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An Experiment

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COMMUNICATION AND MOTIVATION IN COMMUNITY DEVELOPMENT:

AN EXPERIMENT

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PREFACE

Both the need for U.S. technical assistance programs and the costs of such programs continue to increase. It is of immediate importance, therefore, to search for practical means for implementing U.S. technical assistance as economically as possible. One potential approach is being investigated in an experimental study by the Institute for International Services of the American Institute for Research under Contract No. AID/1a-27 (repa-18) with the Agency for International Development.

This report describes a study in which various communication media were used in a systematic campaign to induce people in rural communities to adopt several innovations. An experiment was designed to test the comparative effectiveness of different communication media under realistic conditions and to determine the circumstances in which the media are effective. A somewhat similar study was first proposed in 1960 in a paper by Florence Thomason and Roger Wolcott called Breaking the Illiteracy Barrier through Radio.

The experiment was done in relatively isolated towns in the Andean Mountains of Ecuador with the cooperation of the Central, Provincial and Municipal governments and with logistic support by the U.S. AID mission in Quito. The research staff consisted of U.S.-based social scientists, working on a part-time basis, and an Ecuadorian social scientist who coordinated and supervised the efforts of Ecuadorian technicians, writers, artists, musicians, and interviewers employed at various periods during the project.

There were two findings of special note that are not mentioned in this report. One was that momentum for community improvement was developed during the experiment and continued after its completion. Local Governmental officials in the area where the experiment took place have made formal requests to U.S. authorities in Ecuador to conduct additional campaigns in that area and have pledged local funds to help defray the costs. The second finding was that previous U.S. effort in the training and education of Ecuadorians in skills needed for that country's development has begun to pay dividends. Most of the key persons who were recruited for the field staff in Ecuador had received at least some of their technical training in various programs conducted or sponsored over the years by the U.S. Government. Without such a nucleus of technically trained individuals, this research would have been impossible.

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INTRODUCTION

Every program of social development requires communication among individuals. Ideally, perhaps, this communication should occur in a face-to-face situation in which questions about goals can be answered specifically, instructions can be altered to fit the particular self-interests and motivations of each participant, and suitable personal demonstrations of essential techniques can be given. Obviously, face-to-face communication is impractical where there are many potential participants, as in most developmental projects of the U.S. Agency for International Development or other public and private organizations. Even if enough skilled development technicians were available, the costs of using them as personal instructors to the millions of people involved would be prohibitive.

The need to find practical substitutes for face-to-face communication has led to the use of various forms of mediated communication -- newspapers and books, posters and displays, movies and film strips, and radio and television. Each of these media has its unique advantages and limitations, and each has been subjected to considerable research designed to demonstrate and to improve its effectiveness. Such research, however, has been confined mainly to the highly developed literate societies where mass communication is most prevalent. There remains an urgent need to test the various communication media for their comparative effectiveness in the realistic circumstances of developing societies in order to determine the situations in which each is most suitable.

One such test of the comparative effectiveness of communication media was undertaken in the Andean highlands of northern Ecuador. Under relatively controlled conditions, the Institute for International Services of the American Institute for Research conducted a study to determine the relative effectiveness of three modes of communication for inducing people to undertake certain practices. The three modes studied were:

1. radio
2. a combination of audio-visual media, including movies, demonstrations, posters, slides and exhibits, and
3. a mixture of radio and the audio-visual combination.

Each mode was applied to one of three comparable and mutually isolated towns of approximately 100 households. The experimental results were compared to results obtained from control groups.

The particular practices to be undertaken were chosen so that results could be measured objectively. They consisted of constructing a latrine, building a smokeless stove, canning marmalade (as shown by entry in a marmalade contest), and being vaccinated against smallpox. Thus, the basic data came from a simple count of the number of people who did or did not undertake the practices during an information-motivation campaign of nine weeks. Counts were also made of the participants in each of these practices in three control towns where the materials needed for participation were made available, but no specific campaigns were conducted.

After the campaigns all the householders in the experimental towns and one-third of the householders in the control towns were interviewed in an attempt to determine why people either did or did not undertake

the practices. An attempt was also made to determine which media were most suitable to particular kinds of persons, kinds of situations, and kinds of innovations. A second phase of the research, not covered in this report, is aimed at determining whether people followed through on projects undertaken earlier, and why they did or did not.

The details of the procedure, including the various ways in which attempts were made to conduct valid tests of the relative effectiveness of the communication media under comparable conditions, are presented in other sections of this report. However, it should be understood from the outset that it was not possible to maintain perfect control of all conditions and variables that might have affected the results in an experiment of this kind. It was the consensus of the research staff, both in Ecuador and in the United States, however, that conditions were sufficiently well controlled, and the differences in results sufficiently large, to permit certain valid conclusions to be drawn concerning both the question of the relative effectiveness of the media and the questions about the reasons for such effectiveness.

Statements made about the media in this report may carry the simple term "radio" or "movies," and may thus imply that the device itself had a certain effect. It should be recognized that such terms are merely expository conveniences. We have viewed each medium as a composite of a channel and the various forms and contents of its messages. A medium never exists as a technical or mechanical abstraction, and the effectiveness of the device itself can probably never be determined.

Despite efforts to make the several modes comparable in message content, the messages transmitted by the different communication media necessarily differed. A visual image presents messages which sound

does not convey, and vice versa. Other differences, such as extent and frequency of exposure, are also inherent in the several modes. It is ultimately all of the differences between media which must explain the results in this (or any other) communication experiment. Each communication mode was designed to do its best motivating and instructional work, as programmed and pre-tested by highly qualified technicians in Ecuador. Thus, the experiment represents a comparison of media in a practical and technically feasible development effort, with all of the essential differences among the media retained and to some extent explicitly manipulated. Details on the media are presented in the Procedures section.

Three general questions were asked in the experiment:

1. Which of the communications media had the greatest motivational influence?
2. What factors other than media might have influenced the results? These factors included many of the influences in the lives of the townspeople which were not controlled in the experiment.
3. What interactions were there between the effects of the media and the other factors? For example, was higher literacy associated more often with participation in the Radio Town than in the Audio-Visual Town?

A series of sub-hypotheses was generated concerning such other factors as differences in the psychological and economic value of the practices, prior and current motivational states, psychological, social and physical mobility, intellectual preparedness, and susceptibility of the people to social influences.

These hypotheses follow:

1. The mixed media should have greater motivational influence and provide more effective instruction than radio alone or audio-visual media alone.
2. More people should be influenced by radio than by the audio-visual media.
3. The information campaigns would induce people to act on a variety of projects.
4. Each medium might be most suitable to induce action on certain types of projects.
5. People would respond most readily to the appeal which made the least monetary demand on them and least readily to the appeal which made the highest monetary demand on them.
6. Response would be greatest in that practice which offered the most obvious immediate reward; it would be least in that practice whose benefits are perceivable either in the long run or not at all.
7. Costs and perceived benefits would tend to offset each other, e.g., participation in a low-cost practice offering low benefits would be approximately equal to participation in a high-cost practice offering high immediate benefits.
8. The more intelligent a person, the more responsive he would be to the messages. Since it was not possible to determine intelligence directly, indirect measures were used, such as level of education, literacy, extent of reading, and receptiveness to information.

9. Persons with prior interest in latrines, stoves, marmalade, or vaccinations would be more likely to participate than those who had no such interest.
10. Persons who valued latrines, stoves, marmalade, or vaccinations, or valued the effects of these, would be more likely to participate than those who valued other things more.
11. Persons who aspired to improve their own or their children's condition would be more likely to participate in the experiment.
12. Persons who are inclined toward change of any kind would be more likely to participate than those who advocate no change at all.
13. Persons who desire change in new directions would be more likely to participate in the experiment than those desiring changes that tend to reinforce existing conditions or to return to previous ones.
14. Wealthier persons would be more likely to participate in the practices than poorer ones.
15. Social facilitation, e.g., talking to other people about a practice, would tend to encourage participation in that practice.
16. Interest or opposition on the part of community leaders would influence participation.
17. Persons who travel more frequently and extensively would participate in the practices more than those who travel less.

18. Households which include persons with suitable construction skills would be more likely to participate than households which lack such skills.
19. Persons who liked particular features of the campaigns would be more likely to participate than those who did not like them.
20. Persons who disliked either the whole campaign or certain features of the campaign would be less likely to participate than those who were either neutral or positive toward it.
21. Persons who could recall some substantive information conveyed by the media would participate more than those who could not recall such information.
22. Persons who mentioned the media used in the study as sources of information would have participated more than those who mentioned other sources or no source of information.

As indicated previously, the interaction of the above factors with the communication modes was of prime consideration in the study.

PROCEDURE

General

The basic approach of the study was to conduct the same campaign in three towns, using a different communications treatment in each town. The results in the experimental towns were compared with each other and with the results in control towns which had received no experimental treatment. The three experimental treatments were:

1. radio broadcasts,
2. a mixture of radio broadcasts and other audio-visual communications media, including films, slides, exhibits, posters, bulletins, lectures, personal demonstrations and personal discussions, and
3. all of the audio-visual communications media listed in 2 above except radio.

Three towns in the Canton of Totacachi of the Province of Imbabura were chosen for experimental treatment. Three other towns in the same canton served as controls.

Campaigns were conducted to induce the people in all three experimental towns to participate in four development practices:

1. to build latrines,
2. to build smokeless stoves,
3. to prepare marmalade from a locally available berry, and
4. to be vaccinated against smallpox.

The Ecuadorian project staff prepared campaigns for radio broadcasts and for the other audio-visual media. Small transistor radios were distributed to all the households in two of the three experimental towns, and a radio studio with a 500-watt transmitter was set up to broadcast to these towns. The audio-visual campaign was also conducted in one of the towns having radios and in a third town which had received no radios. The campaigns were conducted for a period of nine weeks in January, February, and March 1963.

At the conclusion of the campaigns, all the householders in the three experimental towns and one third of those in each of the three control towns were interviewed by local interviewers who had been trained by the project staff. The main purposes of the interview were to get detailed data not otherwise available concerning the characteristics of the people and the towns and to determine why individuals participated or failed to participate in the practices advocated in the campaign. The data were categorized and coded in Ecuador and tabulated and analyzed in the United States. The procedures used in the study are described in detail in the remaining sections.

Selection of Experimental Towns

An attempt was made to choose towns which were comparable to each other in important demographic and sociological characteristics. Although complete comparability was of course impossible, towns were sought which were similar in ways that were originally hypothesized to be related to responsiveness to communications.

Certain constraints limited the choice of towns. For example, it was necessary to conduct the experiment in a region where the local political authorities would lend active support. It was also necessary

to obtain two towns for radio communication which were isolated from each other, but close enough together to receive broadcasts from a common transmitter. A third town, isolated from the two with radios, was also needed. Furthermore, it was desirable to choose towns of approximately the same size and of similar ethnic composition.

Potential sites in several parts of Ecuador were surveyed. Various areas in Guayas, Manabi, and Imbabura Provinces were visited, and each was judged on the following characteristics:

1. Feasibility of choosing practices which would be both useful to the people and suitable for measurement.
2. Availability of subject matter specialists for practices chosen.
3. Cooperativeness of the population.
4. Cooperativeness of secular authorities.
5. Cooperativeness of clerical authorities.
6. Availability of police or military protection.
7. Quality of radio reception.
8. Suitability of climate during proposed campaign time.
9. Transportation facilities and distance from headquarters.
10. Sociological aspects: size of families, participation in politics, occupations, social organizations.
11. Rough estimates of existing communications media: radio receivers, newspapers, radio stations, networks of roads and paths that would facilitate or hinder personal contacts among people from different towns.

12. Psychological aspects: disposition toward physical violence, feelings of community pride, education levels.
13. Economic aspects: markets, industries, commerce.
14. Similarity of towns with regard to size, economic condition, social organization, etc.
15. Representativeness of sample.

The Canton of Cotacachi in the Province of Imbabura was chosen chiefly because it rated highest in the preliminary survey. Local authorities promised cooperation and assistance, the population was judged to be stable and not inclined to create disturbances, and representative towns were available. Furthermore, its towns were relatively isolated from each other, yet psychologically and sociologically comparable and reasonably accessible to a central headquarters for field personnel. Three towns in the canton were chosen: Cuicocha was the town selected for radio communications exclusively; San Jose was chosen as the town in which radio and the other communications media would be used; Imantag was chosen for the non-radio, audio-visual mode.^{1/}

Each of the experimental towns had approximately 100 households. (See Table 1, p. 12, for details on town and sample characteristics.) They are located approximately 135 kilometers northeast of Quito (by road) and are at approximately 8,500 feet altitude in the Andes Mountains. The climate is mild with little seasonal temperature variation although there are dry and moist periods. Cuicocha, the Radio Town, and Imantag, the

^{1/} Hereafter Cuicocha will often be called the "Radio Town," San Jose will be called the "Mixed Town," and Imantag the "Audio-Visual Town" or "A-V Town."

Table 1
CHARACTERISTICS OF SAMPLE

| Characteristics | Experimental Towns | | | Combined Control Towns |
|---|---------------------|--------------------------------------|---------------------------|------------------------|
| | Radio (Cuicocha) | Radio and Audio-Visual (San Jose) | Audio-Visual (Imantag) | |
| Population | 414 | 420 | 347 | 377 |
| Number of households | 103 | 89 | 88 | 86 |
| Persons per household | 4.0 | 4.7 | 3.9 | 4.4 |
| Persons per room | 2.1 | 1.9 | 1.6 | 1.5 |
| % in ages 12 to 50 | 61 | 62 | 56 | 50 |
| % owning home property | 92 | 80 | 85 | 80 |
| % owners with over 1 hectare | 7 | 6 | 8 | 14 |
| <u>Physical living conditions</u> | | | | |
| % of houses with: | | | | |
| Separate kitchens | 80 | 81 | 69 | 83 |
| Potable water | 0 | 20 | 19 | 0 |
| Paint | 8 | 35 | 32 | 30 |
| Hall | 12 | 28 | 32 | 34 |
| Covered floor | 26 | 27 | 23 | 40 |
| Electricity | 3 | 65 | 53 | 63 |
| Windows | 18 | 24 | 22 | 33 |
| Glass windows | 0 | 6 | 5 | 7 |
| Extra facilities | 16 | 24 | 24 | 25 |
| <u>Respondent characteristics</u> | | | | |
| Mean age | 44 | 47 | 49 | 47 |
| Mean years of schooling | 3.4 | 3.4 | 3.3 | 4.2 |
| % who can read | 67 | 82 | 67 | 67 |
| <u>Occupations</u> | | | | |
| % in each of the following categories: | | | | |
| Domestic | 9 | 18 | 16 | 14 |
| Farmer | 18 | 6 | 20 | 25 |
| Merchant | 25 | 3 | 11 | 24 |
| Crafts-labor | 45 | 66 | 42 | 30 |
| Employee | 2 | 6 | 7 | 1 |
| Other | 0 | 0 | 1 | 1 |
| None | 1 | 1 | 2 | 4 |
| <u>% reporting prior interest in:</u> | | | | |
| Latrines | 10 | 16 | 8 | 17 |
| Stoves | 14 | 20 | 18 | 18 |
| Marmalade | 7 | 11 | 1 | 11 |
| % of respondents vaccinated before campaign | | | | |
| | 77 | 83 | 80 | 67 |
| % of population vaccinated before campaign | | | | |
| | 57 | 69 | 71 | 58 |

Audio-Visual Town, are situated at the ends of very poor roads and are 10 to 12 kilometers from the cantonal capital of Cotacachi. San Jose is situated on a road leading directly into Cotacachi, approximately two kilometers away. The people of San Jose have more interaction with Cotacachi than do the people of Cuicocha or Imantag. Although Cuicocha is in the Canton of Cotacachi, its principal market town is Otavalo in another canton, and the road between it and Otavalo is better than the road to Cotacachi.

Imantag and San Jose appear to be somewhat more urban than Cuicocha. The latter is a grouping of small farms connected by winding lanes rather than a collection of houses on intersecting streets. The houses in Cuicocha give the impression of being more rustic, less well constructed, and less decorated than those in San Jose and Imantag. Virtually none is painted. In general, they are somewhat smaller and have fewer extra features such as rabbit hutches, paintings and pictures, and household appliances or utensils. Its school is a rather dilapidated one-room building, and the closest thing to a town square is the relatively spacious schoolyard. (San Jose's school was destroyed by an earthquake several years before the experiment, and its children attend school in Cotacachi. Imantag has a relatively new and handsome school building.)

Cuicocha and Imantag were chosen to be the radio and the non-radio towns, respectively, because their relative isolation from other towns would reduce contamination of their experimental treatments by informal communication. Although Imantag already had a few more radios than Cuicocha (seven vs. four), Cuicocha was chosen as the radio town because of its better reception of broadcasts from the project's radio transmitter and its relatively poor reception of broadcasts from commercial radio stations. It should be noted that it was not possible to find towns which completely lacked radios and also met the other criteria for inclusion.

Although San Jose and Imantag gave the appearance of being more urban than Cuicocha, the distribution of occupations belies this appearance. As can be seen from Table 1, p. 12, the percentage of persons falling into the occupational class labelled "merchants" is much larger in Cuicocha than in the other towns. Most of these merchants were "muleteers" who hired out their mules to transport goods and who also bought and sold goods. Thus, it may have been more urban functionally than either of the other two towns. Even though its appearance and several other indicators would seem to show it to be the poorest of the three towns economically, its people may have had more money available than those of the other towns.

It was part of a general agreement with the municipal authorities of the Canton of Cotacachi that the town of El Ejido would be included in the study as a control town. Since there was the possibility that the municipality's special interest in El Ejido might influence the responses of its citizens, two additional towns were treated as control towns. It was felt desirable that no conscious choice be made of the control towns by any project personnel. Therefore, it was decided to use as additional control towns two of the places whose citizens spontaneously requested assistance to participate in the practices being advocated in the experimental towns. The towns of Anrrabi and El Punge were the first two to request such assistance that had only a few radios. They were therefore designated as control towns along with El Ejido. The control towns were provided with the materials, services, and instructions necessary for participation. However, no systematic efforts were made to persuade persons in the control towns to participate.

The towns are generally similar in size, ethnic composition (about 5% Indian, the remainder mestizo^{2/}), educational level of householders, educational level of the householder's dependants, and general economic condition. Mean number of rooms, mean size of property, mean number of persons per room, and distribution of property ownership also differed relatively little between towns (see Table 1, p. 12).

The towns differed somewhat with regard to occupational composition. Although the modal occupation in all the towns was crafts-labor, San Jose had more persons (66%) employed in this category than any of the other towns and it had fewer persons employed in the merchant and farmer categories (3% and 6% respectively). Cuicocha and the control towns had higher percentages of persons in the merchant category (25% and 24% respectively) than did the other two towns. San Jose, the Mixed Town, had both potable water and electricity. Cuicocha had neither potable water nor electricity. Imantag had no potable water. The literacy rate in San Jose is not significantly higher than in the other two experimental towns.

The Development Practices

The four practices chosen for the study were:

1. construction of latrines,
2. construction of smokeless stoves,
3. canning marmalade, and
4. vaccination against smallpox

^{2/}It is often difficult to classify persons as either Indian or mestizo. Many Indians in the region can speak Spanish in addition to the indigenous Quechua. Many Indians also dress more or less in European style.

Campaigns were conducted on the same four practices in all three experimental towns. Thus, the subjects of the information campaigns were the same -- the modes of communication were different. The practices were chosen in consultation with USAID personnel and local and national Ecuadorian authorities.

Practices were chosen to represent different points along a theoretical dimension of cost and effort and to provide opportunities for men and women to participate differentially. An average of ten man-days of effort was required to build a latrine, and each household was required to pay 40 sucres for the materials. An average of five man-days of effort was required to build a stove, and each household was required to pay 20 sucres for the materials. Approximately one third of a man-day was required to cook and to can marmalade, and 10 sucres was paid for the materials. Vaccination required only a few minutes time, and no charge was made for the service. The practices were also selected to represent different levels of intrinsic tangible benefits. Stoves and marmalade were believed by the project staff to afford the most immediate tangible benefit. Latrines and vaccinations were judged to have less perceptible benefits.

In the campaigns the men were urged to build the latrines; women were urged to build the stoves and to can marmalade. Both men and women were to be vaccinated. As part of the routine procedure for constructing latrines, five-man teams were to be formed to build latrines for all their members. Similarly, five-woman teams were to be formed to build smokeless stoves. The women canned marmalade individually.

The latrines consisted of an excavation (2 x 2 x 2 1/2 meters deep) covered by a cement slab in a privy. Ordinarily the privies were made of wood, but in some cases people elected to build them of pressed bricks. Each latrine had to be dug in appropriate soil at an appropriate distance and in a suitable position in relation to the dwelling.

The stoves consisted of a raised brick fire-box, a cooking surface, and a chimney either rising through the roof or to an opening in the wall above the stove. Pressed bricks had to be made from soil. Previously cooking had generally been done on some stones on the kitchen floor.

Marmalade was made by cooking and sugaring ovos, locally available berries. The women were taught to sterilize the glass jars in which the marmalade was preserved.

Tools and supplies were made available equally to all experimental and control towns. For example, a brick-making machine, cement for slabs, jars for canning, etc., were provided to each town so that all households had equal opportunity to use them.

Vaccinating teams of two persons visited each town twice a week for three weeks on a schedule judged to give the townspeople equal opportunities to be vaccinated. See Appendix A for the vaccination schedule.

Preparation of Campaign Materials

The project staff developed radio programs, motion pictures, slide sets, and other informational materials for the campaigns. In addition, several already available public health films and an extensive set of musical recordings were used.

Although there is no way to guarantee the comparable motivational quality of the materials employed in the different communications treatments, pre-campaign tryouts were made of the materials on small samples of people judged to be similar to those living in the experimental towns in order to test whether the messages for the different media were equally appealing and instructive. Trips were taken to towns similar to the

experimental towns and the campaign materials were tested and retested on small groups of approximately five people each until the "message" could be repeated accurately and/or observers reported that the presentation was liked.

The radio broadcasts were composed of both informational material and entertainment. They consisted of the following:

1. Spot announcements, jingles, and slogans;
2. A series called "Nuestra Tierra," which discussed developments in the locality, including reports of the opinions of eminent local personalities on the various practices;
3. A radio serial entitled "Familia Perez," a dramatic series in which a local family of four persons was portrayed in situations bearing on the practices advocated in the campaign;
4. A series of programs called "Compadre Jorge," in which a dramatic personage visited friends throughout the region, listening to problems and giving advice;
5. A series entitled "Escuela del Aire," in which children played the chief dramatic roles;
6. Instructions on the practices;
7. Music; and
8. News.

All broadcasts were in Spanish except for one hour daily when Quechua was used.

The non-radio, audio-visual materials consisted of the following:

1. Photographic exhibits on each of the practices;
2. An illustrated bulletin on each of the four practices;

3. Two posters about each of the practices;
4. A motion picture on latrines;
5. Slide sets with synchronized sound recordings on stoves, marmalade, and vaccination;^{3/}
6. Outlines for live demonstrations;
7. Introductory and concluding remarks for audio-visual shows and demonstrations; and
8. Announcements for public-address equipment.

The sanitary engineer and the home economist who worked as staff members during the campaign also participated as actors and advisors in the development of the films, slides, bulletins, and other materials.

Conduct of the Campaign

The campaign was divided into two general periods. The first, designated as the "motivation period," was designed chiefly to inform people that a campaign for certain practices was underway and to induce them to participate. This period lasted two weeks. The second period (seven weeks) was designed to continue to motivate the people to participate and follow through on the practices they had undertaken, but was also devoted to specific instructions on latrine and stove building, canning, and vaccination.

Radios were distributed to each household in Cuicocha, the Radio Town, and in San Jose, the Mixed Town, on the first day of the "motivation

^{3/} Motion pictures were made on each of the practices but, except for the one on latrines, they were lost between Quito and the United States where they were sent for processing. The slide series and sound recordings were made as substitutes.

period." Each householder was instructed briefly on how to operate the radio and where to obtain battery replacements. Battery supplies were left with the school teacher in Cuicocha and with the priest in San Jose. When a replacement was necessary, a new battery was given in return for a used one. After this initial contact in Cuicocha, the only further interaction with this town consisted of visits by the vaccination team, and visits by the project director to distribute the tools and supplies necessary for building latrines and stoves and for preparing marmalade. The project director also spoke to a number of people in the town to determine whether instructions were clear. All modifications in instructions, however, were made via radio. It should be noted that all instruction as well as motivation in Cuicocha was given by means of radio only.

During the "motivation period" the radio broadcasting schedule was from 5:45 a.m. to 9:00 a.m., then from 11:00 a.m. to 12:50 p.m., and from 5:00 p.m. to 8:00 p.m. During the remaining seven weeks of the campaign, the broadcasting schedule was from 5:45 a.m. to 11:00 a.m. and from 1:00 p.m. to 7:00 p.m. The broadcasting schedule for a typical day in each period is shown in Appendix B.

It had originally been intended to devote equal radio time to all practices except vaccination. However, because of inability to control on-the-spot discussions of the practices during live interviews, a final count of broadcasting time showed that more time had been given to latrines (4657 minutes) than to the other two practices (stoves, 4054 minutes; marmalade, 4090 minutes). The total vaccination campaign lasted only three rather than nine weeks since the vaccinating team was available only for the shorter period. Broadcast time devoted to vaccination totaled 2040 minutes. See Table 2, p. 21, for the specific distribution of recording and broadcasting time.

Table 2

TIME FOR RECORDING AND BROADCASTING PROGRAMS

(In Minutes)

| PROGRAMS | Latrines | | Stoves | | Marmalade | | Vaccination | |
|----------------------------------|------------------------------|------------|-----------|------------|-----------|------------|-------------|------------|
| | Re-corded | Broad-cast | Re-corded | Broad-cast | Re-corded | Broad-cast | Re-corded | Broad-cast |
| Interviews, Discussions, etc. | 163 | 326 | 151 | 302 | 67 | 201 | 8 | 56 |
| Nuestra Tierra | 45 | 135 | 45 | 135 | 45 | 135 | 45 | 135 |
| Familia Perez | 97 | 194 | 97 | 194 | 97 | 194 | 97 | 194 |
| Instructions | 157 | 628 | 180 | 900 | 154 | 616 | 50 | 200 |
| Compadre Jorge | 58 | 174 | 78 | 234 | 48 | 144 | 35 | 105 |
| Spots | 8 | 3,200 | 8 | 2,289 | 7 | 2,800 | 9 | 1,350 |
| Music and News | Remaining broadcasting time. | | | | | | | |
| Total Minutes of Recording | 528 | | 559 | | 418 | | 249 | |
| Total Minutes of Broadcasting | | 4,657 | | 4,054 | | 4,090 | | 2,040 |

In San Jose, the Mixed Town, and Imantag, the Audio-Visual Town, the campaign used the materials mentioned before for audio-visual shows and demonstrations. Individual instruction was also given during the supervision of construction activities and marmalade preparation. In addition, two newsletters were produced and circulated which contained items of local information and news about progress in the various practices. Two-hour audio-visual shows were given from one to three times each week. Shows were given in the control towns less frequently, after these towns had requested them. Table 3, p. 23, indicates the hours devoted to shows in each community during the campaign. A show consisted of the following:

1. music and an invitation to attend by means of a public-address system -- 15 minutes;
2. a spoken introduction -- 15 minutes;
3. motion pictures (entertainment) -- 15 minutes;
4. a motion picture or a slide set on one of the practices -- 30 to 45 minutes; and
5. a lecture after the motion picture -- 15 minutes.

Table 4, p. 23, shows the distribution of total time spent by the project staff during the campaign on demonstration, vaccination, A-V shows, and supervision of activities at each community. Except for minor differences, the time spent in the Mixed and Audio-Visual Towns was the same. Although in the aggregate San Jose shows more staff time than Imantag (256 hours vs. 244 hours), the actual time difference each week and at each session during any week was small.

In order to determine the degree of participation in the marmalade practice, a contest was organized as part of the campaign. The contest took place during the last three weeks of the campaign. Each household was permitted to submit one jar of marmalade which was judged on

Table 3
 TIME SPENT BY THE AUDIO-VISUAL UNIT IN EACH COMMUNITY
 (In Hours)

| Towns | Weeks of the Campaign | | | | | | | | | Totals |
|---------------------|-----------------------|---|---|---|---|---|---|---|---|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| <u>Mixed</u> | | | | | | | | | | |
| San José | 6 | 4 | 4 | 6 | 6 | 6 | 2 | 2 | 2 | 38 |
| <u>Audio-Visual</u> | | | | | | | | | | |
| Imantag | 6 | 4 | 4 | 6 | 6 | 6 | 2 | 2 | 2 | 38 |
| <u>Control</u> | | | | | | | | | | |
| El Ejido | | | | | 2 | 2 | 2 | 2 | 2 | 10 * |
| Anrrabi | | | | | | 2 | 2 | 2 | 2 | 8 * |
| El Punge | | | | | | | 2 | 2 | 2 | 6 * |

*Audio-Visual Unit started showing at these towns after requests from them.

Table 4
 TOTAL TIME GIVEN TO EACH COMMUNITY FOR DEMONSTRATION,
 SUPERVISION, VACCINATION, AND AUDIO-VISUAL SHOWS
 (In Hours)

| Towns | Weeks of the Campaign | | | | | | | | | Totals |
|---------------------|-----------------------|----|----|----|----|----|----|----|----|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| <u>Mixed</u> | | | | | | | | | | |
| San José | 50 | 24 | 52 | 36 | 32 | 22 | 14 | 14 | 12 | 256 |
| <u>Audio-Visual</u> | | | | | | | | | | |
| Imantag | 48 | 18 | 50 | 34 | 32 | 18 | 18 | 14 | 12 | 244 |
| <u>Control</u> | | | | | | | | | | |
| El Ejido | | | | 20 | 31 | 10 | 8 | 6 | 6 | 81 |
| Anrrabi | | | | 10 | 22 | 22 | 9 | 6 | 6 | 75 |
| El Punge | | | | 10 | 10 | 28 | 10 | 8 | 6 | 72 |

hundred-point rating scales for consistency, flavor, appearance, and storage location by independent judges. A separate contest was held in each of the towns and the prize in each case was a set of cooking and canning materials.

Equipment

Transistor radios were distributed to all households in Cuicocha, the Radio Town, and in San Jose, the Mixed Town. The radios were six-transistor, battery-operated units permitting reception on the regular AM band from 550 to 1550 kilocycles. The project's transmitters broadcast at a frequency of 1400 kilocycles. Reception of the signal was excellent in both towns. The people were free to listen to whichever stations they chose. Ordinarily HCJB, a radio station operated by Protestant missionaries in Ecuador, was the only other station that could be received readily although from time to time radio stations from other parts of Ecuador and Columbia could also be received.

The original plan was to install the radio transmitters and equipment in trucks at a point approximately midway between the two radio towns. However, because of the strike of U. S. dockworkers in late 1962, the trucks were late in arriving, and it was necessary to locate the transmitters in a building in the town of El Ejido.

Other equipment included a brick-making machine to compress earth into blocks, and tools for building latrines and stoves. The brick-making machine was available to all towns. Each town was provided with complete sets of tools for latrine and stove construction, consisting of hand saws, measuring sticks, iron bars, shovels, pails, hammers, etc. After a job was completed by a work team, that is, after five latrines or five stoves were finished, the tools were given to another team in the same town until all who wished to use them had had an opportunity to do so.

In developing and conducting the radio information campaigns a wide variety of recording, printing, broadcasting and projection equipment was used. The complete list of equipment is given in Appendix C.

Interviews

The interview schedule contained 72 items, various blocks of which were designed to obtain information bearing on the hypotheses presented in the first section. Nine items were to be completed on the basis of direct observations by the interviewers, and the remainder were questions to be asked of the householders. As a general rule, the male householder was interviewed; if absent, his wife was interviewed. A copy of the interview schedule is presented in Appendix D.

The interviewers were 20 students and teachers from the Technical College of Cotacachi. They were given a training course over a two-month period which included explanations of the purposes of the study, the intent of the survey, and the meaning of each item. They were instructed in basic interview procedures and were encouraged to discuss each aspect of the interviewing. They were then given opportunities to conduct practice interviews before the class.

Interviewing was conducted within a few days after the campaign in each town. It was desirable to complete the interviewing soon in order to give the townspeople as little opportunity as possible to discuss the interviews among themselves. Therefore, all interviewers were used in a town at the same time, and interviewing in each town was completed within a two-day period. All households in the three experimental towns and one-third of the households, randomly selected from each of the control towns, were surveyed.

Data Analysis

Differences among groups were evaluated by means of the Chi Square test. (The Yates correction for continuity was used when an expected cell frequency was below 50.) For the objective results, i.e., counts of latrines, stoves, marmalade and vaccinations, a difference was considered significant if it could be expected to occur by chance no more often than once in 20 times (the 5% confidence level). For all other results, such as the difference between the proportion of participants and non-participants possessing a given attribute, a difference was considered significant only if it could be expected to occur by chance no more often than once in 1,000 times (the .1% level of confidence). This significance level is an extremely conservative one; it was adopted chiefly because of the large number of Chi Square computations done in the study. It should be pointed out that "large" but "not significant" differences are frequently cited in this report because the adoption of so stringent a significance level incurs the risk of interpreting real differences as chance findings. The large differences are cited to minimize this risk.

RESULTS

The results of the experiment can be conveniently considered in three groupings:

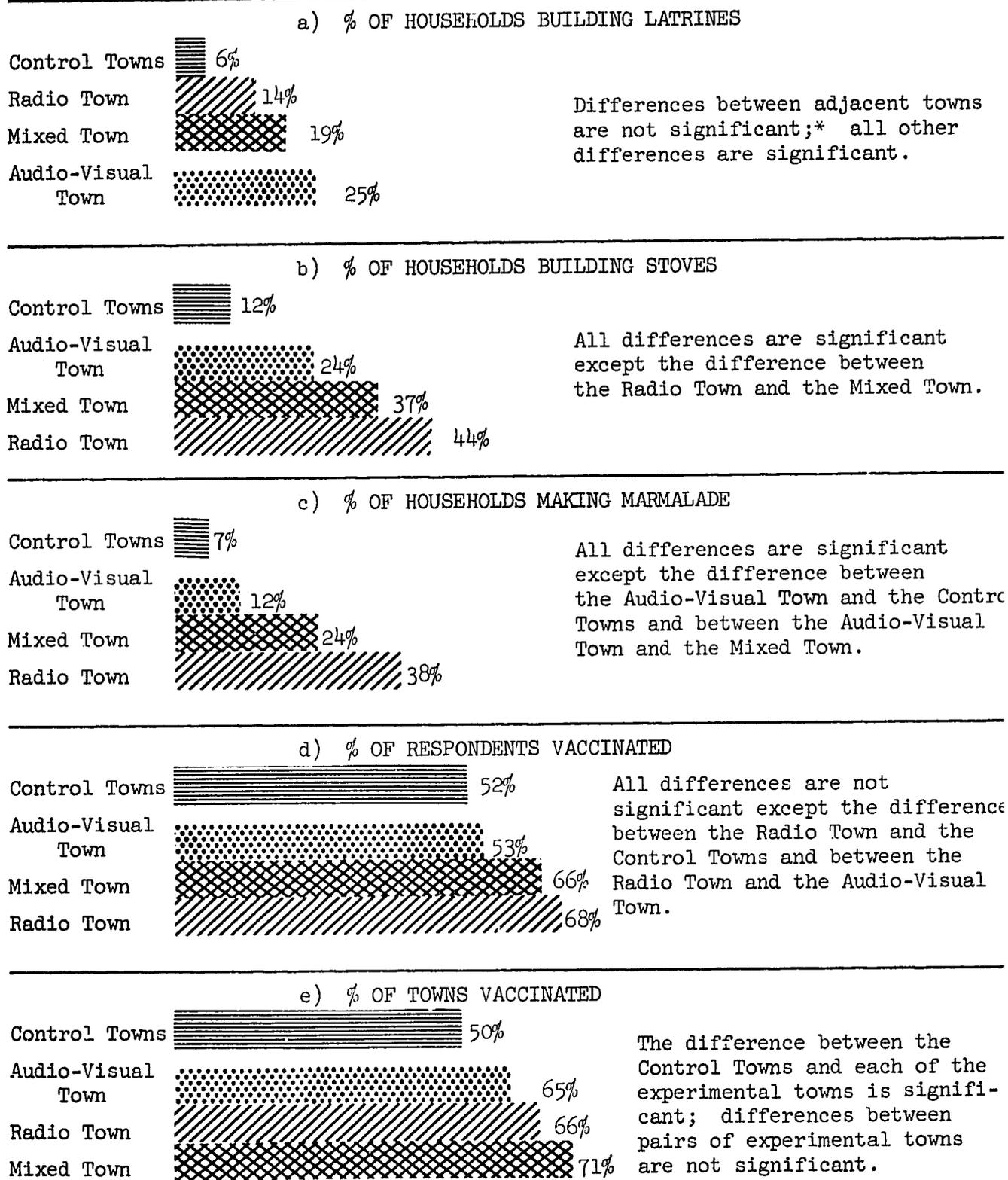
1. Findings on differences in participation in the practices among the experimental and control towns at the end of the communications effort. These are the objective results, based on direct observation by physical inspection.
2. Findings on the effects of the different media, based directly on the interview responses or inferred from the distribution of these responses.
3. Findings on statistical relationships between:
 - 1) social, psychological and other conditions prevailing in the experimental towns, and
 - 2) participation of the townspeople in the various practices.

Participation Results

The results on participation in each practice are summarized in Figure 1, p. 28.

Latrines. A significantly greater percentage of the households in the Audio-Visual Town built latrines than in the Radio Town. Significantly larger percentages of the households in the Mixed and Audio-Visual Towns built latrines than in the Control Towns. The

Fig. 1. Do the Towns Differ in Participation?



* Differences in this figure are considered significant if they could have occurred on a chance basis less than once in 20 times.

difference between the Radio Town and the Control Towns is not significant. In the three experimental towns combined, 19% of the households built latrines; this is significantly greater than the participation in the Control Towns.

Stoves. Significantly greater percentages of the households built stoves in the Radio Town and in the Mixed Town than in the Audio-Visual Town. Significantly more stoves were built in each of the three experimental towns than in the Control Towns. In the three experimental towns combined, 35% of the households built stoves; significantly more than in the Control Towns.

Marmalade. A significantly larger percentage of the households in the Radio Town made marmalade than in the Mixed Town or in the Audio-Visual Town. In both the Radio and the Mixed Towns significantly more households made marmalade than in the Control Towns, but the difference between the Audio-Visual Town and the Control Towns is not significant. Twenty-five percent of the households in the combined experimental towns participated in the marmalade practice; significantly more than in the Control Towns.

Vaccination. A significantly larger percentage of the householders in the Radio Town were vaccinated than in the Audio-Visual Town or in the Control Towns. The differences between the Mixed and Audio-Visual Towns on the one hand, and the Control Towns on the other, are not significant. For the experimental towns combined, 63% of the householders were vaccinated; this is not significantly different from the 52% in the Control Towns.

Significantly greater percentages of the people in each of the experimental towns were vaccinated than in the Control Towns, but

differences between experimental towns are not significant. Two thirds of the population in the combined experimental towns were vaccinated; this is significantly different from the Control Towns, where one half of the population was vaccinated.

Combined Practices. The amount of "effort" involved in latrine construction, stove construction, and marmalade preparation was determined by the formula:

$$\text{effort} = \text{cost of materials} + (\text{days of work} \times \text{average daily labor rate})$$

Each latrine cost the builder 40 sucres^{4/} in cash, and required 10 man-days of labor; each stove cost 20 sucres and 5 man-days of labor; canning required 10 sucres for materials and one third of a man-day in labor^{5/}. Labor value was calculated at 12 sucres per day, the prevailing rate for semi-skilled labor in the region. Thus, the formula for calculating a town's score on the level of effort scale was:

$$\text{Town's Score} = (L \times 160) + (S \times 80) + (M \times 14)$$

Where L equals number of latrines built in a town,

S equals number of stoves built in a town,

M equals number of participants in the marmalade contest,

and the numerical values are the sum of the cash outlay and the estimated cash value of the labor involved in each practice.

The results of the monetary conversions are shown in Table 5, p. 31.

^{4/}Approximately 20 sucres equals one U.S. dollar.

^{5/}Vaccination cost no money and the time required was relatively small. Furthermore, it would not be appropriate to assign a cash value to the time of children who were vaccinated. Vaccination, therefore, is treated separately.

MONEY EQUIVALENTS OF GENERAL RESULTS (IN SUCCRES)^a

| | Radio Town | Mixed Town | Audio-Visual Town | Control Towns | Totals |
|---------------------------|-------------|-------------|-------------------|---------------|--------------|
| Number of households | 103 | 89 | 88 | 86 | 366 |
| <u>Latrines</u> | | | | | |
| Number of projects | 14 | 17 | 22 | 5 | 58 |
| Cash | \$ 560 | \$ 680 | \$ 880 | \$ 200 | \$2320 |
| Labor value | <u>1680</u> | <u>2040</u> | <u>2640</u> | <u>600</u> | <u>6960</u> |
| Total | \$2240 | \$2720 | \$3520 | \$ 800 | \$9280 |
| <u>Stoves</u> | | | | | |
| Number of projects | 45 | 33 | 21 | 10 | 109 |
| Cash | \$ 900 | \$ 660 | \$ 420 | \$ 200 | \$2180 |
| Labor value | <u>2700</u> | <u>1980</u> | <u>1260</u> | <u>600</u> | <u>6540</u> |
| Total | \$3600 | \$2640 | \$1680 | \$ 800 | \$8720 |
| <u>Marmalade</u> | | | | | |
| Number of projects | 39 | 21 | 11 | 6 | 77 |
| Cash | \$ 390 | \$ 210 | \$ 110 | \$ 60 | \$ 770 |
| Labor value | <u>156</u> | <u>84</u> | <u>44</u> | <u>24</u> | <u>308</u> |
| Total | \$ 546 | \$ 294 | \$ 154 | \$ 84 | \$1078 |
| Total active projects | 98 | 71 | 54 | 21 | 244 |
| Total cash | \$1850 | \$1550 | \$1410 | \$ 460 | \$ 5270 |
| Total labor value | <u>4536</u> | <u>4104</u> | <u>3944</u> | <u>1224</u> | <u>13808</u> |
| Total effort | \$6386 | \$5654 | \$5354 | \$1684 | \$19078 |
| Active projects/household | .95 | .80 | .61 | .24 | .67 |
| Effort/household | 62.0 | 63.5 | 60.8 | 19.6 | 52.1 |

The total score for each town on the effort scale is as follows:

| | |
|-------------------|---|
| Radio Town | = 6,386 sucres or 62.0 sucres per household |
| Mixed Town | = 5,654 sucres or 63.5 sucres per household |
| Audio-Visual Town | = 5,354 sucres or 60.8 sucres per household |
| Control Towns | = 1,684 sucres or 19.6 sucres per household |

Thus, the three experimental towns participated to approximately the same degree when the practices are combined on a simple monetary scale. The effort of the Control Towns was approximately one-third that of the experimental towns.

Another general measure of the degree to which the people were motivated was the total number of practices undertaken by each town (again excluding vaccination). The results show that the people of the Radio Town undertook 98 practices, an average of .95 per household. The people of the Mixed Town undertook 71 practices, an average of .80 per household, and in the Audio-Visual Town the people undertook 54 practices, an average of .61 per household. The Control Towns undertook 21 practices for an average of .24 per household. The composition of the total practices is shown in Table 5.

Using still another measure, we find that 55% of the households in the Radio Town and 56% of those in the Mixed Town undertook one or more of the practices requiring an outlay of money, as compared with 39% of the households in the Audio-Visual Town and 21% in the Control Towns. When vaccination of householders is included we find that 81% of the households in the Mixed Town, 79% in the Radio Town, 70% in the Audio-Visual Town, and 61% in the Control Towns participated in at least one practice.

When the number of active practices undertaken is divided by the number of active households, the average number of acts per motivated household is obtained. Here the Radio Town leads with an average of 1.75 per active household, followed by the Audio-Visual Town with 1.58 per active household, the Mixed Town with 1.44 per active household, and the Control Towns with 1.16 per active household.

Still another measure was considered: the number of practices or acts undertaken as a percentage of the total possible number for each town. The number of acts undertaken is the sum of latrines, stoves, marmalade projects, and householders vaccinated. The number of possible acts in each town was taken as four times the number of households.^{6/} Measured this way, the Radio Town undertook 40.7% of the practices theoretically available to its householders; the Mixed Town undertook 36.5%, and the Audio-Visual Town undertook 28.7%. The Control Towns undertook 19.2% of the total possible.

There were several differences among the towns with regard to the pattern of their participation. In the Radio Town, 86% (84 of 98) of the active practices (all but vaccination) were undertaken by women.^{7/} In the Audio-Visual Town, however, significantly fewer of the practices were done by women: 59% (32 of 54). In both the Mixed Town and

^{6/} An alternative procedure is to substitute the number of people vaccinated for the number of householders vaccinated and define the possible acts as three times the number of households (for latrines, stoves, and marmalade) plus the number of adults or persons capable of making independent decisions to be vaccinated. Lacking this last datum, we chose the number of householders vaccinated as the next most suitable statistic.

^{7/} One practice, latrine construction, was exclusively for men, and two practices, stoves and marmalade, were intended exclusively for women.

the Control Towns, 76% of the practices were done by women (54 of 71, and 16 of 21, respectively).

When the efforts of women were compared with the efforts of men, the results in the towns differed. In the Radio Town the men participated in 13.6% of their possible practices (14 latrines out of a possible 103), while the women participated in 40.7% of their possible practices (84 of 103 x 2). In the Mixed Town: men 19.1%, women 30.3%. In the Audio-Visual Town: men 25%, women 18.2%. In the Control Towns: men 5.8%, women 9.3%. The difference between the participation of men and women is significant only in the Radio Town. It should also be noted that the Audio-Visual Town is the only one in which the men participated to a greater degree than the women.

The distribution of expenditures shows a similar pattern. In the Radio Town, 70% of the funds were spent on women's activities; in the Mixed Town this figure drops to 56%, and in the Audio-Visual Town it falls to 35.5%. The results parallel the foregoing very closely when expressed in terms of the distribution of total effort among men and women as a percentage of the total possible effort.

Perceived Effects of Communication Media

In addition to the observable differences in overt behavior in the experimental towns, a number of less easily observable differences between and within towns were obtained through interviews with householders. The effectiveness of each medium can be measured against four criteria based on such subjective evidence. First, and most important, a medium is effective if participants report it as a source of information about a practice more often than non-participants. Second, it is effective if participants report it as a source of information more

often than they cite other media. Third, it is effective if participants report it as the most influential medium in their decision to participate more often than they cite other media. Fourth, it is effective if participants report it as the most effective medium for instruction more often than other media. The results on sources of information, influence, and instruction are summarized in Tables 6, 7, 8, and 9, pp. 36-39.

In general, radio was the most effective medium as measured by the first three criteria, but less effective than certain of the other media as an instructional or teaching medium. First, radio was reported to be a source of information about each of the four practices in each experimental town consistently (though not significantly) more often by participants than by non-participants with but one exception -- slightly more non-participants than participants in the Mixed Town reported radio to be a source of information on vaccination (87% vs. 86% respectively). Second, in the Mixed Town, where people had access to all the media, far more people cited radio as a source of information for all practices than any other medium. Third, it was reported to be the medium most influential in making decisions to participate in all four practices in the Mixed Town. Fourth, it was reported to be the best teaching medium by most participants in the Mixed Town only with regard to one of the three active practices (latrines), and substantially fewer people in the Radio Town cited it as the best teaching medium than cited it as the most influential medium in making decisions to participate in the various practices.

An additional source of data about the instructional effectiveness of radio is the marmalade contest in which the quality of the marmalade was rated by a panel of independent judges. This panel judged each participant's marmalade on 100-point rating scales for color, consistency, flavor, and quality of storage. Although an

Table 6

CITATIONS OF MEDIA AS SOURCES OF INFORMATION, INFLUENCE, AND INSTRUCTION - LATRINES

| Media | Sources of Information ^a | | | | | | Most Influential in Decision to Participate | | | Best for Instruction | | |
|----------------|-------------------------------------|-------------|------------|-------------|-----------|-------------|--|---------------|---------------|----------------------|---------------|---------------|
| | Radio Town | | Mixed Town | | A-V Town | | Radio Town | Mixed Town | A - V Town | Radio Town | Mixed Town | A - V Town |
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P | % of P | % of P | % of P | % of P | % of P | % of P |
| Radio | 100 | 79 | 94 | 82 | 41 | 24 | 79 | 47 | 9 | 86 | 53 | 5 |
| Bulletins | 0 | 0 | 6 | 0 | 18 | 2 | 0 | 0 | 9 | 0 | 0 | 9 |
| Demonstrations | 0 | 2 | 35 | 8 | 41 | 18 | 0 | 18 | 23 | 0 | 36 | 37 |
| Exhibits | 0 | 0 | 0 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 5 |
| Movies/Slides | 14 | 4 | 53 | 32 | 45 | 42 | 0 | 29 | 14 | 0 | 12 | 18 |
| Posters | 0 | 0 | 24 | 17 | 5 | 6 | 0 | 0 | 5 | 0 | 0 | 5 |
| Neighbors | 0 | 21 | 12 | 25 | 18 | 30 | 0 | 0 | 9 | 0 | 0 | 0 |
| Other | 0 | 1 | 0 | 6 | 14 | 17 | 7 | 6 | 18 | 0 | 0 | 14 |
| None | | | | | | | 14 | 0 | 14 | 14 | 0 | 9 |

Note.--The column headings P and N-P indicate Participants and Non-Participants, respectively.

^aSince many respondents cited more than one source of information, the figures in these columns do not total 100%.

Table 7
CITATIONS OF MEDIA AS SOURCES OF INFORMATION, INFLUENCE, AND INSTRUCTION - STOVES

| Media | Sources of Information ^a | | | | | | Most Influential in Decision to Participate | | | Best for Instruction | | |
|----------------|-------------------------------------|----------|------------|----------|----------|----------|---|------------|------------|----------------------|------------|------------|
| | Radio Town | | Mixed Town | | A-V Town | | Radio Town | Mixed Town | A - V Town | Radio Town | Mixed Town | A - V Town |
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P | % of P | % of P | % of P | % of P | % of P | % of P |
| Radio | 98 | 72 | 97 | 77 | 52 | 19 | 71 | 45 | 0 | 67 | 33 | 0 |
| Bulletins | 0 | 0 | 3 | 0 | 0 | 7 | 0 | 3 | 0 | 2 | 18 | 0 |
| Demonstrations | 2 | 2 | 30 | 11 | 43 | 20 | 8 | 21 | 53 | 18 | 42 | 57 |
| Exhibits | 0 | 0 | 0 | 2 | 5 | 3 | 0 | 0 | 0 | 2 | 0 | 0 |
| Movies/Slides | 2 | 0 | 24 | 13 | 71 | 18 | 0 | 6 | 10 | 0 | 0 | 14 |
| Posters | 0 | 0 | 12 | 20 | 24 | 3 | 0 | 0 | 5 | 0 | 0 | 5 |
| Neighbors | 13 | 34 | 27 | 32 | 29 | 31 | 7 | 9 | 14 | 7 | 0 | 10 |
| Other | 9 | 5 | 3 | 4 | 10 | 10 | 11 | 12 | 19 | 2 | 3 | 14 |
| None | | | | | | | 2 | 3 | 0 | 2 | 3 | 0 |

Note.--The column headings P and N-P indicate Participants and Non-Participants, respectively.

^aSince many respondents cited more than one source of information, the figures in these columns do not total 100%.

Table 8

CITATIONS OF MEDIA AS SOURCES OF INFORMATION, INFLUENCE, AND INSTRUCTION - MARMALADE

| Media | Sources of Information ^a | | | | | | Most Influential in Decision to Participate | | | Best for Instruction | | |
|----------------|-------------------------------------|----------|------------|----------|----------|----------|---|------------|------------|----------------------|------------|------------|
| | Radio Town | | Mixed Town | | A-V Town | | Radio Town | Mixed Town | A - V Town | Radio Town | Mixed Town | A - V Town |
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P | % of P | % of P | % of P | % of P | % of P | % of P |
| Radio | 100 | 70 | 95 | 79 | 36 | 22 | 77 | 52 | 0 | 72 | 38 | 0 |
| Bulletins | 0 | 0 | 14 | 0 | 18 | 5 | 0 | 0 | 9 | 0 | 5 | 9 |
| Demonstrations | 5 | 2 | 24 | 10 | 73 | 15 | 3 | 24 | 73 | 10 | 38 | 82 |
| Movies/Slides | 5 | 2 | 24 | 15 | 45 | 32 | 0 | 5 | 9 | 0 | 10 | 9 |
| Posters | 0 | 0 | 29 | 12 | 27 | 10 | 0 | 0 | 9 | 3 | 0 | 0 |
| Neighbors | 10 | 31 | 19 | 32 | 0 | 29 | 5 | 5 | 0 | 5 | 0 | 0 |
| Other | 3 | 2 | 5 | 4 | 9 | 13 | 5 | 5 | 0 | 0 | 0 | 0 |
| None | | | | | | | 10 | 10 | 0 | 10 | 10 | 0 |

Note.--The column headings P and N-P indicate Participants and Non-Participants, respectively.

^aSince many respondents cited more than one source of information, the figures in these columns do not total 100%.

Table 9
CITATIONS OF MEDIA AS SOURCES OF INFORMATION, INFLUENCE, AND INSTRUCTION - VACCINATION

| Media | Sources of Information ^a | | | | | | Most Influential in Decision to Participate | | |
|----------------|-------------------------------------|----------|------------|----------|----------|----------|---|------------|------------|
| | Radio Town | | Mixed Town | | A-V Town | | Radio Town | Mixed Town | A - V Town |
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P | % of P | % of P | % of P |
| Radio | 87 | 70 | 86 | 87 | 32 | 22 | 71 | 66 | 9 |
| Bulletins | 0 | 0 | 2 | 3 | 9 | 7 | 0 | 0 | 2 |
| Demonstrations | 4 | 6 | 2 | 3 | 13 | 0 | 5 | 7 | 17 |
| Exhibits | 1 | 0 | 2 | 0 | 11 | 0 | 0 | 0 | 0 |
| Movies/Slides | 6 | 0 | 19 | 23 | 34 | 34 | 6 | 3 | 19 |
| Posters | 0 | 0 | 17 | 13 | 19 | 15 | 0 | 3 | 11 |
| Neighbors | 14 | 30 | 24 | 37 | 34 | 29 | 9 | 8 | 23 |
| Other | 6 | 3 | 3 | 7 | 11 | 17 | 9 | 12 | 15 |
| None | | | | | | | 0 | 0 | 4 |

Note.--The column headings P and N-P indicate Participants and Non-Participants, respectively.

^aSince many respondents cited more than one source of information, the figures in these columns do not total 100%.

individual's score cannot be attributed to the teaching effectiveness of the media, the aggregate score for all the participants in a town can be. Thus, if one town's marmalade quality score is significantly lower than another's, then it is probably because its women received poorer instructions. The Mixed Town achieved the highest mean score, 342, followed by the Audio-Visual Town with 318, and the Radio Town with a low score of 200. The difference between the Radio Town and each of the other two towns is significant. Thus significantly more women made marmalade in the Radio Town than in the other towns, and the quality of the marmalade in the Radio Town was significantly lower than in the other towns.

The only other media which proved to be practically effective, as measured against the four criteria, were demonstrations and movies (or slides). For each active practice, both demonstrations and movies/slides were mentioned as information sources more often by participants than by non-participants. Movies/slides were reported by participants to be sources of information more often than any other medium for three of the four practices in the Audio-Visual Town, but demonstrations were reportedly the most influential medium in decisions to participate in three of the four practices in that town. Demonstrations were most often reported to be the best teaching medium in the Audio-Visual Town for all active practices. In the Mixed Town, demonstrations were reported to be the best teaching medium for stoves, and were reported as often as radio as the best instructional medium for marmalade.

After radio, the next most frequently cited sources of information about the practices in the Audio-Visual and Mixed Towns were demonstrations, movies, and posters. Slightly more participants than non-participants usually reported them as sources of information.

However, they were almost never mentioned either as the medium most influential or the one best for teaching.

In all towns, exhibits and bulletins were rarely reported to be sources of information, by either participants or non-participants. They were virtually never mentioned as influential in decisions to participate or as the best instructional media.

Neighbors apparently were the least effective source of information, and were rarely mentioned as influential in decisions to participate or as the best teaching medium. It is the only source which is almost always mentioned more often by non-participants than by participants in all towns and for all practices.

Effects of Other Factors

The interview was designed to obtain information about the people which might have been related to the effects of the media. In general, answers were sought to four questions: first, whether the towns differed significantly with regard to characteristics which might in themselves have been determinants of differences in participation; second, whether a particular characteristic was possessed by significantly more participants than non-participants across towns; third, whether the participants differed from the non-participants within a town; and fourth, whether the participants in one town differed from the participants in the other towns. The latter two were asked in order to determine whether a particular medium interacted with a particular characteristic.

Data were sought on the following characteristics:

1. Prior interest or experience with the practices
2. Reasons for participating or not participating in each project
3. Education
4. Literacy and extent of reading
5. Exposure to non-project radio broadcasts
6. Mobility
7. Social relations
8. Personal values and attitudes
9. Age
10. Availability of skills related to practices
11. Availability of potentially productive persons
12. Attitude toward working in teams
13. Economic condition

The towns did not differ significantly in regard to most of these factors. Participants differed from non-participants in regard to several of them and for one or two of them there appeared to be an interaction between the factor and one of the communication media. Details are presented in the following sections.

Prior Interest in the Practices. It was thought that differences in the results might be due to differences between the towns in interest or desire for the various practices, rather than, or in addition to, differences in the media. (None of the households actually had latrines or stoves or had made marmalade before the campaigns.) The respondents were therefore asked whether they had been interested in each of the three active practices before the campaigns and whether they had ever been vaccinated previously. (Interviewers were instructed to record indications of disaffection with vaccination because of

previous trouble with it.) No significant differences were found between towns or between participants and non-participants in their pre-campaign interests in the four practices. Table 1, p. 12, shows the percentage of respondents in each town who reported prior interest and previous vaccination.

Reported Reasons for Participating or not Participating. The householders were asked why they participated in each of the projects (if they did), or why not (if they did not). The answers received to each question were categorized into relatively homogeneous groups. The percentage citing each type of response is shown on Tables 10-13, pp. 44 and 45.

The reasons given for participation were generally similar in all three towns and similar to the reasons stressed in the campaign. However, significantly fewer persons who built latrines or stoves in the Radio Town gave hygiene as a reason for building than in either the Mixed or Audio-Visual Towns, a finding which may indicate a differential impact of the messages.

Reasons for not building stoves and latrines and for not making marmalade show similar patterns in all three towns. Lack of money was always reported more frequently than any other reason and similar percentages of persons in each town cited lack of money as a reason for not participating. No other reason was given by more than about 20% of the respondents.

The reasons for not being vaccinated show a different and more variable pattern. Of those not vaccinated in the Radio Town, 39% reported that they did not have the time to do so, as compared with only 3% in the Mixed Town and 12% in the Audio-Visual Town. The

Table 10

REASONS FOR PARTICIPATING IN ACTIVE PROJECTS

| Reasons | Latrine Construction | | | Stove Construction | | | Marmalade Preparation | | |
|------------|----------------------|------------|----------|--------------------|------------|----------|-----------------------|------------|----------|
| | Radio Town | Mixed Town | A-V Town | Radio Town | Mixed Town | A-V Town | Radio Town | Mixed Town | A-V Town |
| | % of P | % of P | % of P | % of P | % of P | % of P | % of P | % of P | % of P |
| Useful | 50 | 41 | 45 | 51 | 45 | 48 | 33 | 24 | 27 |
| Hygienic | 14 | 76 | 50 | 20 | 64 | 57 | 0 | 0 | 0 |
| Comfort | 7 | 18 | 9 | 9 | 18 | 19 | -- | -- | -- |
| Attractive | 36 | 12 | 0 | 24 | 12 | 10 | 36 | 33 | 36 |
| Other | 7 | 12 | 14 | 18 | 9 | 0 | 23 | 38 | 36 |
| Don't know | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 5 | 0 |

Table 11

REASONS FOR BEING VACCINATED

| Reasons | Radio Town | Mixed Town | A-V Town |
|------------|------------|------------|----------|
| | % of P | % of P | % of P |
| Useful | 14 | 12 | 17 |
| Health | 71 | 75 | 74 |
| Easy | 1 | 2 | 0 |
| Other | 14 | 17 | 9 |
| Don't know | 3 | 0 | 2 |

Note.--Entries represent percent of participants who gave each reason. Since many cited more than one reason, the columns do not total 100%.

Table 12

REASONS FOR NOT PARTICIPATING IN ACTIVE PROJECTS

| Reasons | Latrine Construction | | | Stove Construction | | | Marmalade Preparation | | |
|---------------|----------------------|-------------------|-----------------|--------------------|-------------------|-----------------|-----------------------|-------------------|-----------------|
| | <u>Radio Town</u> | <u>Mixed Town</u> | <u>A-V Town</u> | <u>Radio Town</u> | <u>Mixed Town</u> | <u>A-V Town</u> | <u>Radio Town</u> | <u>Mixed Town</u> | <u>A-V Town</u> |
| | % of N-P | % of N-P | % of N-P | % of N-P | % of N-P | % of N-P | % of N-P | % of N-P | % of N-P |
| No help | 18 | 18 | 9 | 16 | 25 | 19 | 17 | 18 | 21 |
| Not useful | 11 | 13 | 8 | 12 | 18 | 13 | 2 | 7 | 14 |
| Lack of time | 12 | 10 | 8 | 16 | 13 | 7 | 14 | 18 | 14 |
| Lack of money | 33 | 26 | 30 | 29 | 25 | 24 | 33 | 32 | 22 |
| Not own house | 9 | 7 | 18 | 14 | 11 | 15 | -- | -- | -- |
| Other | 15 | 31 | 21 | 21 | 16 | 12 | 28 | 28 | 18 |
| Don't know | 8 | 4 | 17 | 7 | 2 | 13 | 13 | 7 | 13 |

Table 13

REASONS FOR NOT BEING VACCINATED

| Reasons | <u>Radio Town</u> | <u>Mixed Town</u> | <u>A-V Town</u> |
|-------------------------------------|-------------------|-------------------|-----------------|
| | % of N-P | % of N-P | % of N-P |
| Not able to go or didn't know where | 24 | 20 | 10 |
| Not useful | 12 | 20 | 39 |
| Lack of time | 39 | 3 | 12 |
| Danger | 0 | 13 | 7 |
| Other | 21 | 43 | 29 |
| Don't know | 9 | 3 | 5 |

54 Note.--Entries represent percent of participants who gave each reason. Since many cited more than one reason, the columns do not total 100%.

differences between the Radio Town and the Mixed Town are statistically significant. Another large but not significant difference was found between the Audio-Visual Town and the Radio Town with respect to the percentage who said they did not consider vaccination useful -- 39% in the Audio-Visual Town and 12% for the Radio Town.

Education. The towns were similar with regard to years of schooling for heads of households (see Figure 2, p. 47). The mean years of schooling for the entire populations of the towns was also similar (Radio Town, 3.00 years; Mixed Town, 3.25 years; Audio-Visual Town, 3.14 years).

Years of schooling of heads of households was clearly related to participation in the active projects. In all of the practices and in each town, the participant groups contained more heads of households with four or more years of schooling than with less than four years of education. The non-participant groups, however, tended to either divide equally into the two schooling levels or to contain more heads of households with low education than high education. The differences in the education of participating and non-participating heads of households tended to be larger in the two towns with radio than in the Audio-Visual Town. (In the Audio-Visual Town, similar percentages of latrine participants had high and low education.) Statistically significant relationships were found between stove-building and education, and between marmalade participation and education when all towns were considered together. The relation between education and stove building is also statistically significant in the Radio Town. The relation between participation and education is least pronounced for the vaccination practice.

Fig. 2 . What is the Relation Between
Education and Participation?

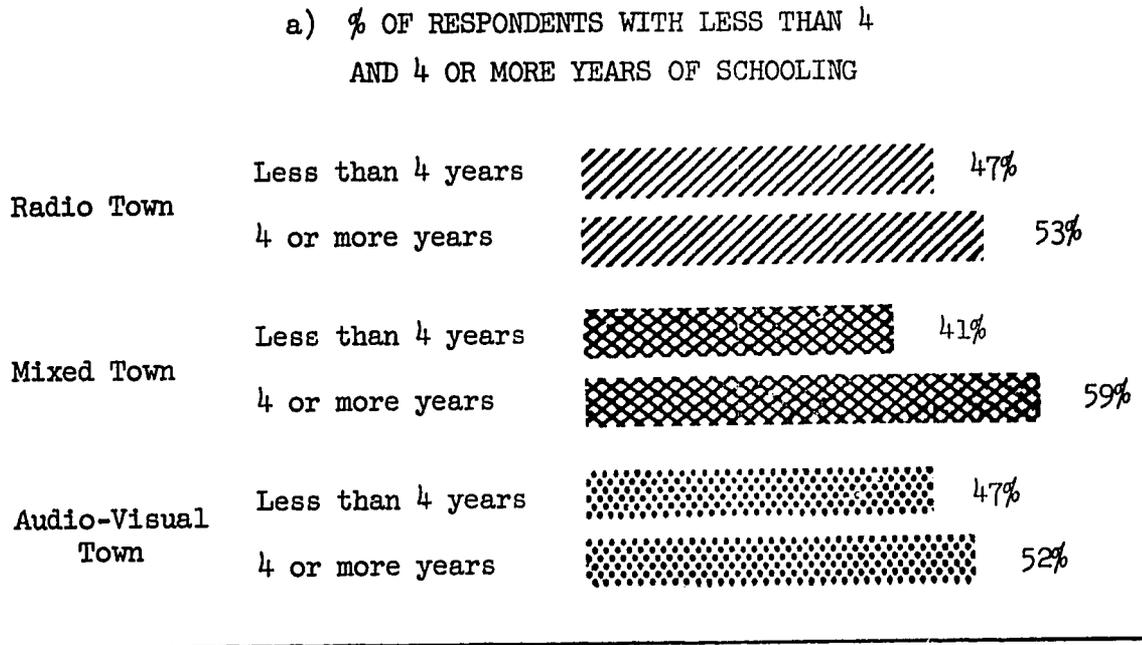


Fig. 2. What is the Relation Between
Education and Participation? (Contd.)

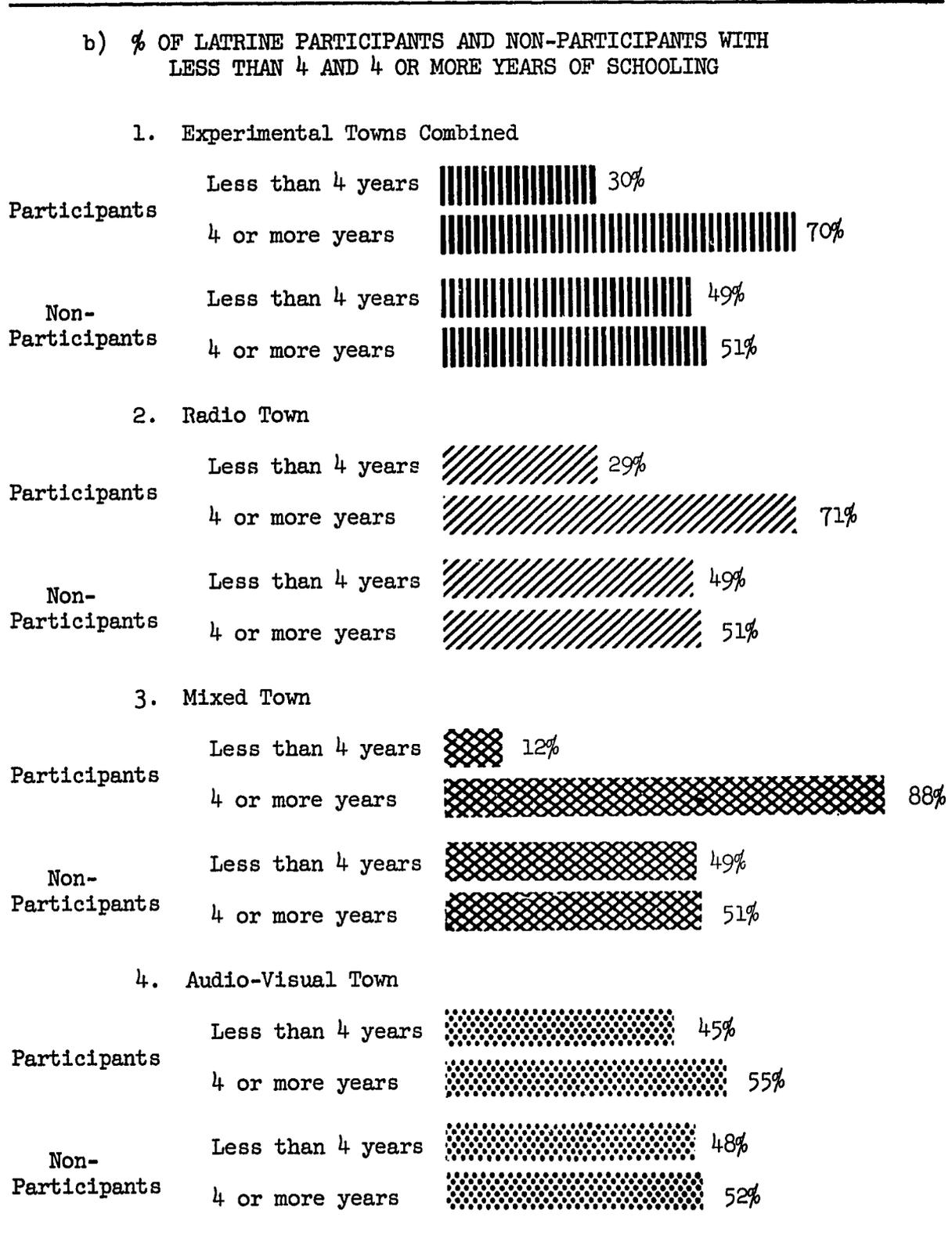
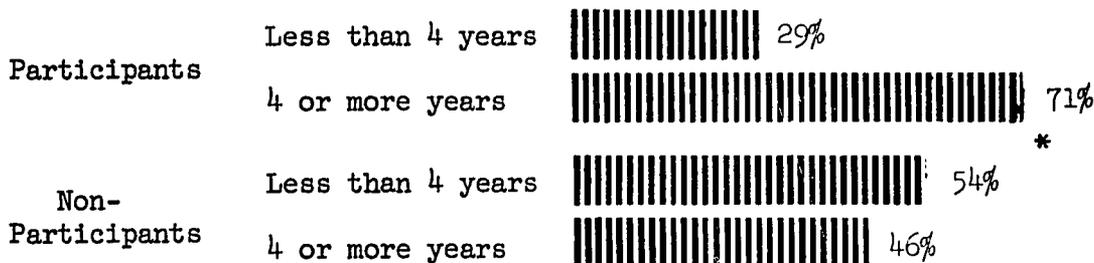


Fig. 2. What is the Relation Between
Education and Participation? (Contd.)

c) % OF STOVE PARTICIPANTS AND NON-PARTICIPANTS WITH
LESS THAN 4 AND 4 OR MORE YEARS OF SCHOOLING

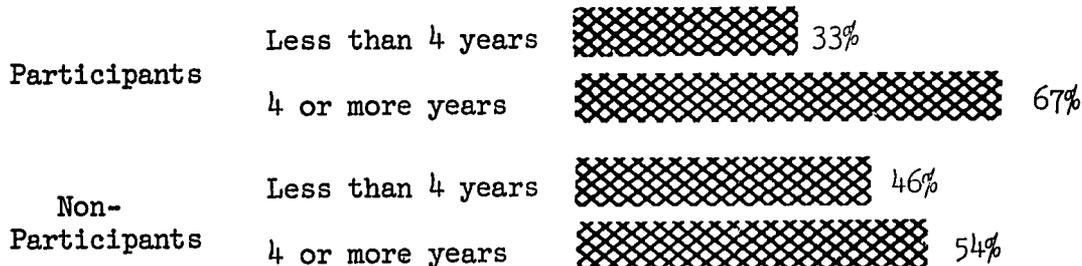
1. Experimental Towns Combined



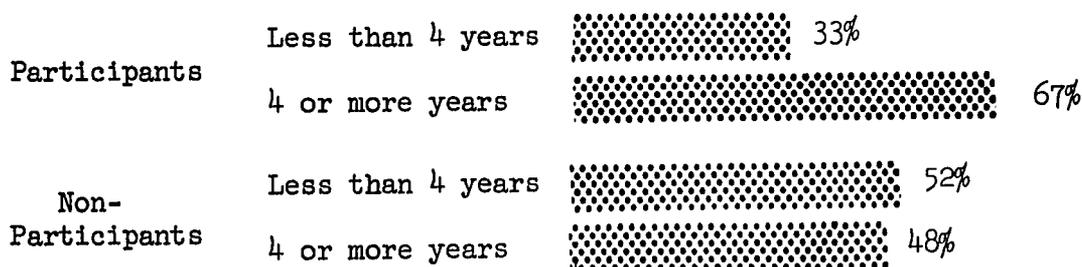
2. Radio Town



3. Mixed Town

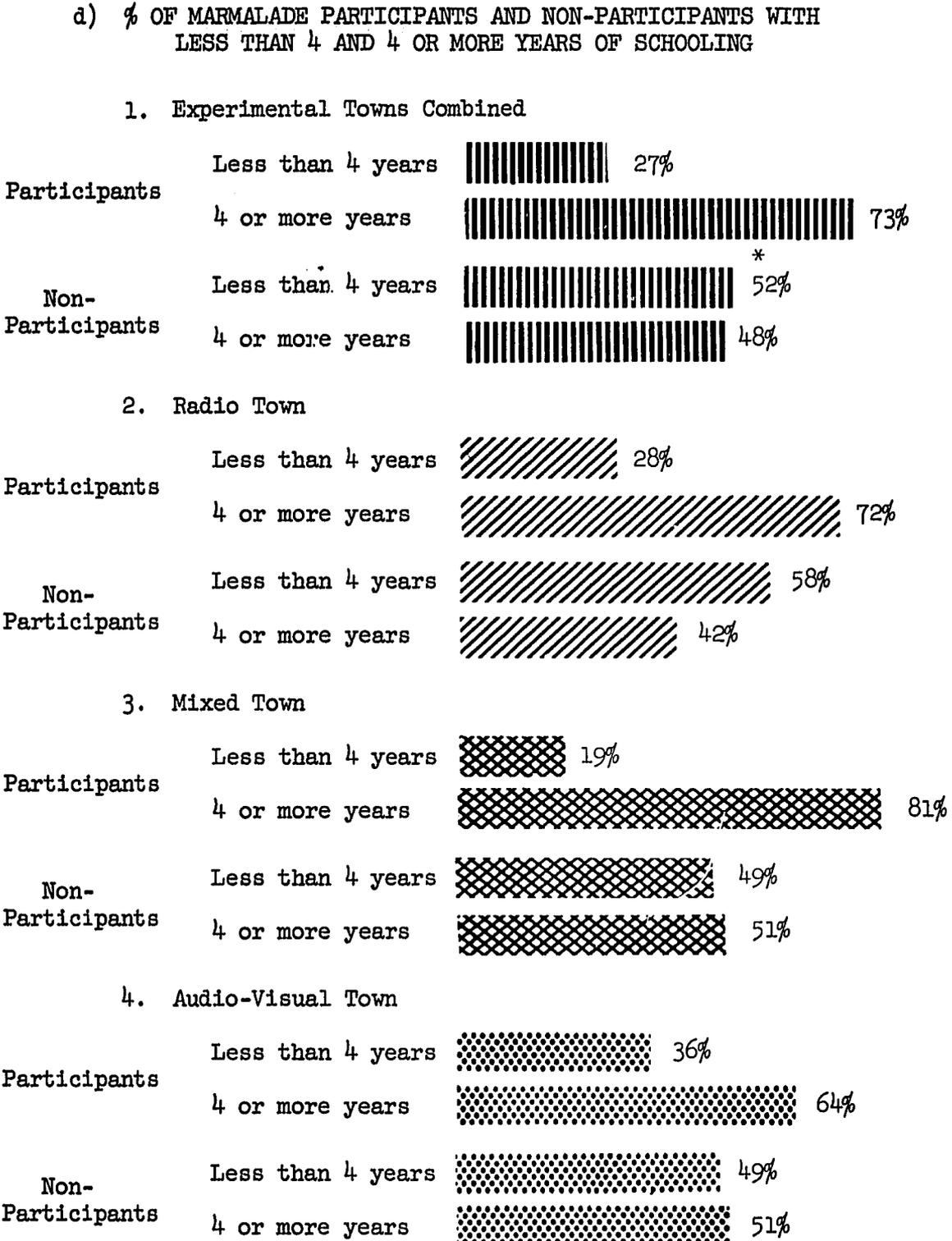


4. Audio-Visual Town



* Starred figures indicate relationships that would occur by chance less often than once in 1,000 times.

Fig. 2. What is the Relation Between Education and Participation? (Contd.)



* Starred figures indicate relationships that would occur by chance less often than once in 1,000 times.

Fig. 2. What is the Relation Between
Education and Participation? (Contd.)

e) % OF VACCINATION PARTICIPANTS AND NON-PARTICIPANTS
WITH LESS THAN 4 AND 4 OR MORE YEARS OF SCHOOLING

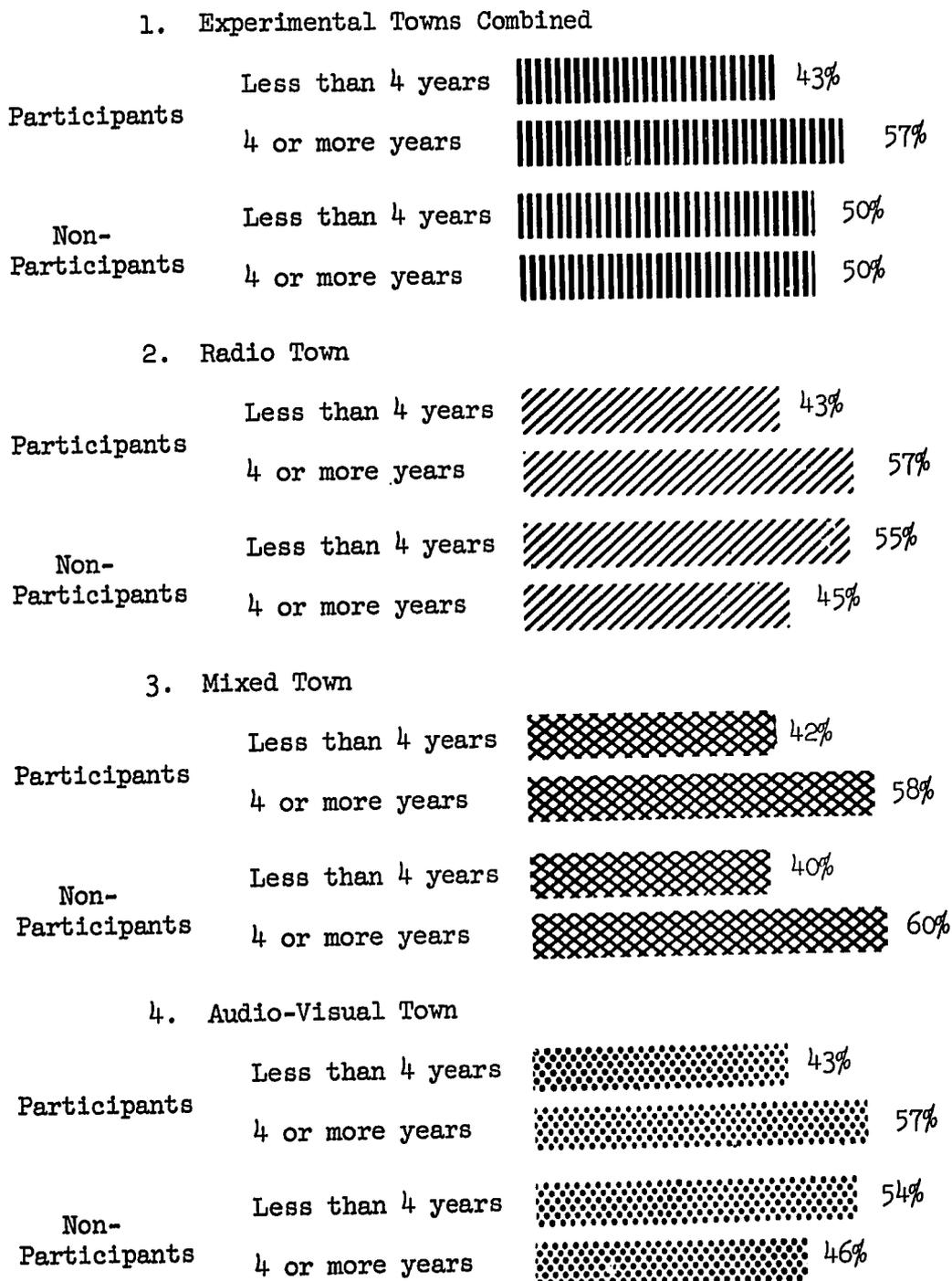
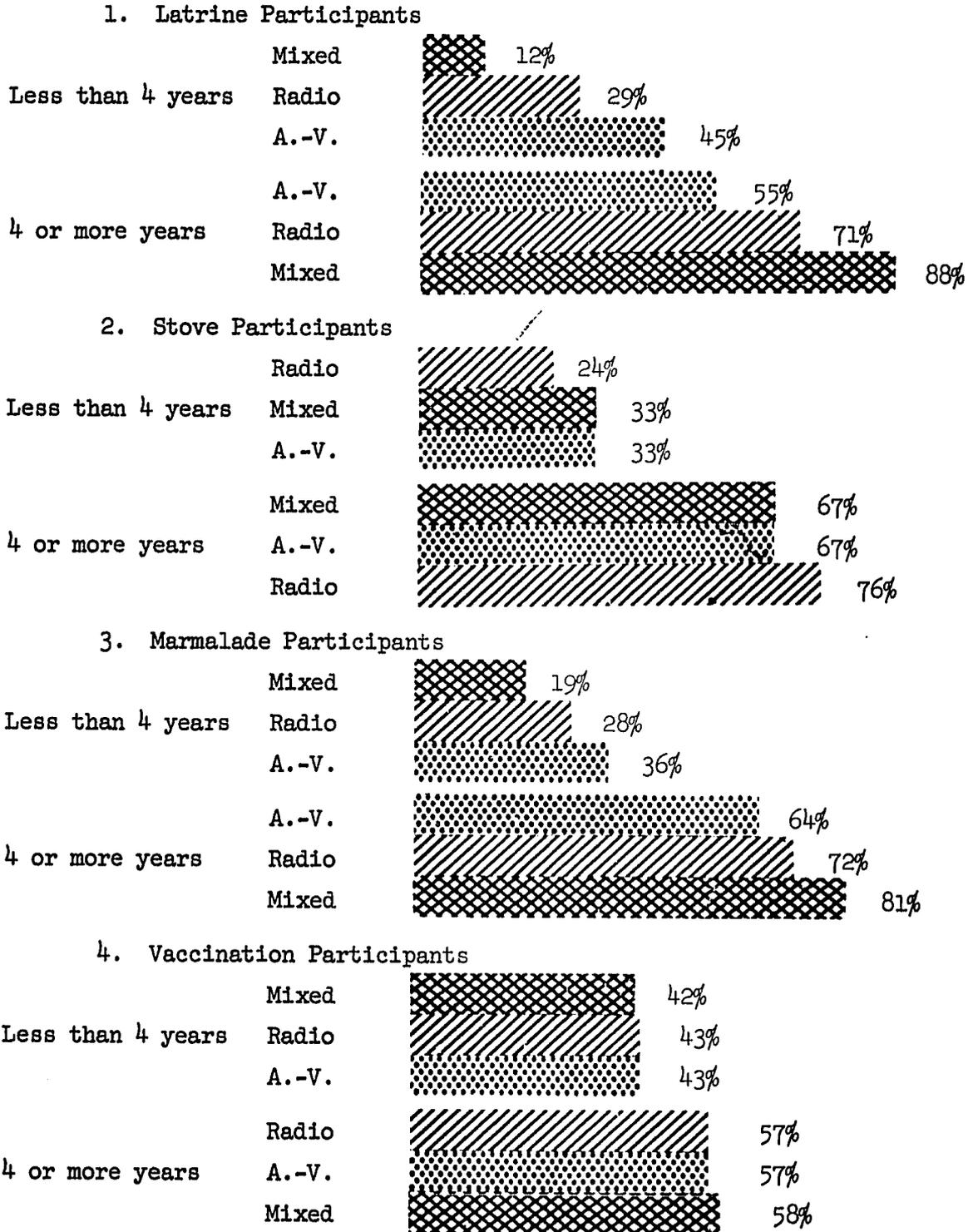


Fig. 2. What is the Relation Between
Education and Participation? (Contd.)

f) % OF PARTICIPANTS IN EACH TOWN WITH
LESS THAN 4 AND 4 OR MORE YEARS OF SCHOOLING



Literacy.^{8/} No statistically significant differences were found in literacy among the towns, although the percentage of literate householders in the Mixed Town is higher than in the Radio or the Audio-Visual Towns (82% vs. 67% and 67% respectively). The findings on literacy are summarized in Figure 3, p.54. With one minor exception, a greater percentage of the participant groups had literate householders than the non-participant groups. The exception is the finding that in the Mixed Town essentially equal percentages of those vaccinated and not vaccinated were literate (81% and 83% respectively).

In the Radio Town, stove-builders and marmalade-makers came significantly more frequently from households whose heads were literate than did the non-participants in these practices. The relation between participation in these two practices and literacy is also statistically significant when the three towns are combined.

Respondents were asked if they read books or periodicals and to specify the publications read. The findings were almost the same as for literacy. (See Table 14, p. 58.) Participants scored better than non-participants for all practices in all towns with the exception of the vaccinees and non-vaccinees in the Mixed Town, where similar percentages cited one or more publications. In the Radio Town, respondents in households that built stoves cited a publication significantly more frequently than those where stoves were not built.

^{8/} A respondent was considered literate if he was able to read a card which stated (in Spanish): "This concludes the interview; many thanks for your cooperation."

Fig. 3. What is the Relation Between
Literacy and Participation?

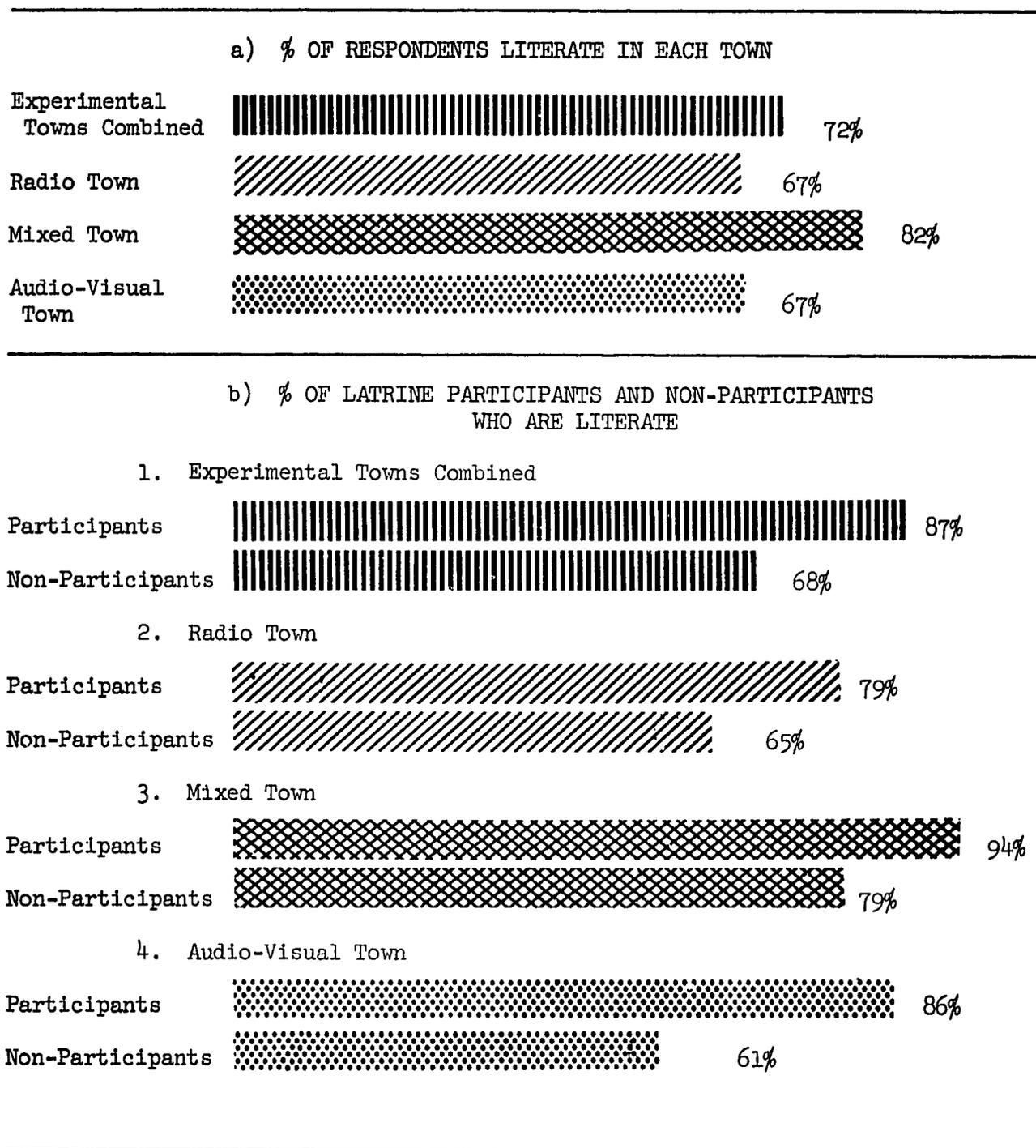
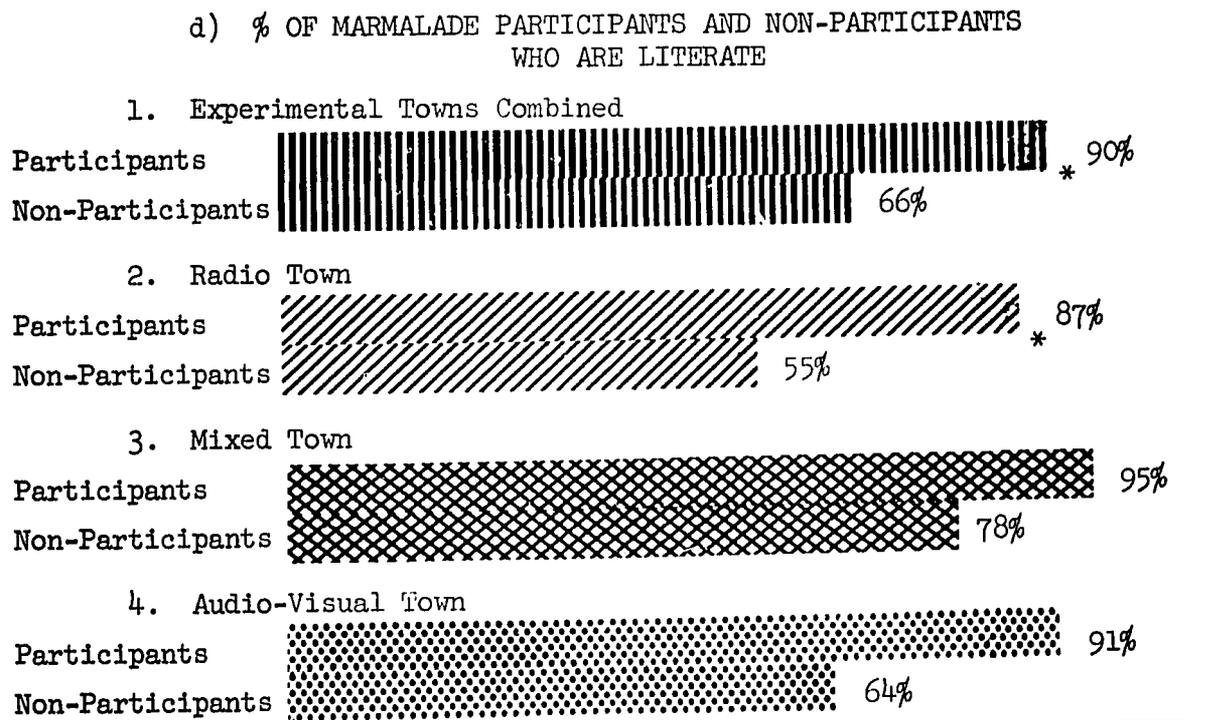
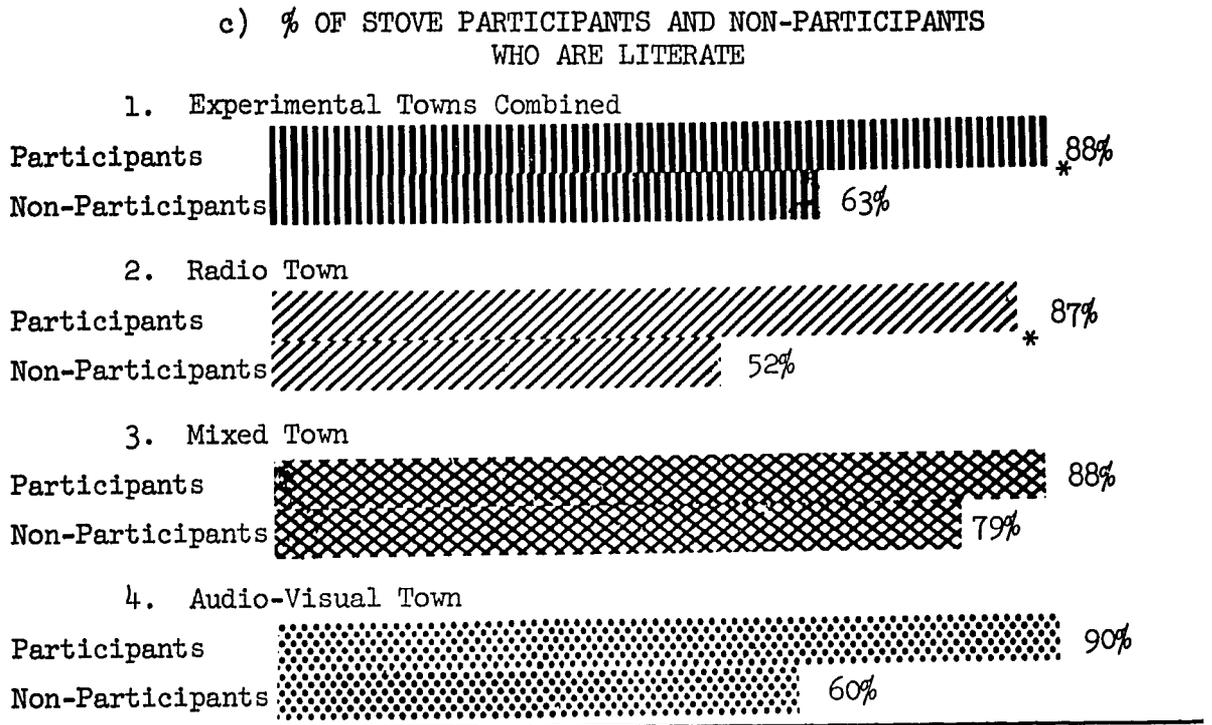


Fig. 3. What is the Relation Between
Literacy and Participation? (Contd.)



* Starred figures indicate relationships that would occur by chance less often than once in 1,000 times.

Fig. 3. What is the Relation Between
Literacy and Participation? (Contd.)

e) % OF VACCINATION PARTICIPANTS AND NON-PARTICIPANTS
WHO ARE LITERATE

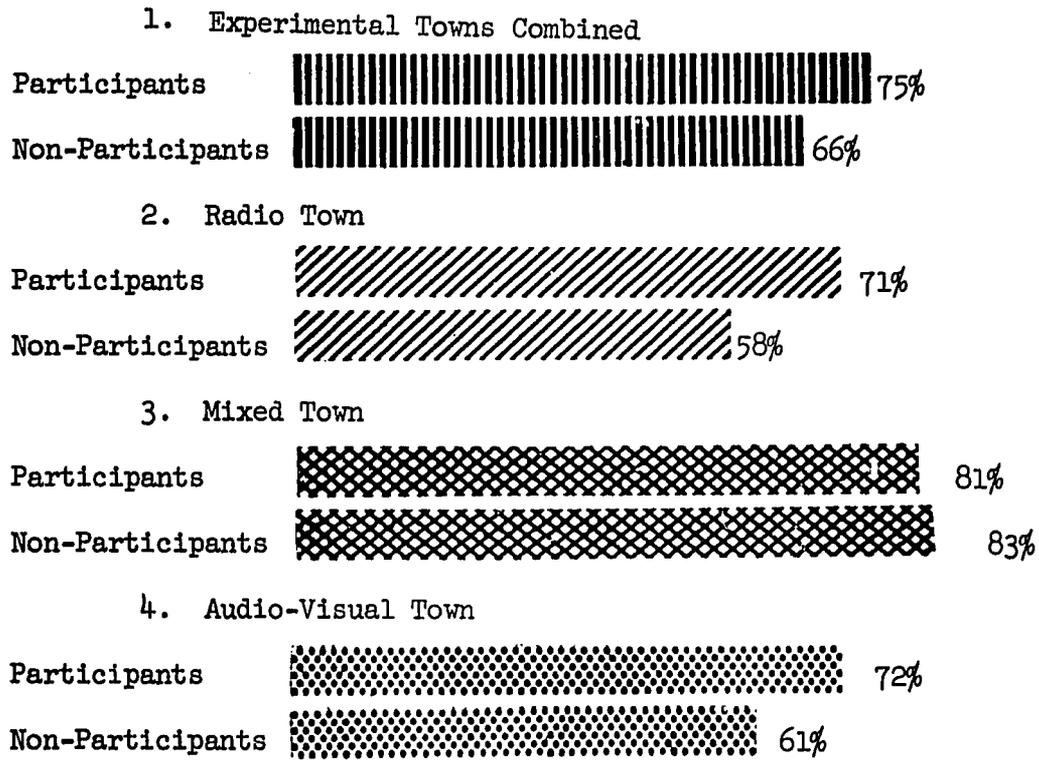


Fig. 3. What is the Relation Between
Literacy and Participation? (Contd.)

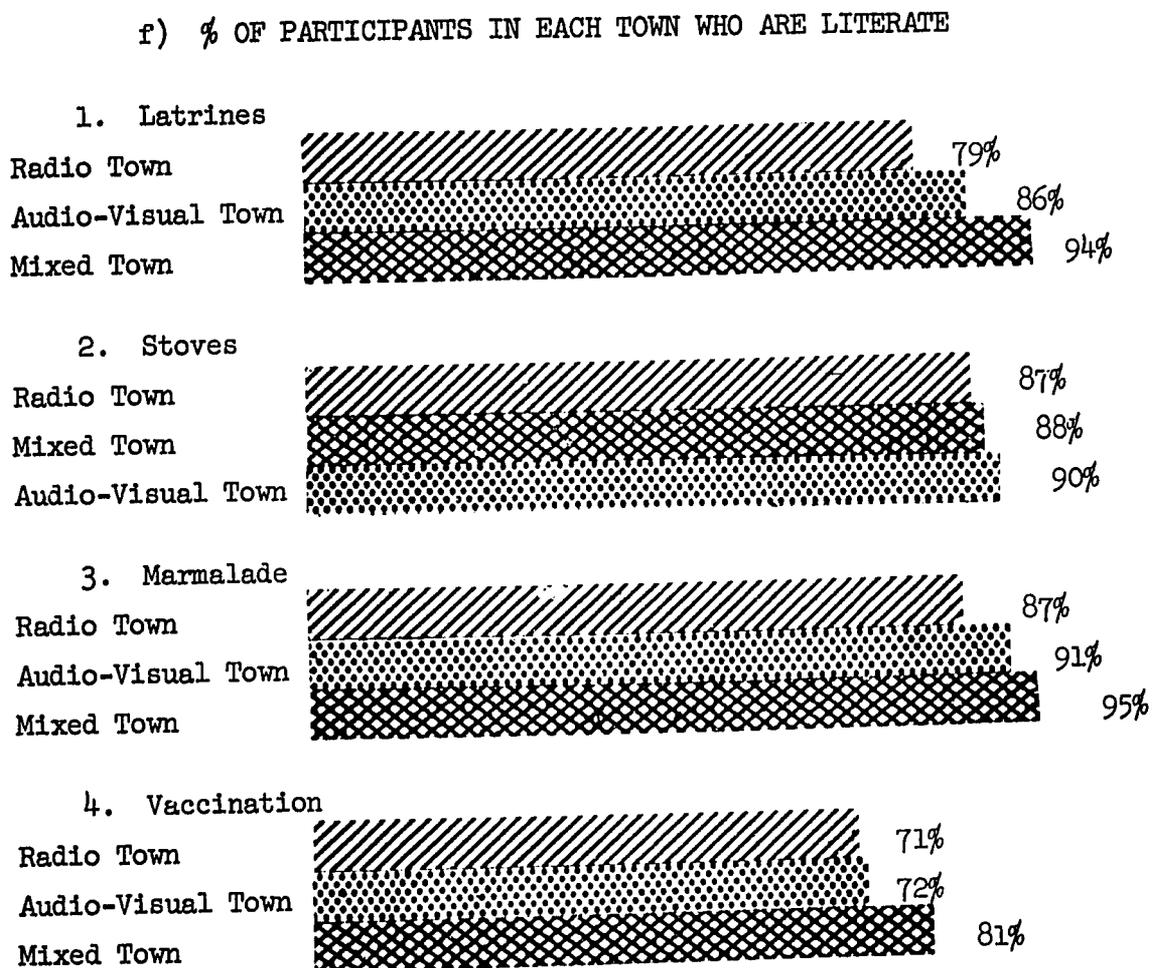


Table 14

**% OF PARTICIPANTS AND NON-PARTICIPANTS
WHO NAMED AT LEAST ONE PUBLICATION READ**

| | Radio Town | Mixed Town | Audio-Visual Town | All Towns Combined |
|----------------------------------|------------|------------|----------------------|-----------------------|
| Latrine participants | 64 | 41 | 45 | 49 |
| Latrine non- participants | 27 | 25 | 35 | 29 |
| Stove participants | 60 | 30 | 67 | 52 |
| Stove non- participants | * 10 | 27 | 28 | * 22 |
| Marmalade participants | 51 | 48 | 73 | 54 |
| Marmalade non- participants | 20 | 22 | 32 | * 25 |
| Vaccination participants | 40 | 27 | 51 | 39 |
| Vaccination non- participants | 15 | 30 | 22 | 22 |

*The difference between participants and non-participants could occur by chance once in approximately 1,000 times.

Exposure to Other Broadcasts. Approximately one third of the householders in each town reported that they listened to radio stations other than that of the campaign. As shown in Figure 4, p. 60, 33% in the Radio Town, 38% in the Mixed Town, and 33% in the Audio-Visual Town listened to other stations.

In the Radio Town, stove-building householders reported listening to other stations significantly more often than heads of non-participating households. In both the Radio and Audio-Visual Towns, people who built latrines reported listening to other (non-project) broadcasts more often than those who did not participate in this practice, but these differences fail to reach statistical significance. In the Audio-Visual Town, 64% of the marmalade participants listened to other stations, and only 29% of the non-participants did so; this difference too is not statistically significant. In the Mixed Town, 50% of the non-participants in vaccination listened to other stations, while only 32% of the participants did so. Again this fails to reach statistical significance.

Mobility. It was hypothesized that persons who travel extensively would tend to participate more than those who travel less. Therefore, questions were asked about individual mobility -- length of residence in the house, preferred locations for residence, and frequency, extent, and location of travel.

The towns differed little in their mobility patterns. Average lengths of residence were: Radio Town, 16.0 years; Mixed Town, 17.3 years; and Audio-Visual Town, 15.8 years. Length of residence is not systematically related to participation in the various projects.

Fig. 4. What is the Relation Between Listening to
Non-Project Radio Stations and Participation?

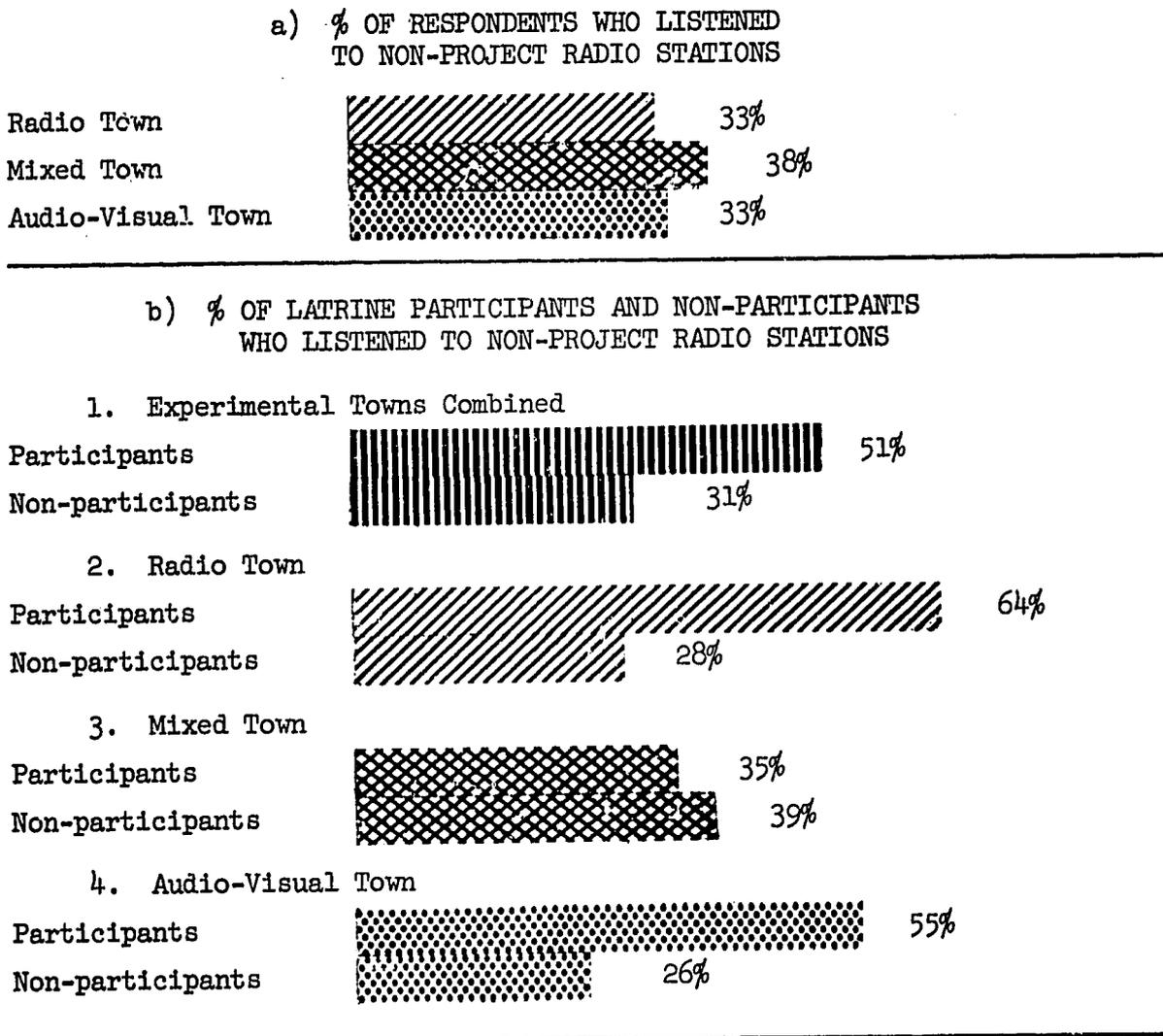
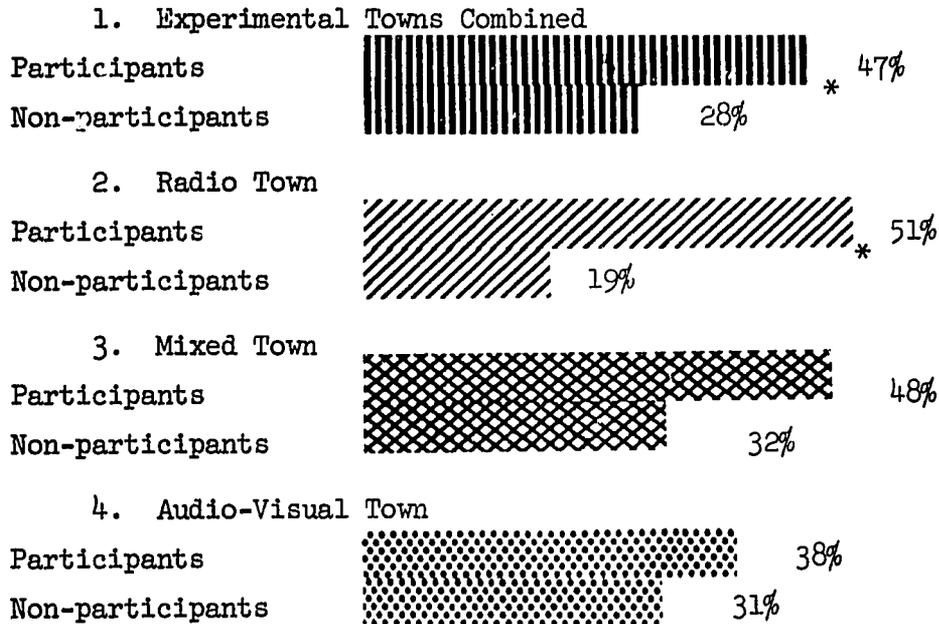
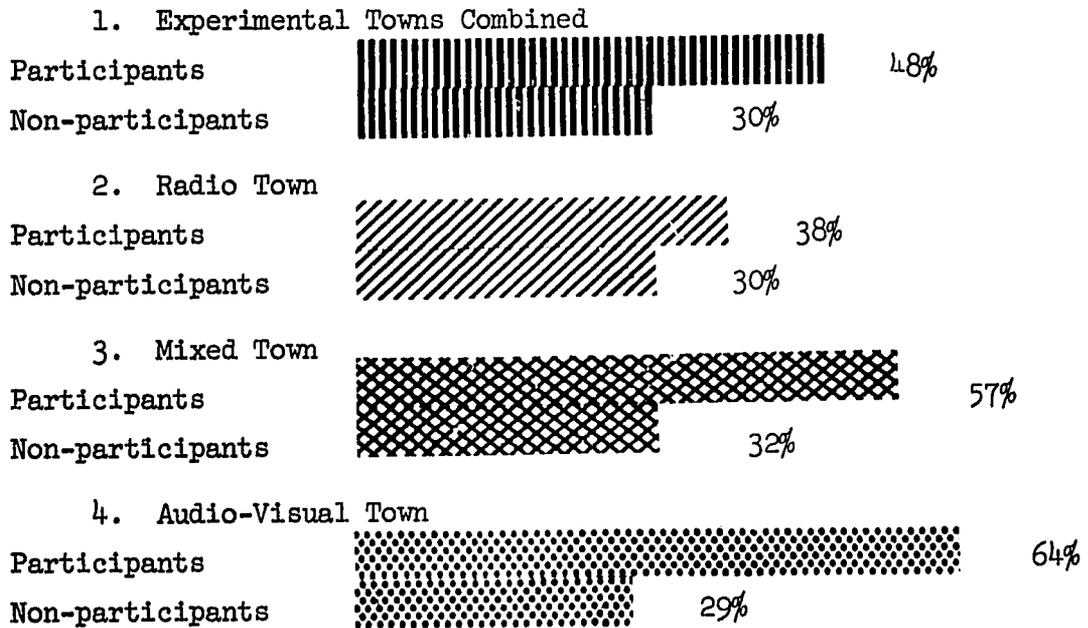


Fig. 4. What is the Relation Between Listening to
Non-Project Radio Stations and Participation? (Contd.)

c) % OF STOVE PARTICIPANTS AND NON-PARTICIPANTS
WHO LISTENED TO NON-PROJECT RADIO STATIONS



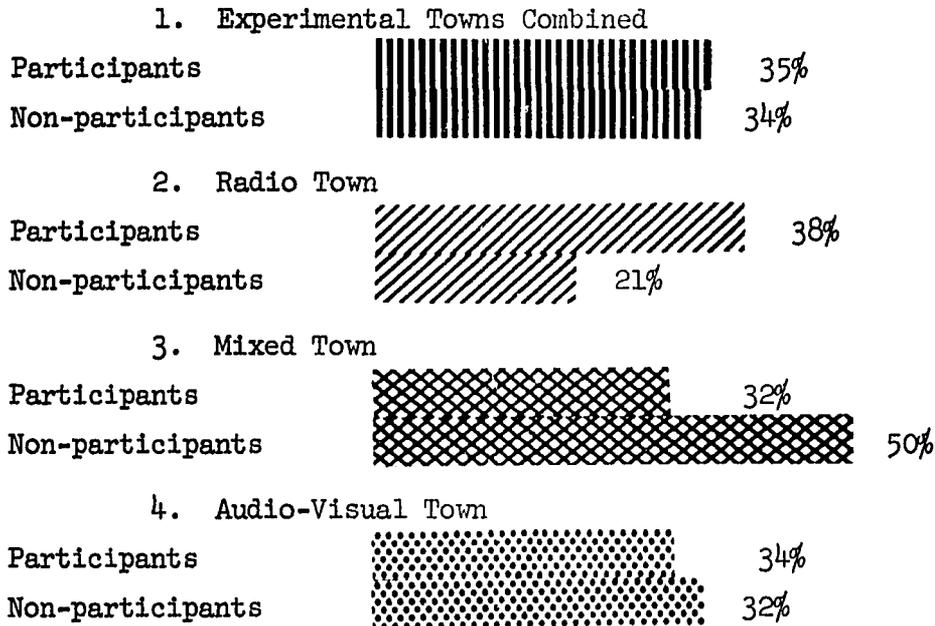
d) % OF MARMALADE PARTICIPANTS AND NON-PARTICIPANTS
WHO LISTENED TO NON-PROJECT RADIO STATIONS



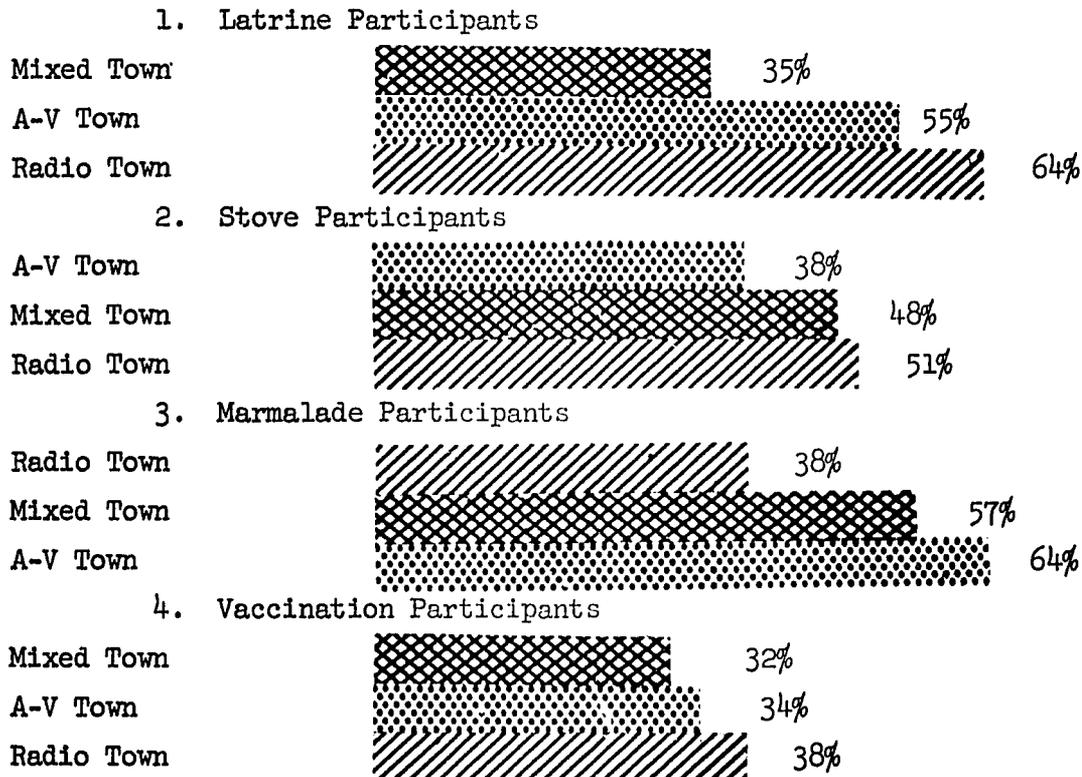
* Starred figures indicate relationships that would occur by chance less often than once in 1,000 times.

Fig. 4. What is the Relation Between Listening to Non-Non-Project Radio Stations and Participation? (Contd.)

e) % OF VACCINATION PARTICIPANTS AND NON-PARTICIPANTS WHO LISTENED TO NON-PROJECT RADIO STATIONS



f) % OF PARTICIPANTS IN EACH TOWN WHO LISTENED TO NON-PROJECT RADIO STATIONS



There were no significant differences between towns with regard to residential preferences. Seventy-five percent of the respondents in the Radio Town, 66% in the Mixed Town, and 59% in the Audio-Visual Town signified a preference for their present residence. Only very small percentages of respondents wanted to move elsewhere within the canton. No relationship was found between residence preferences and participation.

There was very little travel reported between experimental towns. Almost all respondents reported that visits to other experimental towns were made once a year or less. The towns differed slightly in their travel to urban areas (mainly to nearby market towns); 58% of the householders in the Radio Town reported travel to urban areas once a week or more, as compared to 44% in the Mixed Town and 48% in the Audio-Visual Town. There were no systematic relationships between frequency of travel to urban centers and participation.

The extent of travel was the same in the Radio and Audio-Visual Towns, 81% of the respondents reporting restricted travel (within the canton); in the Mixed Town 65% reported travel restricted to the canton. There were no systematic relationships found between extent of travel and participation.

Social Relations. It was hypothesized that persons with wider social contacts would tend to participate in practices more than those with narrower social relationships. A series of questions was asked about membership in organizations of all kinds, and about frequency of participation in such organizations. Respondents were also asked

about persons they had spoken to about each of the practices, and about persons with whom they spent most of their time.^{2/}

Membership in organizations was indicated by relatively few householders (Radio Town 13%, Mixed Town 31%, Audio-Visual Town 22%). There was a consistent tendency for participants to belong to organizations more often than non-participants in each town (see Table 15, p. 65). In the Audio-Visual Town, there is a statistically significant difference between the proportion of latrine-builders (50%) and non-builders (12%) who belong to a club. Information on frequency of meetings was too sparse to afford data on relationships between this variable and participation in the projects.

Participation in the three active practices was highly related to talking to other persons about them (see Figure 5, p. 66). In the Audio-Visual Town and with the three towns combined, the relationship between latrine-building and speaking to others about latrines is highly significant. In the Radio Town and in the three towns combined, preparation of marmalade and speaking to others about it were also found to be significantly related. A statistically significant relation was also found for stove-building when the three towns were combined.

Vaccination shows no relationship with talking to others about the practice. The percentages of participants who reported speaking to others about vaccination were much lower than the percentages of

^{2/} It was not possible to map sociometric relations as was initially intended, partly because of the repetitiveness of respondents' names in each town, partly because answers were vague: "a friend" rather than a name, and partly because the interviewers did not have time to unravel the relationships. An attempt will be made to obtain this type of data with a smaller sample in Phase II of the study.

Table 15

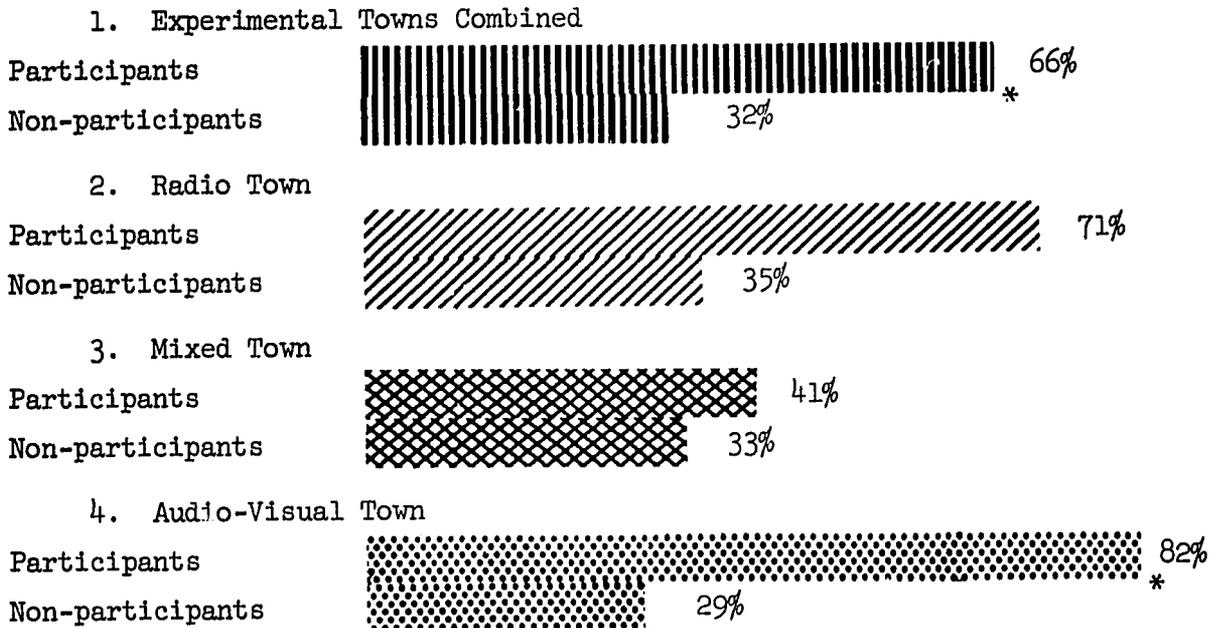
% OF PARTICIPANTS AND NON-PARTICIPANTS
WHO BELONG TO A CLUB

| | Radio Town | Mixed Town | Audio-Visual Town | All Towns Combined |
|----------------------------------|------------|------------|----------------------|-----------------------|
| Latrine participants | 21 | 59 | 50 | 45 |
| Latrine non- participants | 11 | 25 | 12 | 16 |
| Stove participants | 18 | 36 | 33 | 27 |
| Stove non- participants | 09 | 29 | 18 | 18 |
| Marmalade participants | 23 | 29 | 27 | 25 |
| Marmalade non- participants | 06 | 32 | 21 | 20 |
| Vaccination participants | 14 | 34 | 23 | 23 |
| Vaccination non- participants | 9 | 27 | 20 | 18 |

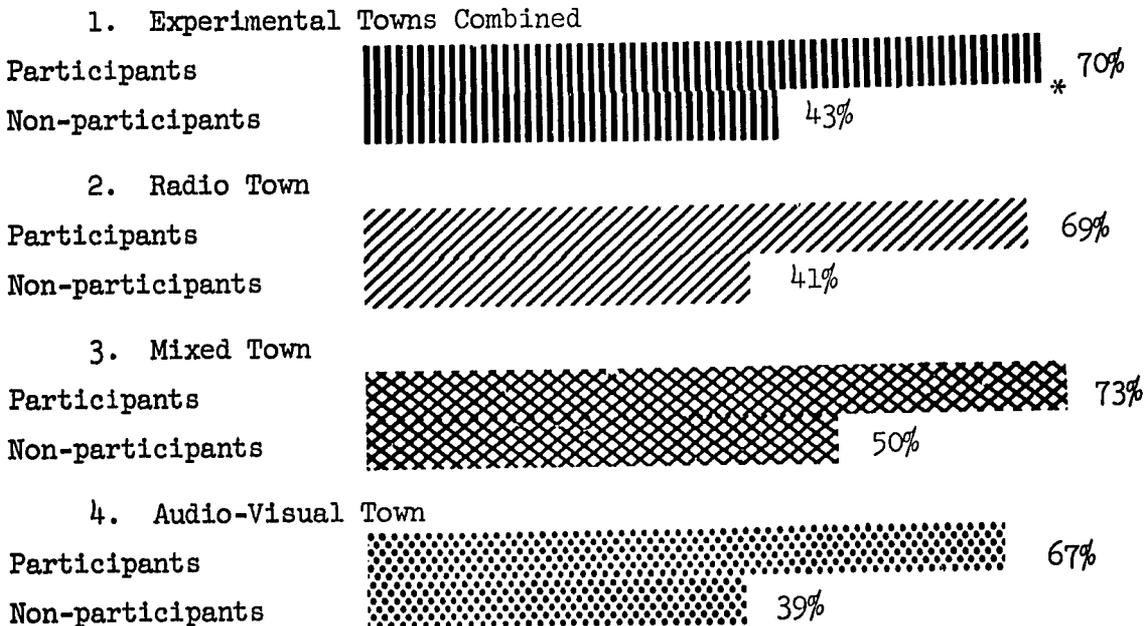
*The difference between participants and non-participants could occur by chance once in approximately 1,000 times.

Fig. 5. What is the Relation Between Speaking to Others About a Practice and Participation?

a) % OF LATRINE PARTICIPANTS AND NON-PARTICIPANTS WHO SPOKE TO OTHERS ABOUT THE PRACTICE



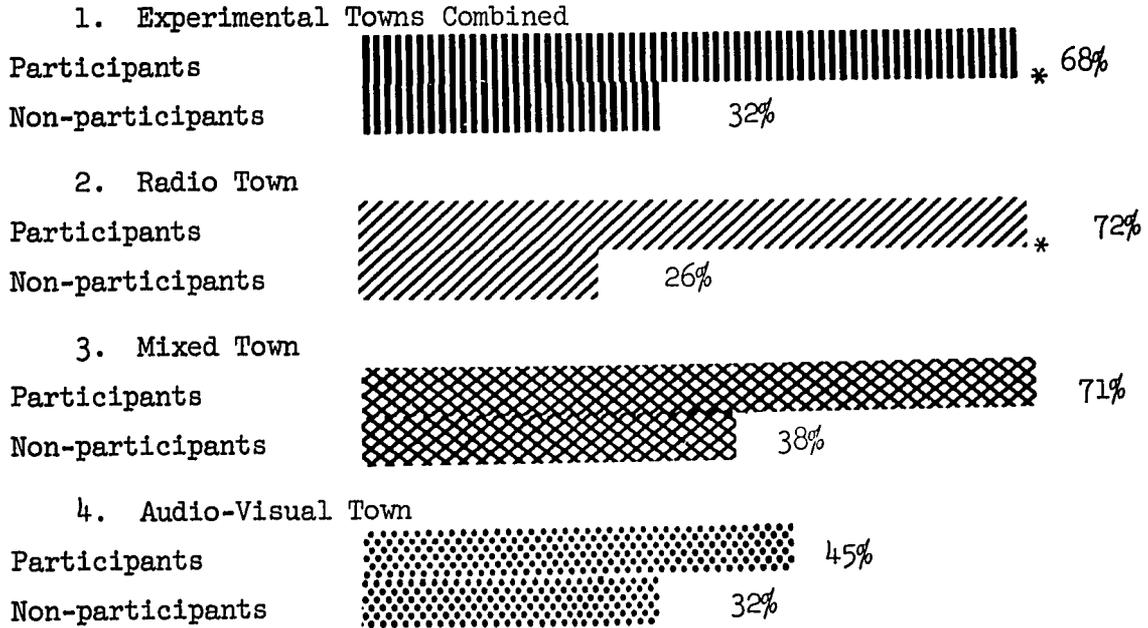
b) % OF STOVE PARTICIPANTS AND NON-PARTICIPANTS WHO SPOKE TO OTHERS ABOUT THE PRACTICE



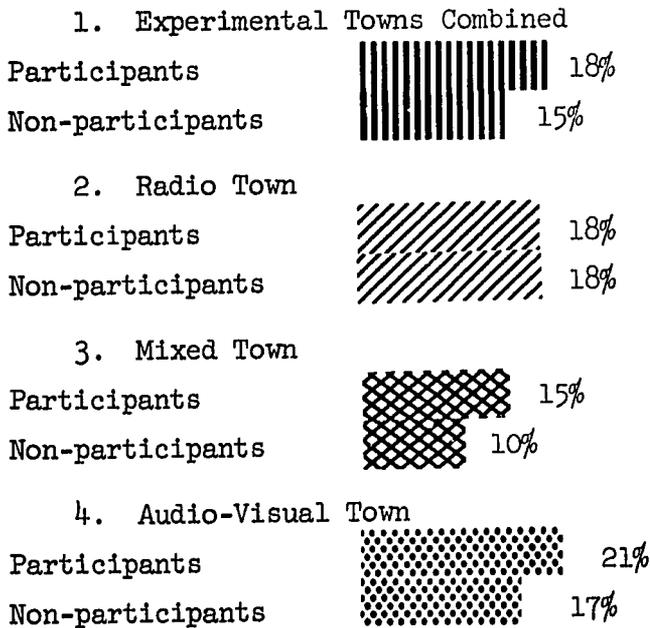
* Starred figures indicate relationships that would occur by chance less often than once in 1,000 times.

Fig. 5. What is the Relation Between Speaking to
Others About a Practice and Participation? (Contd.)

c) % OF MARMALADE PARTICIPANTS AND NON-PARTICIPANTS
WHO SPOKE TO OTHERS ABOUT THE PRACTICE



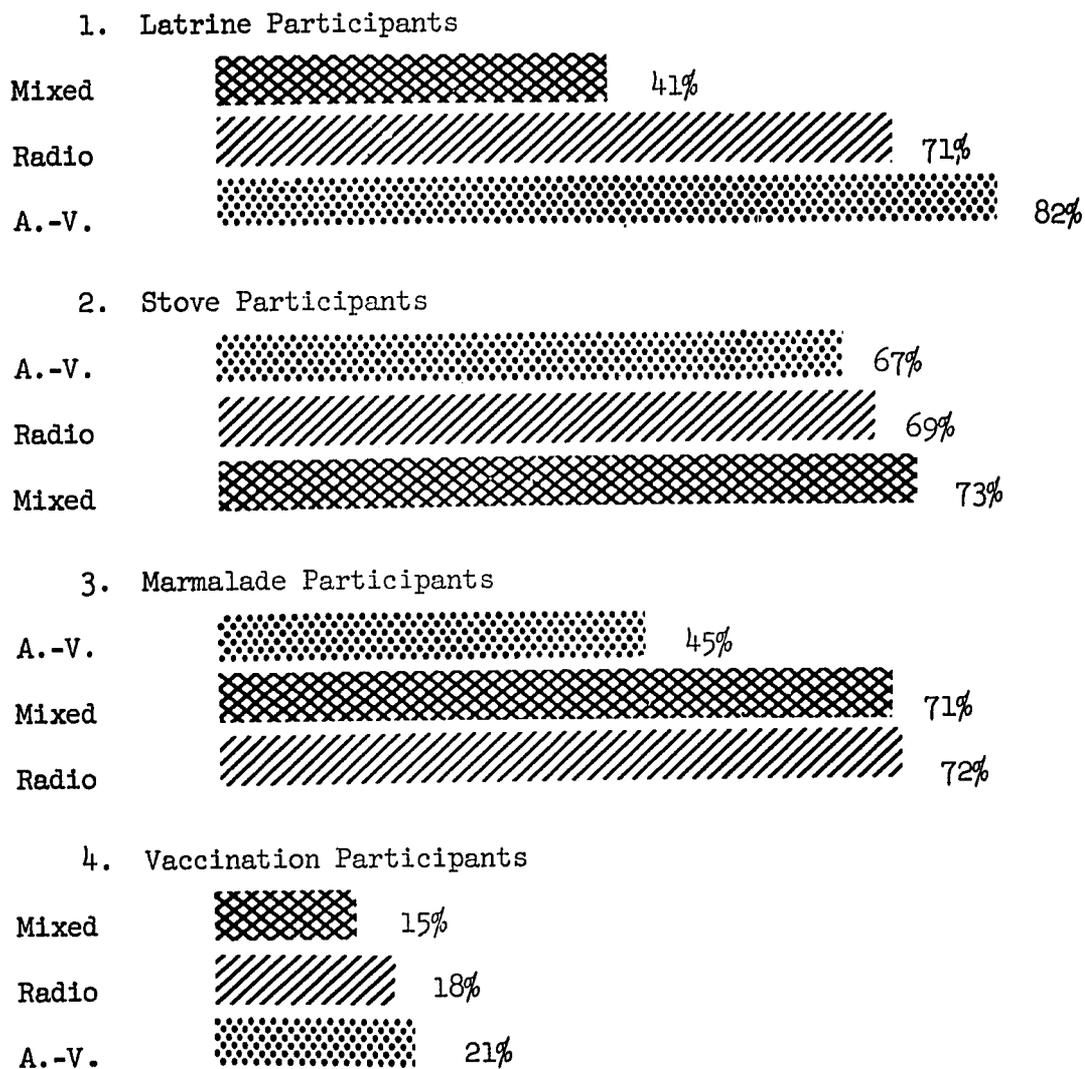
d) % OF VACCINATION PARTICIPANTS AND NON-PARTICIPANTS
WHO SPOKE TO OTHERS ABOUT THE PRACTICE



* Starred figures indicate relationships that would occur by chance less often than once in 1,000 times.

Fig. 5. What is the Relation Between Speaking to Others About a Practice and Participation? (Contd.)

e) % OF PARTICIPANTS IN EACH TOWN WHO SPOKE TO OTHERS ABOUT THE PRACTICE



participants who spoke to others about the three active practices. For vaccination these figures ranged between 15% and 21%. For all three of the other practices, the range was from 41% to 82%.

Personal Values and Attitudes. Questions were asked to determine the current attitudes, values, and interests in the towns. Householders were asked what changes they believed would be beneficial to their towns, to themselves and their families, and to Ecuador as a whole. (The latter question was an attempt to identify strong political views which may have prevented participation in the study because of the program's identification with existing authority.) They were also asked what they would do with lottery winnings and what they wanted their sons to be, to obtain indications of relatively immediate practical desires and long-term social aspirations. The responses to these questions can be found in Tables 16-23, pp. 70-73. In general, the findings for the towns are quite similar, and only rarely was a category of responses to any of the questions related to participation in the practices advocated in the campaign.

The few differences among the towns probably reflect physical conditions in the respective towns rather than differences in basic social attitudes. In answer to the question, "What improvements would be good for this town?" potable water is frequently mentioned in the two towns where it is least available (see Table 16, p. 70). Similarly, the responses reflect the lack of electricity in the Radio Town, the lack of a school in the Mixed Town, and the lack of a good road between the Audio-Visual Town and its market town. Answers to the question, "What improvements would benefit you and your family?" show quite similar distributions of percentages in all three towns (see Table 17, p. 70). Stoves, better jobs, the chance to buy or improve a house and latrines are the improvements most frequently cited.

Table 16

CHANGES THAT WOULD BE BENEFICIAL TO COMMUNITY

| Changes | <u>Radio Town</u> | <u>Mixed Town</u> | <u>A-V Town</u> |
|------------------|-------------------------|-------------------------|-------------------------|
| | % of all respondents | % of all respondents | % of all respondents |
| Religious topics | 11 | 9 | 6 |
| Homes | 10 | 11 | 7 |
| Roads or streets | 12 | 17 | 32 |
| Hospitals | 2 | 1 | 1 |
| Potable water | 43 | 6 | 41 |
| Schools | 27 | 44 | 5 |
| Electricity | 44 | 1 | 2 |
| Industries | 4 | 3 | 3 |
| Other | 11 | 25 | 30 |

Table 17

CHANGES THAT WOULD BE BENEFICIAL TO RESPONDENT AND FAMILY

| Changes | <u>Radio Town</u> | <u>Mixed Town</u> | <u>A-V Town</u> |
|---------------------|-------------------------|-------------------------|-------------------------|
| | % of all respondents | % of all respondents | % of all respondents |
| Better job | 14 | 15 | 8 |
| Buy land | 2 | 2 | 7 |
| Buy house | 9 | 16 | 13 |
| Education or skills | 1 | 4 | 2 |
| Potable water | 10 | 2 | 9 |
| Electricity | 14 | 0 | 1 |
| Health | 2 | 2 | 1 |
| Vaccination | 4 | 7 | 5 |
| Latrine | 7 | 15 | 13 |
| Smokeless stove | 25 | 33 | 22 |
| Marmalade | 3 | 6 | 2 |
| Other | 37 | 27 | 39 |

Table 18
CHANGES THAT WOULD BE BENEFICIAL TO ECUADOR

| Changes | <u>Radio Town</u> % of all respondents | <u>Mixed Town</u> % of all respondents | <u>A-V Town</u> % of all respondents |
|-----------------------|--|--|--|
| To have more religion | 2 | 3 | 5 |
| Good government | 3 | 15 | 10 |
| More chances of jobs | 15 | 17 | 11 |
| Social benefits | 7 | 10 | 6 |
| Potable water | 4 | 1 | 2 |
| Schools | 9 | 11 | 3 |
| Roads | 8 | 2 | 8 |
| Industries | 16 | 24 | 9 |
| Other | 45 | 29 | 49 |

Table 19
USE OF LOTTERY WINNINGS

| Use | <u>Radio Town</u> % of all respondents | <u>Mixed Town</u> % of all respondents | <u>A-V Town</u> % of all respondents |
|--|--|--|--|
| Pay debts | 4 | 3 | 2 |
| Help others | 6 | 8 | 1 |
| Help the church | 4 | 3 | 8 |
| Individual improvement | 13 | 12 | 20 |
| Home improvement or buying own property | 44 | 61 | 41 |
| Education for children | 8 | 13 | 11 |
| Enter industry or business | 15 | 17 | 16 |
| Buy land for income | 11 | 6 | 6 |
| Other | 17 | 10 | 18 |

Table 20

ASPIRATIONS FOR SON CITED BY PARTICIPANTS AND
NON-PARTICIPANTS IN LATRINE CONSTRUCTION

| Aspirations | Radio Town | | Mixed Town | | A-V Town | |
|--------------|------------|----------|------------|----------|----------|----------|
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P |
| Help parents | 0 | 2 | 0 | 7 | 0 | 3 |
| Religion | 0 | 1 | 0 | 7 | 5 | 2 |
| Farmer | 0 | 1 | 6 | 1 | 0 | 5 |
| Teacher | 7 | 13 | 12 | 11 | 5 | 6 |
| Professional | 79 | 31 | 53 | 43 | 55 | 23 |
| Other | 7 | 35 | 12 | 25 | 23 | 29 |

Table 21

ASPIRATIONS FOR SON CITED BY PARTICIPANTS
AND NON-PARTICIPANTS IN STOVE CONSTRUCTION

| Aspirations | Radio Town | | Mixed Town | | A-V Town | |
|--------------|------------|----------|------------|----------|----------|----------|
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P |
| Help parents | 2 | 2 | 3 | 7 | 5 | 1 |
| Religion | 0 | 2 | 6 | 5 | 5 | 1 |
| Farmer | 2 | 0 | 3 | 2 | 0 | 4 |
| Teacher | 7 | 17 | 15 | 9 | 10 | 4 |
| Professional | 51 | 28 | 52 | 41 | 57 | 22 |
| Other | 29 | 33 | 18 | 25 | 19 | 30 |

Note.--The column headings P and N-P indicate Participants and Non-Participants, respectively.

Table 22
 ASPIRATIONS FOR SON CITED BY
 MARMALADE PARTICIPANTS AND NON-PARTICIPANTS

| Aspirations | Radio Town | | Mixed Town | | A-V Town | |
|--------------|------------|----------|------------|----------|----------|----------|
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P |
| Help parents | 3 | 2 | 0 | 7 | 0 | 3 |
| Religion | 0 | 2 | 10 | 4 | 0 | 3 |
| Farmer | 0 | 2 | 5 | 1 | 0 | 4 |
| Teacher | 8 | 16 | 29 | 6 | 0 | 6 |
| Professional | 59 | 25 | 38 | 47 | 36 | 30 |
| Other | 18 | 39 | 10 | 26 | 45 | 25 |

Table 23
 ASPIRATIONS FOR SON CITED BY
 VACCINATION PARTICIPANTS AND NON-PARTICIPANTS

| Aspirations | Radio Town | | Mixed Town | | A-V Town | |
|--------------|------------|----------|------------|----------|----------|----------|
| | % of P | % of N-P | % of P | % of N-P | % of P | % of N-P |
| Help parents | 3 | 0 | 3 | 10 | 0 | 5 |
| Religion | 0 | 3 | 5 | 7 | 4 | 0 |
| Farmer | 1 | 0 | 2 | 3 | 0 | 7 |
| Teacher | 9 | 21 | 10 | 13 | 9 | 2 |
| Professional | 46 | 21 | 47 | 40 | 36 | 24 |
| Other | 27 | 39 | 22 | 23 | 30 | 24 |

Note.--The column headings P and N-P indicate Participants and Non-Participants, respectively.

Participants and non-participants tended to respond similarly to questions on changes beneficial to the community and improvements for self and family. The only significant difference is found in the Radio Town, where 64% of the stove-builders and only 26% of the non-builders cited potable water as a desired change for the community. Other large (but not significant) differences are found in the Radio Town between marmalade participants and non-participants who desire potable water (62% vs. 31%) and who desire electricity (59% vs. 34%). Also, more latrine-builders in the Radio Town (57%) cited schools than did non-builders (22%), and 50% of the latrine-builders cited "stove" as a desired self-improvement, compared with 21% of the non-builders. The only findings of interest in the Mixed Town and Audio-Visual Town are that roads or streets are cited in each town by more participants than non-participants.

Responses concerning changes that would be desirable for Ecuador again show a rather uniform distribution among the towns (see Table 18, p. 71). The largest difference, 24% who chose industries in the Mixed Town as compared to 9% in the Audio-Visual Town, possibly reflects the more cosmopolitan character of the former and the more insular condition of the latter. There are no statistically significant differences in the responses of participants and non-participants for this question. The largest differences were found between latrine-builders and non-builders citing industries in the Mixed Town (41% vs. 19%) and citing good government in the Audio-Visual Town (27% vs. 5%). Industries were also cited more frequently by the stove-builders of the Radio Town (24% vs. 9%) and by the latrine-builders of the Audio-Visual Town (18% vs. 6%). The Radio Town latrine-builders cited jobs more often than non-builders (29% vs. 12%), and in the Mixed Town they cited schools more often than non-builders (24% vs. 8%). Not surprisingly, these differences, like those found in the two preceding questions, show the participants citing desired changes more frequently than non-participants

The question concerning disposition of lottery winnings elicited uniform distributions of responses from the towns (see Table 19, p. 71). The largest percentages in all three towns gave answers which fell into the category: "Buy Own Property or Improve Existing Home" (Radio Town: 44%; Mixed Town 61%; Audio-Visual Town 41%). The next largest categories were: "Enter Industry or Business" (Radio Town 15%; Mixed Town 17%; Audio-Visual Town 16%); and "Individual Improvement" which included such responses as "take a trip," "buy clothes," or "study" (Radio Town 13%; Mixed Town 12%; Audio-Visual Town 20%). Differences between participants and non-participants are few and are not statistically significant. Education for children was more frequently cited by stove-builders in both the Mixed and Audio-Visual Towns (24% vs. 7% and 29% vs. 6% respectively), and by marmalade-makers in the Audio-Visual Town (36% vs. 8%). Marmalade-makers also cited "enter Industry or Business" more often in both the Radio and Mixed Towns (23% vs. 9% and 33% vs. 12% respectively).

The answers to the question, "What do you want your son to be?" are summarized in Tables 20-23, pp. 72-73. In all three towns the largest response category by far was "Professional" (Radio Town 38%; Mixed Town 45%; Audio-Visual Town 31%). The second largest category was "Teacher" (Radio Town 13%; Mixed Town 11%; Audio-Visual Town 6%). The remaining categories were mentioned by very few persons. In general, the participants in each of the practices chose "Professional" with greater frequency than the non-participants, as shown in Table 24, p. 76. For the three towns combined, mention of this category is significantly related to both latrine and stove participation, and within the Radio Town, it is significantly related to participation in the marmalade practice. Differences between participants who cite the category and non-participants who cite it are smallest in the Mixed Town.

Table 24
 % OF PARTICIPANTS AND NON-PARTICIPANTS WHO CITED
 "PROFESSIONAL" ASPIRATIONS FOR SON

| | Radio Town | Mixed Town | A-V Town | All Towns Combined |
|--------------------|------------|------------|----------|-----------------------|
| <u>Latrine</u> | | | | |
| Participants | 79 | 53 | 55 | 60 |
| Non-Participants | 31 | 43 | 22 | 33* |
| <u>Stove</u> | | | | |
| Participants | 51 | 52 | 57 | 53* |
| Non-Participants | 28 | 41 | 22 | 30 |
| <u>Marmalade</u> | | | | |
| Participants | 59* | 38 | 36 | 49 |
| Non-Participants | 25 | 47 | 30 | 34 |
| <u>Vaccination</u> | | | | |
| Participants | 46 | 47 | 36 | 44 |
| Non-Participants | 21 | 40 | 24 | 28 |

*The difference between participants and non-participants could occur by chance once in approximately 1,000 times.

Answers in the "Other" category for the questions on personal values and attitudes consist largely of meaningless responses or indications of unwillingness or inability to answer. Responses of this kind were fewest in the Mixed Town and there was a consistent tendency for fewer participants than non-participants to respond in this way.

Age. The towns did not differ in the average age of householders and age was not systematically related to participation in any of the practices.

Construction Skills. It was hypothesized that households with persons whose occupations required skills that were also necessary for participation in the construction practices would participate more frequently in latrine and stove construction than households lacking such skills. This hypothesis was not confirmed by the present results, since participation was not found to be related to construction skills.

Productive Persons in Household. Persons between ages 12 and 50 were classified as potentially productive. It was hypothesized that the larger the number of productive persons in a household the more likely that the household would participate in the active practices. The number of productive persons per household was not found to be related to participation in the practices.

Attitude Toward Work in Teams. Attitude toward work in teams appeared not to be related to participation in any of the practices.

Economic Condition. Indications of the relative economic condition of the people in the various towns are shown in Table 1, p. 12. The towns did not differ significantly on any of the measures

employed in this study. Although participants usually scored higher on the various economic measures, e.g., more rooms per house, larger property, extra facilities in homes, there were no significant differences between participants and non-participants.

Exposure and Reactions to Campaign

A series of control questions was asked about the extent of exposure and the perceived appeals of the campaigns in the different towns, to determine whether gross disparities in these factors had violated the essential message comparability of the different experimental treatments. This set of items covered awareness and specific knowledge of the campaigns, extent of listening to the project radio broadcasts, and positive or negative reaction to any aspects of the campaigns.

Awareness and Specific Knowledge of Campaigns. The towns differ in the percentages of householders who reported that they had heard of the campaign. In the Radio Town 88% and in the Mixed Town 92% of the householders reported an awareness of the campaign. In the Audio-Visual Town, however, only 74% reported such an awareness. The difference between the Radio and Mixed Towns combined and the Audio-Visual Town is statistically significant. In all three towns, and for each practice, more participants than non-participants had heard of the campaigns (see Table 25, p. 79). When the three towns are combined, the differences in awareness between participants and non-participants for stoves and marmalade are statistically significant.

Results concerning specific knowledge of some aspect of the campaign very closely parallel those on awareness of the campaign (see Table 26, p. 79). In the Mixed Town, 92% of the respondents had

% OF PARTICIPANTS AND NON-PARTICIPANTS WHO HEARD OF THE CAMPAIGN

| | Radio Town | Mixed Town | A-V Town | All Towns Combined |
|--------------------|------------|------------|----------|--------------------|
| <u>Latrine</u> | | | | |
| Participants | 100 | 94 | 91 | 94 |
| Non-Participants | 87 | 92 | 68 | 83 |
| <u>Stove</u> | | | | |
| Participants | 98 | 94 | 95 | 96 |
| Non-Participants | 91 | 91 | 67 | 79* |
| <u>Marmalade</u> | | | | |
| Participants | 95 | 100 | 100 | 97 |
| Non-Participants | 84 | 90 | 70 | 81* |
| <u>Vaccination</u> | | | | |
| Participants | 93 | 92 | 81 | 89 |
| Non-Participants | 79 | 93 | 66 | 78 |

Table 26

% OF PARTICIPANTS AND NON-PARTICIPANTS WHO REPORT KNOWLEDGE OF CAMPAIGN

| | Radio Town | Mixed Town | A-V Town | All Towns Combined |
|--------------------|------------|------------|----------|--------------------|
| <u>Latrine</u> | | | | |
| Participants | 100 | 94 | 100 | 98 |
| Non-Participants | 83 | 92 | 65 | 81 |
| <u>Stove</u> | | | | |
| Participants | 100 | 94 | 96 | 97 |
| Non-Participants | 74* | 91 | 67 | 77* |
| <u>Marmalade</u> | | | | |
| Participants | 100 | 100 | 91 | 99 |
| Non-Participants | 77* | 90 | 71 | 79* |
| <u>Vaccination</u> | | | | |
| Participants | 94 | 92 | 81 | 90 |
| Non-Participants | 67* | 93 | 66 | 74* |

*The difference between participants and non-participants could occur by chance once in approximately 1,000 times.

specific knowledge, in the Radio Town 85%, and in the Audio-Visual Town only 74%. Again, significantly more people in the towns with radio had specific knowledge than in the Audio-Visual Town. For most of the practices, participants in the Radio and Audio-Visual Towns almost invariably mentioned some specific item of information, while considerable numbers of non-participants were unable to do so. In the Radio Town, the difference is statistically significant for all practices but latrine construction. In the Mixed Town, approximately the same percentages of participants and non-participants knew something of the campaigns. The overall difference between participants and non-participants is statistically significant for all practices except latrine construction. (For this practice, the difference could be expected to occur by chance once in about 250 times.)

Exposure to Project Radio Station. In the Radio Town and in the Mixed Town 83% and 93% of the respondents, respectively, reported listening to the project's broadcasts; in the non-radio town, 43% said that they had heard the broadcasts. In the Radio and Mixed Towns, 79% of all respondents reported that they listened to the broadcasts more than one hour per day. In the non-radio town, 31% reported that they listened to the project's broadcasts more than an hour per day. In all three towns participants listened to the project's broadcasts more often than non-participants, but the overall difference between the two groups was not significant. In the Radio Town, however, listening is significantly related to participation in the stove and marmalade practices.

Aspects of the Campaign Reported Liked and Disliked

The householders were asked two open-ended questions on the aspects of the campaign they liked or disliked, chiefly as a way of determining whether there were major differences between the radio broadcasts and the audio-visual presentations. No single aspect of the campaign was either liked or disliked by any large percentage of respondents. In all three towns approximately 40% of the respondents reported that they liked everything and approximately 20% reported that they liked nothing. Although more participants reported that they liked everything than non-participants, the difference was not significant. Responses to the question on features that were disliked proved even more fruitless. Between 84% and 88% of the respondents in the three towns reported that they disliked nothing.

DISCUSSION

The chief purpose of the experiment was a practical one -- to determine the relative effectiveness of three feasible modes of communication as they might be used in development programs. In general, each of the three experimental treatments was found effective in motivating people to participate in a community development campaign. The people in all three experimental towns made significantly more decisions to act than those in the control towns. A total of 139 households in the experimental towns made decisions to volunteer 1050 man-days of labor (7.5 days per household) and to spend 4,810 sucres on 233 projects. In addition, 797 of these townspeople were vaccinated in a period of a few days.

It should be noted that the four practices advocated in the experiment represent important social changes in these communities and that there was little prior interest in them. Yet, as a consequence of the campaigns, large segments of the populations of the experimental towns were motivated to spend their very limited funds and to devote time and effort to the practices advocated. The objective results clearly testify to the efficacy of the various media of communication used in this research in motivating people and to the potentialities of such media for inducing action in community development programs elsewhere.

Prior research on media comparisons, e.g., Wilke (23), Lazarsfeld, Berelson and Gaudet (13), Katz and Lazarsfeld (11), Emery and Oeser (7), led to the point made by Klapper (12) and reiterated by Katz (10) that the search for the one most influential medium may be fruitless and that different media may have different uses in varying social and psychological

circumstances. The present findings tend to confirm this view. No one medium was generally better than the others in all circumstances. Rather, one was apparently more suitable for certain purposes and certain circumstances while another was better because of different situational factors.

We shall try to explain the basic findings in terms of the social and psychological circumstances inferred from interviews with the townspeople. In particular we shall discuss the interactions among such factors as the amount of exposure to the messages, the relative costs of participating in the various practices, the perceived inherent rewards of the practices, the possible competitiveness of the media, and some personal characteristics of the townspeople. The practical implications for the use of the various media in different situations should be treated cautiously, since beyond the basic conclusions, the explanations are usually based on relationships among subjective data or between objective and subjective data. Wherever possible, explanations involving subjective data should themselves be tested experimentally before substantial commitments are made to one communications mode or another in development campaigns.

While the experimental treatments were almost equally effective in motivating participation in community activities, they differed in the types of action and effort they induced. The audio-visual media were more effective than radio alone or mixed with other media in motivating people to undertake the largest and most costly practice, the building of latrines. Conversely, the Radio Town engaged more frequently in the smaller practices (stoves and marmalade) than the Audio-Visual Town. In general, the Mixed Town fell between the other two. The net effect of this pattern of participation in the Mixed Town was that its total effort equalled those of the other experimental towns but its effort on certain practices tended to be more like the Radio Town and on other practices more like the Audio-Visual Town.

It is possible, particularly in view of the findings from the Mixed Town, that each town undertook as much as it could afford in response to persuasive methods. If true, this would suggest that there may be a fixed limit to the amount of effort and money which any area or community can allocate to social change in a given time span. It must be remembered that the people were asked to participate in four practices, three of which took considerable time and funds. The three towns participated equally in terms of money and labor, and lack of money was cited more often than any other reason for not participating. Moreover, approximately the same percentages in each town cited this reason, and much greater percentages in each town were vaccinated (at no cost) than participated in the other practices. The results, while not conclusive on this point, suggest that groups of people can or will undertake only a finite amount of new investment and activity in a given period of time, regardless of the amount or type of campaigning which is conducted.

The various communications media probably influenced the two sexes differently. Radio was clearly more influential in stimulating participation by women. Eighty-four of the 98 active practices undertaken in the Radio Town (excluding vaccination) were undertaken by women. Furthermore, 70% of the money spent in the Radio Town was on women's practices, while only 36% of the money in the Audio-Visual Town was spent on such practices. In the Mixed Town, the expenditures were more equally distributed between men's and women's practices. This pattern of expenditure is similar regardless of the measure used -- number of projects, cash outlay, or labor value.

The patterns of exposure were probably different for the different media. Theoretically, one of radio's inherent advantages lies in its potentially great coverage. This advantage was realized in the present study. Quite probably radio reached and influenced the women in the two

radio towns more than the men because they were at home more often during the daily broadcast periods. In the Audio-Visual Town, it is also probable that many of the women were prevented by their domestic duties from attending the showings and demonstrations and, therefore, relatively more men than women in this town were exposed to and influenced by the campaign. Probably the almost equal distribution of effort in the Mixed Town reflects a more equal exposure of both men and women to the campaign. Neither sex in this town participated as heavily as their counterparts in either of the "unmixed" towns.

Differential exposure to the media probably explains the differences in results only in part. It may be that radio was less able to motivate people to undertake investments in the most costly and extensive practice, latrine building, because the investment in a venture whose outcome they could not clearly visualize was too great to risk. The less costly and time-consuming stoves and marmalade may have appeared more feasible because of the relatively smaller risks involved. Such conjecture is supported by the finding that more men's teams were formed in the Radio Town than in either the Mixed or Audio-Visual Towns, yet fewer of these teams actually built latrines than those in the other two towns. The teams may have been formed initially in the Radio Town before the men realized how formidable a task faced them; they then did not carry through when they realized that they had undertaken a major project and could not see clearly its exact implications. The demonstrations of latrine building that were held in both the Mixed and Audio-Visual Towns may have actually discouraged certain potential latrine builders, while encouraging certain others by showing that the practice, though a difficult one, could be accomplished with concerted effort. It is likely that the greater flexibility inherent in the audio-visual mode, the ability to deal with negative attitudes, was instrumental in inducing participation in latrine construction.

Whether radio is less effective than the other media in stimulating work on relatively large-scale undertakings or whether it is merely less effective in stimulating men to participate in any kind of project, cannot readily be determined from the present experiment because the two conditions, high costs and men's practices, were partly confounded. There was neither a low-cost men's practice, nor a high-cost women's practice offered as a choice.

It does appear, however, that radio, while less effective than the audio-visual media in obtaining participation on the largest project, was able to induce people to undertake projects of substantial magnitude as well as the smaller, less costly ones. This is shown by the fact that the construction of stoves, involving twice as much money and 15 times as much labor as marmalade, was more popular than marmalade in the Radio Town as well as in the other towns, and by the fact that significantly more stoves were built in both the Radio Town and the Mixed Town than in the Audio-Visual Town. Thus, there is some evidence that the difference in participation found between the Radio and the Audio-Visual Towns may be due more to a sex difference in exposure than to an inability of radio to gain cooperation on large-scale projects.

It had been hypothesized that the less costly the practice, the larger would be the number of persons participating in it, regardless of media. In general the hypothesis was confirmed, but not without exception. As hypothesized, more people participated in the free practice vaccination, than in any other, and the fewest participated in the most expensive practice, latrine construction. More people built stoves, however, than made marmalade, despite the greater cost of stoves. In percentage terms, 35.4% of the households in the experimental towns built stoves, while only 25.4% canned marmalade and 18.9% built latrines; 63% of all respondents were vaccinated.

The greater number of stove participants than marmalade participants perhaps can be attributed to the difference in perceived benefits of the two practices. There are more intrinsic rewards perceivable in eliminating smoke from one's home than in eating marmalade, and it is likely that this was the factor which overcame the disparity in costs. Such an interpretation is supported by the finding that of all the practices in the campaign, only stoves were cited by substantial numbers of respondents as a change that would be beneficial to one's self and family. The making of marmalade was probably the second most immediately rewarding practice. Although of less importance to the people than the smokeless stove, marmalade would be immediately sampled and, if properly prepared, judged as rewarding.

The rewards of latrine and vaccination were not as clearly perceived. The ultimate benefits of latrines are greatly delayed and not observable. These benefits, and the benefits from vaccination, have to be taken on faith. Yet, vaccination, without a readily discernible reward, was participated in most frequently by all townspeople. The lack of cost and promise of future reward may explain the popularity of vaccination -- the people were getting little, but at no cost. Low cost with low but immediate return, may have accounted for the intermediate position of marmalade. Moderate cost with high return may have been the operative relationship with regard to stoves. High cost with low immediate return, and only the ill-perceived promise of future reward, may account for latrines being the least frequently chosen practice.

If such motivation "equations" are valid, it may always be necessary to supplement the influence of mass communication media with the relatively greater influence inherent in direct face-to-face communication in order to overcome such a generally unattractive "equation" as that represented in this campaign by latrines. Face-to-face communication

was present in the demonstrations and personal discussions that were held in both the Audio-Visual and Mixed Towns. It may be, therefore, that to gain a difficult end in community development programs, a greater investment in face-to-face communication may have to be made even though fewer persons will be reached (relative to radio) on a fixed communications budget.

Contrary to expectations, the results in the Mixed Town almost always fell between those for the Radio Town and the Audio-Visual Town rather than above either of them. It was expected that more households in this town would participate and that the amount of participation per household would be greater since its townspeople were exposed both to radio and audio-visual campaigns. But only in the percentages of persons vaccinated do the results in the Mixed Town exceed those in the other towns by a substantial (but not statistically significant) figure. There is clear evidence that the Mixed Town did in fact receive greater exposure to the campaign. Larger percentages of both its participants and non-participants were aware of and had specific knowledge of the campaign than those in the other towns, and a greater number of campaign sources were cited for each of the practices in this town than in the other towns.

It is possible that the campaign appeals reached levels of saturation in the Mixed Town and further appeals, regardless of media, were ineffective. Generally, when more media were employed in one place, fewer people mentioned each one as a source of information or influence than when fewer media were used. With few exceptions, more persons in the Audio-Visual Town cited the non-radio media than in the Mixed Town. For example, 71% of the participants in the stove-building practice cited photographic slides as a source of information in the Audio-Visual Town as compared with 24% in the Mixed Town, and more people in the

Audio-Visual Town than in the Mixed Town cited the various non-radio media as most influential in their decision. Thus, it appears that in the Mixed Town the presence of radio tended to suppress either the operation of the other media or the mentioning of them in post-campaign interviews. Similarly, the operation of the other media may have suppressed the power of radio since consistently slightly smaller percentages of participants in the Mixed Town than in the Radio Town cited radio as one of their sources of information. Furthermore, although approximately 75% of the participants in the various practices in the Radio Town reported that radio was most influential in decisions to participate, only approximately 50% cited radio in the Mixed Town.

Although we cannot conclude firmly on the basis of the foregoing evidence that a communications saturation level had been reached in the experimental towns, the possibility must be seriously entertained since, as a practical matter, development programs might overuse communications. More may be spent on informational campaigns than is either necessary or desirable. Too much propaganda may desensitize people to its messages and may reduce participation when it goes beyond an optimal point for a particular population. It is also possible that the extent of the Mixed Town's participation fell between that of the other two towns because its economic potential was split almost equally between men's and women's practices, under the influence of the audio-visual mode and the radio mode respectively, while the Radio Town put its efforts into the women's practices and the Audio-Visual Town concentrated on the men's practices.

Most communications studies which have been concerned with the topic have found that the mass media are most effective in reaching and influencing the more highly educated (4), literate (20) and sophisticated (14) persons -- those who are open to new ideas, and are curious about

the wider world as well as the known and familiar (2). Such characteristics suggest various aspects of what is often considered to be general intelligence.

It was hypothesized that the more intelligent people would be more likely to seek opportunities to be informed; would be more attentive to mass media (or any other source of information); and would participate more frequently in the practices, partly because of their greater receptiveness to new ideas and partly because they could more readily appreciate the benefits of participating. Lacking direct or even specific measures of intelligence, it was predicted that the more literate, more educated persons, persons who knew more about the campaigns and who listened more to the radio, would participate more often in the various practices.

In general, the predictions were correct. More participants than non-participants were literate, more had relatively high education, and more mentioned reading specific books and periodicals. One of the most important findings concerning this issue was that radio's greatest effect was not on the illiterate and uneducated, but on the more literate and educated people in the two radio towns. This result agrees with findings from several countries indicating that people with more education listen more to the radio than less educated people.^{10/} Radio cannot be expected to circumvent the illiteracy barrier entirely, despite its potentially great efficacy.

^{10/} These findings are reported from Argentina (20), Brazil (20), Cambodia (19), India (1), Mexico (20), and the Philippines (4).

The strongest relationships between education and participation were found in regard to stove building and marmalade preparation. Results show, in effect, that the husbands of women who participated were more highly educated than the husbands of women who did not. Here, there is evidence of a complex psychological condition related to the effectiveness of communications. The householders whose families participated in the active practices may have tended to be not only better educated but also inclined to conduct their family affairs more democratically, with women's needs or wishes given considerable weight. This would be in consonance with the attitude of equality which Holmberg and Dobyn (9) postulated as operating in a truly developing society. It is also in consonance with the findings by Emery and Oeser (7) that on more progressive farms the wives and children participate more in farm matters.

Emery and Oeser (7) formulated succinctly the idea that among members of an agrarian community, knowledge must be achieved and tested by personal practice and experience and transmitted by face-to-face communication, whereas in an urbanized culture, knowledge is accepted as being publicly held and testable and transmitted by impersonal means such as books and teachers who are remote. A concept akin to this may explain why the less educated people of the Audio-Visual Town participated in building latrines almost as heavily as the more highly educated people. It may well be that the less educated individual, like the more rural, needs visual demonstrations and perhaps personal involvement with other people to be convinced that an innovation is desirable and worthwhile. Consequently, the audio-visual media, with their greater personal involvement between project staff and townspeople, were better able than radio to induce action in persons who "needed to be shown."

Fairly consistently over the years researchers have found that innovators or early adopters of new practices differ in their communications behavior from late adopters, e.g., Ryan and Gross (18), Menzel and Katz (16), Emery and Oeser (7), Fisk (8), Deutschmann and Fals Borda (5). The present findings confirm such a difference. Not only did more participants than non-participants listen for longer periods to the project's radio broadcasts, but participation was even more strongly related to listening to other radio stations. Thus, it appears that the persons who were most influenced to undertake the various practices were information seekers. It is difficult to determine from the available data, however, whether those who participated did so because they encountered more ideas; because they came into contact with the ideas promoted by the campaign more frequently; because they were generally more progressive in attitude; or because they were more readily able to perceive the immediate and long-range benefits of participation. Perhaps each of these factors operated with different individuals; perhaps all operated in various combinations.

Responses to questions on respondents' values and aspirations shed some light on the psychological differences between participants and non-participants. Although in only very few cases were there statistically significant differences between the two groups, there was an almost invariable tendency for more participants to reply in definite terms about changes they desired for themselves, for their towns, and for Ecuador and what they would do with lottery winnings. It is difficult to determine whether this is a further indication of their greater intelligence or whether this represents a motivational state more or less independent of intelligence. Such a state might exemplify van der Kroef's notion of "a certain degree of individual or collective acquisitiveness (which is) indispensable to the success of....economic development schemes (22)" or Lionberger's point that dissatisfaction is necessary if change is to come about (15).

Another piece of evidence points strongly to a desire for change on the part of participants. In the Radio and Audio-Visual Towns, substantially more participants than non-participants reported that they wanted their sons to become members of a profession. In the Mixed Town, substantial numbers of both participants and non-participants indicated this same sort of aspiration, a finding which tends to confirm the general impression that the Mixed Town was somewhat more "modern" than the other two. Aspiring for one's children to be "professionals" is clearly an indication of a desire for change, since none of the people are now professionals.

It has generally been found that early adopters are wealthier than late adopters, e.g., Lionberger (15), van den Ban (21), Bose (3), Ryan and Gross (18), Rogers (17), Deutschmann and Fals Borda (5). Although the interviewers and analysts in this study gained the strong impression that participants were wealthier than non-participants, none of the economic measures used indicated this at the established statistical level. However, participants fairly consistently owned property, lived in houses with more rooms and more facilities, such as halls and separate kitchens, and tended to be merchants, craftsmen, or farmers rather than domestics or unskilled laborers.

There was not a sensitive enough measure of property size to permit direct comparisons of the findings with those of Deutschmann and Fals Borda (5) and Rogers (17). However, it appears (though not significantly) that participants tended to have more property. One clear finding is that latrine builders were almost invariably home owners and that stove builders and marmalade makers were usually home owners. However, since renters would not be expected to make permanent major improvements in landlords' property, home ownership may not be a suitable index of more general economic factors that may have influenced participation.

As has generally been found in communications studies since the initial identification of the two-stage flow of communications by Lazarsfeld, Berelson and Gaudet (13), mass or impersonal communication was intimately bound up with personal communication in the present study. Participants discussed the practices with others to a considerable extent. The post-campaign interviews were not sufficiently probing to determine directly whether decisions to participate in a practice led to talking to others, or whether talking to others influenced the decision. The relevant findings are:

1. neighbors were almost never cited as the most influential source in decisions to participate;
2. neighbors were cited as a source of information least often in the Radio Town, where participation and talking to others about a practice are strongly related; and
3. neighbors were cited as a source of information most often in the Audio-Visual Town, where membership in an organization is most strongly related to participation.

The first two findings suggest that the decision to participate led to talking to others, and the third suggests that talking led to participation. It is possible that in the Radio Town people talked with others after an interest had been aroused by the radio, whereas in the Audio-Visual Town other townspeople served to arouse interest to a substantial degree. In the Mixed Town probably both processes operated.

Lerner (14), Dobyns, Monge and Vasques (6), and others report that mobility is related to the adoption of innovations. Generally, persons who returned to their villages or people who travelled more or less routinely, have been found to have more progressive attitudes or less traditional ideas. This is not confirmed in this study. Participants

did not travel more extensively or more frequently than non-participants. Moreover, there was no difference between the two groups in length of residence at their present locations or in expressed desire to move to new locations. It should be recognized that the towns in this study are probably not as isolated and remote as some of those in which mobility has been found to be a factor in progressiveness.

Effectiveness of Radio

Although the study was concerned with two major modes of communication and their combination, there was a very practical interest in the effectiveness of radio because of its potential ability to overcome the almost insurmountable cost barrier in disseminating information to isolated people. One may ask, aside from all other considerations, how well radio worked. That the experiment provided a good test of the efficacy of radio as a source of influence in an Andean town, is indicated by the fact that virtually all contact between the project staff and the Radio Town was by radio, and the responses of the householders in this town indicated that there was very little influence other than radio in the town. Only one or two persons in the entire town mentioned other media as sources of information, influence or instruction.

Both objective and subjective results show the effectiveness of radio. Objectively, more individuals made decisions to participate in the Radio Town than in the Audio-Visual Town; as much money was spent per household in the Radio Town as in the other towns; each participating household undertook a greater number of projects, and a larger percentage of the households undertook three or all four of the practices than in either of the other towns.

The subjective results also point to the effectiveness of radio. In the Mixed Town where people were exposed both to radio and to other media, the largest percentages of the respondents reported radio as a source of information for the practices when they might have reported any of the other media. This does not imply necessarily that the other media were not sources of information -- they may well have been -- but radio was mentioned as the source far more often than any others.

A more sensitive indication of the effectiveness of radio lies in the contrast between the number of participants and non-participants who cited it as a source of information about the various practices. Thus, in all three towns, including the one in which radios were not distributed to each household, participants reported radio as a source of information about practices more often than did non-participants.

The lack of experimental purity in the Audio-Visual Town, where a few people already had radios before the study was undertaken, becomes an advantage in considering the effectiveness of radio. The special effect of the distribution of radios to the households, which may have been operating to make radio the consciously perceived source of information in the two towns where radios were distributed, could not be operating in the Audio-Visual Town. The people were given no radios, yet a very considerable proportion of those who participated actively in the practices said that they heard of them by means of radio although they presumably had greater opportunity to hear about the practices through the non-radio media actively employed in this town. Thus, although there were only seven radios in the town and only 27% of all householders reported hearing of stoves through radio, 52% of those who actually built stoves reported that radio was a source of information, while only 19% of those who did not build cited radio as a source. For latrines, 41% of the builders cited radio, while only 24% of the non-builders cited radio as a source of information.

The results from the Mixed Town also tend to support the effectiveness of radio. Almost all active participants mentioned radio as a source of information, while no more than 53% of the participants reported any other medium as a source. Radio was cited by a greater percentage of participants than non-participants in each practice.

In the two towns that had radios distributed, radio was reported in both as the most influential medium in decisions to participate in each of the practices. In the Radio Town, as could be expected, overwhelmingly large percentages cited radio as the most influential medium, and practically no one cited any other source. In the Mixed Town, the results are most illuminating. From 45% (stoves) to 66% (vaccination) of the participants cited radio as the most influential source. In contrast, the next highest medium cited as most influential was movies (29% by latrine builders). All other media were mentioned less frequently regardless of the practice involved.

Despite its general effectiveness, two reservations must be made concerning radio. First, it was less effective in obtaining participation in the largest of the practices (or the men's practice). Second, it was probably somewhat less effective as a medium of detailed instruction than the audio-visual media. Neither of these reservations should be taken as highly limiting to the general conclusions about the effectiveness of radio communication. They imply only that fewer persons were motivated on one practice and fewer were properly instructed on certain practices by radio than by means of the other media. Radio was effective in both motivating and instructing some people about these practices in addition to the many who were motivated to participate in the other practices and who were effectively taught about them.

Conclusions

On the basis of the findings and discussion, certain general conclusions appear to be justified:

1. A systematic information campaign is more effective than no directed campaign in inducing participation in community development practices.
2. The radio mode and the audio-visual mode are each superior to the other for certain practices.
 - a) Radio is especially suitable for inducing women to undertake both cooperative and individual practices which have relatively low costs and easily perceived benefits.
 - b) Radio is especially suitable for inducing people to participate in free public health practices, such as immunization.
 - c) The audio-visual mode is most suitable for inducing men to undertake cooperative construction practices involving relatively high costs and deferred benefits.
3. Although it is more costly than either mode alone, a combined radio and audio-visual mode is moderately suitable to all types of practices.
4. Certain media in the audio-visual mode (demonstrations, movies, slides) are more effective in giving instructions about specific procedures than the radio mode.
5. Among homogeneous groups, regardless of communication mode, there appears to be a similar economic limit to efforts made during a particular period of time in response to development campaigns.

6. Regardless of communication mode, participation is associated with education, literacy, social interaction, and greater interest in mass media (other than the project's).
7. The radio mode is more influential with literate and better-educated people than with others.

APPENDIX A

DESCRIPTION OF VACCINATION PERIOD

The vaccination team was composed of two persons, a nurse and a sanitary inspector, from the Public Health Dispensary of Cotacachi:

Starting from the third week of the campaign, these two persons went to each town in the study.

The vaccination period lasted three weeks, from February 4 - 23, 1963, starting at eight o'clock in the mornings, from Monday to Saturday. They were able to spend around ten hours a day vaccinating the townspeople.

The vaccination calendar was rotated for each town to avoid time differences in the treatment. The schedule calendar was as follows:

| <u>First week</u> | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------------------|--------|---------|-----------|----------|--------|----------|
| Cuicocha | X | X | | | | |
| San Jose | | | X | X | | |
| Imantag | | | | | X | X |
| <u>Second week</u> | | | | | | |
| Cuicocha | | | | | | X |
| San Jose | | | | | X | |
| Imantag | | | | X | | |
| El Ejido | | | X | | | |
| El Punge | | X | | | | |
| Anrrabi | X | | | | | |
| <u>Third week</u> | | | | | | |
| Cuicocha | | X | | | | |
| San Jose | X | | | | | |
| Imantag | | | X | | | |
| El Ejido | | | | X | | |
| El Punge | | | | | X | |
| Anrrabi | | | | | | X |

APPENDIX B

BROADCASTING TIME-TABLE

During the first two weeks of the campaign, the time-table for broadcasting was as follows:

| | |
|------------|--|
| 5:45 a.m. | Greetings, Ecuadorian music |
| 6:00 | Andean voices (music) |
| 6:15 | News of the campaign |
| 6:30 | General news |
| 6:45 | Ecuadorian music |
| 7:00 | What should be done (motivational materials) |
| 7:30 | General news |
| 7:45 | Ecuadorian musical groups |
| 8:00 | School of the Air |
| 8:45 | Pan-American music |
| 9:00 | End of the first broadcasting period |
| <hr/> | |
| 11:00 | Greetings, Ecuadorian music |
| 11:15 | P.I.C. Reporting (news of the campaign) |
| 11:30 | Perez Family |
| 12:00 | National melodies |
| 12:15 p.m. | Our Land |
| 12:45 | International music |
| 12:50 | End of the second broadcasting period |
| <hr/> | |
| 5:00 | Greetings, Ecuadorian music |
| 5:15 | Ecuadorian Music Book |
| 5:30 | El Compadre Jorge |
| 6:00 | Music |
| 6:30 | Perez Family (same program) |
| 7:00 | Pan-American music |
| 7:30 | Our Land (same program) |
| 8:00 | End of the third broadcasting period |
| <hr/> | |

During the last seven weeks of the campaign, the time-table for broadcasting was as follows:

| | |
|------------|---|
| 6:00 a.m. | Greetings, Ecuadorian music |
| 6:15 | Andean voices (music) |
| 6:30 | General news |
| 6:45 | Music |
| 7:00 | The work for today (instructions to groups) |
| 7:30 | General news |
| 7:45 | Music |
| 8:00 | School of the Air |
| 8:45 | International music |
| 9:00 | Instructions from Home Economic Agent and/or Sanitary Engineer |
| 10:00 | Music |
| 10:15 | El Compadre Jorge |
| 10:45 | Music |
| 11:00 | News of the campaign |
| 11:30 | Music |
| 12:00 | Our Land |
| 12:30 p.m. | Pan-American music |
| 12:50 | End of the first broadcasting period |
| <hr/> | |
| 3:00 | Greetings, Ecuadorian music |
| 3:15 | The Home Economic Agent with you (instructions to groups) |
| 3:45 | Music |
| 4:00 | Recommendations to groups on practices (with Quechua translations) |
| 4:45 | Music |
| 5:00 | El Compadre Jorge |
| 5:30 | Our Land |
| 6:00 | Sanitary Engineer and/or Home Economic Agent |
| 6:30 | Evening melodies |
| 6:45 | Perez Family |
| 7:15 | Music |
| 7:20 | End of the second broadcasting period |
| <hr/> | |

APPENDIX C

AUDIO-VISUAL EQUIPMENT

Filmsound Projector, 16mm. with cover, microphone, tube replacement kit, and fuses.

Versatol Projection Screen.

Viewlex V-22 Filmstrip Projector.

Revere 505-S Slide Projector, with 5" & 7" lenses & 6 trays. 16mm. film splicer.

Spare Projection Lamps, and Presstape for film.

G.E. Gasoline Electric Generator 2.5KW, 120V, 60 cys AC, with carrying frame.

300 watts Acme Variable Voltage adjuster.

ATR Inverters, 12V DC - 110V AC 250 watts.

Emico Voltage Testers.

Weatherproof Speakers, BLC.

Cable for Speaker.

Transistorized Amplifier, BT-25, 12V DC.

Transcription Player, e-speed, 110V, 60 cys.

Dynamic microphones, floor & desk mike stands and two gooseneck connectors.

Mixer Preamplifier MX-6, 110V, 60 cys.

Adj. voltage transformer, 12 amps 115V input, 0-270V output, types 3020B.

Power extension cords; 2 10ft., 2 50ft.

Speaker Support Platform.

Revere Tape recorders, Model 202, 110V, 60 cys.

Portable Tape recorder, Battery & AC.

Mixer for Revere recorders & earphones (2).

Magnetic tape eraser, magnetic tape splicer.

Magnetic recording tape, 1800 ft., Audio 1861.

Magnetic recording tape, 600 ft., 651-B.

Plastic reels, 5", reel labels, & leader tape.

Records: Latin American music, International music, selected music & sound effects.

Motion Pictures (Spanish, Optical, 16mm.): "Hookworms," "Prevent Dysentery," "Constructing a Sanitary Pit," "Planning for Good Eating," "The Land Must Eat,"

Film for Black & White, and for color. Paper & chemicals.

Radio Transmitters, 500 watts output, Antenna L-type, five channel panel, microphone and adjustable voltage transformer.

APPENDIX D

INTERVIEW SCHEDULE

| Name | Age | Years of School | Occupation | Smallpox Vaccination? |
|------|-----|-----------------|------------|--------------------------|
|------|-----|-----------------|------------|--------------------------|

1. How many years have you lived here?
2. Have you heard of the Campaign for Environmental Improvement?
3. About what aspect of the campaign?

ABOUT LATRINES

4. Were you interested in latrines before the campaign?
5. During the campaign, by means of which media did you hear of latrines?

| | |
|----------------|--------------|
| Demonstrations | Publications |
| Exhibitions | Posters |
| Radio | Films |
| Neighbors | Others |
6. Did you build a latrine?
7. Why (did you) or (did you not) follow the recommendation?
8. Which of the media most influenced your decision to follow the recommendation (to build a latrine)?
9. Which of the media do you believe served best to instruct you in how to build the latrine?

ABOUT STOVES

10. Were you interested in stoves before the campaign?
11. During the campaign, by means of which media did you hear of stoves?

| | |
|----------------|--------------|
| Demonstrations | Publications |
| Exhibitions | Posters |
| Radio | Films |
| Neighbors | Others |
12. Did you build a stove?
13. Why (did you) or (did you not) follow the recommendation?
14. Which of the media most influenced you to build a stove?
15. Which of the media do you believe served best to instruct you in how to build a stove?

ABOUT MARMALADE

16. Were you interested in making marmalade before the campaign?

17. During the campaign, by means of which media did you hear of making marmalade?

| | |
|----------------|--------------|
| Demonstrations | Publications |
| Exhibitions | Posters |
| Radio | Films |
| Neighbors | Others |

18. Did you make marmalade?

19. Why (did you) or (did you not) follow the recommendation?

20. Which of the media most influenced you to make marmalade?

21. Which of the media do you believe served best to instruct you in how to make marmalade?

ABOUT VACCINATION

22. Were you vaccinated against smallpox before the campaign?

23. During the campaign, by means of which media did you hear of being vaccinated?

| | |
|----------------|--------------|
| Demonstrations | Publications |
| Exhibitions | Posters |
| Radio | Films |
| Neighbors | Others |

24. Were you vaccinated?

25. Why (did you) or (did you not) follow the recommendation?

26. Which of the media most influenced you to be vaccinated?

27. Have you heard P.I.C. Radio? How many hours a day?

28. Have you heard other stations? How many hours a day?

29. What pleased you most about the campaign?

30. What displeased you most about the campaign?

31. How would you like to work in groups in the future?

32. What do you think would benefit you and your family most?

33. What do you want your son to be when he is grown?

34. What do you want to improve in Ecuador?

35. If you were to win a large sum of money in the lottery, what is the first thing you would do with it?

36. What would you like to be improved or developed in this area?
37. Do you go anywhere frequently?
How often? (to each place mentioned)
38. Do you visit more in town or out of town?
39. Do you travel to other cities? to which and how frequently?
for what purpose?
40. Do you like living here or would you prefer to live in another place?
41. Do you read books, reviews, periodicals or other publications?
42. Do you work at home or away from home?
at what times are you away?
43. Who is the person whom you most admire or like in this town?
44. Did you speak with anyone about marmalade, latrines, stoves or
vaccination?
45. If yes, with whom and about what?
46. Do you belong to any club, society or other organization?
47. What kind?
48. How often do you meet?
49. How many rooms do you have in your house?
50. What size is your property?
51. Do you have a separate kitchen?
52. Do you have potable water here?

| | | | | | | |
|---------|------|---------|-------|-------------|---------|-------|
| House | | Covered | Earth | | | With |
| Painted | Hall | Floor | Floor | Electricity | Windows | Glass |

EXTRA FACILITIES

Reading ability

Good Fair Bad None

This concludes the interview; many thanks for your cooperation.

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