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# The County Extension Agent And His Constituents

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# THE COUNTY EXTENSION AGENT AND HIS CONSTITUENTS[1]

EVERETT M. ROGERS and HAROLD R. CAPENER[2]

## SUMMARY

New farm technology is very important to modern farmers. The county Extension agent is an important communication channel through which farmers learn about new farm practices. Some farmers have a great deal of contact with their county Extension agent, and others have none.

The major purpose of this publication is to report the characteristics of farmers who have a high and a low degree of contact with their county Extension agent. Field interviews were completed with a statewide sample of 104 commercial farm operators in 1957. An Extension Contact Scale was developed to measure the degree of contact each farmer had with his county Extension agent.

The major findings may be summarized as follows:

1. Farmers perceive the county Extension agent as their most important single line of communication with agricultural scientists.

2. Fifty-seven percent of the respondents had no direct, personal contact with their county Extension agent during the year preceding the field interviews. Twenty-two percent had no impersonal contact (such as through mass media) of any kind in the same period of time. About one-fifth of the farmers reported no personal or impersonal contact with their county agent during the year preceding the study.

3. Farm operators who made greater use of their county Extension agent were characterized by: more education, a higher social class position, larger farms (as measured in labor requirements), higher farm

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[1]Ohio Agricultural Experiment Station Project Hatch 166, entitled: **The Communication Process and the Adoption of Farm and Home Practices in Ohio.**

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incomes, employment in off-farm work, both owning and renting farm land, readership of more farm magazines, more direct contact with agricultural scientists and VoAg teachers, higher adoption-of-farm-practices scores, earlier awareness of new farm practices, a tendency to be adoption leaders, better acquaintance with the county Extension agent, and a better understanding of the Extension Service.

4. No significant relationships were found between Extension Contact Scores and: age, venturesomeness toward new ideas, belief in agricultural magic, distance from county seat, size of farm (in acres), and length of the adoption period from awareness to adoption.

5. While almost half of the respondents reported **indirect** contact with their county Extension agent (through another farmer), these farmers tended to be the same individuals reached through **direct** contact with their county Extension agent.

6. Farmers who were visited personally by the county Extension agent made greater use of other types of Extension contact. Farm visits, however, are not generally used by county Extension agents as a means to contact the "hard-to-reach" among their constituents.

## INTRODUCTION

Farming and homemaking today are undergoing a highly accelerated rate of change as a result of new technology being developed by scientists. For example, in 1840, each farm worker produced only enough agricultural products to support four other persons. By 1920 this figure was 8, and today it is more than 25! A farmer's efficiency has doubled in the past 15 years.

Research workers in the state agricultural experiment stations and the USDA, along with commercial research personnel, have developed a vast amount of farm and home technology. Among these technological practices are: hybrid seed corn; new crop varieties; 2,4-D and other weed sprays; improved methods of soil conservation; stilbestrol, antibiotics, and other feed additives; DDT, warfarin, and other pesticides; balers, combines, hay choppers, and other farm equipment; and such homemaking practices as "miracle" fabrics, electronic ranges, frozen foods, powdered foods, improved floor coverings, and many types of household equipment.

Very little agricultural research is performed by farmers or homemakers themselves. Rather, it is completed by agricultural experiment stations, the USDA and commercial companies. The farm family has

little direct contact with the agricultural scientist. Thus, the transfer of new technology from the scientist to the farm family is a problem of **communication.**

Various governmental agencies have been established to provide an organized system for communicating, recommending and interpreting new technological changes. The essential purpose of these agencies is to communicate information about new farm ideas to farm families and to assist them in adopting those changes which seem acceptable, economical, and efficient. These agencies are called "change agencies", and their employees termed "change agents."

One of the main roles or "jobs" of change agents is to communicate new farm technology to their constituents, the farm people living in their assigned area of work.

Ideally, the change agent would have either: (1) equal contact with all members of his constituency, or else (2) greater contact with those constituents who have the greatest need for technological assistance. The results of previous research studies in New York, New Hampshire, Washington, Louisiana, Michigan, and Iowa indicate, on the contrary, that the people making greatest use of certain change agencies are actually the segment of the rural population who have the least need for educational assistance from the standpoint of relative economic income.

This should not be taken as a criticism of the existing policies or procedures of governmental change agencies. If only a portion of their constituency makes use of their services, the reasons may be related to a number of causes. An important reason may lie with the constituents themselves. It becomes increasingly important for change agents to know exactly who they are reaching (and who they are not) and the reasons why. These agencies may then more effectively consider procedures to involve the "hard-to-reach" among their constituents. The rule, "know your audience", is basic to both propagandists and advertisers. It is probably also good advice for change agents.

## PURPOSE

The purpose of this publication is to report the characteristics of the "users" and "non-users" of one aricultural change agency, the Agricultural Extension Service. The central concern throughout this study is upon the human relationships between the county Extension agent and his constituents.

## METHOD OF STUDY

Field interviews were completed with a random sample of farm people in the state of Ohio in 1957. Ninety sample areas were randomly selected at different locations in the state, as is shown in Figure 1. Each of these small areas was about a square mile in size. This method of sampling is called "area sampling" and is often used when a list of farmers' names is not available.


**Fig. 1.—Location of sample areas in which farmers were interviewed.**

All of the farm operators and their wives residing in each of the sample areas who met certain qualifications were interviewed. The qualifications were as follows: (1) the farmer must have operated at least 20 acres; (2) operated his present farm for at least two years; and (3) worked off the farm for pay less than 100 days in 1956. These criteria were used so as to operationally define "commercial" farmers. Part-time farmers, retired farmers, and rural non-farm residents were not interviewed.

One hundred and twenty-three farm operators met the qualifications. Interviews were completed with 104 farmers. Nineteen either refused to be interviewed or else could not be contacted after three farm visits. Each farm operator meeting the above qualifications in the state of Ohio had approximately one chance in 410 of being included in the sample. Findings from the present study can be generalized to all of the farm operators in Ohio meeting the qualifications mentioned. Although several past studies have investigated Extension contacts of farm people, only one other study has been based upon a state-wide sample.

The farmer respondents were asked how much contact they had with two important change agents, the county agricultural Extension agent and the vocational agriculture teacher. Eighty-eight of the wives of the farm operators were also interviewed. The degree of contact each farm wife had with the Extension home agent and the vocational homemaking teacher was also obtained. This present publication is mainly concerned with the farmer constituency of the county Extension agent.

## DIRECT CONTACT WITH AGRICULTURAL SCIENTISTS

A drawing called a "stimulus picture" (Figure 2) was used to help farmers express their own attitudes and perceptions of agricultural scientists. Stimulus pictures are one type of projective technique. A basic assumption with stimulus pictures is that as the respondent "projects" himself into the picture by describing what is happening, he provides data about his **own** attitudes, perceptions and experience.

The respondents were asked a series of questions about this picture of an agricultural scientist and a farmer. There was a feeling on the part of our respondents that the agricultural scientist was a "distant" person and someone with whom the farmer would have little direct contact. The respondents were asked, "How well does the farmer in the picture know the scientist?" Replies are shown in Table 1.

**TABLE 1.—Acquaintance of Farmers with the Agricultural Scientist**

| How Well the Farmer Knows the Scientist | Number of Responses | Percent |
|---|---|---|
| "I don't know" | 12 | 11 |
| "Not at all" | 30 | 29 |
| "Knows him a little bit" | 53 | 51 |
| "Knows him intimately" | 9 | 9 |
| Total | 104 | 100 |

Only a few respondents visualized any direct contact between the farmer in the picture and the scientist. This reflects the perception of the agricultural scientist as an important but a "distant" person.

The respondents were also asked whether they had any contact with agricultural experts at the Agricultural Experiment Station or The Ohio State University during the past year. Eleven percent of the respondents had traveled directly either to Wooster or to the University to secure help on a farm problem or attend a field day. These agricultural experts included research workers, teaching staff, and Extension specialists.

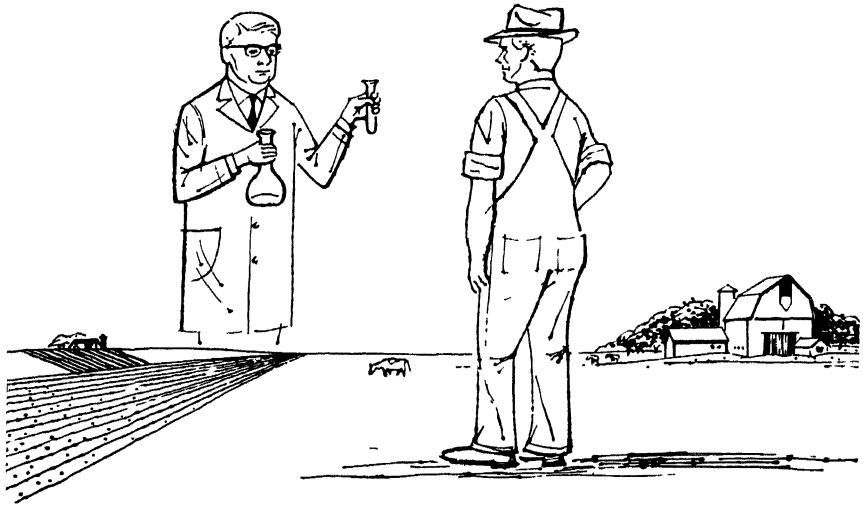

**Fig. 2.—Scientist stimulus picture utilized in the present study.**

Respondents were asked whether they knew any professors or other faculty in agriculture at the Experiment Station or the University. Twenty-one percent of the 104 respondents knew the names of at least one such person. Of these, 14 percent knew these people personally.

Farmers tend to see the agricultural scientist as someone with whom they have little contact and, in actual practice, only a portion of the farmers had any direct contact with agricultural experts.

## COMMUNICATION WITH AGRICULTURAL SCIENTISTS

Since most farmers cannot secure information **directly** from agriculture scientists, they must secure it through other communication channels. As the discussion progressed about the stimulus picture (Figure 2), the respondents were asked, "How would the farmer in the picture contact the scientist if he wished to get information?"

The channel indicated (Table 2) was mainly that of the county agricultural Extension agent or the Agricultural Extension Service.

**TABLE 2.—Means of Contacting the Agricultural Scientist for Information**

| Means of Contact | Number of Responses | Percent |
|---|---|---|
| Through Extension Service | 7 | 7 |
| Through County Extension Agent | 58 | 56 |
| Go Direct to the Scientist | 27 | 26 |
| Mass Media (Radio, T. V., etc.) | 1 | 1 |
| Other | 1 | 1 |
| Don t Know | 10 | 9 |
| Total | 104 | 100 |

Farmers tended to perceive the county Extension agent as their most important single channel of communication with the agricultural scientist. In fact, some farmers saw their county Extension agent as almost their **only** line of communication with the scientist. A typical remark was:

> The farmer in the picture would get his information from his Extension agent, I'd say. Then he [county Extension agent] gets the answers from the scientist.

This finding provides evidence of the high degree of credibility or confidence placed by farmers in the Agricultural Experiment Station–

Extension Service organization. The county Extension agent is viewed by farmers as a very vital link with agricultural scientists and their research findings.

A careful analysis of the setting in which the stimulus picture was used indicates that there was little suggestability of responses. A possible bias might have occurred if the research interviewers were somehow mistakenly connected with the Extension Service. However, the interviewers were identified early in the process as employees of the Ohio Agricultural Experiment Station. The respondents generally indicated at later points in the interview that they did not connect the interviewer with the local county Extension agent.

The findings of the present study are in agreement with the earlier findings of an Iowa study[3] in which the same questions and stimulus picture were utilized.

## PERSONAL AND IMPERSONAL CONTACT

Farmers perceive the county agent's role as an interpreter and "legitimizer" of new technological ideas in agriculture.

At its most simple level of conceptualization, the present study is concerned with the communication of new farm ideas from the county Extension agent to the farmer. A variety of communication channels are available. These channels range from the various mass media to personal visits and meetings. Some county agent-to-farmer communication is of a direct nature. Other communication is indirect through such intermediaries as other farmers.

The voluntary contact of constituents with their county Extension agent may be categorized into two classifications, **personal** and **impersonal.** Personal contact would entail a face-to-face communication with the county Extension agent, while impersonal contact would include reading or listening to mass media communications.

The farm operators were asked which, if any, of four different types of personal contact they had with the county Extension agent during the year preceding the interview. The percentage of farmers having each type of personal contact with their county Extension agent are shown in Table 3.

The number of respondents with each degree of personal contact with their county Extension agent are shown in Table 4.

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[3]George M. Beal and Everett M. Rogers, "The Scientist as a Referent in the Communication of New Technology," **Public Opinion Quarterly,** 22: 555-563, 1959.

**TABLE 3.—Types of Personal Contact with County Extension Agent**

| Type of Contact | Number of Respondents | Percent |
|---|---|---|
| Visited county Extension agent in his office or called him on the telephone | 34 | 33 |
| Attended local or county meetings, tours, or demonstrations | 29 | 28 |
| County Extension agent visited respondent s farm | 18 | 17 |
| Helped plan Extension program | 10 | 10 |

**TABLE 4.—Distribution of Extension Personal Contact Scores**

| Number of Personal Contacts | Number of Respondents | Percent |
|---|---|---|
| None | 59 | 57 |
| One | 16 | 15 |
| Two | 16 | 15 |
| Three | 8 | 8 |
| Four | 5 | 5 |
| Total | 104 | 100 |

More than half of the respondents (57%) had no personal contact with their county Extension agent during the year preceding the field interview. Only five percent had all four types of personal contact.

**TABLE 5.—Types of Impersonal Contact with County Extension Agent**

| Type of Contact | Number of Respondents | Percent |
|---|---|---|
| Watched or listened to the county Extension agent on TV or radio farm show | 69 | 66 |
| Read a circular letter, mailed announcement, or bulletin from the county Extension agent | 66 | 63 |
| Read any newspaper articles written by the county Extension agent | 59 | 57 |

The respondents were asked through which, if any, of three different types of impersonal contact they had communicated with their county Extension agent during the year preceding the interview. The percentage of farmers having each type of impersonal contact with their county Extension agent are shown in Table 5.

Farmers were more likely to have impersonal contact than personal contact with the county Extension agent. Only one of the four types of personal contact reached as many as one-third of the respondents (Table 3) while each of the three types of impersonal contact reached more than one-half of the respondents.

The number of respondents with each degree of impersonal contact with their county agent are shown in Table 6.

**Photo 1.—Farm Tours and Demonstrations Offer One Type of Personal Contact with County Extension Agents.**

**TABLE 6.—Distribution of Extension Impersonal Contact Scores**

| Number of Impersonal Contacts | Number of Respondents | Percent |
|---|---|---|
| None | 23 | 22 |
| One | 25 | 24 |
| Two | 34 | 33 |
| Three | 22 | 21 |
| Total | 104 | 100 |

Twenty-two percent had no impersonal contact with their county Extension agent. Almost an equal number (21%) had all three types of impersonal contact.

There was a tendency for the same respondents who had personal contact with their county Extension agent to also have impersonal contact (Table 7).

**TABLE 7.—Personal Contact with County Extension Agent by Those Also Having Impersonal Contact**

| Personal Contact | Impersonal Contact | | Total |
|---|---|---|---|
| | No Contact | Some Contact | |
| | Percent | Percent | Percent |
| No Contact | 21 | 36 | 57 |
| Some Contact | 1 | 42 | 43 |
| Total | 22 | 78 | 100 |

About one-fifth (21%) of the farmers in the present study had no personal or impersonal contact with their county Extension agent within the past year. Impersonal (mass media) contacts reach a number (36%) of the farmers who do not have personal contact. However, only one percent of the personal contacts reach farmers who do not also have impersonal contact.

## EXTENSION CONTACT SCALE

The overall measure of contact with the county Extension agent utilized throughout this publication is the Extension Contact Scale. This scale included both impersonal and personal types of contact with county Extension agents. The characteristics of those farmers who

have a "high" and "low" degree of contact with Extension workers may be determined by relating such characteristics as age, education, income, etc. to the Extension Contact Scores.

One point was awarded for each type of personal or impersonal contact that a farmer had with the county Extension agent in the one-year period preceding the interview. The distribution of the Extension Contact Scores is shown in Table 8.

**TABLE 8.—Distribution of Extension Contact Scores**

| Extension Contact Score | Number of Respondents | Percent |
|---|---|---|
| None | 22 | 21 |
| One | 22 | 21 |
| Two | 13 | 13 |
| Three | 15 | 14 |
| Four | 12 | 11 |
| Five | 13 | 13 |
| Six | 4 | 4 |
| Seven | 3 | 3 |
| Total | 104 | 100 |

A wide difference in the degree of contact with their county Extension agent characterized the respondents in the present study. Twenty-one percent had no personal or impersonal contact with their county Extension agent during the year preceding the interview. At the other extreme, three percent of the respondents had all seven types of Extension contact. The average Contact Score for the 104 farm operators is 2.41.

The Extension Contact Scores are the dependent variable throughout most of the present publication. If the reader is interested in a further report of the Scale's unidimensionality, reliability, and validity, he may turn to Appendix A.

## THE COUNTY EXTENSION AGENT'S CLIENTELE

The data reveal that farmers in this study had different degrees of contact with their county agent. We will now attempt to determine who among the county agent's constituents are his **clientele,** or are exposed to his educational program.

## PERSONAL CHARACTERISTICS

An analysis of the personal characteristics of farm operators having high and low contact with their county Extension agent will indicate who Extension workers are "reaching" and who they are not reaching with their program of activities.

### Educational Levels

Farmers who had completed more years of education tended to have more contact with the Extension Service. The average Contact Scores for each level of education are shown in Figure 3.

Farm operators with eight grades of schooling or less had the lowest average Contact Scores. The degree of Extension contact increased consistently with higher levels of education. This indicates that farmers who are already more highly educated, make greater use of their county Extension agent.[4]

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[4]Test of significance for each of the characteristics related to the Extension Contact Scores are included in Appendix B.

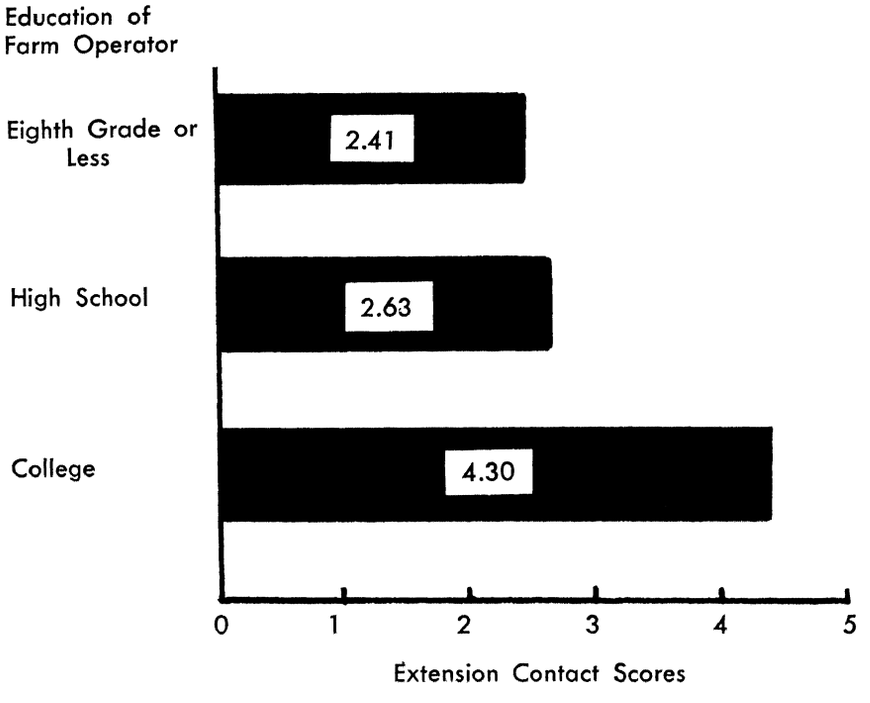


**Fig. 3.—Extension contact scores by education of farm operator.**

### Social Class

Farmers making greater use of Extension Service were also characterized by a higher social class position. Their social status was rated on a five-point scale from "very low" to "very high" by the interviewers at the conclusion of the interview. The interviewers considered the respondent's material possessions (home, farm, automobile, and other items), education, income, and community prestige or respect (from interviews with the respondent's neighbors), in making this composite rating. These factors have been found by sociologists to be the best general indicators of an individual's social class position.

The interviewers considered both the appearance of the farm home and the farm buildings in making the social class ratings. On several occasions, two interviewers each made independent social class ratings of the same farm family. A rather high degree of agreement was found between these separate ratings of the same family. "Upper class" farmers had an average of 3.4 Extension contacts while "lower class" farmers had an average Extension Contact Score of 2.0.

### Summary

Farm operators who made greater use of their county agent were characterized by more education and a higher social class position. The present analysis indicated no significant relationships between Extension contacts and age, venturesomeness (expressed by an attitude of willingness to try six hypothetical new ideas), or belief in agricultural magic (such as belief in signs of the moon or water witching).

## CHARACTERISTICS OF THE FARM ENTERPRISE

The size, efficiency, and other characteristics of the farm enterprise also indirectly reflect the personal characteristics and decision-making ability of the operator.

### Productive Man Work Units

A measure of the size of the farm enterprise is the Productive Man Work Unit (PMWU). A PMWU is the amount of labor performed by an average man in a ten hour day for production of crops, livestock, and livestock products using methods and equipment of average efficiency. As such, the PMWU is probably a more adequate overall measure of size of operation than number of acres operated. The PMWU reflects size of both crop and livestock enterprises. It is essentially an indication of the amount of labor required for a farm.

Farmers who operated farms requiring more PMWU's had significantly greater contact with their county Extension agent. This evidence suggests that operators of larger farms have greater contact with the Extension Service. Farmers with larger annual farm incomes also have more contact with their county Extension agent. However, those who operate larger farms (in acres) tended to have only slightly greater contact with their county Extension agents.

**Rental Status**

Farmers were classified on the basis of rental status into three groupings: (1) rent only, (2) own only, (3) or both rent and own. Farmers in the latter category had the greatest degree of contact with their county Extension agent and those farmers who owned all of their land had the lowest degree of contact (Figure 4).

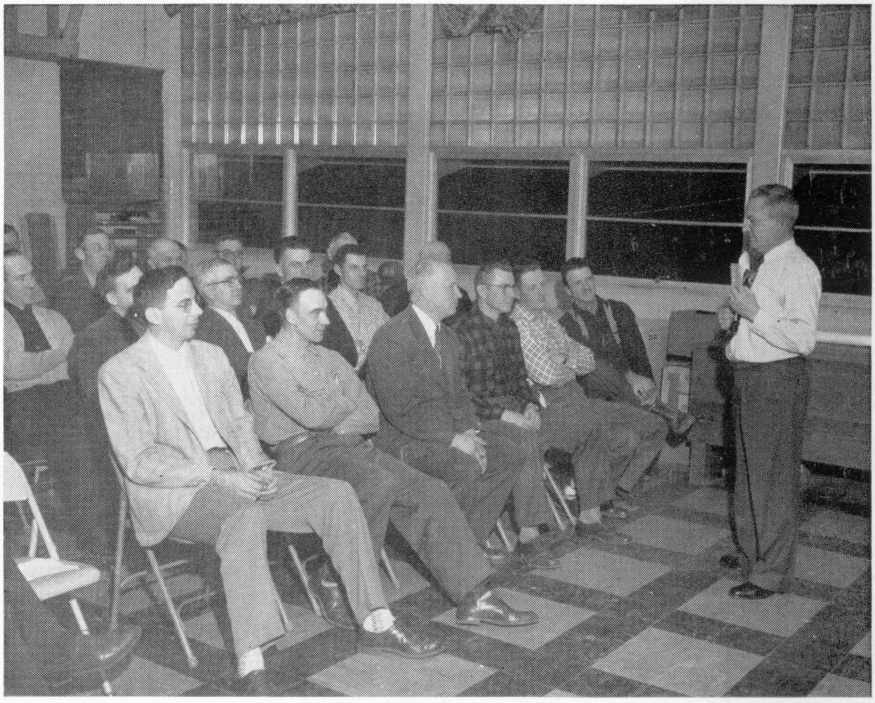

**Photo 2.—Farmers with More Extension Contacts Have More Education and Larger Farm Operations.**

## Non-Farm Jobs

The farm operators were divided into two categories on the basis of whether or not they worked off the farm for pay within the year preceding the interview. Of course, no part-time farmers (defined as operators who worked off the farm more than 100 days in 1956) were included in the present study.

Farmers who engaged in non-farm jobs proved to be higher participators in Extension activities. Their average Extension Contact Score was 3.13, compared to the 2.21 for those farmers who reported no off-farm work (Figure 5). This finding is not especially surprising as many of the non-farm jobs were for only a few months during the winter.

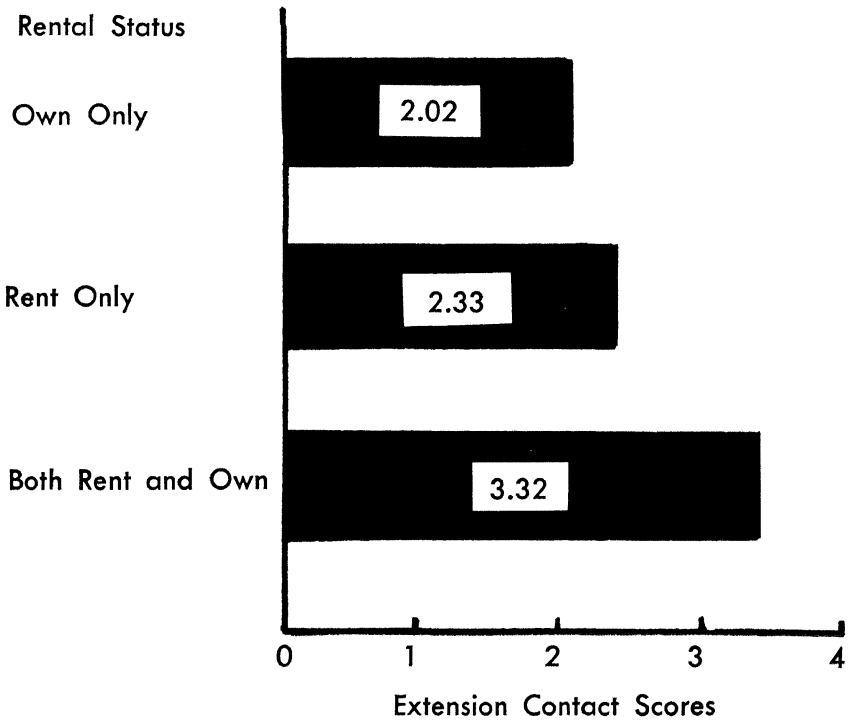


**Fig. 4.—Extension contact scores by rental status of farm operator.**

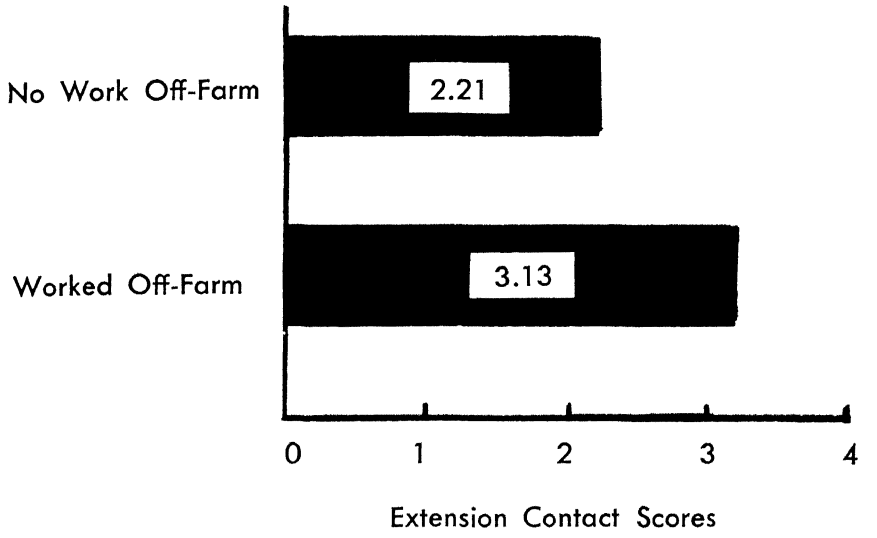


**Fig. 5.—Extension contact scores by whether farm operator was employed off the farm.**

### Distance from County Seat

It would seem reasonable to assume that farmers living in more remote sections of the county would have less contact with their county Extension agent. They might be less likely to attend Extension meetings in the county seat or to personally visit with the county agent in his office. Extension Contact Scores, however, tended to be only slightly lower for farmers residing at a greater distance from their county seat. The relationship was not significant.

### Summary

Farmers who make greater use of their county Extension agent were found to operate larger farms (as measured in PMWU's), earn higher farm income, both rent and own farm land, and work off the farm.

No significant relationship was found between Extension Contact Scores and either: (1) distance from the county seat, or (2) size of the farm in acres.

## COMMUNICATION BEHAVIOR

The findings from past research studies in other states indicate that farmers who are Extension "users" also utilize other sources of information about new farm practices. They are more likely to read farm

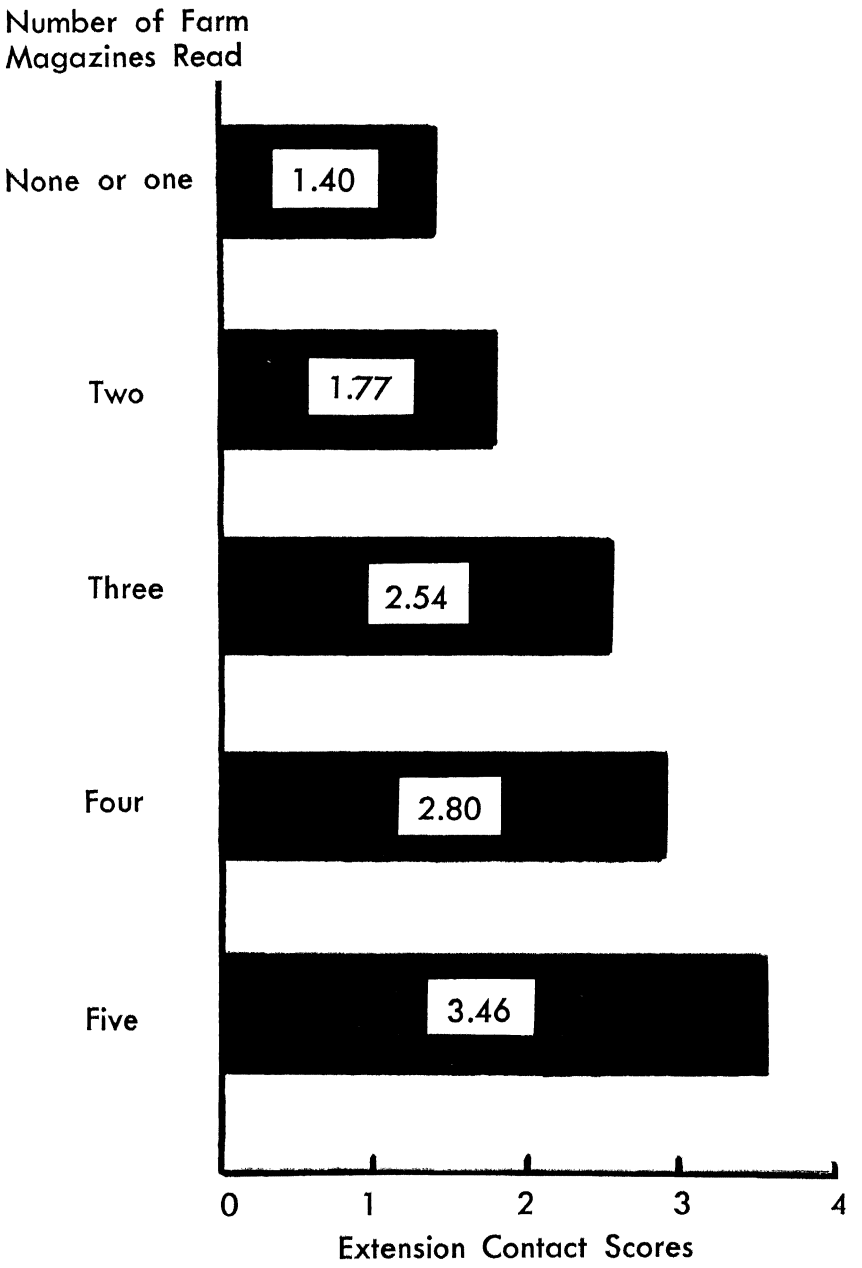


**Fig. 6.—Extension contact scores by number of farm magazines read.**

magazines, directly contact agricultural experts, and contact their high school Vocational Agricultural teacher.

### Farm Magazines

Farmers who read more farm magazines had a greater degree of contact with their county Extension agent (Figure 6).

### Contact with Agricultural Scientists

Eleven farmers in our sample made a trip directly to the Agricultural Experiment Station at Wooster or to the Ohio State University at Columbus in order to secure farm information within the year preceding the interview. These farmers who had direct contact with agricultural experts also had much more contact with their county Extension agent.

The average Extension Contact Score of farmers traveling directly to agricultural experts is 3.64 while for all other farmers, the average Extension Contact Score is 2.27 (Figure 7).

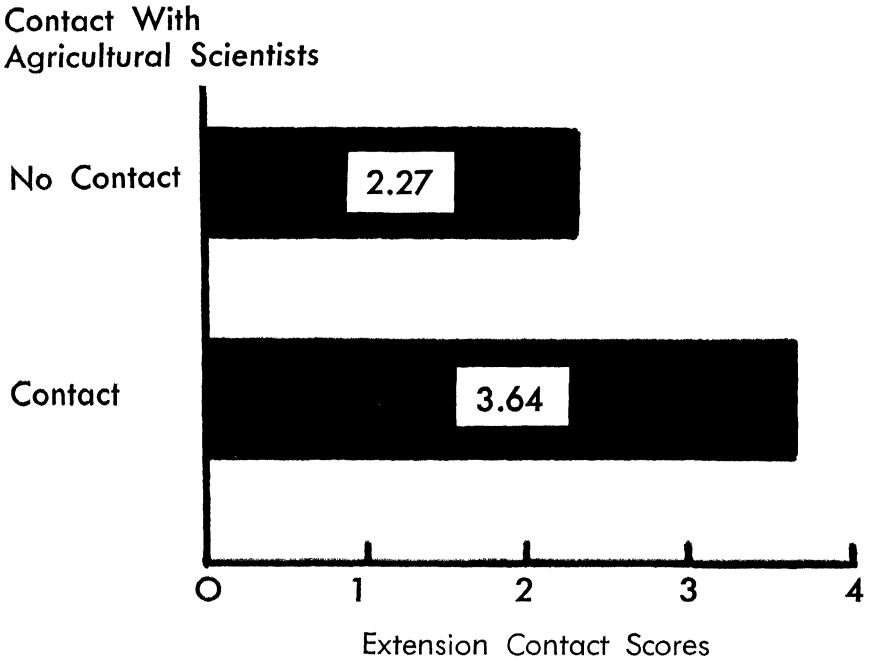


**Fig. 7.—Extension contact scores by contact with agricultural scientists.**

## Contact with VoAg Teachers

Farmers were questioned as to how many types of contact they had with their Vocational Agricultural teacher and a VoAg Contact Scale was correspondingly developed. It was similar in nature to the Extension Contact Scale and was a measure of contact with the high school Vocational Agricultural teacher.

In general, farmers had less contact with VoAg teachers than with county Extension agents. About 64 (62 percent) of the 104 respondents had no personal or impersonal contact with a Vocational Agriculture instructor in the year preceding the study. In comparison, only 21 percent had no contact with their county Extension agent. This difference is explained by the fact that: (1) many communities have no Vocational Agriculture teacher; and (2) VoAg teachers concentrate less of their efforts on adult farmers and more on high school students. Thirty-five (55 percent) of the 64 respondents with no contact with their VoAg teacher said their community had no Vocational Agriculture teacher.

Farmers who have contact with their VoAg teacher are more likely to also have contact with their county Extension agent. Correlation between VoAg Contact Scores and Extension Contact Scores is high.

There is some evidence that while the Extension Service reaches almost all of the farmers that the Vocational Agricultural program reaches, the reverse is not true. Most of the farmers not reached by the county Extension agent are not reached by their VoAg teacher either. About 18 percent of the farmers were not reached by either of these educational programs (Table 9).

**TABLE 9.—Contact with County Extension Agent by Contact with Vocational Agricultural Teacher**

| Vocational Agriculture Teacher | Contact With County Extension Agent | | Total |
|---|---|---|---|
| | No Contact | Some Contact | |
| | Percent | Percent | Percent |
| No Contact | 18 | 43 | 61 |
| Some Contact | 3 | 36 | 39 |
| Total | 21 | 79 | 100 |

## ADOPTION BEHAVIOR

The main purpose for which farmers seek technological farming information from their county Extension agent is presumably to learn about and adopt new farm practices. Therefore, we would expect knowledge about and adoption of new farm practices to be positively related to Extension Contact Scores.

### Adoption of Farm Practices

Respondents were asked whether or not they had adopted each of 25 new farm practices. For each farm practice that was adopted, the respondent was asked the date at which he had adopted it. From this data, an Adoption-of-Farm-Practices Scale was constructed.

Higher adoption scores indicated a tendency to adopt more new farm practices and also to adopt farm practices at a relatively earlier time than the other farmers in the study.

Some of the typical new farm practices in the adoption scale were: bandseeding of grasses and legumes; planting Clintland oats variety; using 2,4-D weed spray; feeding antibiotics to swine; raising hybrid

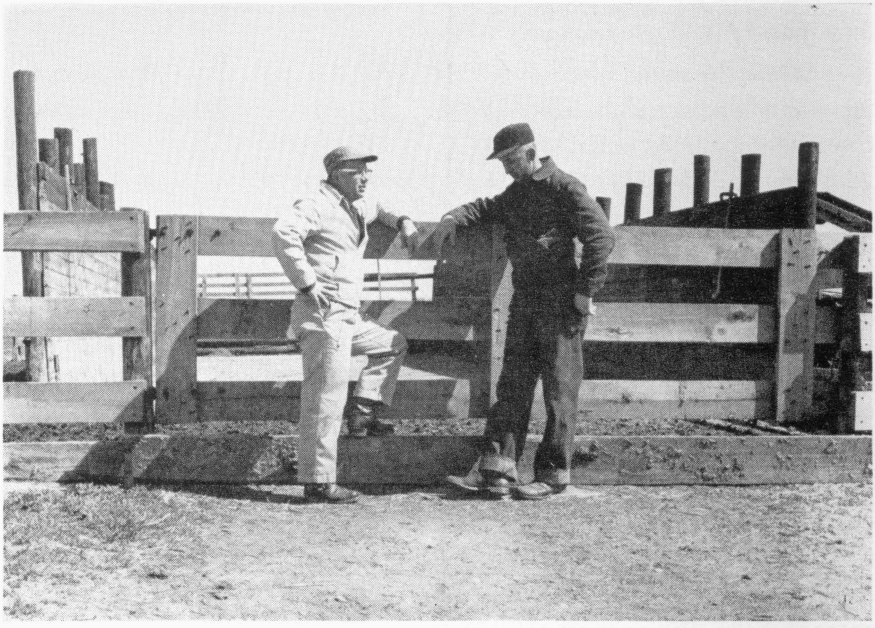

**Photo 3.—Early Adopters Have Greater Extension Contact Than Do Innovators or Other Adopter Categories. Here, a Farmer Discusses His New Self-feeding Bunker Silo with His County Extension Agent.**

chicks; using stilbestrol for beef; installing a bulk milk tank; and using artificial breeding.

Farmers who had higher adoption scores made significantly greater use of the county Extension agent as a source of information.

Rural sociologists and Extension workers commonly refer to farmers as: "innovators", "early adopters", "early majority", "late majority", and "laggards." Innovators are the first farmers to adopt new practices and laggards are the last. As such, innovators would tend to have the highest adoption-of-farm-practices scores and laggards the lowest.

The relationship between time of adoption and degree of Extension contact is indicated in Figure 8. The early adopters have the most contact with their county Extension agent and the laggards have the least. The innovators have above average contact with their county Extension agent, but less than the early adopters. This finding is consistent with the hypothesis that innovators secure much of their information about new practices direct from Extension specialists and research workers. They are less likely to utilize their county Extension agent as a source of information than are the early adopters.

While the early adopters had both greater personal and impersonal Extension contact than other farmers, the use of Extension impersonal contacts was more equally distributed than personal contacts. Early adopters had an average of 1.64 personal contacts compared with an average of 0.88 for all farmers. Early adopters had an average of 2.00 impersonal contacts compared to an average of 1.53 for all farmers.

**Awareness of Farm Practices**

Farmers were also asked when they first became aware of each of the 25 farm practices included in the adoption scale. An Awareness-of-Farm-Practices Scale was constructed in which greater weight was assigned for becoming aware of new practices at an earlier date.

Farmers scoring high on the Awareness-of-Farm-Practices Scale would tend to have "better" or more efficient sources of information (and make better use of them) than the farmers with low scores. This was borne out by the data which indicated farm operators with higher scores on the Awareness Scale also had more contact with their county Extension agent than did farmers with low scores on the Awareness Scale.

## Length of the Adoption Period

Farmers commonly state that they "know how to farm much better than they actually do." Most farmers seem to have a backlog of technological information which they have not yet put to use. Some farmers, however, are likely to adopt a new practice almost as soon as it exists.

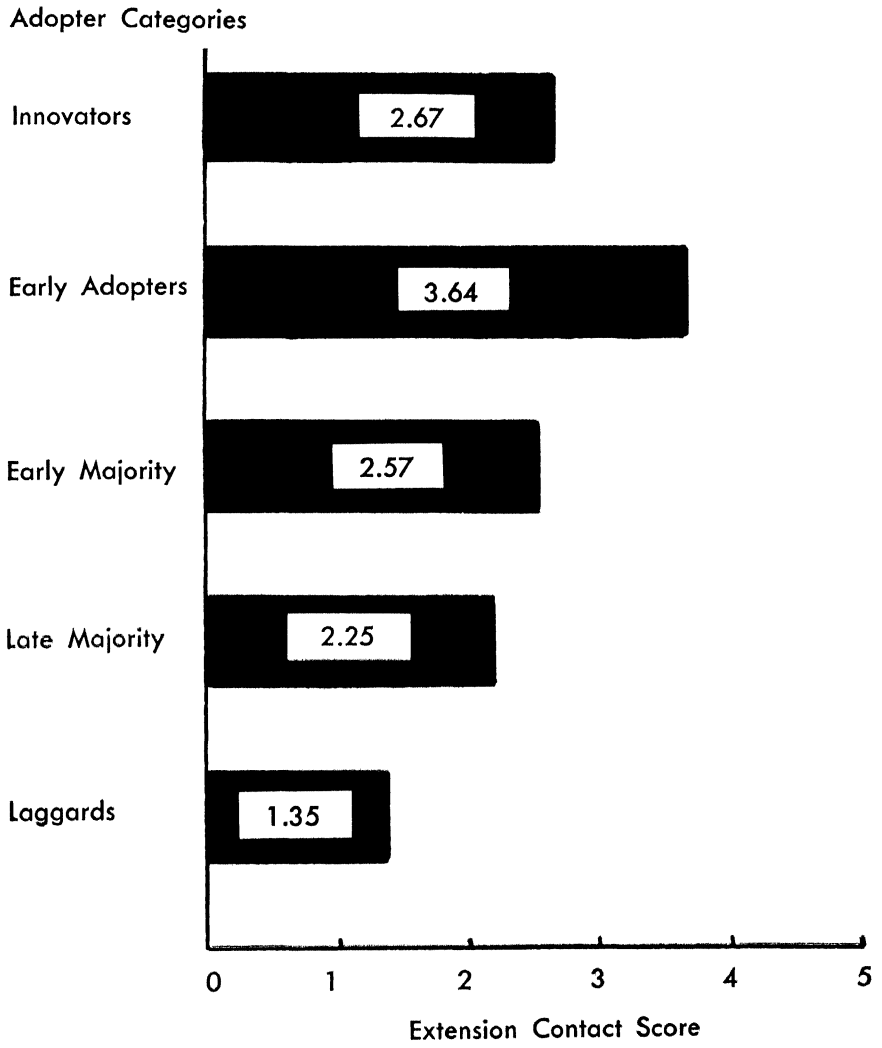


**Fig. 8.—Extension contact scores by adopter categories.**

The adoption process is usually considered to be a series of cumulative steps or stages progressing from awareness of a new practice to final adoption.[5] This adoption process for most new farm practices has generally been found to require several years for the average farmer. The length of this adoption period in years is an indication of how "resistant" a farmer is to a new practice, or how long he deliberates before adopting the practice.

An average length of adoption period for the 25 new farm practices was computed for each farmer in the study. The date of adoption was subtracted from the date of awareness for each practice to yield the length of the adoption period.

Farmers with relatively short adoption periods (which probably reflects a favorable attitude toward new practices) tended only to have slightly more contact with their county Extension agents. There is no significant relationship between length of the adoption period and degree of Extension contact. As previously reported, however, Adoption-of-Farm-Practices Scores and Awareness-of-Farm-Practices Scores were significantly related to Extension contact. This suggests that county Extension agents primarily perform a role of "information-giving" and seldom influence a farmer to adopt a new practice.

## ADOPTION LEADERSHIP

It has been found that farmers vary as to the degree of information-seeking contact they have with their county Extension agents. County agricultural agents are more likely to reach farmers with more education, higher socio-economic status, larger size farm enterprises, higher farm incomes, higher adoption-of-farm-practices scores, and with certain other characteristics.

### THE TRICKLE-DOWN PROCESS

Extension workers are generally aware that all farmers in their county do not equally avail themselves of the educational services provided. There is, however, widespread belief that the lower-income, educationally disadvantaged farmers are reached by the "trickle-down" process. This trickle-down theory may best be described as the process

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[5]For a more detailed discussion of the adoption process, See: North Central Rural Sociology Committee, Subcommittee for the Study of Diffusion of Farm Practices, "How Farm People Accept New Ideas", Iowa State College, Agricultural Extension Service Special Report 15, 1955; or George M. Beal, Everett M. Rogers, and Joe M. Bohlen, "Validity of the Concept of Stages in the Adoption Process", **Rural Sociology** 22: 166-168, 1957.

by which (1) certain farmers (often called "adoption leaders" or "influentials") have **direct** contact with Extension workers, and then (2) pass the technological information along to their neighbors who are more likely not to have direct contact with their county agent. Thus, while only a portion of the county Extension agent's constituents may have **direct** contact with him, numerous others may have indirect contact through adoption leaders.

The trickle-down process is actually a special case of a more general communication model which sociologists have observed in a variety of information-transmitting situations. Lazarsfeld and others[6] first postulated a "two-step flow of communications" on the basis of their study of the 1940 Presidential election in Erie County, Ohio. The concept of the two-step flow of communication is that "ideas often flow from radio and print to the opinion leaders and from them to the less active sections of the population." A number of subsequent studies have confirmed the existence of this relay function of opinion leaders and of the importance of word-of-mouth communication.

Later analyses of the two-step flow of communication have indicated that opinion leaders may secure their information not only from the mass media but from any appropriate source.[7] In the case of new farm technology, one of the more appropriate information sources for the opinion leaders would be the county Extension agent. Thus, it can be seen that the trickle-down process is a special case of the more general two-step flow of communication. The adoption leaders (one type of opinion leaders) secure their technological farm information from the county Extension agent and then pass this information along to their neighbors and friends as personal influence or word-of-mouth communication (Figure 9).

Much of the Extension Service program is geared through leader-training methods. This is especially true in home economics and youth work, rather than in the agricultural program. Special materials are prepared and meetings are held to train leaders. County Extension agents presumably make special efforts to select and work intensively with adoption leaders.

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[6]Paul F. Lazarsfeld and others, **The People's Choice,** N. Y. Duell, Sloan and Pearce, 1944, p. 151.

[7]Elihu Katz, "The Two-Step of Communication: An Up-To-Date Report on an Hypothesis", **Public Opinion Quarterly** 21: 61-78, 1957; and Elihu Katz and Paul F. Lazarsfeld, **Personal Influence,** Glencoe, Illinois, Free Press, 1955.

The respondents in the present study were generally aware that adoption leaders existed. Sixty-three percent of the respondents named at least one neighbor or friend whom they would be most likely to go to if they needed information about some new farm practice. Twenty percent supplied the names of two or more farmers whom they would seek out.

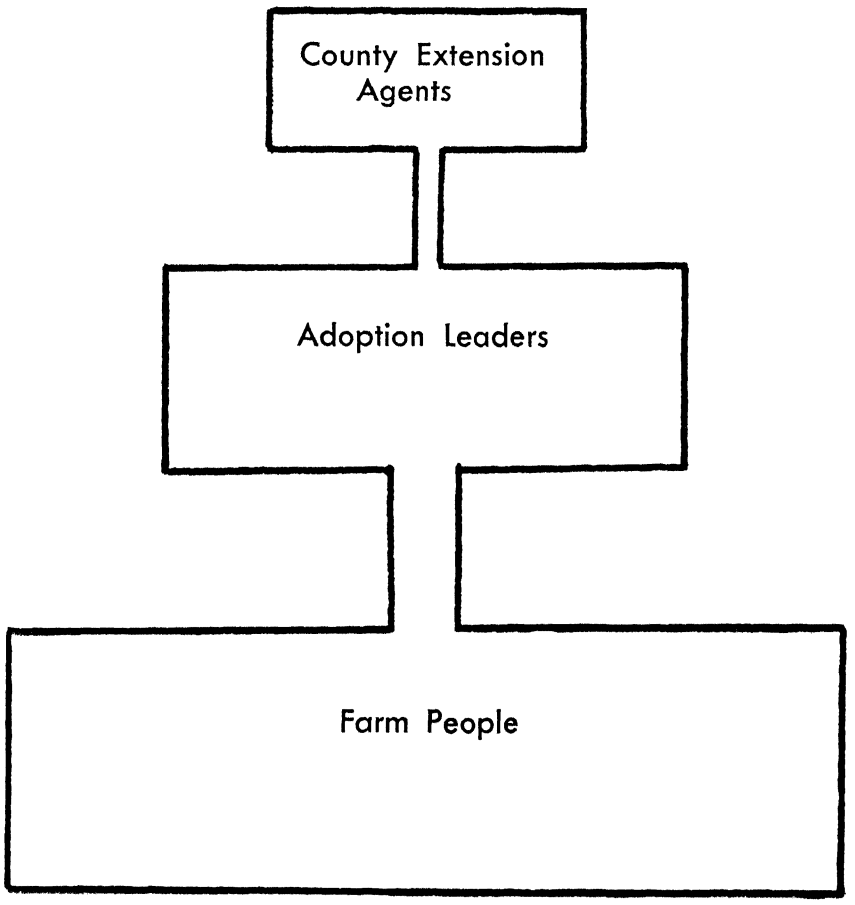


**Fig. 9.—The two-step flow of new farm practices from county extension agents through adoption leaders to the farm people.**

## MEASURING ADOPTION LEADERSHIP

An Adoption Leadership Scale was constructed to measure the degree to which each respondent was an adoption leader. Adoption leadership was not viewed as a dichotomy. In other words, a farmer is not either a "leader" or a "non-leader." Rather, adoption leadership is a matter of degree. Some farmers have a high degree of adoption leadership, others have less, and some farmers receive no appreciable recognition from their neighbors as adoption leaders.

The Adoption Leadership Scale consisted of six items. The responses to these questions were scored on a three point basis so that total Adoption Leadership Scores could range from zero to 12. Typical items were: told someone about a new farm practice within the past six months; likely to be asked for advice about new farm practices; and tried to convince friends of new farm practices in personal discussions.[8]

Farmers who possess a higher degree of adoption leadership have significantly more contact with their county Extension agents. This indicates that county Extension agents do tend to concentrate their efforts upon adoption leaders (Figure 10). There is also evidence, however, that county Extension agents do not reach many farmers who have a high degree of adoption leadership.

## INDIRECT CONTACT

This publication has been mainly concerned with direct channels of contact between county Extension agents and farmers. However, if the trickle-down process is a valid theory, there must be considerable indirect contact through adoption leaders.

This indirect contact is more difficult to measure. Farm operators cannot be expected to know which information they secure from adoption leaders, nor whether the adoption leaders obtained it from the county Extension agent.

As an attempt to measure the importance of this indirect contact with county agents, the respondents were asked, "During the past year have you talked with a farmer who said he had received information from the county agent or from Extension?"

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[8]Several items in this Adoption Leadership Scale are similar to those utilized in previous scales to measure opinion leadership, e.g. Katz and Lazarsfeld, **op. cit.** Evidence as to the scale's validity, reliability, and unidimensionality will be contained in a future publication.

Forty-eight percent indicated having some indirect type of contact with the county Extension agent. It must be cautioned that this is probaby an underestimate of indirect contact because many farmers cannot identify where the adoption leaders secured their information. Also, some adoption leaders may not admit they secured information from these county Extension agents. The picture is further complicated because the communication process from county agent to farmer may not be a two-step flow. For example, a farmer may have secured farm

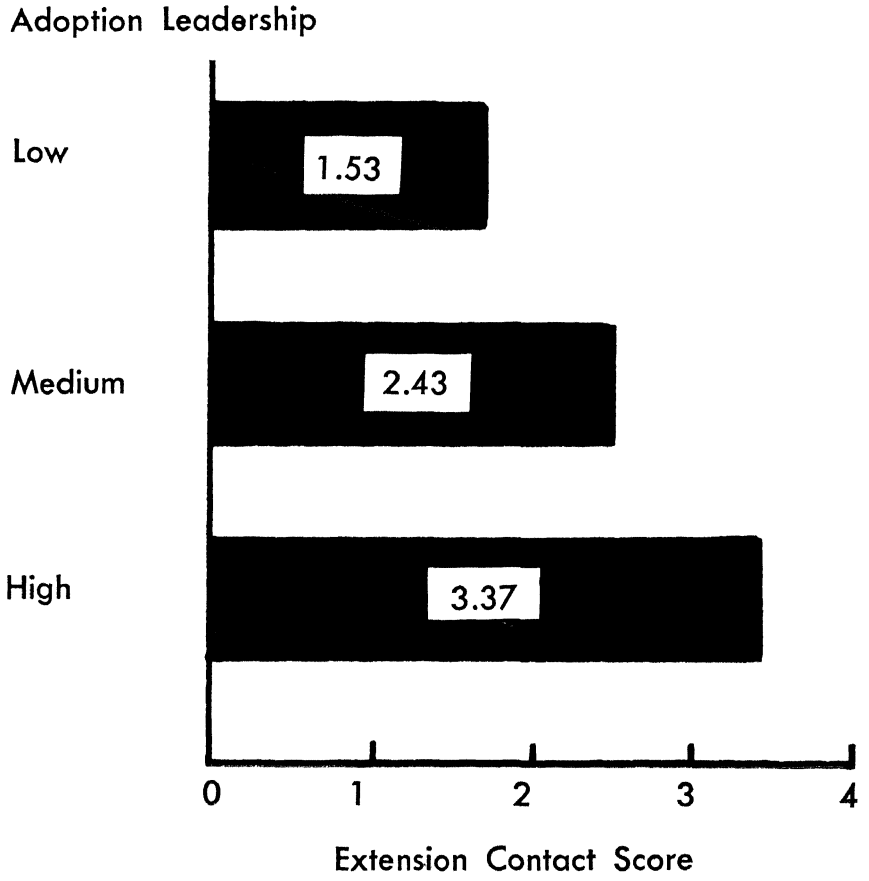


**Fig. 10.—Extension contact scores by adoption leadership.**

information from an adoption leader who obtained it from another leader who in turn secured the information directly from the county Extension agent. This would be a "three-step flow of communication."

In any event, almost half of the respondents (48 percent) realized that they obtained information indirectly from the county agent via word-of-mouth communication with other farmers. The farmers reporting **indirect** contact tended to also have greater **direct** contact with their county Extension agent (Table 10).

**TABLE 10.—Indirect Contact with County Extension Agent by Direct Contact with County Extension Agent**

| Indirect Contact With County Extension Agent | Direct Contact With County Extension Agent | | Total |
|---|---|---|---|
| | No Contact | Some Contact | |
| | Percent | Percent | Percent |
| No Contact | 19 | 32 | 51 |
| Some Contact | 2 | 47 | 49 |
| Total | 21 | 79 | 100 |

There are very few farmers reached by indirect contact that are not also reached by direct contact with their county Extension agent. On the contrary, many of the farmers who are not reached by indirect means are reached by direct contact with the county Extension agent. This finding casts some doubts as to whether the trickle-down process is an effective method by which a county Extension agent may indirectly reach the "hard-to-reach" members of his clientele.

## ACQUAINTANCE WITH COUNTY EXTENSION AGENT

Farmers vary as to the extent to which they are personally acquainted with the county Extension Agent. Some farmers know the county Extension agent by name only, some know him personally, while others do not even know his name.

In order to measure this dimension, respondents were asked, "Do you know the name of the county agent in this county?" If a farmer replied that he did, he was further asked if he knew the county Extension agent personally. As a result there are three different degrees of acquaintance with the county Extension agent:

1. Don't know the name of the county Extension agent (19 percent).
2. Know county Extension agent's name, but don't know him personally (26 percent).
3. Know county Extension agent personally (55 percent).

Farmers who are more personally acquainted with their county Extension agent have more contact with him. There is a high degree of relationship between Acquaintance Scores and Extension Contact Scores (Figure 11). Acquaintance with the county Extension agent may occur as a result of personal contact with him, or, on the contrary, personal contacts may occur as a result of close acquaintance with the county Extension agent.

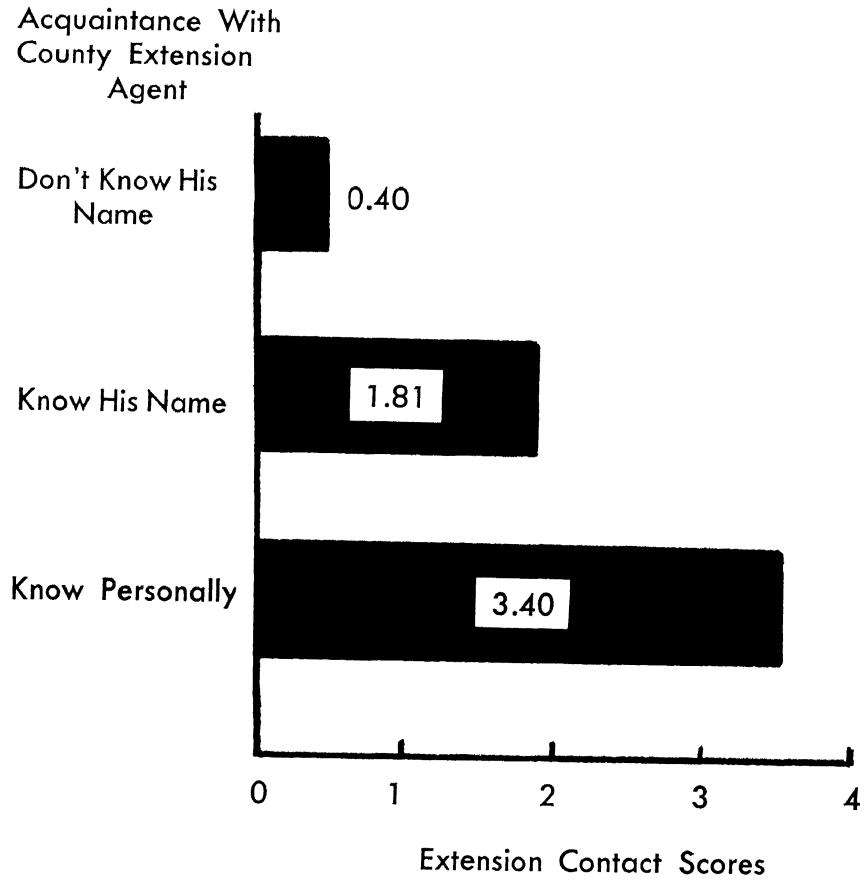


**Fig. 11.—Extension contact scores by degree of acquaintance with county extension agent.**

Acquaintance with the county Extension agent was more highly related to Extension Contact Scores than any other factor investigated in the present study. For this reason an analysis was made of factors related to the Acquaintance Scores.

The degree to which a farmer was acquainted with his county Extension agent was significantly related to:

1. Adoption-of-farm-practices scores.
2. Awareness-of-farm-practices scores.
3. Social class position.
4. Farm income.
5. Adoption leadership.
6. A lack of belief in agricultural magic.

Acquaintance scores were not significantly related to:

1. Length of the adoption period.
2. Age.
3. Size of farm in acres.
4. Size of farm in work units.
5. VoAg Contact Scores.
6. Venturesomeness Scores.
7. Favorable attitudes toward agricultural scientists.

Farmers who are more personally acquainted with their county Extension agent are characterized by higher socio-economic status, higher farm incomes, earlier adoption and awareness of new farm practices, and a disbelief in aricultural magic. Adoption leaders tend to be more personally acquainted with county Extension agents.

## UNDERSTANDING OF EXTENSION SERVICE

It was expected that farm operators who made greater "use" of the county Extension agent would also have a more adequate understanding of the Extension Service. In order to measure understanding of the Extension Service, the respondents were presented three statements with which they could agree, disagree, or partly agree.

1. There is no direct connection between the Farm Bureau and the Extension Service (32 percent agreed which is the correct response).

2. There is no direct connection between 4-H Clubs and the Extension Service (68 percent disagreed which is the correct response).

3. The purpose of the county Extension Advisory Committee is to give local people a "say" in deciding what things Extension does in the county (53 percent agreed which is the correct response).

Respondents varied widely as to their understanding of the Extension Service. Eighteen percent gave the incorrect response on all three questions and only 15 percent responded correctly on all three items.

Previous studies concerned with measuring members' knowledge of organizations to which they belong have generally indicated a similar lack of knowledge. A sample of 600 Ohio farmers were asked a question similar to the first knowledge statement in field interviews completed in 1957. About 70 percent of these respondents correctly knew there was no direct relationship between the Farm Bureau and the Extension Service. Historically there was a connection between the Farm Bureau and the Extension Service; however, in Ohio the two organizations were officially separated in 1919.

Farmers who had a more adequate understanding of the Extension Service were more active in seeking information from their county Extension agent. Extension understanding scores are also related to the degree to which a farmer is acquainted with the county Extension agent. Farmers who have a more adequate understanding of the Extension Service were also characterized by:

1. Higher adoption-of-farm-practices scores.
2. Higher awareness-of-farm-practices scores.
3. Higher social class position.
4. Less belief in agricultural magic.

No significant relationships were found between Extension Understanding Scores and:

1. Length of the adoption period.
2. Age.
3. Size of farm in acres.
4. Size of farm in work units.
5. Farm income.
6. Adoption leadership.
7. Contact with VoAg teacher.
8. Venturesomeness.
9. Favorable attitudes toward agricultural scientists.

The rather high degree of relationship between understanding of the Extension Service and contact with county Extension agent suggests that one way to involve the hard-to-reach portion of a county agent's clientele may be to first provide them with a more adequate understanding of the Extension Service. For example, a block to greater Extension contact may be the mistaken idea that a farmer must belong to the Farm Bureau in order to secure information from his county Extension agent.

It should also be pointed out that the high degree of relationship between Extension understanding and contact may be due to the fact that as farmers have contact with their county Extension agent, they also gain understanding of the Extension Service. That is to say, it is impossible to conclude from available evidence that lack of Extension understanding **causes** a lack of contact with the county Extension agent. However, it seems logical to assume that this might be the case.

## IMPLICATIONS

### THE TRICKLE-DOWN PROCESS

Some evidence presented in the present study suggests that the trickle-down process does not operate in such a fashion that county Extension agents **indirectly** contact those people with whom they have little direct contact. County Extension agents appear to be concentrating their efforts on certain of the adoption leaders among their constituents. However, there seem to be many adoption leaders with which county Extension agents have little contact. One implication of the present findings is that the Extension Service might improve its method of leader selection. By working through more of the adoption leaders among his constituents (and involving them on planning committees) a county Extension agent may be able to indirectly reach a higher proportion of the people in his county.

### REDIRECTED EFFORTS

One finding of the present study was that low-income farmers generally have less contact with their county Extension agent. It might be argued that these low-income farmers have a special need for educational assistance from the Extension Service.

If present Extension prorams are not adequately reaching certain segments of the rural population, there may be a need to redirect some efforts in this direction. The recently initiated Rural Development Program is a step to provide special educational services for low-income farmers.

There may also be some justification for additional personnel and facilities to reach the hard-to-reach portions of the Extension constituency. Results of a recent program in Michigan in which an Extension worker was assigned to each township suggest that the Extension Service reached farm people who had never been contacted before.[9]

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[9]James Nielson and William Crosswhile, "The Michigan Township Extension Experiment", Michigan Agricultural Experiment Station Technical Bulletin 266, 1958.

There is some evidence that even the portions of the Extension clientele that are not presently reached, may welcome Extension educational efforts. Findings from another study[10] suggest that most farmers (especially those with little Extension contact) have some "guilt feelings" because they are not using their county Extension agent. As one respondent in the present study said:

> We're short on know-how. I think we need to work a little more closely with our county agents. They can tell us how much fertilizer to put on. I'm a great believer in this Extension stuff and we should use the county agent more.

## PERSONAL CONTACT

Most types of Extension contacts are initiated by the farmer rather than the county Extension agent. One exception is farm visits. This type of communication may be initiated by the county Extension agent. As such, farm visits would provide one means by which county Extension agents could reach the "hard-to-reach" among their clientele.

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[10]Rogers and Beal, p. 63.

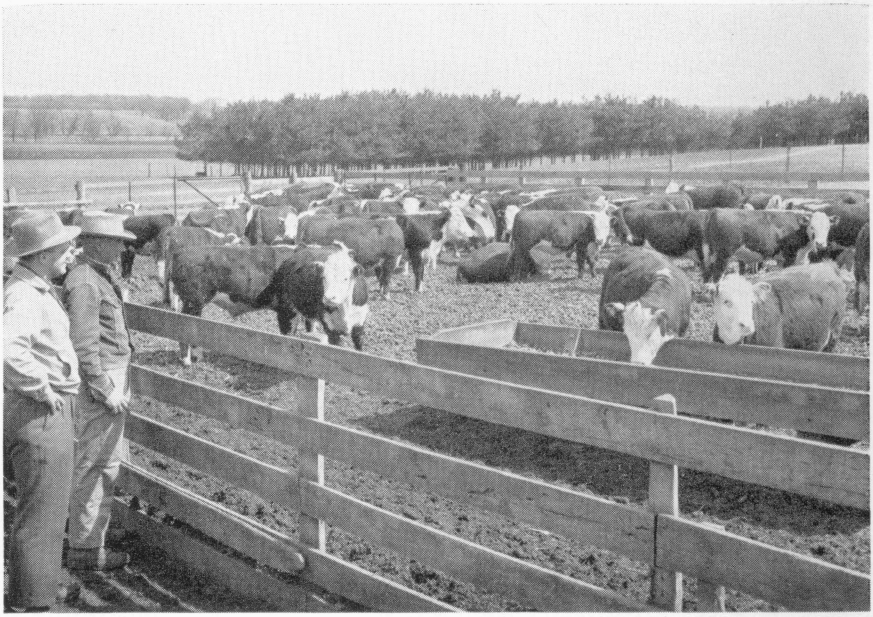

**Photo 4.—Farm Visits are One Means by which County Agricultural Agents May Contact Their Hard-to-Reach Constituents.**

**TABLE 11.—Extension Contact Scores by Whether County Extension Agent Visited Farm**

| Extension Contact Scores | County Extension Agent Visited Farm | | Total |
|---|---|---|---|
| | No | Yes | |
| | Percent | Percent | Percent |
| None | 21 | -- | 21 |
| Low (one or two contacts) | 34 | -- | 34 |
| Medium (three or four contacts) | 21 | 5 | 26 |
| High (five, six or seven contacts) | 6 | 13 | 19 |
| Total | 82 | 18 | 100 |

For this reason, a special analysis was completed of the farmers who were reached and those who were not reached by farm visits. The results generally indicate that the same farmers reached by other types of Extension activities are also the farmers whom county Extension agents visit personally. This may be because these farmers request that county Extension agents visit their farms.

County Extension agents tend to visit the farms of those farmers who have a high degree of other types of contact with their county Extension agents. (Table 11).

The average Extension Contact Score for farmers who received a personal visit from the county Extension agent is 4.94 while the average Extension Contact Score for those not visited is only 1.88. This difference is highly significant.

Farmers with more years of education are also more likely to be visited by their county Extension agent (Table 12).

Farmers with higher social class ratings were much more likely to be visited by their county Extension agent. Farmers visited personally by their county Extension agent were also more likely to be more intimately acquainted with him, as might be expected.

In summary, the farmers who were visited personally by their county Extension agent tended to have a greater number of other types of Extension contact, more education, a higher social class position, and a more intimate acquaintance with their county Extension agent. These findings suggest that farm visits are not presently used by county Extension agents as a means to contact the hard-to-reach among their clientele.

**TABLE 12.—Educational Level by Whether County Extension Agent Visited Farm**

| Educational Level | County Extension Agent Visited Farm | | Total |
|---|---|---|---|
| | No | Yes | |
| | Percent | Percent | Percent |
| Don't Know | 6 | -- | 6 |
| Eighth Grade or Less | 32 | 4 | 36 |
| High School | 38 | 10 | 48 |
| College | 6 | 4 | 10 |
| Total | 82 | 18 | 100 |

## NEEDED RESEARCH

The problem of differential participation in Extension Service educational activities is not novel to that government agency alone. The fact that the clienteles of the Extension Service and other agencies overlap suggests a need for a coordinated research study on the constituents of all the major agricultural agencies. This type of research would attempt to determine who does and who does not utilize the educational services of the Extension Service, the Soil Conservation Service, and Vocational Agriculture teachers. One of the findings in the present study, for example, was that farmers who had no contact with their county Extension agent also had no contact with their VoAg teacher.

The findings of future research studies of this type might be used by policy makers in these government agencies: (1) to evaluate the effectiveness of their endeavors, and (2) attempt to increase participation and use of the services they are providing.

## OTHER RELEVANT RESEARCH

Several other research studies of Extension contact have been completed by rural sociologists in Iowa, New York, Michigan, Washington, and New Hampshire. One study of Extension contact has been completed in Australia. The findings of these various studies are generally consistent with the findings presented in this publication.

The interested reader may wish to consult the following reports of these studies.

1. Lee Coleman, "Differential Contact with Extension Work in a New York Rural Community", **Rural Sociology** 16: 207-216, 1951.

2. D. L. Gibson, "The Clientele of the Agricultural Extension Service", **Michigan Agricultural Experiment Station Quarterly Bulletin** 26: 1-10, 1944.

3. E. J. Niederfrank, "New Hampshire Extension Service Looks At Itself", New Hampshire Agricultural Extension Service Circular 294, 1949.

4. Ross Parish, "Extension Services and the Grazier on the South-West Slope", **Review of Marketing and Agricultural Economics** 24: 222-235, 1956.

5. Lois Scantland, C. A. Svinth, and Marvin J. Taves, "A Square Look at Extension Work in Spokane County, Washington", Pullman, Washington Agriculture Extension Service Bulletin 463, 1952.

6. Walter L. Slocum, Owen L. Brough, Jr., and Murray A. Straus, "Extension Contacts, Selected Characteristics, Practices and Attitudes of Washington Farm Families", Washington Agricultural Experiment Station Bulletin 584, 1958.

7. Maurice E. Voland, "Factors Related to Participation in an Extension Program", Unpublished Master's Thesis, Iowa State College Library, 1956.

## APPENDIX A

The overall measure of contact with the county Extension agent utilized throughout the present study is the Extension Contact Scale. The purpose of this Appendix is to discuss the unidimensionality, reliability, and validity of the Extension Contact Scale.

The Extension Contact Scale was subjected to a Guttman scale analysis.[11] The coefficient of reproducibility is 93.4 percent which provides evidence that the Extension Contact Scale is **unidimensional,** that

[11]A description of this method of scale analysis is contained in Margaret J. Hagood and Daniel C. Price, **Statistics for Sociologists,** N. Y Henry Holt, 1952, pp. 143-155.

is, it measures only one dimension or characteristic. If a coefficient of reproducibility of 90 percent or higher is attained, the scale is said to measure only one dimension and does not overlap with other dimensions.

The **reliability** of a scale is defined as the degree to which it consistently measures the dimension or trait that it was designed to measure. The split half method of estimating reliability entails dividing the scale items into two groups, usually on an odds and evens basis. The relationship between the scores on the even numbered items and the corresponding odd numbered items is determined. The coefficient of reliability for the Extension Contact Scale is .79 when computed by the odds-evens technique.

The **validity** of a scale is the degree to which it measures the dimension or trait which it was designed to measure. Two methods are commonly used to determine validity. One of these methods is to correlate the scale with some criterion that is an accepted measure of the dimension that the scale purports to measure. In the present case, however, no outside criterion was available with which to validate the Extension Contact Scale.

The other method of determining the validity of a scale is to attempt to judge what the scale does measure. This method of judging validity was used in the present study to determine the "face validity" or "content validity" of the Extension Contact Scale. In terms of the intended purpose of this scale, the items it contained seemed to measure the desired dimension. This is the only evidence available that the Extension Contact Scale is valid.

## APPENDIX B

### TEST OF SIGNIFICANCE

The relationship between the Extension Contact Scores and each of the farmer characteristics were tested for significance. For example, a correlation of +.40 is significantly different from zero; we are 99 percent sure that a relationship exists between years of education and Extension contact. Likewise, a correlation of less than .195 (when N=104) is not significant. The relationship is not greater than could be due to chance sampling effects.

The relationship between Extension Contact Scores and each of the following variables are presented in the order they appear in the body of this publication.

1. Years of education, correlation is +.40 which is significant at the one percent level.

2. Social class ratings (by interviewers), correlation is +.67 which is significant at the one percent level.

3. Age, correlation is +.18 which is not significant.

4. Venturesomeness, correlations +.13 which is not significant.

5. Belief in agricultural magic, correlation is —.10 which is not significant.

6. Productive man work units, correlation is +.34 which is significant at the one percent level.

7. Annual farm income, correlation is +.30 which is significant at the one percent level.

8. Size of farm in acres, correlation is +.12 which is not significant.

9. Rental status, F ratio is 3.79 which is significant at the five percent level.

10. Non-farm work, F ratio is 3.95 which is significant at the five percent level.

11. Distance from county seat in miles, correlation is —.06 which is not significant.

12. Number of farm magazines, correlation is +.27 which is significant at the one percent level.

13. Contact with agricultural scientists, F ratio is 4.75 which is significant at the five percent level.

14. Contacts with VoAg teacher, correlation is +.21 which is significant at the five percent level.

15. Adoption-of-farm-practices scores, correlation is +.34 which is significant at the one percent level.

16. Awareness-of-farm-practices scores, correlation is +.28 which is significant at the one percent level.

17. Length of the adoption period, correlation is +.07 which is not significant.

18. Adoption leadership scores, correlation is +.40 which is significant at the one percent level.

19. Extension acquaintance scores, correlation is +.60 which is significant at the one percent level.

20. Extension understanding scores, correlation is +.37 which is significant at the one percent level.

The relationship between Extension Acquaintance Scores and each of the following variables are listed in the order they appear in the body of this publication. The Extension Acquaintance Scores are a rough measure of the degree to which a farmer is personally acquainted with his county agent.

1. Extension Contact Scores, correlation is +.60 which is significant at the one percent level.

2. Adoption-of-farm-practices scores, correlation is +.33 which is significant at the one percent level.

3. Awareness-of-farm-practices scores, correlation is +.36 which is significant at the one percent level.

4. Social class ratings (by interviewers), correlation is +.25 which is significant at the five percent level.

5. Farm income, correlation is +.25 which is significant at five percent level.

6. Adoption leadership scores, correlation is +.25 which is significant at the five percent level.

7. Belief in agricultural magic scores, correlation is —.23 which is significant at the five percent level.

8. Length of the adoption period, correlation is —.05 which is not significant.

9. Age, correlation is —.07 which is not significant.

10. Size of farm in acres, correlation is +.14 which is not significant.

11. Size of farm in productive man work units, correlation is +.15 which is not significant.

12. VoAg contact scores, correlation is +.08 which is not significant.

13. Venturesomeness, correlation is +.07 which is not significant.

14. Favorable attitudes toward agricultural scientists, correlation is +.15 which is not significant.

The relationship between Extension Understanding Scores and each of the following variables are listed in the same order that they appear in the body of this publication.

1. Extension Contact Scores, correlation is +.37 which is significant at the one percent level.

2. Extension Acquaintance Scores, correlation is +.54 which is significant at the one percent level.

3. Adoption-of-farm-practices scores, correlation is +.21 which is significant at the one percent level.

4. Awareness-of-farm-practices scores, correlation is +.21 which is significant at the one percent level.

5. Social class ratings (by interviewers), correlation is +.37 which is significant at the one percent level.

6. Belief in agricultural magic, correlation is —.30 which is significant at the one percent level.

7. Length of the adoption period, correlation is —.08 which is not significant.

8. Age, correlation is —.08 which is not significant.

9. Size of farm in acres, correlation is —.06 which is not significant.

10. Size of farm in work units, correlation is +.14 which is not significant.

11. Farm income, correlation is +.16 which is not significant.

12. Adoption leadership scores, correlation is +.19 which is not significant.

13. VoAg Contact Scores, correlation is +.13 which is not significant.

14. Venturesomeness, correlation is +.10 which is not significant.

15. Favorable attitudes toward agricultural scientists, correlation is +.09 which is not significant.