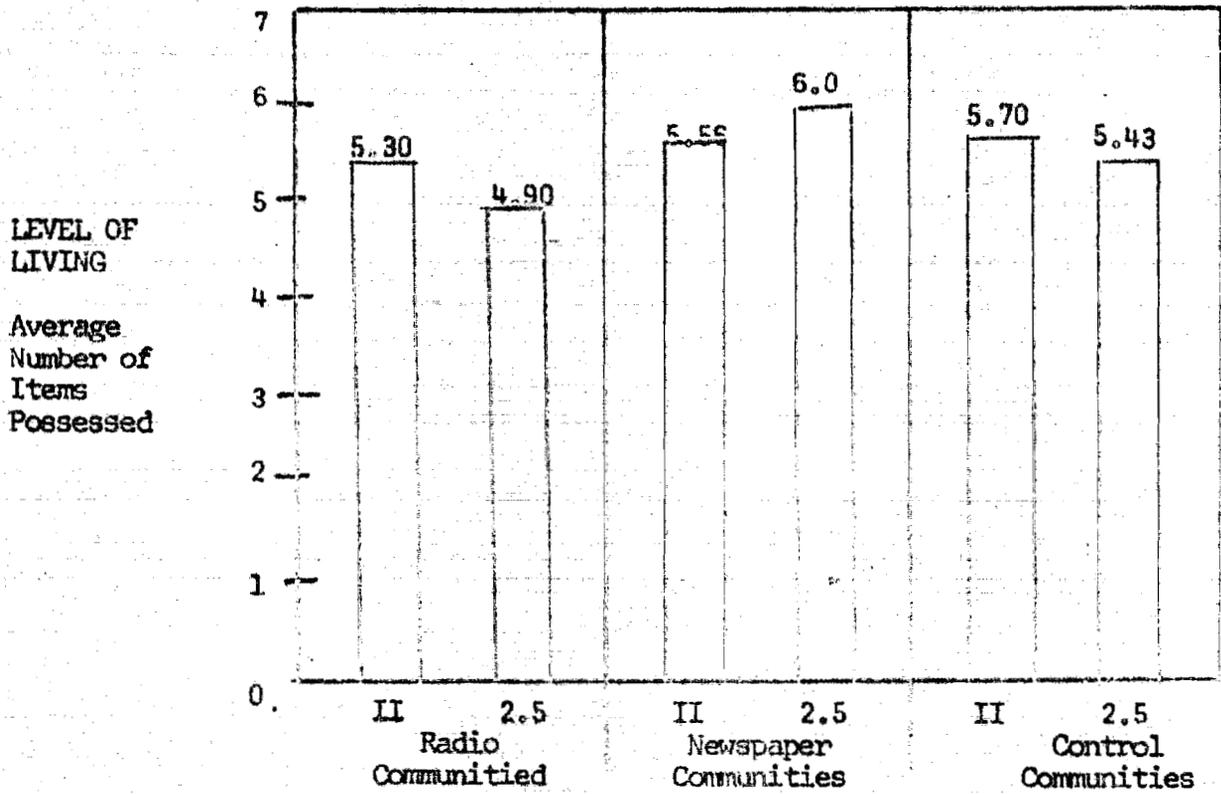


FIGURE 3-3 - Level of Living in Phases II and 2.5\*\*\*

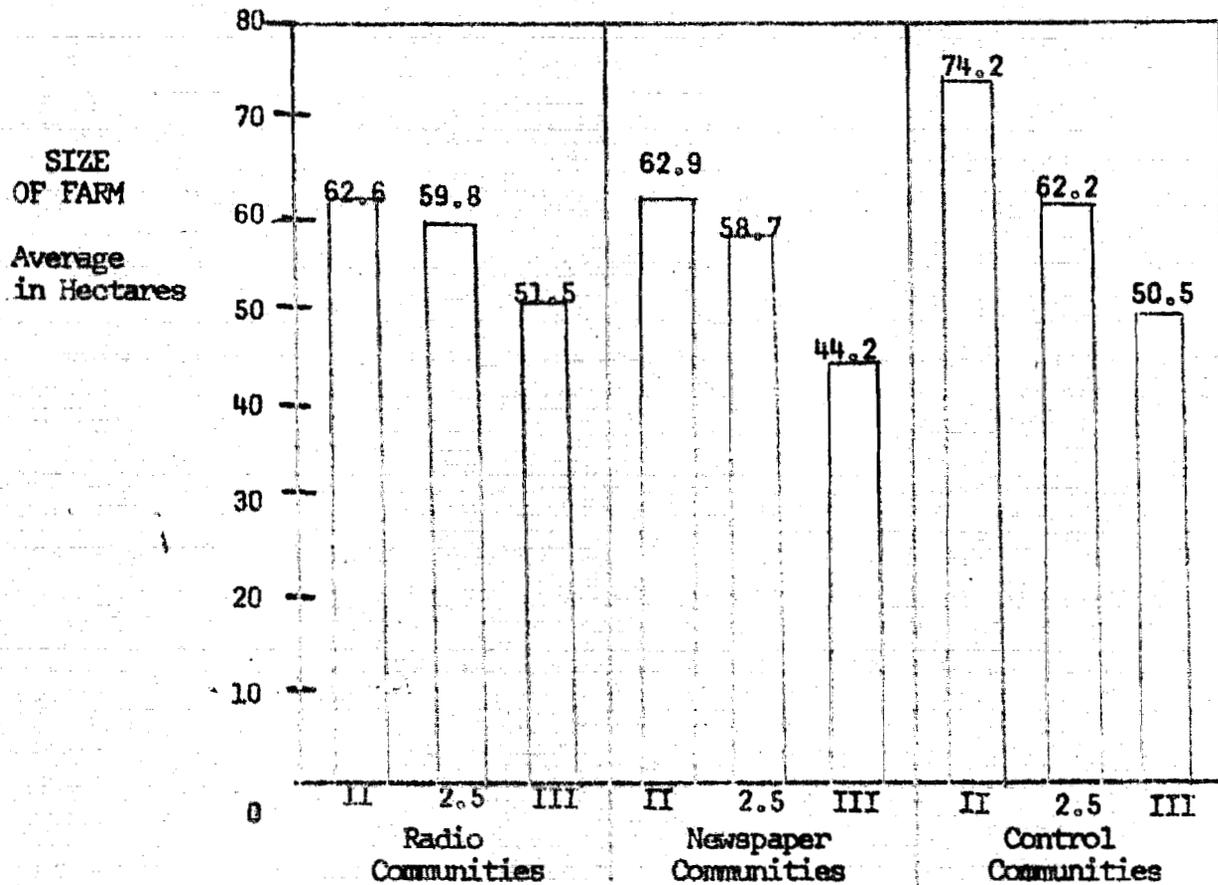


FIGURE 3-4 - Farm Size in Hectares II, 2.5, and III

\*\*\* F for Differences Among the Three Groups, P .005

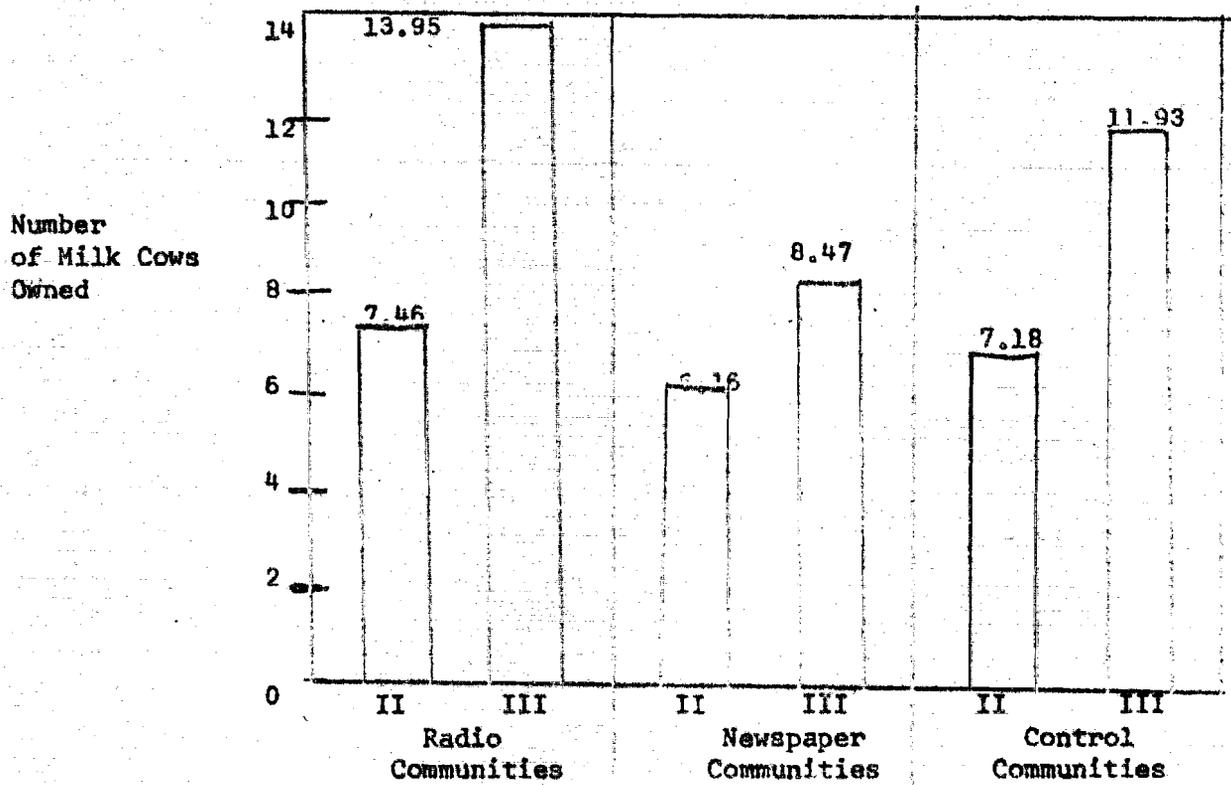


FIGURE 3-5 - Number of Milk Cows Owned in Phases II and III\*\*\*

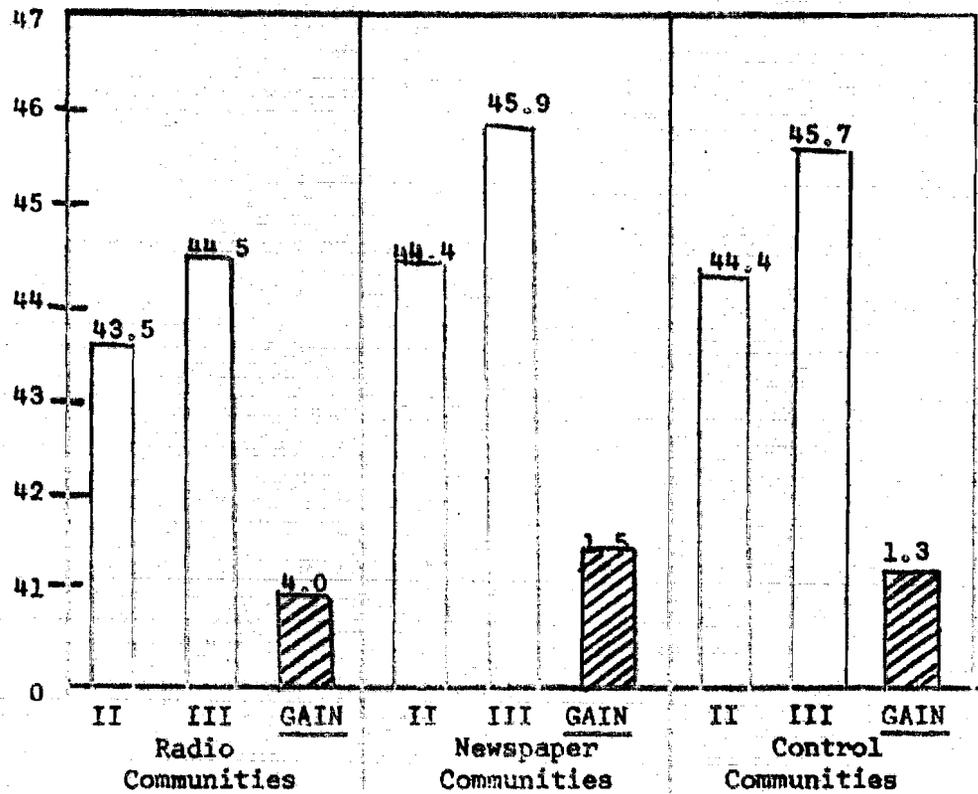


FIGURE 3-6 - Average Age in Phases II and III

\*\*\* F for Differences Among Three Groups,  $P < .005$

difficult to say whether the treatments had any effect in comparison to the control communities. Thus, not only might the treatments be suppressed in the newspaper communities, but real effects of the experimental treatments in the radio and newspaper communities might be overshadowed by the "effects" of other media in the control communities. These possible restraints on interpretation of the experimental results will be further considered in Chapter IV.

#### Social Characteristics of the Three Experimental Groups

We chose four variables to describe some of the social characteristics of the radio, newspaper and control experimental groups: age, education, number of children, and social participation.

Figure 3-6 shows the average age of each treatment group as measured in Phase II and III. As expected, we see that the average age increases by approximately one year in each group. This increase from Phase II to Phase III is represented by the shaded bar labeled "gain" in the figure. There was a gain of 1 year, 1.5 years and 1.3 years in the three groups respectively.

In the case of education, three slightly different questions were used in each of the three data-gatherings, Phases II, 2.5 and III. In Phase II, the question was, "How many years did you attend school?" In Phase 2.5, the question was "Until what year did you study?" And in Phase III, we asked, "Until what year in school did you study?" In Phases II and 2.5 the number of years was coded 0 through 9, with 9 used to indicate 9 or more years; in Phase III, however, the actual number of years was coded, yielding a range from 0 to 17 years. Perhaps these differences in questions and coding account for the fact that in Phases II and 2.5 no appreciable differences are detected (see Figure 3-7) between the three groups, but in Phase III the control had a substantially higher average education level than either of the two treatment groups. A higher level of education in the control communities also reinforces our suspicion that they were on the average richer and perhaps more developed than the

treatment communities.

Again, the ground may be more fertile in these control communities and more prepared to receive the injection of information pertaining to new ideas in agriculture.

Unlike Phase II and 2.5, Phase II included a question on the number of living children each respondent had. Figure 3-8 shows the average number of children in the families of our farm operator respondents. Statistically speaking, the evidence points to a real difference among the three groups in terms of average number of children. In the newspaper communities farm operators had on the average more children than the control communities, and especially more than the radio communities. For the sample as a whole, the average number of children per family was 4.86; 147 families (or 12.5%) had no children, 569 families (or 48.3% had between one and five children, and 501 families (or 38.3%) had six or more children.

We used two measures of social participation. One measure was the total percent of farmers in a community who were members of the local cooperative. The second measure was the average number of other organizations to which the farmers belonged.

Figure 3-9 shows that the three treatment groups were quite different from one another in terms of the percent of farmers who belong to the cooperative. The radio communities had a higher proportion who were members, the control communities ranking close behind, while the newspaper communities ranked the lowest. This ranking of treatment groups holds in both data gatherings, although there appears to be a general increase across all three groups in the number of farmers who were members in the 1968 data gathering.

As for membership in organizations other than the cooperative, this same ranking of treatment groups seems to hold in both Phase II and III. The different measurement used in Phase III gives a picture of substantially more participation than in Phase II,

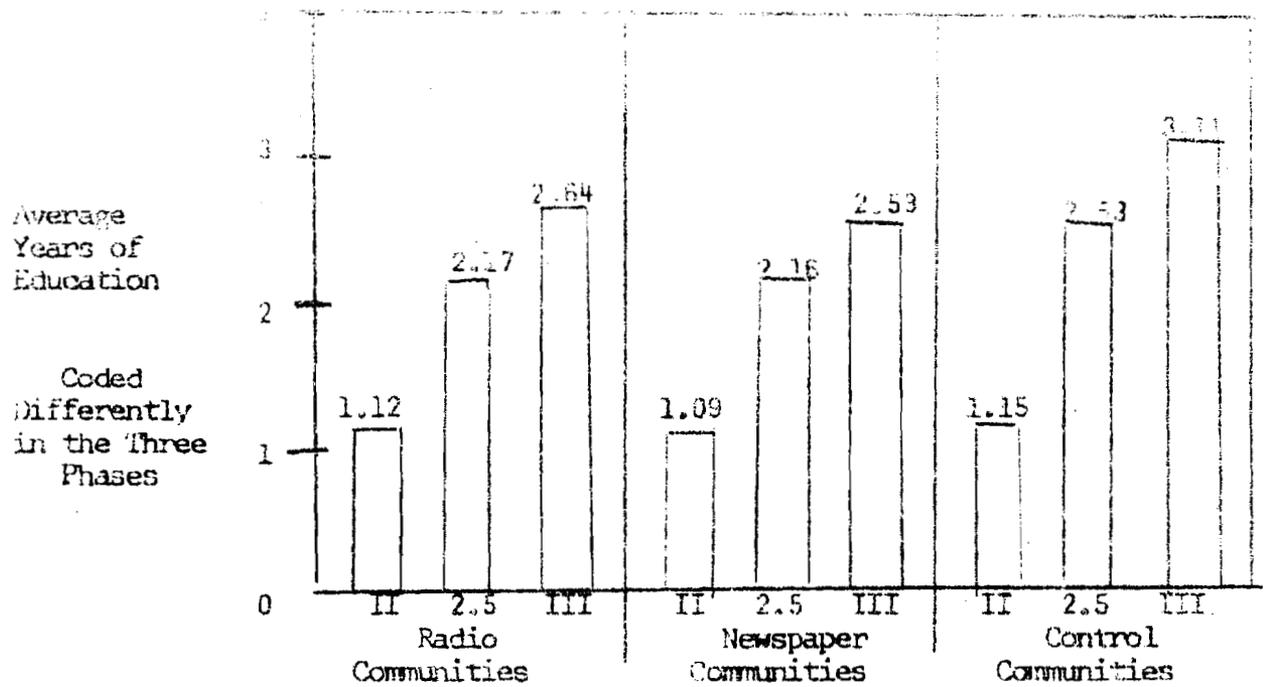


FIGURE 3-7 - Years of Education in Phases II, 2.5, and III\*\*\*

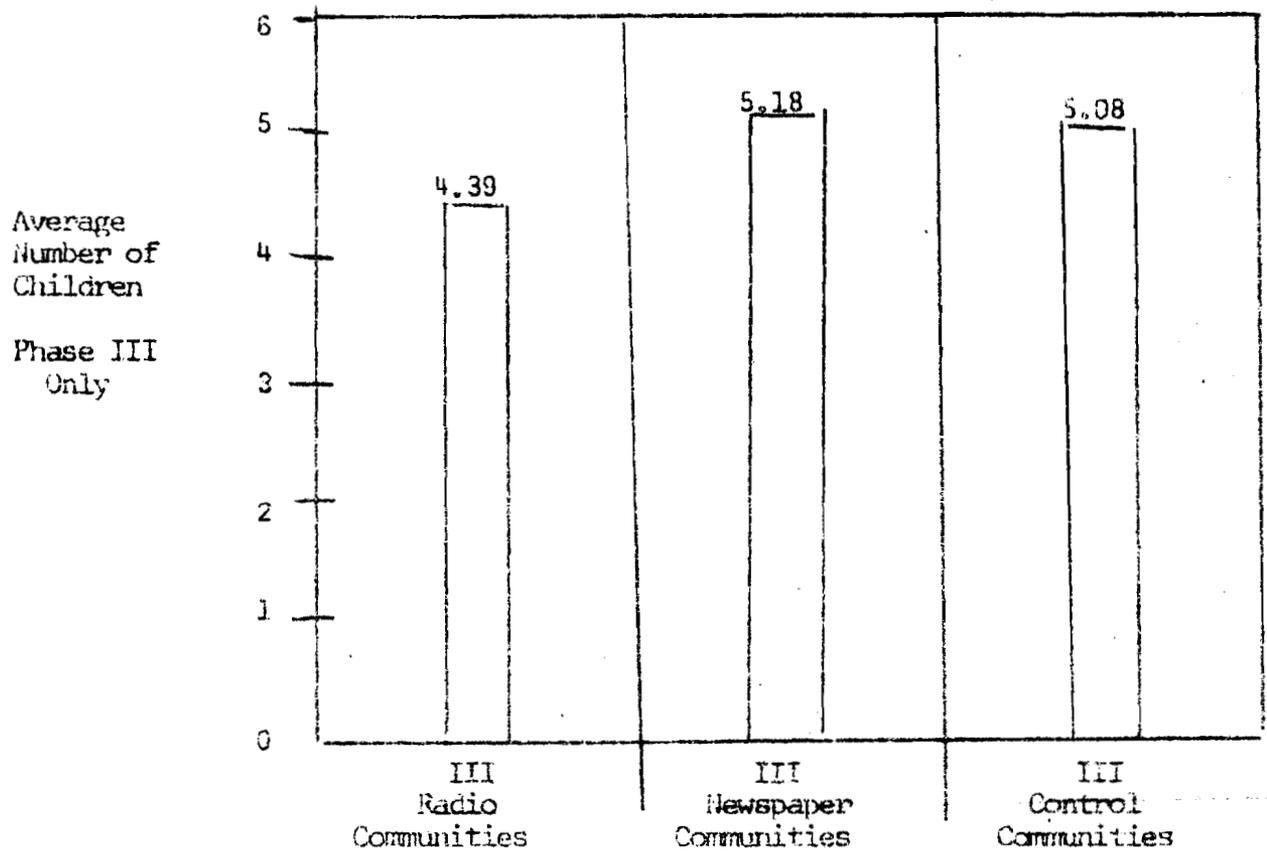


FIGURE 3-8 - Average Number of Children in Phase III\*\*\*

\*\*\* F for Differences Among the Three Groups,  $P < .005$

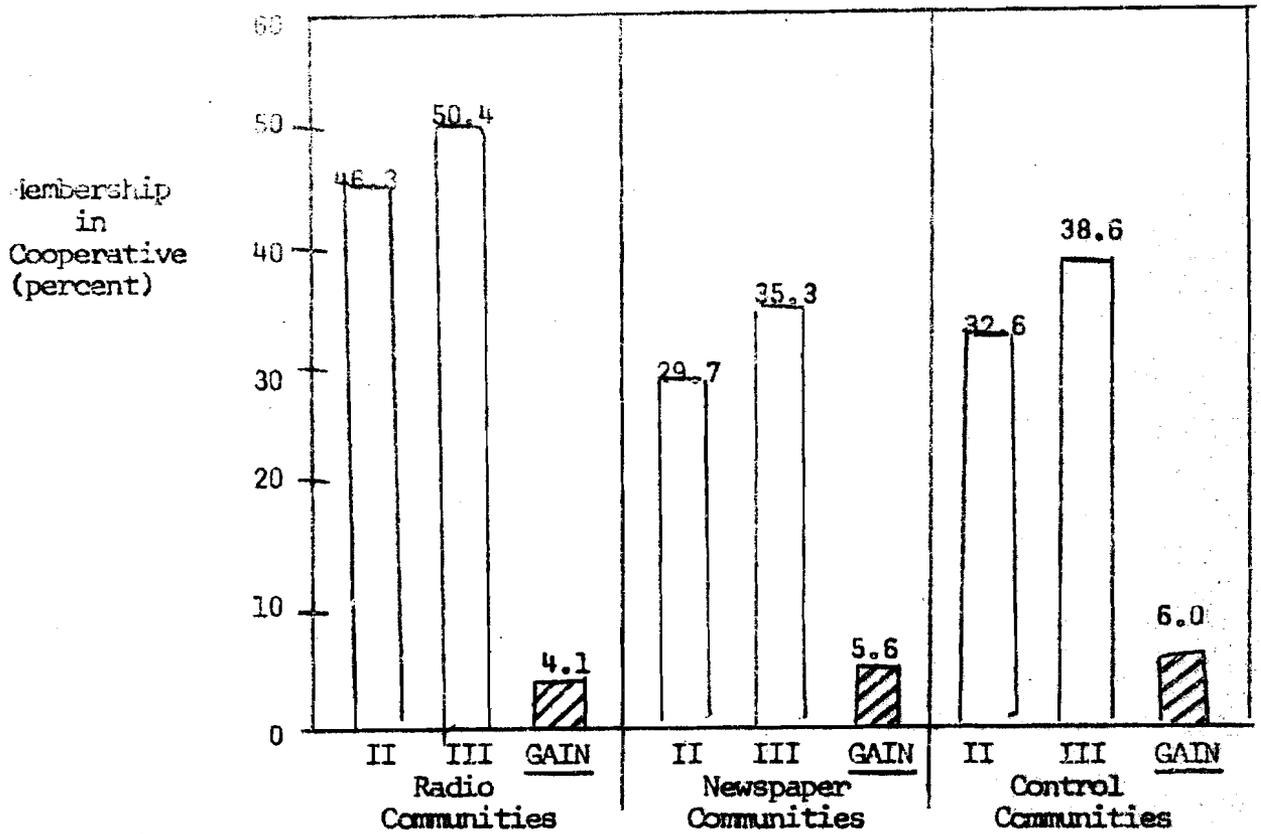


FIGURE 3-9 - Membership in Local Cooperative in Phases II\*\*\* and III\*\*\*

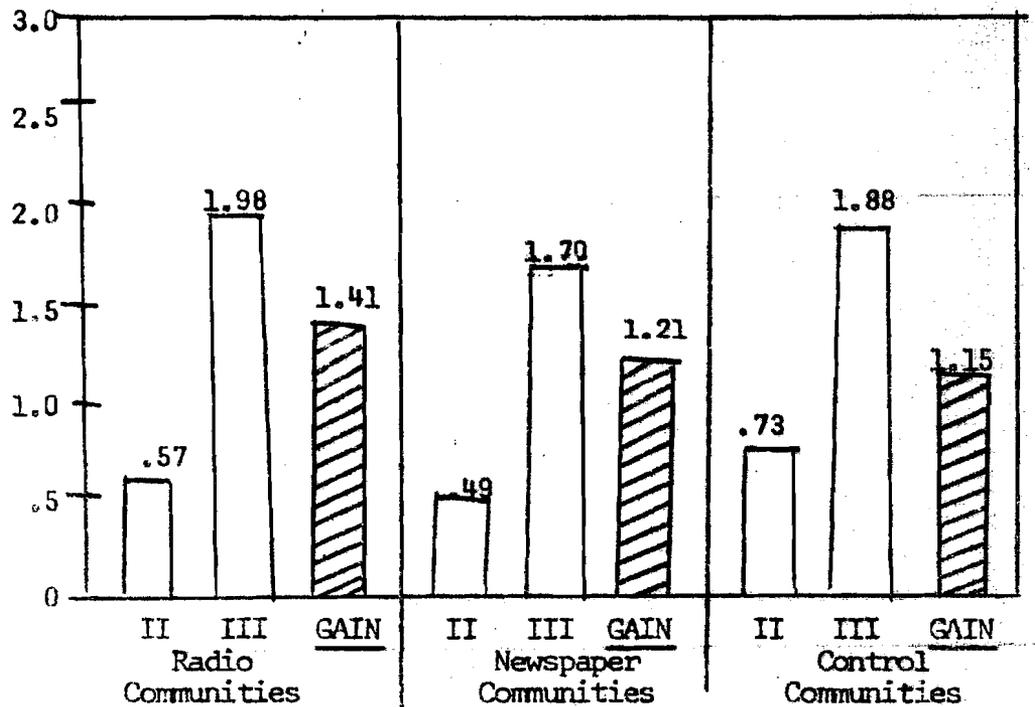


FIGURE 3-10 - Membership in Other Organizations in Phases II\*\* and III\*

\* F for Differences Among the Three Groups,  $P < .05$   
 \*\* F for Differences Among the Three Groups,  $P < .01$   
 \*\*\* F for Differences Among the Three Groups,  $P < .005$

The Phase II question was, "to how many other organizations do you belong?"; the Phase III questions asked about membership in specific organizations known to exist in rural areas. Again, the more specific measure shows a tendency for the less specific measure to give an under-estimate of the actual value of a particular variable, although the rankings of the three groups remain fairly constant whatever the nature of the questions used. For both measures, the newspaper communities appear to rank below the other two groups in terms of the average membership in organizations.

With fewer farmers in the cooperative and fewer people in organizations, the newspaper communities could have been less open to the inflow of information about agriculture via these organizations than the control and radio communities. Once again, the newspaper communities might have been less well off in the race for information about agricultural innovations, a situation that could affect our attempt to diffuse information in the experimental treatments.

#### Conclusion

The first part of this chapter described the nature of our two communication treatments. As noted, we encountered certain difficulties in the initiation of radio forums and community newspapers. Because of these difficulties the experimental treatments were less successful than we would have desired.

The latter part of the chapter described the social and economic characteristics of our three treatment groups. We concluded on the basis of our data that there were apparent and significant differences between our groups in terms of economic, educational, and organizational indices. Generally, the newspaper communities ranked below the other two groups on these variables with the control communities usually ranking higher. These differences indicate it may be relatively difficult to introduce change into the newspaper communities and, in some instances, into the radio communities as compared to the control communities. The control group appears

to be particularly well suited to receive information, and for this reason may show "natural" changes difficult to achieve even with our experimental treatments. At least, the relative increase in information and change in attitudes in the experimental communities may not be as large as they would have been given that the control communities were more nearly equal to the treatment communities. Similarly, the preliminary data indicate that changes in newspaper communities may be relatively less than changes in radio communities because of the poor social and economic conditions in the newspaper group. Chapter IV examines the three groups in terms of variables that may have been affected by the experimental treatments. The background data presented in this chapter should be kept in mind when interpreting the results reported in Chapter IV.

## Chapter IV

### EVALUATION OF COMMUNICATION EFFECTIVENESS

The two communication treatments, radio forums and community newspapers, were in operation for approximately three months during the latter part of 1967. Because the treatments ran for only a short time during the period between harvest and planting, opportunities for the farmers to adopt the innovations suggested by our treatments were extremely limited. Consequently, we were unable to measure actual adoption during our last interviewing in January of 1968. While this would have been our best criteria to evaluate the effectiveness of our treatments, we were able to measure a variety of other indices that give us much insight into treatment effect.

In the early part of this chapter we examine some of the variables that may have changed as a result of the treatments, although not specifically part of the treatments. These variables include the following: urban contact, contact with ACAR, exposure to newspapers and radio, and credibility of radio and newspapers. In the latter part of this chapter we examine two variables that may have changed as a direct result of the communication treatments. Level of information about, and attitude toward the sample innovations.

#### Indirect Effects of Communication Treatments

The two main communication treatments, radio forums and community newspapers, are two means by which an agricultural change agent can reach a fairly large audience with his ideas. The messages these media carried in our experiment pertained for the most part to specific agricultural innovations, but peripheral content also passed over these media, including some entertainment, comment on national holidays, information on where to obtain more knowledge about the practices, and local commentaries. To judge whether this peripheral content had any effect, we shall compare the residents of the radio, newspaper and control communities on urban contact, contact with ACAR, mass media exposure, and credibility assigned to the various media.

### Urban Contact

As in the case of some of the background variables, the questions used in Phase II to determine the extent of urban contact were different from those used in Phase III. In Phase II, we simply asked if the respondent had visited a large city (more than 40,000 inhabitants), and if so, how many times during the last year. In Phase III, we first asked if the respondent had been to the county (municipio) seat; then we asked what other large cities he visited during the last year and the frequency of visits to each. We took the three cities he mentioned first as the primary data, since almost 70 per cent of the sample had been to only two large cities; by adding together the three "frequency of visits" responses, we arrived at a composite index of urban contact.

As Figure 4-1 indicates, there was a gain in urban contact from Phase II to Phase III, especially in the radio and control communities. Phase II data indicate that residents of the control communities have fewer trips to cities than the two treatment communities. The Phase III data, however, show that the radio and control communities far exceed the newspaper communities in average trips to cities. These differences are difficult to interpret.

Such differences could either reflect real changes or could simply be the result of different question formats. Furthermore, real differences could have resulted from our treatments or from other factors. First, the fact that newspaper communities showed a very slight increase of .94 visits while radio communities increased by 7.33 trips and control communities by 8.43 trips indicates that differences in question formats probably is not the reason for different results: using different questions in Phase III should not affect one group more than another. Second, it is apparent that the change between Phase II and III was greatest for the control communities with the radio communities following close behind. Thus we are unable to argue for any experimental effect; the control communities, where the radio forums and

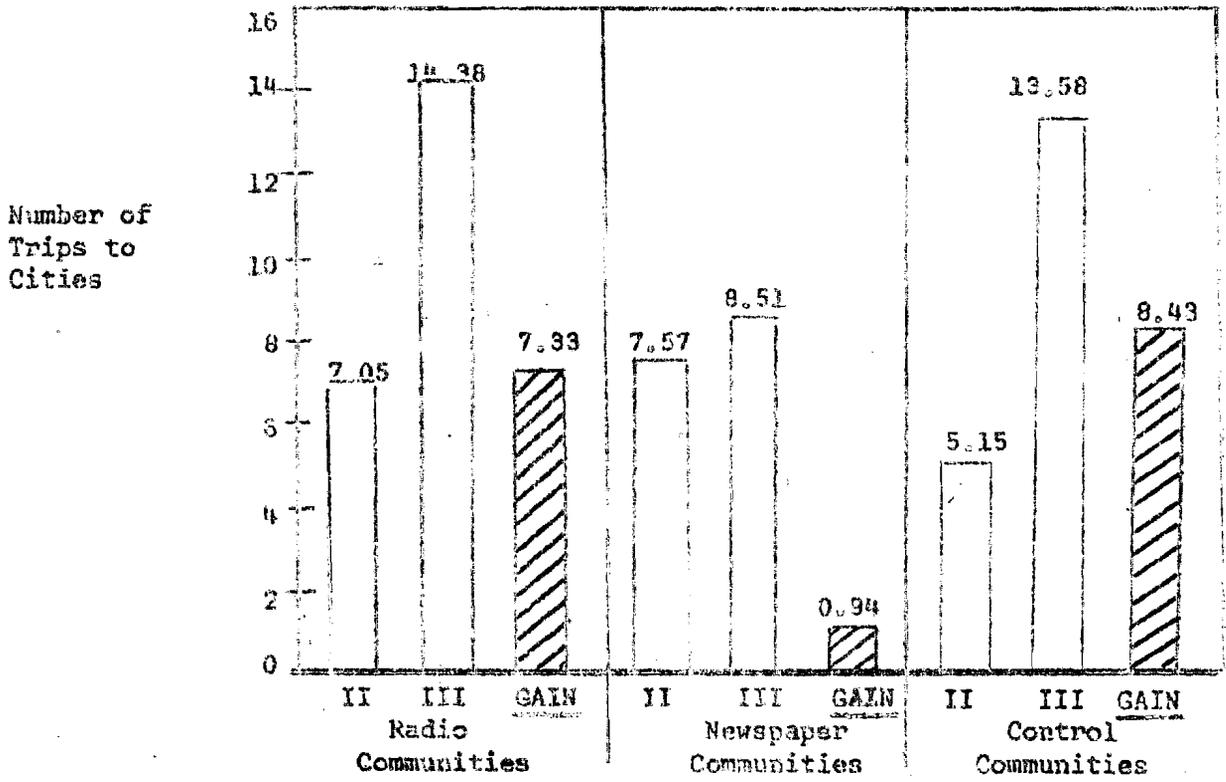


FIGURE 4-1 - Trips to Cities in Phases II\* and III\*\*\*

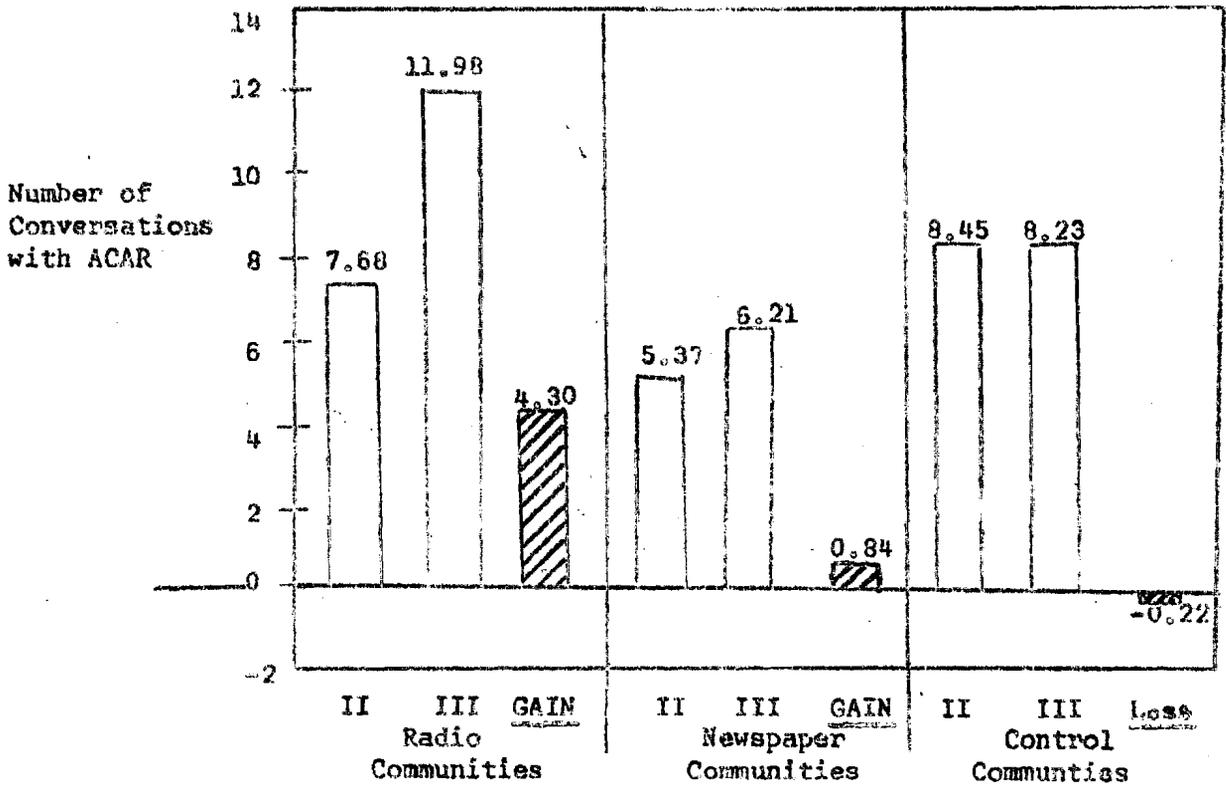


FIGURE 4-2 - Conversations with ACAR in Phases II\*\* and III\*\*\*

\* F for Differences among Three Groups,  $P < .05$   
 \*\* F for Differences among Three Groups,  $P < .01$   
 \*\*\* F for Differences among Three Groups,  $P < .0005$

community newspapers did not exist, increased in average trips to cities more than either of the two treatment communities. It is likely that some other factors operated differentially on the three treatment groups. Perhaps, as we observed in the last chapter, the greater social and economic development of the radio and control communities could account for differences in trips to the cities. As far as the experiment is concerned, we conclude there was no experimental effect on the frequency of visiting large cities.

#### Contact with ACAR

It is reasonable to expect that conversations with ACAR would have been affected by the experimental treatments. The radio forums and community newspapers presented some information about various practices, but certainly did not cover them exhaustively. Since the extension service sponsored the radio program and newspaper, anyone wanting more information probably would have sought out the local extension representative. Thus, contact with ACAR is one measure of how the treatment may have motivated the farmers to seek more information about new practices. Figure 4.2 shows the relative contact\* of the three groups with the ACAR supervisor.

Prior to the communication treatments, as our Phase II measure indicates, the control communities had more contact with the ACAR supervisor than either the newspaper or radio communities. After the treatments, as determined by our Phase III data, the radio communities had substantially more contact with the supervisor, and the newspaper communities had slightly more contact, while the control communities actually had less contact. It would appear that the radio forums motivated the farmers more than the newspapers although part of this effect may have resulted

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\* To measure contact with the extension service in Phase II we simply asked how many times in the previous year the respondent had spoken with the local ACAR supervisor. In Phase III, we asked how many times the respondent talked with the supervisor both in the community and in the town where the supervisor maintains his office, and then added the two figures together.

from radio communities initially higher receptivity. In any event, the treatment groups exceed the control communities in ACAR contact, leading us to conclude that the treatments actually had an effect.

Of course, alternative explanations are still possible. For example, it is possible that the supervisor worked in the radio forum communities more than usual. Thus, our inferred experimental effect could have been an artifact of the experimental treatment rather than a true effect. We attempted to avoid this possibility by instructing the ACAR supervisors not to travel to the radio forum communities more than usual. In fact these instructions probably reduced the effectiveness of the forums below the level they might have reached if the supervisor had been to nearly all of the meetings and actively promoted the forums. In informal conversations with farmers, our research staff often reported a desire on the part of forum participants to talk with someone who could answer technical questions, a function our staff was not prepared to fulfill. While it is possible that the supervisors may have made more visits, it seems more likely that the greater contact with ACAR supervisors in the radio forum communities was not an artifact of the experiment.

Again, experimental effects could be attributed to the slightly different questions used in the two phases. Since the questions were the same in all communities, however, any increase or decrease in contacts should have been common to all communities. The fact that the treatment communities showed increases in contacts while the control communities actually showed a decrease in contact makes this alternative unlikely.

The possibility still exists that our treatment effects were due to differences in social and economic background characteristics. It is apparent, however, that these factors would have been operating even more strongly in the control communities. Still, because the radio forum communities were richer and better educated than the newspaper communities we may not be quite sure that radio forums motivated farmers to

actively seek out ACAR supervisors more than did community newspapers.

Whatever the conditions were, the radio forums were followed by greater contact with the ACAR supervisor than in the newspaper communities. Further, both treatment groups showed a gain in contact, while the control communities showed a decrease. Together, these findings argue rather convincingly for a real treatment effect.

#### Exposure to Newspapers and Radio

We expected the communication treatments, since they so directly involve exposure to the media, to affect the average exposure levels of our treatment communities. In the newspaper communities, we expected an increase in frequency of newspaper reading; in the radio communities, an increase in exposure to the radio. Figure 4-3 indicates the gain in newspaper exposure during the time of the communication treatments for the three treatment groups. The newspaper communities showed a gain of .62, the radio communities increased .10, but the control communities increased 1.77 in terms of the average number of newspapers read during the previous month. Since neither the newspaper nor the radio communities changed as much as the control communities, we conclude there was no experimental effect. In particular, the newspaper experimental treatment did not affect the frequency of newspaper readership.

Given the economic base necessary to purchase newspapers, it is not surprising the control communities showed an increase in newspaper exposure; these communities were fairly rich. Between the two treatment groups we would not have expected an increase in exposure in the newspaper groups if economic factors were operating there also. The radio communities appeared to be more developed economically and therefore more able to afford newspapers. There exists, then, the possibility that the newspaper treatment did induce greater average reading despite poor economic conditions. Controlling for economic conditions, we see some support for saying that the newspaper treatment did have some effect on the frequency of exposure to newspapers.

Number of Times Read Newspaper

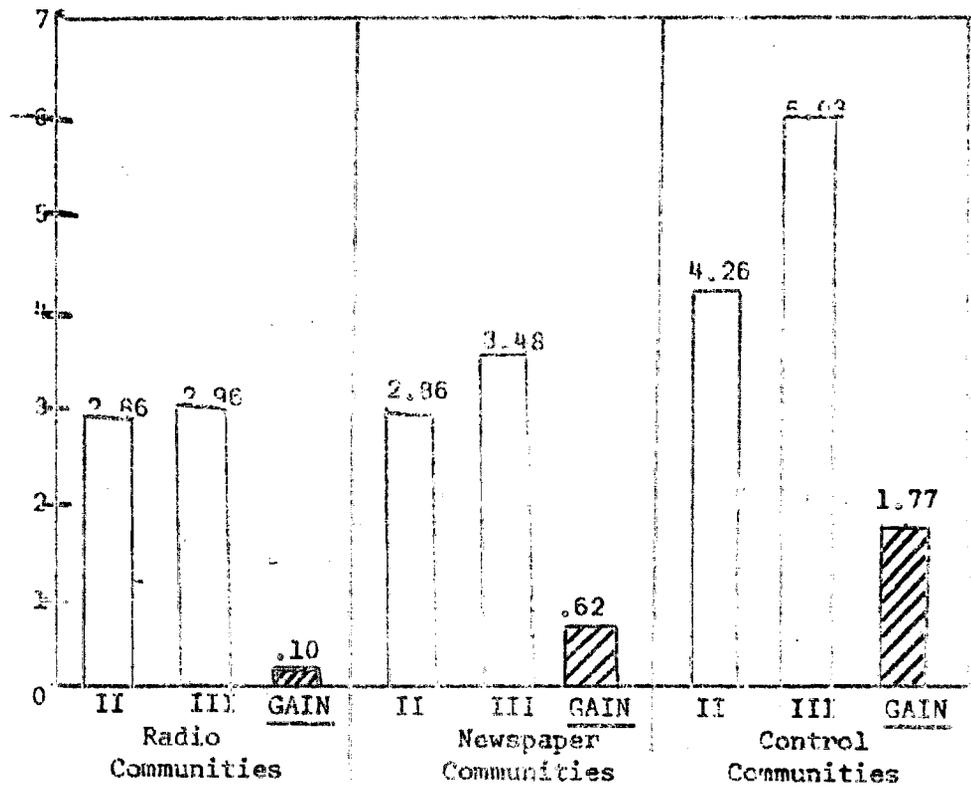


FIGURE 4-3 - Frequency of Reading Newspapers, Phases II\*\* and III\*\*\*

Possession of Radio Percent

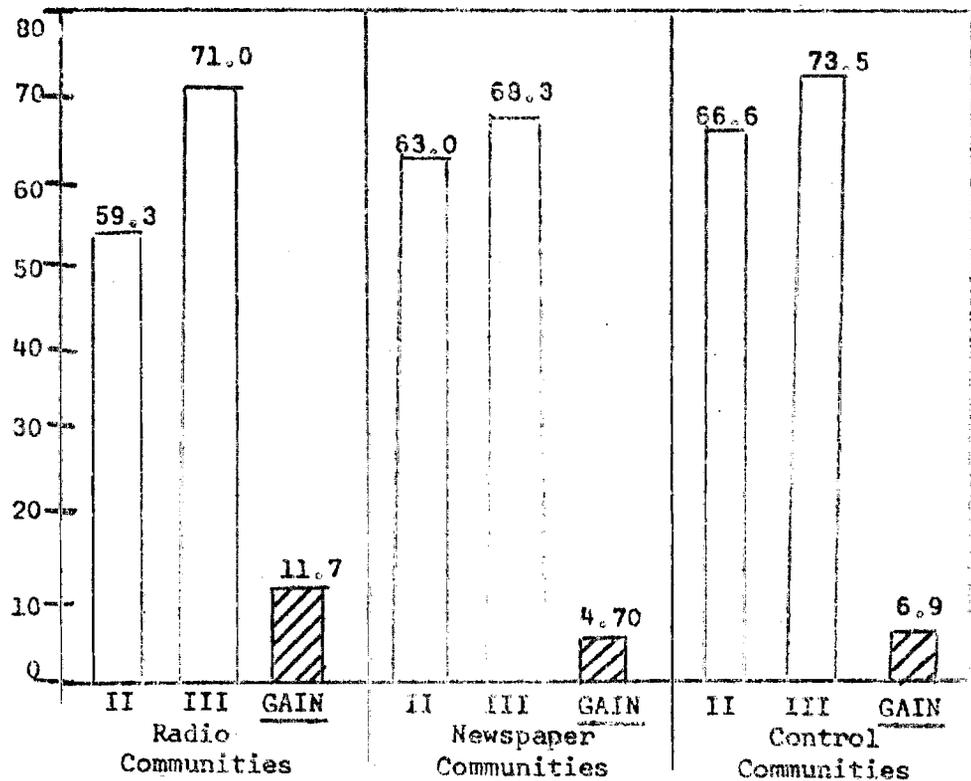


FIGURE 4-4 -- Percent Possessing Radio: Phases II and III

\*\* F for Difference Among the Three Groups  $P < .001$   
 \*\*\* F for Difference Among the Three Groups  $P < .0005$

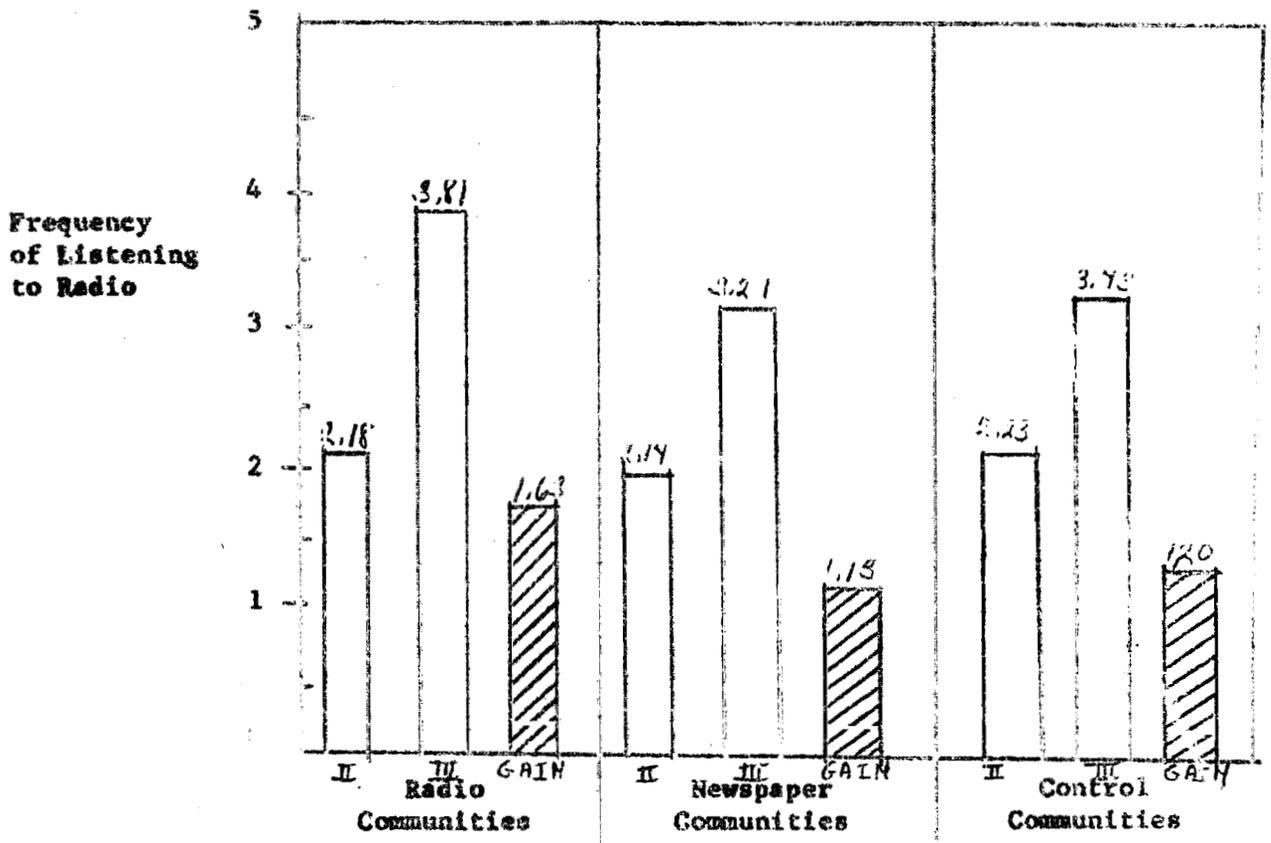


FIGURE 4-5 - Frequency of Listening to Radio in Phase II and III

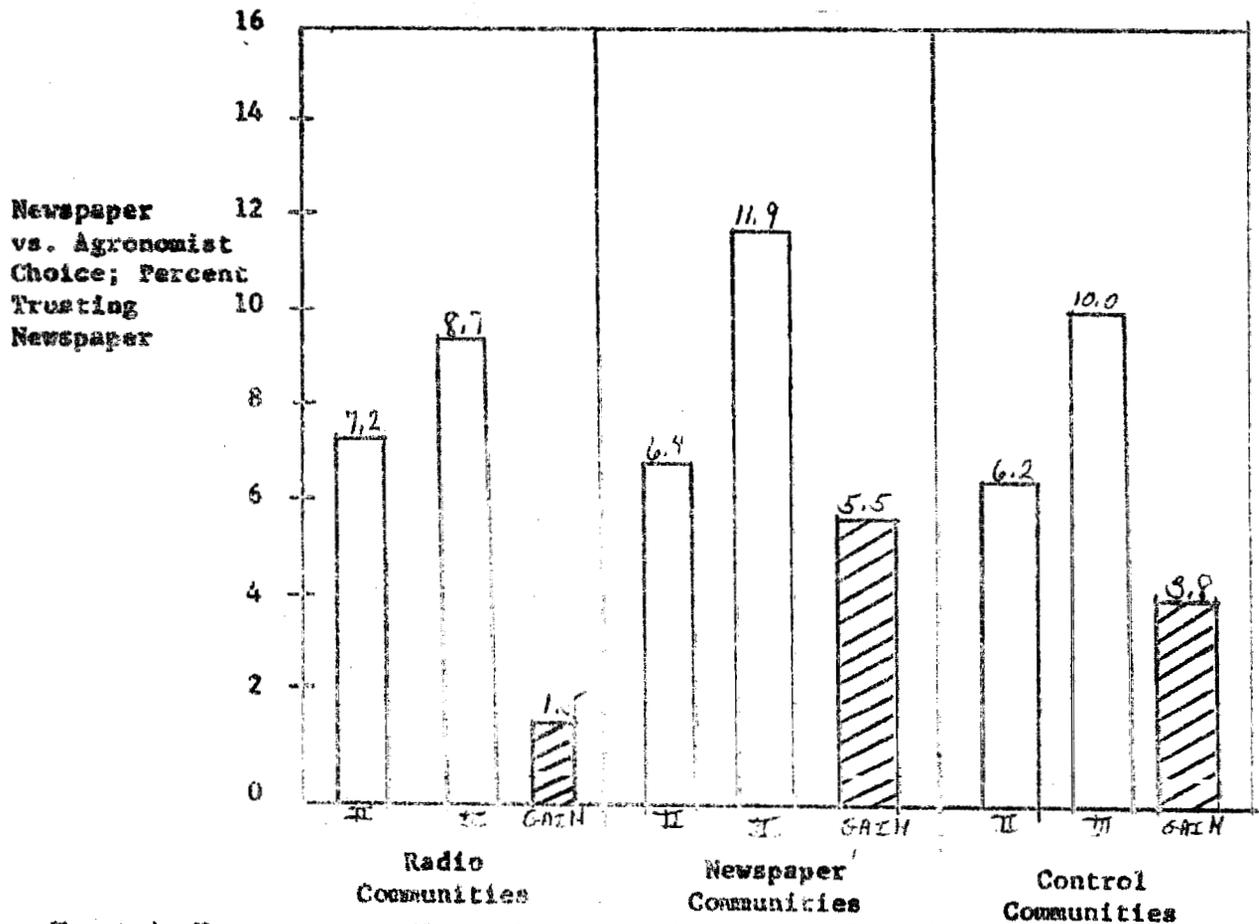


FIGURE 4-6 - Trust in Newspaper vs. Trust in Agronomist, Phase II and III\*

\* F for Difference Among three Groups,  $P < .05$

We expected a larger increase in exposure to radio in the forum communities than in the newspaper or control communities. Figures 4-4 and 4-5 show the increased possession of radios as well as the frequency of listening to radio for the three experimental groups. In each case the radio forum communities had a greater increase in the possession of radios and frequency of exposure to radio than either the newspaper or control communities. The latter two groups both increased their exposure to radio, but to a remarkably similar degree.

In absolute terms, the control communities began the experiment with slightly more radios and more exposure to radio than the radio forum or newspaper communities. The radio forum communities, therefore, began the experiment at a handicap, but at the end of the experiment, while still lagging behind the control group in terms of possession of radios, exceeded the control group in terms of exposure to the radio. We conclude that the radio forum treatment did have the expected effect on the general listening patterns of the forum communities.

#### Credibility of Radio and Newspapers

The credibility an individual attributes to a particular medium can influence the acceptance of a message transmitted over that medium. To a certain extent confidence or credibility in a medium rather than a source is illogical; yet media confidence or credibility is one indicant of how likely it is for a respondent to accept information transmitted by the medium.

Our experimental treatments may have affected media credibility. Exposing farmers to radio programs or newspapers containing information about agricultural innovations may have altered their expectations about these media. Furthermore, exposure may have induced greater confidence in the media as "sources" of technical information. We would expect, therefore, that radio would become more credible in the radio forum communities, and newspapers more credible in the newspaper communities.

To test these notions, we asked each respondent in Phase II to select the more trustworthy source in choices between radio and newspapers, between radio and the agronomist, and between newspapers and the agronomist.\* The question in Phase II was: "Whom do you trust more when it comes to new ideas about farming and cattle in general?" The three pairs of media were then presented to each respondent to get his preferences. In Phase III the same "paired comparison" format was used, although the initial question was somewhat different: "Let's suppose that you can receive information about agriculture and cattle raising in three ways: listening to radio, discussions with the agronomist, or reading newspapers. In which do you trust more when it comes to agriculture and cattle raising?" Again, the three pairs of media were presented to get the respondent's preference in each pair.

Figure 4-6 shows the percent of farmers who trust newspapers more than the agronomist. We see that between the Phase II and Phase III data gatherings, preference for newspapers increased 5.5 percent in newspapers communities, 1.5 percent in the radio communities, and 3.8 percent in the control communities. It appears that trust in newspapers increased more in the newspaper communities, although the percent of farmers who actually prefer the newspaper over the agronomist remains small (11.9 percent in the Phase III newspaper communities). Since the greater increase is in the newspaper communities, we conclude that the community newspapers did have a slight influence on the perceived credibility of newspapers in comparison to the perceived credibility of the agronomist.

In a similar manner we determined the relative credibility of radio as compared to the agronomist. Figure 4-7 shows that increases in radio credibility occurred in the radio communities as hypothesized, but practically the same increase occurred in the control communities where the radio forums did not operate. Thus, we conclude there was no experimental effect on radio credibility in comparison to the credibility

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\* "Agronomist" is a generic term designating a person who has studied agronomy. In rural areas the term is practically synonymous with ACAR supervisor.

of the agronomist in the forum communities. It is interesting to note that radio credibility in comparison with agronomist credibility actually decreased in the newspaper communities. This decrease could point to some experimental effect in the radio communities, or to some interaction of the comparisons between radio, newspaper and agronomist such that the respondents who said they trusted the newspaper rather than the agronomist in one comparison switched back to the agronomist in the radio-agronomist comparison. Whatever the reason, since there was an increase in radio credibility in the control communities practically matching the increase in credibility the radio communities, we are unable to conclude there was an experimental affect on radio credibility when compared to agronomist credibility.

Our two previous estimates of media credibility treatment effects concerned radio and newspaper credibility in comparison to the agronomist. We can also compare radio and newspaper credibility directly, since one of the paired comparisons asked the respondents to chose between these two media. In figure 4-8, we see the percent of respondents who preferred radio in the radio-newspaper comparison for both Phase II and Phase III. There appears to be a substantial increase in radio credibility (16.6%) in the radio communities while only a slight gain in radio credibility appeared in the control and newspaper communities.

To examine newspaper trust directly and eliminate any effect of "Don't know" responses, we present Figure 4-9, the percent of respondents who find the newspaper more credible than the radio. As the figure indicates there was an increase in newspaper credibility of 10.6 percent in the newspaper communities in contrast to a drop in newspaper credibility in both the radio and control communities.

These results argue strongly for an experimental effect on the credibility of the medium used in the treatments. In the radio communities, radio trust increased in comparison to newspaper trust; in the newspaper communities, newspaper trust increased in comparison to radio trust. The negligible changes in media trust in the

Radio vs. Agronomist Choice:  
Percent Trusting Radio

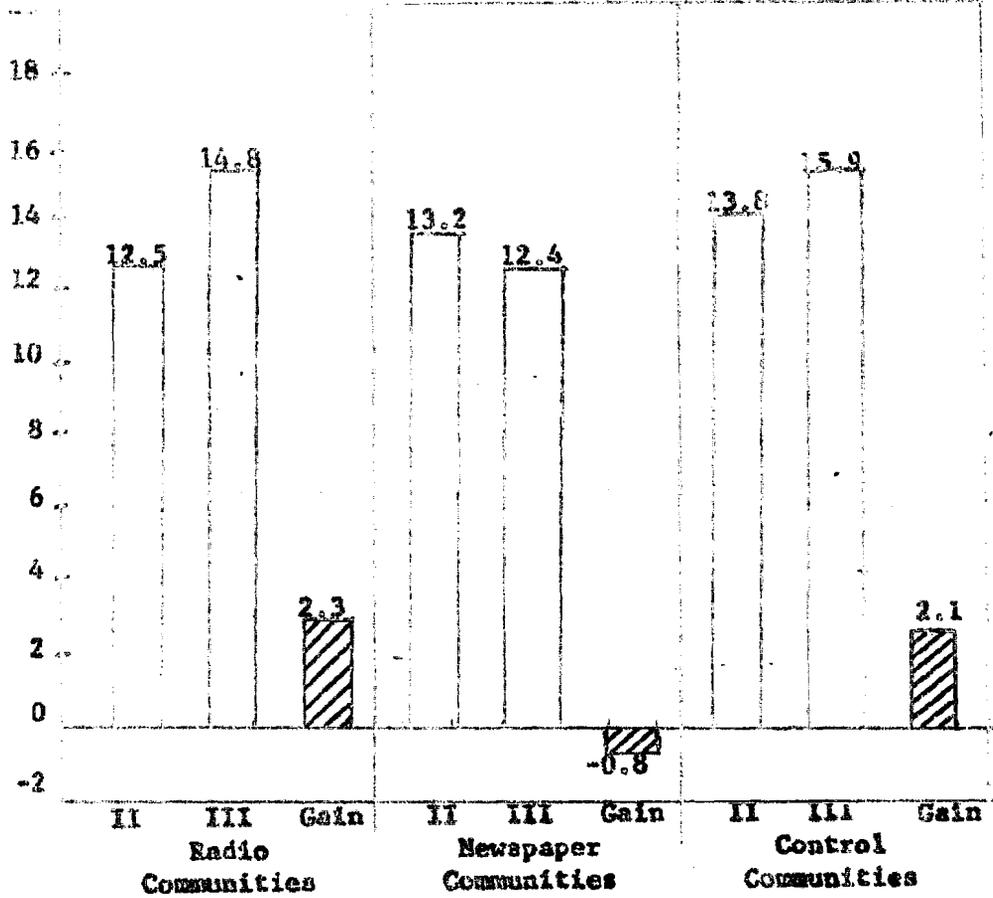


FIGURE 4-7 - Trust in Radio vs. Trust in Agronomist, Phases II and III

Newspaper vs. Radio Choice:  
Percent Trusting Radio

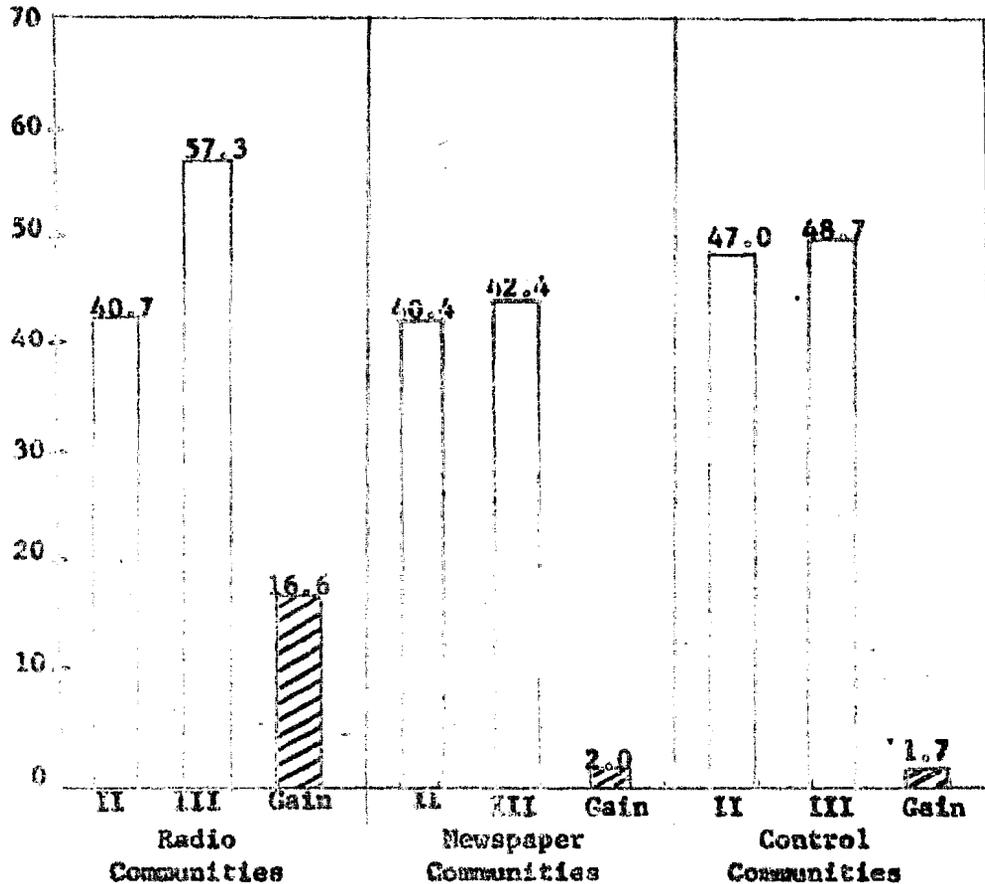


FIGURE 4-8 - Trust of Radio vs. Trust in Newspapers, Phases II and III

Newspaper  
vs. Radio  
Choice:  
Percent  
Trusting  
Newspaper

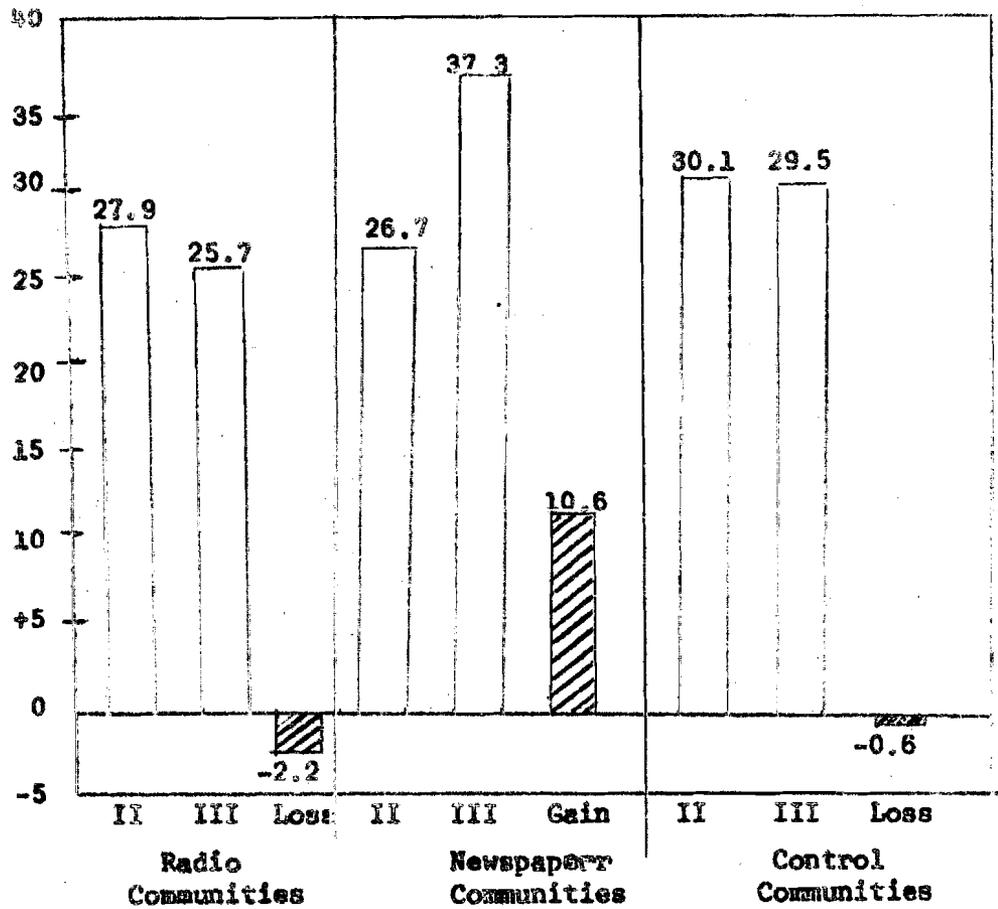


FIGURE 4-9 - Trust in Newspaper vs. Radio; Phases II and III

Knowledge  
of  
Trench Silo

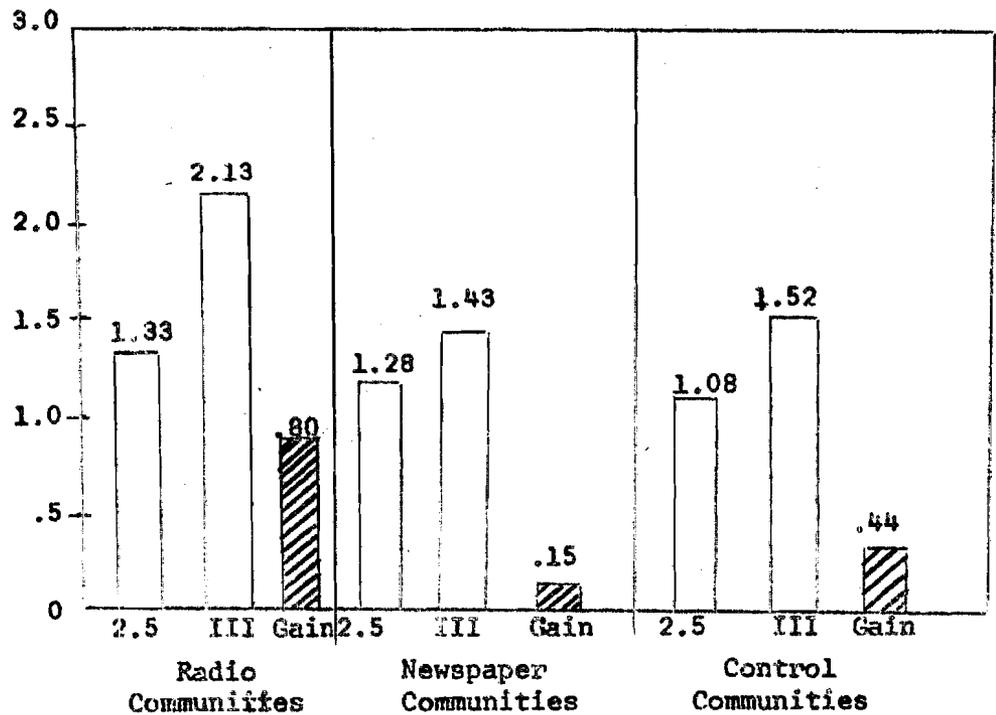


FIGURE 4-10 - Knowledge of Trench Silo in Phases 2.5 and III

control communities allow us to conclude that these changes were the result of the communication experimental treatments. Apparently experience with the media as channels of technical information increased the credibility of the media involved.

#### Knowledge and Attitudes Toward Four New Practices

As mentioned previously, our two main variables for evaluating the success of our communication treatments were level of knowledge about, and attitudes toward new practices. These variables allow us to measure the effects of the communication treatments in the preliminary stages of the adoption process. Level of information is a direct measure of the farmer's awareness of the innovation. Attitude toward the innovation is a direct measure of the farmer's evaluation of the measure.

Level of information was determined by asking a series of questions about each of the four practices included in the experimental treatments. In each case the first question was quite general: for example, "What is a trench silo?". If the respondent could give even a vague answer to this question the interviewer moved to more specific questions about the silo. The questions were constructed by experts on each practice, and were fairly specific so a right or wrong answer could be easily identified. Using these questions we determined the average level of information about each practice in our sample communities.

Two questions were used to measure attitudes toward each practice. The first question usually asked the farmer if he thought the particular practice was applicable to his farm: for example, "Do you feel that a trench silo would be useful on your farm?" A second question asked the farmer if he intended to use the practice in the future. This question was asked whether or not the respondent had actually used the practice.

Our method for determining if the treatments had an effect on knowledge or attitudes was different from the variables discussed earlier in this chapter. To

examine changes in knowledge and attitude we used data from Phase 2.5 for comparison rather than Phase II. Phase II data, unfortunately, did not contain this information. While Phase 2.5 is only based on 315 respondents randomly drawn from the Phase II sample, it does give us some indication of what the situation was before the experiments began.

Figures 4-10 through 4-13 show the increases or decreases in information levels in the three groups for each of the four practices. In the case of the trench silo, strip farming and home pharmacy, there appears to be some experimental effect, in that the control group increases are exceeded by increases in at least one of the experimental treatments, the radio forums. For none of the four practices, however, do the newspaper communities exceed the control group communities, either absolutely in information levels or in terms of the increase that should have occurred between Phase 2.5 and III.

To make sure that these trends are accurate, we added together all the knowledge items about the four practices to get an overall index. Figure 4-14, shows that the radio forums exceed the control groups in overall knowledge gain. The newspaper communities barely change at all, certainly not enough to say there was an experimental effect. We conclude from this data that the radio forums are effective means for transmitting information about agricultural practices to farmers. Community newspapers apparently have little value for this purpose; at least, our procedures were not able to detect any substantial information gain.

Apparently the characteristics of most of the new practices did not effect their ease of transmission over the radio. For all practices except the planter, the increase in information in the radio forum communities was about double the increase in the control communities. Even for the trench silo which was judged very complex and very expensive, the radio forums did an acceptable job. It is not clear why the radio forums did not inform farmers about the planter. The planter was judged as simple, but expensive. It is possible that its expense made it more

Knowledge of Soil Conservation:  
Phases 2.5 & III

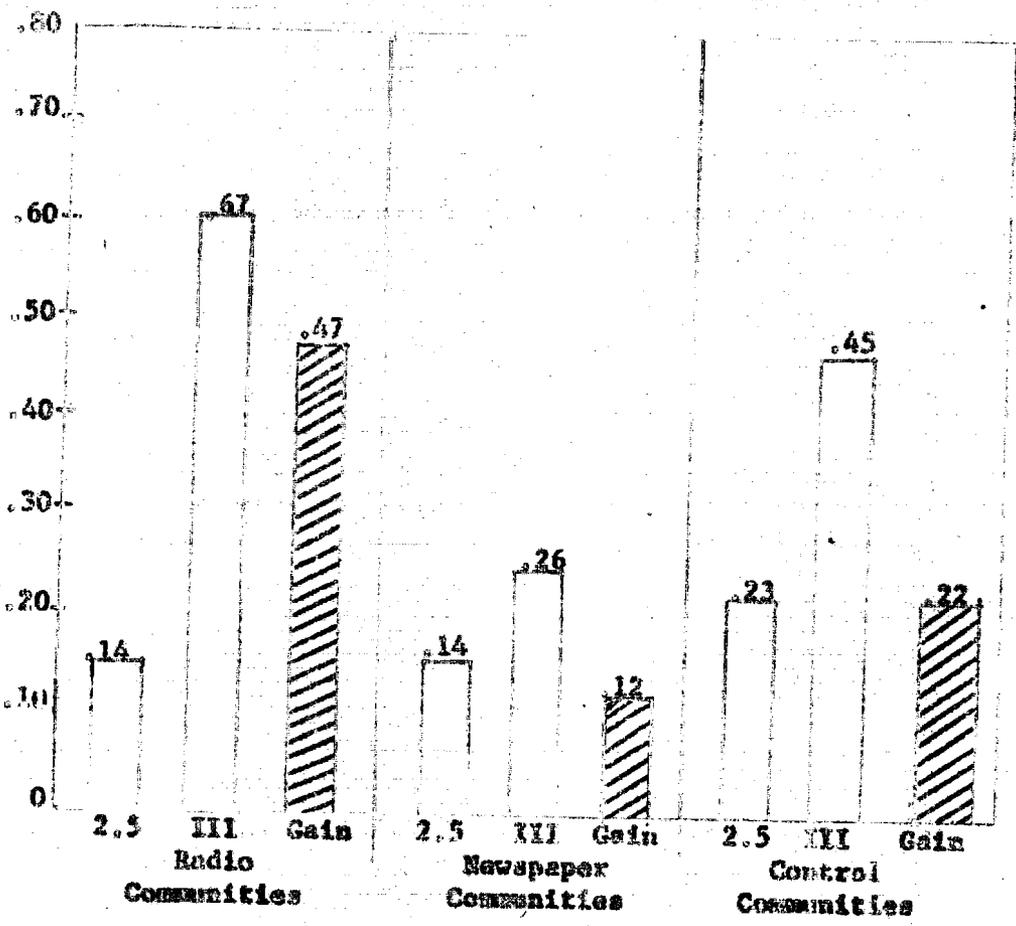


FIGURE 4-11 - Knowledge of Soil Conservation: Phases 2.5 and III

Knowledge of Mechanical Planter  
Phases 2.5 & III

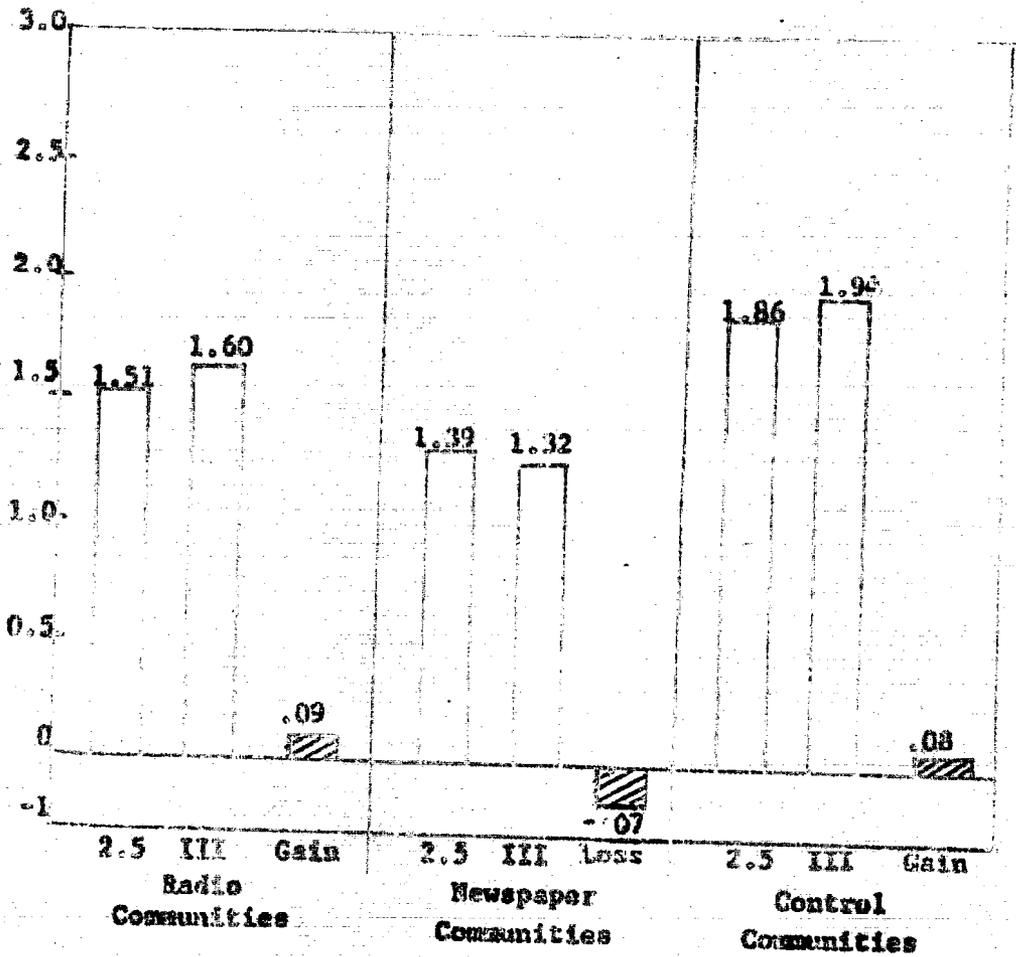


FIGURE 4-12 - Knowledge of Mechanical Planter: Phases 2.5 and III

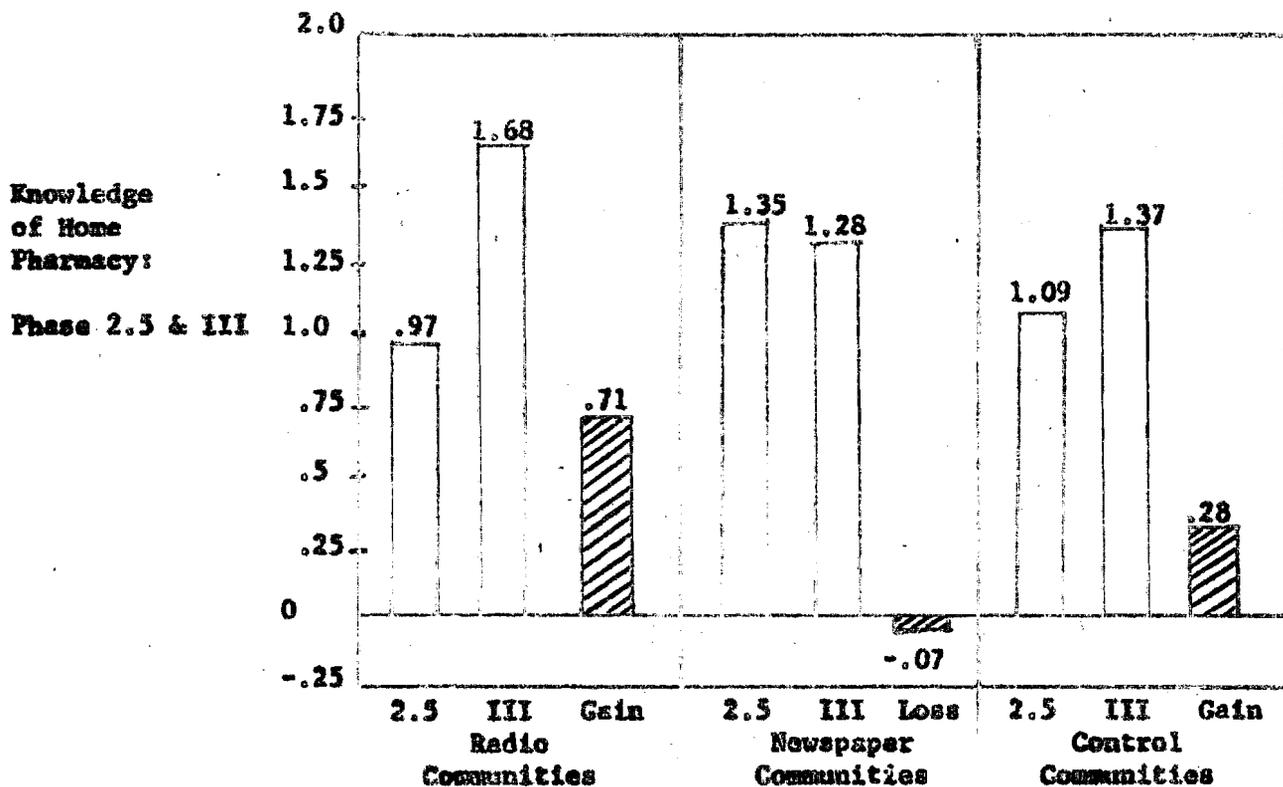


FIGURE 4-13 - Knowledge of Home Pharmacy: Phases 2.5 and III

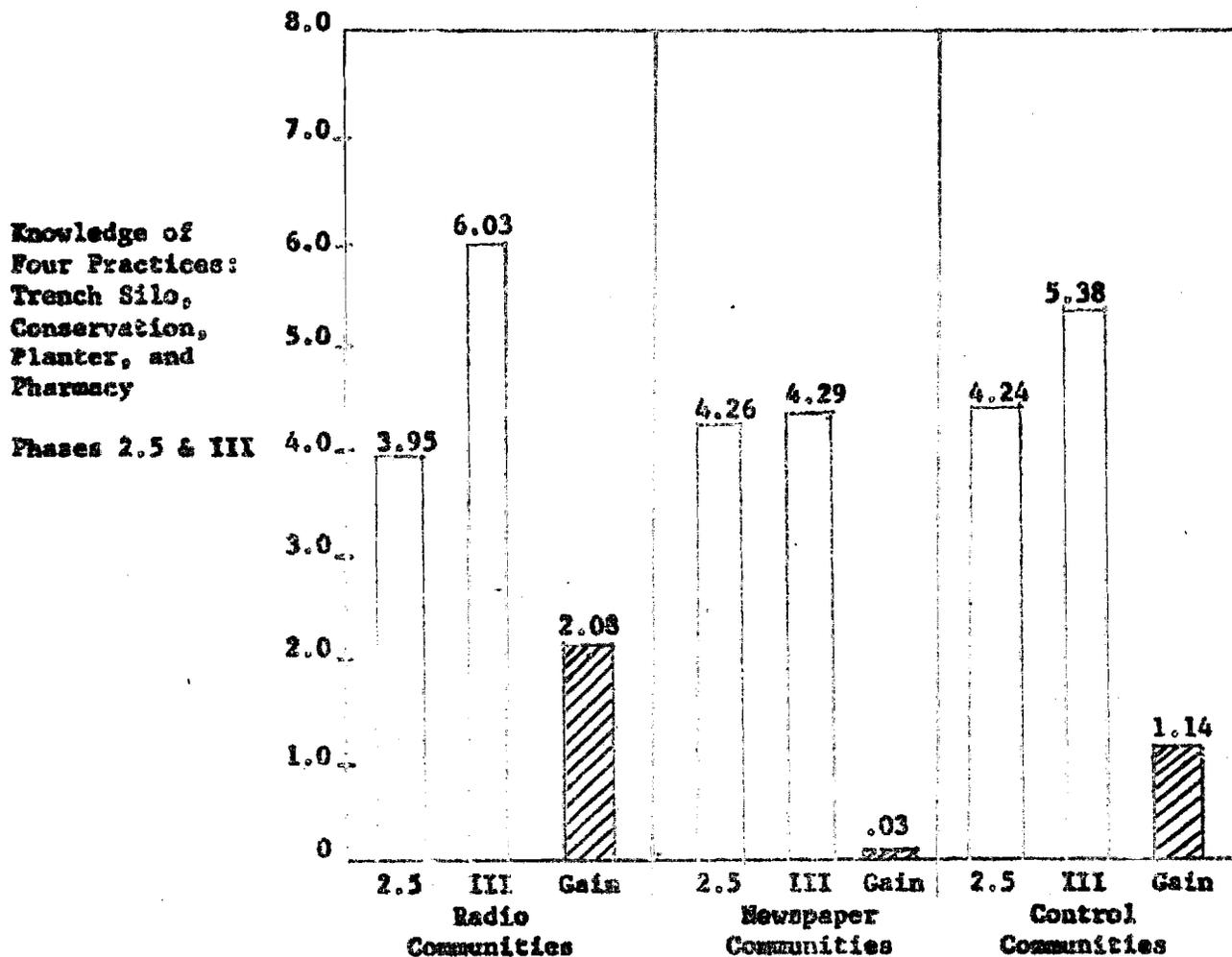


FIGURE 4-14 - Overall Knowledge of Five Practices: Phases 2.5 and III

difficult to communicate; however, the silo was also expensive but was communicated effectively. Perhaps other characteristics of the planter were responsible for lack of an information gain in the forum communities. For example, the term "planter" may have been somewhat ambiguous. Some of the respondents confused our mechanical planter for corn and beans with the common hand planter used for rice. Further, the planter may not have been particularly "divisible" or able to be broken into units that could be discussed over the radio with sufficient clarity and preciseness. At any rate this appears to be an interesting area for future research.

In general, radio forums were an effective media for transmitting information about new practices. Our data indicates they were also fairly successful at creating favorable attitudes toward the practices. Figures 4-15 through 4-19 illustrate the differential effectiveness of radio forums compared to the newspaper and control communities. As in the case of information level, the radio forum communities changed more than the control communities for all practices except the mechanical planter. We conclude, that except for the planter, there was an experimental effect in the radio forum communities. On the other hand, the newspaper communities failed to exceed the control communities for any practice. Therefore, we conclude that the community newspaper was a relatively ineffective medium for creating favorable attitudes toward new practices. Apparently the farmers did not pay much attention to the agricultural page in the community newspaper, neither absorbing information nor assimilating favorable attitudes. The overall attitudinal index, a composite of attitudes toward the four practices, followed this same trend. Only the radio communities showed any experimental effect.

#### Conclusions

In this chapter we explored both the direct and indirect effects of our communication treatments.

1. We found no change in urban contact; all groups changed approximately the same amount in trips to cities.

Attitude  
toward  
Trench Silo:

Phases 2.5 & III

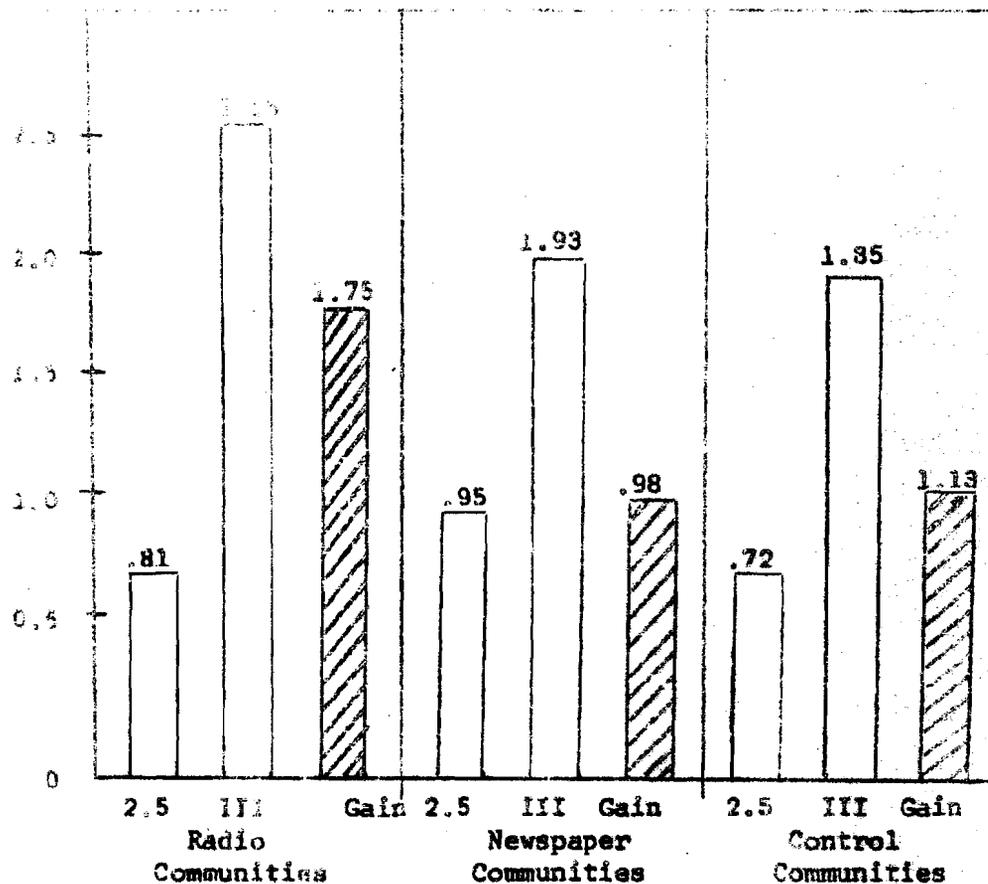


FIGURE 4-15 - Attitude toward Trench Silo: Phases 2.5 and III

Attitude  
toward  
Soil  
Conservation

Phases 2.5 and III

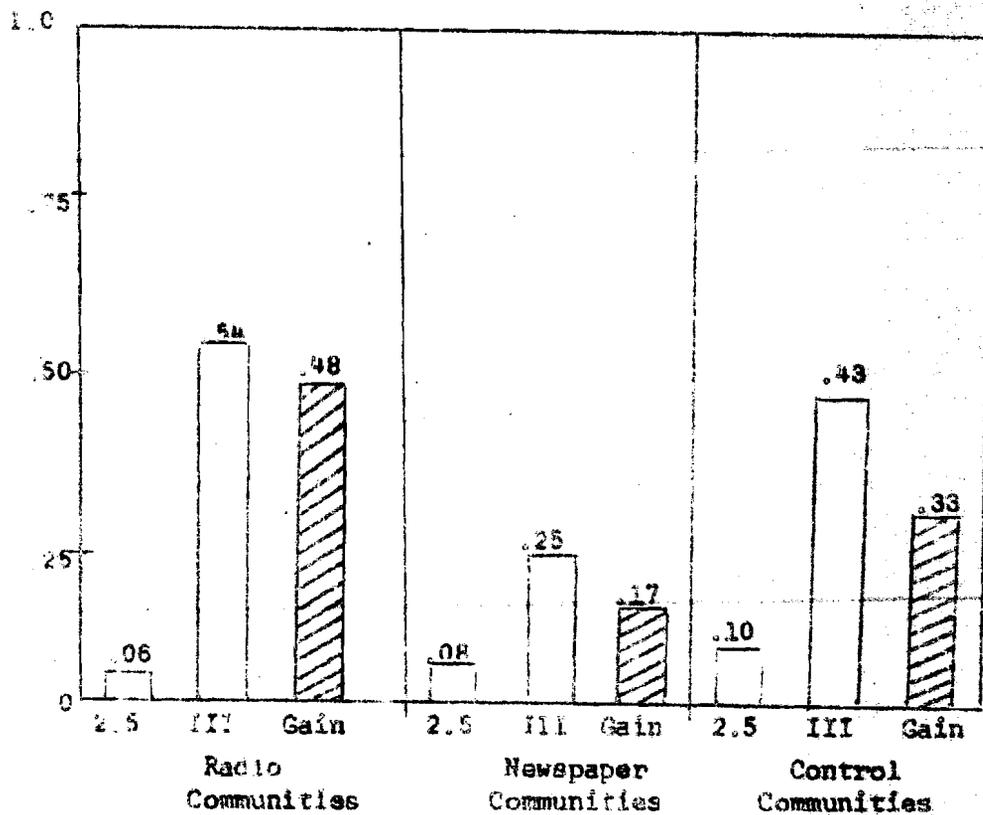


FIGURE 4-16 - Attitude Toward Soil Conservation: Phases 2.5 and III

Attitude toward Mechanical Planter:  
Phases 2.5 & III

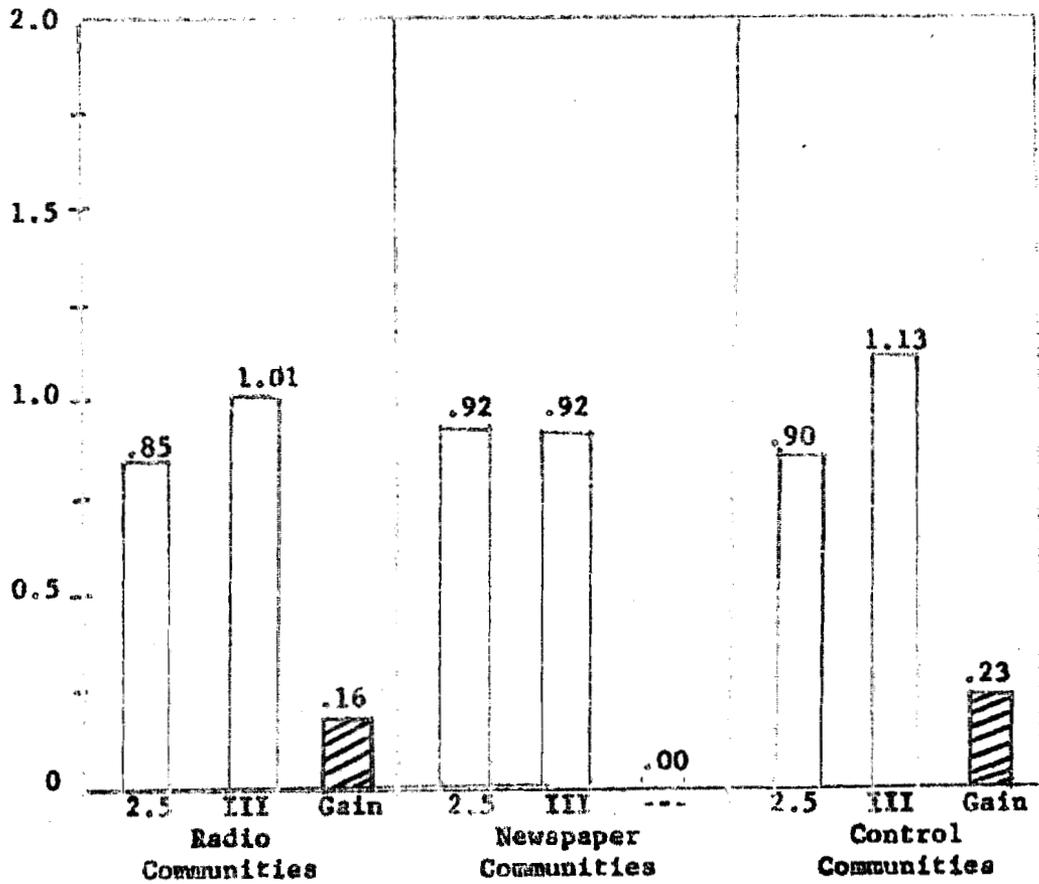


FIGURE 4-17 - Attitude Toward Mechanical Planter: Phases 2.5 and III

Attitude toward Home Pharmacy:  
Phases 2.5 & III

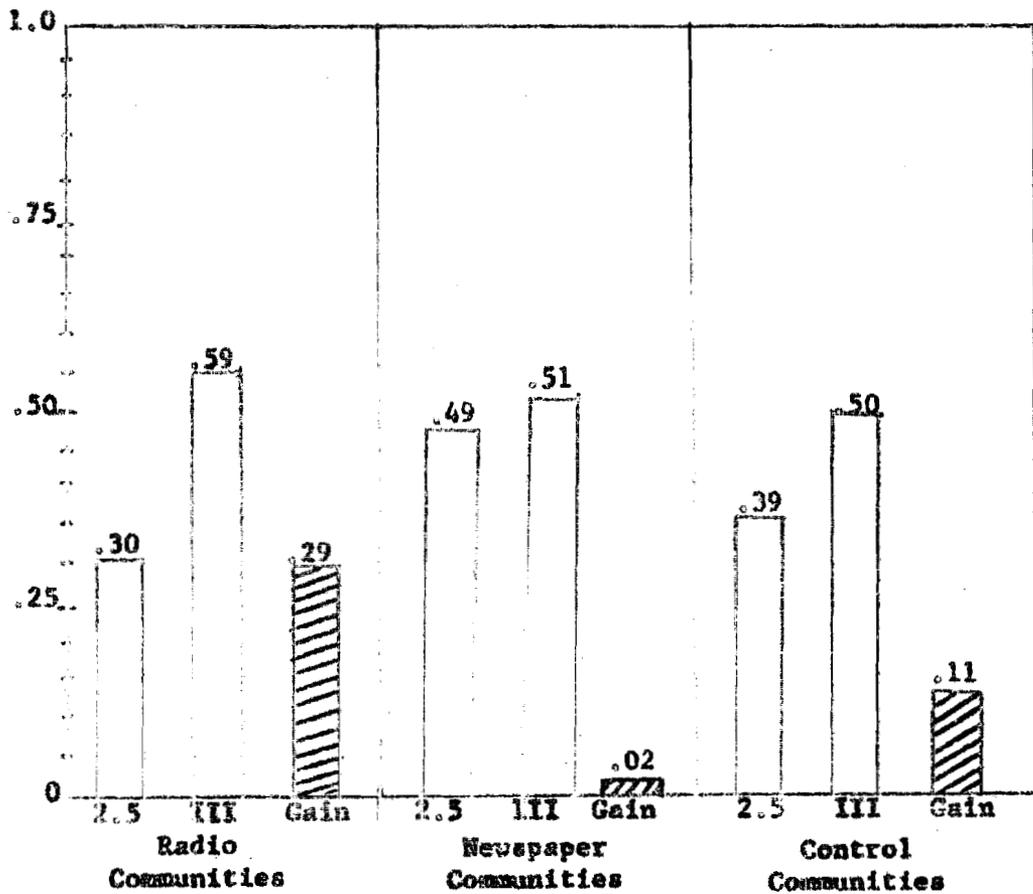


FIGURE 4-18 - Attitude Toward Home Pharmacy: Phases 2.5 and III

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M

Overall  
Attitude  
toward four  
Practices:  
  
Silo,  
Conservation,  
Planter, and  
Pharmacy

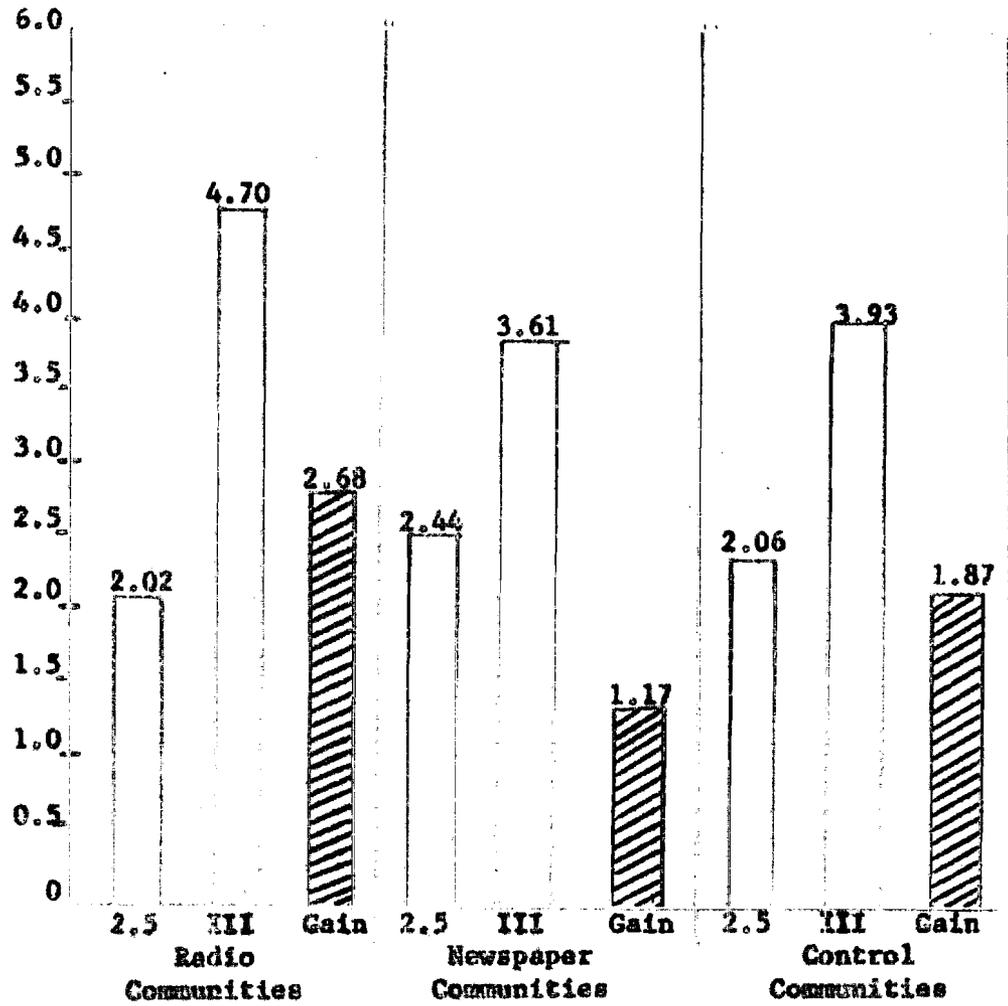


FIGURE 4-19 - Overall Attitude Toward Four Practices: (Silo, Conservation, Planter, Pharmacy) in Phase 2.5 and III

2. The radio forums apparently stimulated farmers to seek out the extension agent for further information about the practices discussed over the radio. Newspaper communities also showed increased contact with the extension agent, but this was very slight when compared to the radio forum communities.

3. Exposure to the radio increased in the radio forum communities but newspaper exposure failed to increase in the newspaper communities.

4. The credibility of radio and newspapers as sources of agricultural information apparently increased in both treatment groups, radio gaining acceptance in the radio forum communities and newspapers becoming more trusted in the newspaper communities.

5. Radio forums appeared to be an effective media for transmitting information and creating favorable attitudes. The radio forum communities exceeded the control communities in terms of information gain and increase in favorable attitudes toward the four principal practices used in the experiment. In no case did the newspaper communities change as much as the control communities, and certainly not as much as the radio communities. Radio forums appear to be viable means for reaching a rural audience with fairly technical information about agriculture.

We are forced to be somewhat inconclusive about the effects of community newspapers. Our earlier analysis showed that this group of communities ranked below the control and radio communities on certain indices of economic and social development. The failure of newspapers to produce information gains or attitude changes may have been a result of this initially low level of development. These considerations should be kept in mind before reaching any firm conclusions about community newspapers as a media for reaching rural audiences.

Chapter V

FUTURE RESEARCH: TOPICS AND METHODS

Our research left certain questions unanswered and uncovered a number of interesting problems. This chapter deals with some of the research suggested by these questions and problems. The first section will propose research on topics directly concerned with our experimental treatments. The last section will propose research on methodological problems encountered during the course of our experimentation.

RESEARCH TOPICS

Analysis of Participants and Non-Participants

Rather than compare participants and non-participants in this report, we considered the community as the main unit of analysis. Our objective was to provide ACAR with information about the effects of the community development schemes and communication treatments on whole communities. This analysis required several crucial assumptions.

Our analytical procedure assumed significant interpersonal communication took place after the information entered the communities. Merely assuming that people talked to one another, however, does not illuminate the specific processes of interpersonal influence. An examination of these interpersonal communication channels would have both theoretical and practical utility. One should be able to trace the diffusion of information about a given practice back to the forum or newspaper, thereby gaining an understanding of the factors which influence interpersonal diffusion. Are family ties important, or do friendship patterns have more influence on the diffusion process? What kind of person usually participates in activities like the forum, and what kind of person does not? What are the characteristics of the best communicators i.e. those who relay their information gained at the forum to the largest number of other individuals. Are the participants changed, or are

their beliefs merely reinforced by the mass media? These and other questions could be examined through an analysis of the radio forum participants and non-participants and the community newspaper readers and non-readers.

#### Other Uses of Radio

We found that radio was a viable medium for reaching a rural audience. Further research might examine the uses of radio more closely. For example, we do not know if radio forums are absolutely necessary. It might be possible to dispense with the rather cumbersome discussion format. Perhaps it would be possible for the extension service to sponsor a regular radio program and have their local supervisors encourage farmers to listen to the programs in their own homes. Research could show the relative value of radio forums versus radio broadcasts without the forums.

A second alternative to the full forum program might be the establishment of a few forums around the state to provide feedback for the extension service. A somewhat simpler procedure might be to maintain panel of radio listeners. These listeners could be interviewed periodically about the structure and content of the radio programs.

Yet a third alternative would be to continue the radio forums over a long period of time, but give more study to factors encouraging attendance at the meetings. We recommended that the local extension agent be actively involved, using the forum as part of his regular activity in the community. Part of the forum period could also be used to gather opinions and questions to be sent to relevant government officials. Certainly a great deal of effort should be devoted to motivating farmers to attend the meetings, listen to the programs and discuss their content. With little or no farmer interest, the advantages of group discussions are lost with all the effort used for the initial formation of the forums. Research could explore these and other methods for motivating farmers to participate in group listening and discussion.

## RESEARCH METHODS

We used a basic "before-after design" to investigate the effects of radio forums and community newspapers. We began with a survey of all the respondents, followed by our experimental treatments. At the completion of our experimental treatments we re-surveyed all the respondents. We showed that the value of this type of design lies in its capacity to tap actual changes no matter how high or low they were initially on various information and attitude scales. The added refinement of a control group which was interviewed, but not exposed to the treatments, showed how much change would normally occur when strangers come into the community asking a lot of odd and difficult questions. Since these "normal" changes were often substantial, having a control group proved invaluable.

### Experimenter Enthusiasm

Certain problems arose in our analysis, however, that show how future research in the same vein might be improved. First, we feel some method should be devised to determine how the enthusiasm of the research staff influences final results. It is quite possible that any effort to introduce change into rural communities would be effective if enough money and energy were poured into the project. On the other hand, a very poorly run treatment will not show the results it might have shown in the hands of a more enthusiastic director. In our experiment we attempted to steer a middle course by running the experimental treatments the way they would have been run if adopted by the state extension service. It is possible that our radio forums were better organized and more closely observed than normal whereas the community newspapers were not promoted as enthusiastically. In our study, the community newspapers received more attention initially than did the radio forums; however, the forums received more encouragement later on than did the newspapers. It is difficult to decide whether or not "balancing" the emphasis of the enthusiasm was effective.

Probably the best way to resolve this problem of "enthusiasm" or lack thereof, would be to define the treatments as closely as possible to how they will be used if adopted by the bureaucracy. This strategy requires the close cooperation of the bureaucracy at all stages of the research, in the definition of the treatments to be studied as well as in the methods by which these treatments will be initiated. This close cooperation adds to the difficulties of "getting the job done", since more people must be involved and more bureaucratic decisions reached, but such procedure would give the research greater practical value. If the local organization is involved and sees the advantages as well as the problems of an idea, it would be more able to adopt and pursue the idea on a large scale once the research is completed. More importantly, from a research point of view, if everything is done in a "normal" bureaucratic manner, the effect of the experimenter on the experiment would also be minimized.

#### Random Assignment or Matching Experimental Groups

A final problem that emerged in our analysis was the initial social and economic inequality of our three treatment groups. Despite careful randomization of communities to treatments it appeared that radio forum communities ranked well above the newspaper communities in terms of average economic well-being. The radio communities appeared to be more economically fertile ground for the seeds of information we dropped, making it difficult to say that changes were simply a result of the radio forums.

We probably erred by randomly assigning communities to treatments instead of matching the treatment groups on crucial variables before the beginning of the experiment. One method of selecting communities would be to randomly select them from a representative list and then match them in the treatment groups. Such a procedure would be less important if each treatment group contained 20 or so communities. However, with only six communities per treatment the chances of

finding significantly different levels of economic development or outside contact are fairly large. This is especially true where there are large differences among communities, an apparent fact in rural Minas Gerais, but a fact which was not overly obvious when the study was planned. Future field experiments would do well to consider this problem.

APPENDIX A  
COSTS OF RADIO FORUMS AND COMMUNITY NEWSPAPERS

In order to give some idea of the costs involved in beginning radio forums and community newspapers, we present some figures on the approximate number of man-days used to get the treatments underway. We present data on man-days instead of financial investments to make the information as "cross-cultural" as possible; having the time requirements in mind allows a planner, irregardless of locale, to arrive at approximate costs.

Radio Forums

There are two types of costs involved in setting up radio forums, the fixed costs which occur relatively independently of the number of forums set up, and variable costs which depend on the number of forums desired.

Fixed costs

(1) Approximately three man-days are needed to write the script for each program and record it on tape. This time estimate assumes one man will write the script, or at least be responsible for its technical content. Two or three other persons may be involved in the actual recording of the script especially where interviews or debates are employed. In our experiment, one ACAR technician was responsible for the content of the radio script. After spending one morning or afternoon preparing an outline of the script he would consult with experts on the content being discussed and rework the script until it was as compact and well written as possible. Usually re-writing required about one man-day of time, with two or three men involved. Actual recording required one technician to operate the equipment plus two or three other men to dub the voices according to the script. Actual recording time for a half-hour show can easily take a half-day. Because at least three men are involved, another one and one half man days are added to the program preparation time. The total time for preparing each program, then, is about three man-days.

(2) Cost of recording equipment is a second fixed cost not easily translated into man-days. If such equipment is available to the extension service, then the price of equipment will not be a factor. If, however, equipment is not readily available free of charge, some arrangement for rental of studios and recording equipment must be made. In our cost estimates, we will assume that equipment is available without charge.

(3) Radio time is an additional cost difficult to translate into man-hours, but which could become troublesome. Depending on the locale, radio time can be very expensive; we assume the change agency has access to radio time, either through the government or from the radio stations as a public service.

#### Variable Costs

(1) About three man-days are required to set up a forum. One day is spent getting acquainted with the local change extension agent as well as the community itself. A second day must be spent meeting community leaders and others who the local agent feels would participate in a forum. This meeting is usually designed to explain the basic idea of the forums and chose an acting president and secretary for the forum. Since this meeting is very crucial, a second meeting on the following day might be necessary. During this meeting the participants could be given a chance to listen to an actual program from a tape recorder and discuss its content. The remainder of this third day should be allocated to travel to and from the community.

(2) Each forum should be visited frequently by the forum organizer or local change agent, especially in its initial stages. Perhaps twice a month during the first month and thereafter only once a month would be sufficient. Over a year, then, about 13 man-days would be spent visiting the forum by the forum organizer or his representative.

(3) A final variable cost, not confronted in Brazil but which might occur in other localities, is the cost of radios and their maintenance. In certain countries these costs would have to be calculated.

To arrive at overall cost estimates, let us assume that 20 forum broadcasts would occur in a given year. Fixed costs, at three man-days per program, would be 60 man-days. Variable costs for each forum would be about 16 man-days. In order to get a rough estimate on the amount of time and effort that would go into a radio forum project, we would begin with 60 man-days and then multiply the number of forums by 16 man-days. For example, if we wanted to set up 20 separate forums in Brazil running over a period of one year and involving 20 radio broadcasts and forum meetings, the investment in labor would be 60 man-days plus  $16 \times 20$ , or 380 man-days in total. If two men were to do all the work, which is practically impossible, approximately 90% of their time during this year would be devoted to the radio forums. Certainly, some division of labor would be advisable and some corners could be cut as more experience was gained, but these figures show the large amount of time and energy required for such a program. Furthermore, if radios were not readily available, or if broadcasting facilities and airtime were costly, substantial additional funds would be required. In any event, the investment in time and money is certainly not to be taken lightly.

#### Community Newspapers

##### Fixed Costs

One man-day would be sufficient to prepare each Technical article for the newspaper. An additional half day may be required to reproduce a large number of copies of each article.

##### Variable Costs

(1) An editor, reporter, and lay-out man must be trained in each community.

This training can be done in two steps; a) a one week training course requiring up to five man-days per team and, b) an initial period of intensive help with writing, layout, reporting, and securing financial aid within the community. This latter training requires about 8 trips to each community of about two man-days per trip. Thus, training would involve about 21 man days per newspaper.

(2) Selection of individuals to be responsible for the newspaper would require about as much time as setting up radio forums. A trip to the community is necessary along with conversations with the local change agent, community leaders and other interested parties. At least two man-days per newspaper would be required for this activity.

(3) Material is the final variable cost, with the price of paper, ink, and silk screen depending on the locale. We can roughly equate these costs to about one man-day per issue. Assuming there are 20 such issues per year, we would have the equivalent cost of an additional 20 man-days per newspaper. This brings our total variable costs to 43 man-days per newspaper.

If, for example, we wanted to start 20 community newspapers of 20 issues each, these time and cost estimates would come to 30 man-days ( $1.5 \times 20$ ) of fixed costs plus about 860 man-days ( $43 \times 20$ ) of variable costs. Together, then, two newspapers would require 890 man-days, or the allotment of four full time men for one whole year.

We see that community newspapers, because high fixed and variable costs, are over twice as expensive as radio forums. Again, it would also be possible to reduce some of these costs especially if production was placed in the hands of the local ACAR supervisor. Even with there reductions, however, community newspapers would still remain an expensive proposition.

RESEARCH REPORTS  
ON THE DIFFUSION OF INNOVATIONS\*\*

- #1 Bibliography of Research on the Diffusion of Innovations, 1964.\*
  - #2 Opinion Leadership in Traditional and Modern Colombian Peasant Communities, 1964.
  - #3 Bibliography on the Diffusion of Innovations, 1965.\*
  - #4 Bibliography on the Diffusion of Innovations, 1966.\*
  - #5 Achievement Motivation Among Colombian Peasants, 1966.
  - #6 Bibliography on the Diffusion of Innovations, 1967.
  - #6a Supplement to the Bibliography on the Diffusion of Innovations, 1968.
  - #7 Innovation in Brazil: Success and Failure of Agricultural Programs in 76 Minas Gerais Communities, 1967.
- Summaries of Diffusion Research Report #7, (English and Portuguese)
- #8 Innovation in Eastern Nigeria: Success and Failure of Agricultural Programs in 71 Villages, 1968.
  - #9 Innovation in India: The Success and Failure of Agricultural Programs in 71 Villages, 1968.
  - #10 Patterns of Diffusion in Rural Brazil, 1968.
  - #11 Patterns of Diffusion in Rural Eastern Nigeria, 1968.
  - #12 Patterns of Agricultural Diffusion in Rural India, 1968, (hardback and mimeo).
  - #13 Communication in Brazil: Experiments in Introducing Change, 1968.
  - #14 Communication in Eastern Nigeria: Experiments in Introducing Change, 1968.
  - #15 Communication in India: Experiments in Introducing Change, 1968.
  - #18 Correlates of Family Planning in Eight Indian Villages, 1968.
  - #19 Adoption of High Yielding Varieties in Three Indian Villages, 1968.
  - #20 Development and Change in a Bengal Village, 1968.\*
  - #21 Adoption of Health Practices in Village India, 1968.
  - #24 Diffusion of Innovations in Brazil, Nigeria, and India, 1969.

Forthcoming

- #16 Survey Research Methods in Developing Nations, 1968.
- #17 Comunicacao de Novas Ideas: Pesquisas Aplicaves Ao Brasil, 1968.
- #22 Opinion Leadership Analysis, 1968.
- #23 Opinion Leaders and Their Role in Social Change, 1968.

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\*No longer available.

\*\*The reports can be requested by number from the Department of Communication,  
Michigan State University, East Lansing, Michigan, U.S.A., 48823.