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Contacts with Agricultural Agents

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contacts with agricultural agents

**FACTORS RELATED TO VARIOUS TYPES OF CONTACTS
FARMERS HAVE WITH PROFESSIONAL AGRICULTURAL
WORKERS AND THE EFFECT OF THESE CONTACTS ON
TECHNOLOGICAL CHANGE**

RURAL SOCIOLOGY DEPARTMENT

AGRICULTURAL EXPERIMENT STATION

SOUTH DAKOTA STATE COLLEGE, BROOKINGS

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Summary and Conclusion

A study of a probability sample of 224 farm operators in Deuel County, South Dakota, was undertaken to secure among other things information related to contacts with professional agricultural workers. This information is expected to contribute toward the development of a body of knowledge useful in planning and carrying out educational farm programs.

To determine if farmers profit from their contacts with agricultural workers, contacts have been studied in relation to the three aspects of technological change which are emphasized by Extension theorists—skills and habits (actual adoption of farm practices), basic knowledge about farming, and attitudes toward recommended farm practices. All three areas have been found positively related to contacts. Actual adoption has shown the highest association with contacts, while basic knowledge has shown the lowest.

The higher competence of those

who have more contacts should not be attributed entirely to the efforts of the agricultural agencies in the county because farmers who have more contacts, due to different motivation, are different to start with. It is true, however, that these skills, knowledge, and attitudes would probably not have been acquired if the various agricultural agencies had not created opportunities and situations in which these farmers have gained the necessary learning experiences.

Learning is a modification of behavior. What a man learns, according to educational psychologists, is determined on the one hand by his constitution, and on the other by the demands which the environment makes upon him. Factors which deal with the constitution of the individual, such as education and age, and factors which deal with the demands of the environment, such as economic and social variables, have been used to show

that farmers who have more contacts constitute a distinct group in regard to motivation and performance.

Two statements have been derived from the findings of the present study:

(1) It has been shown that factors dealing with economic and social and personal motivation influence contacts and that they influence specific types of contacts differently.

(2) It has been shown that such factors also influence the learning situation. This has been demonstrated by showing that farmers who have the same contacts acquire different learning experiences where their motivation is different.

Since there is probably a spurious relationship between a number of motivational factors and contacts with agricultural workers, the term "characteristics of farmers with more or fewer contacts" is used to express such a relationship.

Contact seeking is determined by motivation. One of the most distinguishable characteristics of farmers who have more contacts with agricultural workers (highest coefficient of contingency between the two variables) is that they have wider social contacts and wider contacts to secure farm information. Higher gross farm income is also a very distinguishable characteristic of those who have more contacts. A number of other factors have also been found characteristic of those with more contacts. No significant differences between the two groups have been

found concerning age, years as a farm operator, tenure, and number of acres owned.

Different characteristics were also found among farmers who have different personal, group, and mass contacts. Besides the fact that statistically significant differences were found between individual factors and the three types of contacts, in almost all cases where there was such a relationship, the association was higher between personal contacts and the respective individual factor. This difference becomes smaller when factors which have been found highly related to contacts in general are concerned.

Similarly, differences were found between individual factors and almost every specific type of contact. With farm visit, for example, the highest association was found between this variable and the index which measures the total of adoption, knowledge, and attitudes toward recommended farm practices.

Among all the relationships between specific types of contacts and this index, the relationship with farm visit has shown the highest association. Farm visit has also been mentioned by the respondents along with farm analysis with the worker, as the most useful type of contact with agricultural workers in the county. This data, along with previous data showing that variables related to contacts are related more to personal contacts, probably demonstrate the specific role of personal contacts.

Regardless of their low contact cost and the fact that mass media have been highly developed in the later years, personal contacts play an important role in the diffusion process. The role of such contacts would probably become more significant if the characteristic of the participant farmer and the stage of the diffusion process were carefully considered.

Office visit is the type of contact, which in reference to its relationship with the various selected factors, comes closer to the relationship between these factors and contacts in general. As an internal criteria, then, this is the most representative item of the variable "contacts with agricultural agents."

Motivation affects learning experience directly. To see if motivational factors besides contacts also influence the learning situation, money invested in livestock and machinery, net worth, and social status were introduced as control variables of the relationship between contacts and the index which measures the total of adoption, knowledge, and attitudes toward recommended farm practices. In all three cases the group with the higher motivation showed a higher zero order correlation. This difference between the high and the low motivation groups was found significant (with the use of Z) at the 10% level for net worth and social status. For money invested in livestock and machinery a level of significance higher than the 10%, the highest level accepted for such comparisons, was found.

Since the three economic variables mentioned are related to education, to test the latent function of education on the above relationship, education has been introduced as control variable of the relationship between contacts and the total of adoption, knowledge, and attitudes toward recommended farm practices. No significant difference has been found between the two groups, although the correlation in the low education group is slightly higher. A similar finding has been reported by Dean, Aurbach, and Marsh in a study where rationality was the control variable instead of education.

Age, on the other hand, has been found to be a factor which conditions the relationship between contacts and the total of adoption, knowledge, and attitudes toward recommended farm practices. When age is introduced as a control variable, the relationship becomes curvilinear and is higher ($r=.333$) for the group which includes farmers 25 to 40 years of age, as compared with the 40 to 50 years of age group ($r=.219$). However, the difference between the two zero order correlations is not significant at the 10% level. When this 40 to 50 years of age group is compared with the group over 50, the relationship becomes higher ($r=.470$) for the group of farmers over 50 years of age and the difference is significant at the 10% level.

Supporting information. Information collected to give a better perspective of the previous data

has shown that the average farmer in the county was visited by some agricultural worker 2.2 times in the 12 months prior to this study. The farmer visited the office of some worker 5.8 times, read 10.2 circular letters, attended 2.5 group meetings called by these workers, obtained 4.8 bulletins from them, had 1.6 phone conversations with them, visited demonstration plots 0.8 times, made 0.2 individual farm analysis with a worker, participated in 0.7 group farm and home planning procedures with a worker, attended 0.3 farm tours, 0.5 annual meetings and finally 0.1 Extension program planning meetings.

Farmers indicated the most useful contacts were those in which they had the opportunity and time to discuss their problems personally with the worker. This was particularly true when the discussion took place on their farm.

When farmers were asked to mention which of all the media used in and out of the county they found most helpful in securing farm information, they mentioned: first, farm papers and farm magazines; and second, neighbors, friends, and relatives. Individual talks with the county agent, South Dakota State College bulletins, and circular letters from the county agent were mentioned third, fourth, and fifth; however, the differences between them were small.

Other workers (excluding the county agent) and seed, feed, and fertilizer dealers followed.

Useful sources were also studied in relation to contacts with agricultural workers. Individual talks with the county agent are considered the most useful source by those who have more frequent contacts with agricultural workers. Farm tours, Extension demonstrations and meetings, and local newspapers were also considered more useful by those who had more frequent contacts with agricultural workers. South Dakota State College bulletins, on the other hand, were considered more useful by farmers who had fewer or no contacts with agricultural workers.

In conclusion we could say that the present data indicate that agricultural programs should not be planned for a single group but with the understanding that the clientele of the agricultural workers consists of distinct sub-groups with different characteristics, motivations, and behavior patterns. Specific groups of farmers with fewer or no contacts, for instance, exhibit characteristics and qualities of farmers who through the years are forced to quit farming. Ways to initiate contacts with such farmers and ways to select specific types of contacts and subject matter should be carefully considered in planning such programs.

Contacts with Agricultural Agents

JOHN D. PHOTIADIS¹

For a long time the Cooperative Extension Service and other groups promoting technical agriculture have known that: (a) there are certain segments of the farm population which do not come in contact with agricultural agencies, or they come in very limited contact with them; (b) those who come in contact often follow different behavior patterns concerning the type of contact and use of information media; and (c) amount and type of contact are related to the personal, social, and technological development of farm people.

There is an area, however, which has not yet been explored—the area dealing with the role personal and motivational factors play in the effectiveness of contacts as agents of technological change.

The present inquiry deals with all four of these previous areas of knowledge. Its purpose is two-fold: first, to investigate the existing situation in South Dakota as far as the first three areas are concerned; and second, to explore selected aspects, not yet investigated, of all four areas.

Aid to Program Planning

The implications of this study for Extension workers and others

interested in promoting agricultural life are numerous, particularly for the area of Extension program planning. Planning such a program is a continuous process. It involves definition of the existing situation, statement of objectives, selection of teaching methods appropriate to reach these objectives, and finally evaluation.

It is obvious that all four stages of the program planning process are interrelated and mutually dependent. An inaccurate definition of the situation, for example, could lead to the statement of wrong objectives, to the selection of wrong teaching methods, and as a consequence, to less desirable results.

This publication refers primarily to the definition of the situation and selection of teaching methods. An attempt has been made to answer such questions as: Who are the farmers who come in contact with professional agricultural workers? Who are those who have no contacts? Which contacts and which media in general do farmers consider most helpful? Which media are considered most helpful by those who have few or no contacts? What is the influence of contacts on skills, knowledge, and at-

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titudes? What are the characteristics of farmers who prefer specific types of contacts? Who are those farmers who need most and profit most from these contacts?

The Extension Service is an educational agency whose aim is to bring about desirable changes in human behavior. These changes can be achieved only through learning, and effective learning results from a plan and design—not from trial and error.

A skillful worker can create opportunities or situations in which people gain the abilities necessary to successfully meet their needs and interests in line with their ob-

jectives. People develop these abilities by reacting mentally or physically to seeing, hearing, or doing the things to be learned. Through participation in these activities they gain insight and understanding useful in solving their problems. Such situations and opportunities, however, cannot be created by the professional agricultural worker unless he knows the answers to questions similar to those previously stated.

This, then, is an attempt to furnish the worker or the leader with information which will help him plan and execute his program and make his teaching more effective.

Methodology

A random sample of farm operators was selected proportionally from each of the 16 townships of Deuel County, South Dakota. This sample included 224 persons and represented about 15% of the farm operators in the county. Three college graduates with agricultural background conducted the interviewing after 3 days of interview training. A pretest was administered to 25 farm operators who live on the border of a neighboring county and use the agricultural services of Deuel County.

It was necessary to revise the initial schedule after the pretest.

Since the data were initially collected for a study dealing with the evaluation of the Farm and Home Development Program in Deuel County, the sampling, as in most

studies dealing with such contacts, was limited to this county. Generalizations drawn from these data, and particularly presentation of marginals, should be interpreted in reference to farm people and professional agricultural workers of Deuel County. If we assume, however, that this county and its workers constitute representative groups of this area,² with discretion we could broaden the area of application of these findings; at least we could broaden their application concerning findings that deal with more general aspects of behavior.

²Deuel County is the only county in the state where the Farm and Home Development Program has been extensively pursued. It is considered representative of the area in type of farming, people, and professional agricultural workers.

Contacts Are the Main Variable

The main variable in this study refers to contacts with professional agricultural workers in the county. This includes the county agricultural agent and the Farm and Home Development agent of the Extension Service, the SCS work unit conservationist, the ASC office manager, and the FHA county supervisor.

Though the responsibilities of these workers are different, it was decided that contacts with all of them should be treated as a single variable. This was based on two factors: (1) Lionberger's findings indicate there are no important differences between farmers who use the county agent and those who use other institutionalized services, while there are significant differences between users of professional agricultural workers and nonusers;³ (2) since all these workers promote agriculture, the group of farmers who do not have contacts with one of them does not necessarily constitute a control group.

Thirteen types of contacts were used to define the variable—contacts with professional agricultural workers. Because some of these contacts are considered more influential than others, a team of eight judges associated with the agricultural agencies in the county was chosen to weight each of these contacts. It was decided that a score of 1 should be given to the least influential contact. The judges' mean score for each of these contacts is as follows:

Type of Contact ⁴	Mean Score
Worker visit your farm.....	8
Attend group meetings called by the worker.....	4
Read circular letters or cards from the worker.....	1
Visit the worker's office.....	5
Obtain bulletins from the worker (through the mail, at his office, or brought by worker).....	3
Have phone conversations with the worker.....	4
Visit demonstration plots or attend other demonstrations.....	6
Make an individual farm analysis with the worker....	10
Participate in group farm and home planning procedure with the worker.....	8
Make a trip with the worker.....	4
Attend farm tours in the township or county.....	5
Attend annual meetings.....	2
Attend Extension program planning meetings.....	3

Farmers were asked to mention the number of times they had each type of contact with each of the five workers (Appendix I). This number multiplied by the score which corresponds to each type of contact gave an index and a distribution of scores for each type of contact. A total of all these scores gave an index measuring contacts with all professional

³Herbert Lionberger, *Information Seeking Habits and Characteristics of Farm Operators*, Research Bulletin 581, Agricultural Experiment Station, College of Agriculture, University of Missouri, 1955, pp. 47-51.

⁴See Appendix I.

agricultural workers in the county. In a similar fashion indices measuring total contacts with each particular agent were secured.

Adoption, Knowledge, and Attitudes in Single Index

The aim of Extension Education is to influence people to make desirable changes in behavior which will contribute to better farming and richer family living. Wilson and Gallup⁵ present these changes in three forms; the first refers to knowledge about basic farm information, the second to skills and habits, and the third to attitudes toward the various farm practices. An attempt has been made to include all three areas in a single index.

For knowledge, 19 true or false and multiple choice questions dealing with basic farm information were used. Some of the subjects covered were: What is a complete fertilizer? On what basis would you decide when to breed heifers? On what basis would you choose a bull calf for a future herd sire? What do you think will happen to yields if you apply additional ni-

trogen when plowing under a heavy crop of stubble?

For skills and habits, 27 questions dealing with actual adoption of farm practices were used, and for attitudes, 9 questions dealing with attitudes toward recommended farm practice.

Because the questions of all three areas dealt with different types of farming, only the questions which dealt with areas of farming in which the operator was involved were used in scoring. Questions which did not refer to specific areas of farming, such as information about soil practices or record-keeping, were used for all farmers.

The items included in each of the three areas were selected with the help of subject matter specialists. This was done to secure items which would help differentiate people in relation to their competence and to secure items involving practices recently introduced by the agricultural workers in the county. Because the sample included people involved in different kinds of enterprises, no attempt was made to scale the various items.

Contacts with Agricultural Workers and Their Relative Effectiveness

Types of contacts, frequency of contacts, and proportion of farmers who had such contacts constitute information which is expected to provide a perspective from which to view these data. Table 1 shows

the types of contacts farmers had, the frequency of these contacts,

⁵M. Wilson, and G. Gallup, *Extension Teaching Methods*, U. S. Department of Agriculture, Extension Circular 495, 1955, p. 4.

Table 1. Proportion of Farmers Having Each Type of Contact, and Contact Ratio Per Individual in the County

Type of contact*	Number of contacts					Ratio per ind. in county
	None	1-2	3-4	5-10	Over 10	
1. Agent visit your farm.....	45.1	22.8	9.9	18.4	3.8	2.2
2. Attend group meetings called by the agent ...	54.4	18.5	13.0	9.3	4.8	2.5
3. Read circular letters or cards from the agent	11.9	6.5	11.4	25.0	45.2	10.2
4. Visit the agent's office.....	26.0	12.5	15.3	23.9	22.3	5.8
5. Obtain bulletins from the agent(through the mail, at his office, or brought by agent) ..	31.5	17.9	10.9	18.5	21.2	4.8
6. Have phone conversations with the agent ...	78.3	9.8	3.3	5.4	3.2	1.6
7. Visit demonstration plots or attend other demonstrations	60.4	27.8	6.4	5.4	—	0.8
8. Make an individual farm analysis with the agent	88.0	9.9	1.6	.5	—	0.2
9. Participate in group farm and home planning procedures with the agent	91.0	7.0	1.5	.5	—	0.7
10. Make a trip with the agent.....	91.0	7.5	.5	.5	.5	0.3
11. Attend farm tours in the township or county	82.6	13.6	3.8	—	—	0.3
12. Attend annual meetings.....	71.9	20.0	7.1	.5	.5	0.5
13. Attend Extension program planning meetings	91.8	7.0	1.2	—	—	0.1

*See Appendix I. Agent as used in Table 1 refers to professional agricultural workers.

and the proportion of each contact which corresponds to each individual in the county. Inspection of this table shows, for example, that 45% of the farmers in the county were not visited by a worker during the last 12 months, but 22% were visited more than five times; 26% did not visit the office of any worker, but 46% visited their offices more than five times.

Table 1 also shows the individual contact ratio—the number of specific contacts the average farmer in the county had.

When people were asked which of the types of contacts listed in Table 1 they had found most helpful, they most often mentioned farm visits. Studies in various parts

of the country a number of years ago had shown that method and result demonstrations accounted for most of the adoption of farm practices.⁶ In this study, demonstrations have been mentioned as helpful sources of farm information much fewer times. This is probably because in recent years less emphasis has been placed on result demonstrations in this and other states.

Group meetings have also been found in previous studies to account for the adoption of more practices than farm visits. The only group meetings which have been mentioned often in this in-

⁶*Ibid.*, p. 17.

quiry are those referring to participation in group farm and home planning procedures with the worker. Such group meetings, along with individual farm analyses with the worker and farm visits constitute types of contacts which have been mentioned as most helpful.

This indicates that farmers feel they get the most help from the worker when they have the opportunity and time to personally discuss with him all problems which refer to their enterprise and particularly when this can happen on their farm. This may be an indication of the place of individual contacts, which, although more expensive than other means of transmission of farm information, perform a specific function which probably cannot be replaced by group and mass media.⁷

Favorable opinions concerning such replacement have been expressed in recent years due to the overall effectiveness of the new mass media, such as television, in the dissemination of farm information. It is quite probable, however, that for certain practices, certain stages of the diffusion process, and certain individuals such effectiveness is not enough to secure complete adjustment to the new situation. However, it is also known that for a considerable number of farmers if the farm enterprise is to survive, it is necessary that the farmer continuously adjust his skills and knowledge to fit the new situation.

Table 2 shows the proportion of

Table 2. Proportion of Farmers with Different Contact Scores According to Each Professional Agricultural Worker

Worker	No score	Score 1-50	Score over 50
County agent	27.1	59.2	13.7
SCS work unit			
conservationist	34.1	50.2	15.7
ASC office			
manager	12.6	57.8	29.6
FHA county			
supervisor	86.5	9.5	4.1
Farm and Home			
Development			
agent*	0.0	8.0	92.0
All workers	2.6	39.2	58.2

*These proportions refer only to 45 farm operators who cooperate with the Farm and Home Agent.

contacts which corresponds to each worker in the county. This table does not refer to each contact but to the total score of all contacts with each professional agricultural worker. As has been explained previously, each type of contact has been given a score. This score multiplied by the times that contact has occurred gives the total score for each type of contact, and also the total score of contacts with each worker.

Inspection of Table 2 shows only 2.6% of the farmers have not had any contact with agricultural workers in the county. On the other hand, 58.2% have a score of at least 50. This implies that if the only contact these people had was the farm visit, each would have had in the last 12 months a minimum of

⁷Information on the effectiveness of the various methods in relation to cost can be found in Wilson and Gallup, *op. cit.*, p. 16.

contacts corresponding to 5.2 farm visits.

Comparing professional agricultural workers as to the amount of contact they had with farmers in the county, the same table shows that there is a higher proportion of farmers with scores over 50 having contact with the ASC office manager, as compared with those who had the same amount of contacts with the county agent. Coughnour on the other hand, who has also sampled a single county, has found the opposite to be true.⁵

Farmers were also asked to mention which worker's program in general they had found most helpful. In rank order they mentioned: the programs of the county ASC, SCS, Extension Service, and FHA. Of those who participated in the Farm and Home Development Program, 78% mentioned it.

This information is presented to provide a perspective from which to view these data, not to compare agencies. Such a comparison would not be realistic because of the nature of the work of each agency.

Sources of Most Helpful Information in Farming

Besides the exploration of contacts with agricultural workers in the county, there are a considerable number of studies which deal with sources of farm information in general and also the influence of these sources on the adoption of farm practices. Wilson and Gallup,⁹ reviewing a large number of studies conducted in 27 states between 1923 and 1941, found that neighbors and friends were credited for adoption of more practices than any other source, while result demonstrations were second.

A few of the recent studies have also shown that neighbors and friends are the most often mentioned source.¹⁰ However, most of these later studies show farm journals and newspapers as most often mention sources, while either radio or newspapers frequently follow.¹¹ In the present study, farm journals

have also been found to be the most often mentioned source of

⁵Milton Coughnour, *Agricultural Agencies As Information Sources for Farmers in a Kentucky County*, Progress Report 82, Kentucky Experiment Station, University of Kentucky, 1959, p. 8.

⁹Wilson and Gallup, *op. cit.*, p. 13.

¹⁰*The Cass County Study: An Evaluation of the Extension Service and the Farm and Home Labor Saving Show in the Atlantic, Cass County, Iowa, Trading Area*, Iowa State College Agricultural Extension Service, 1949.

¹¹Herbert Lionberger, *Low-Income Farmers in Missouri: Their Contacts with Potential Sources of Farm and Home Information*, Research Bulletin 441, Agricultural Experiment Station, College of Agriculture, University of Missouri, 1949, pp. 22-25. Herbert Lionberger, *Sources and Use of Farm and Home Information by Low-Income Farmers in Missouri*, Research Bulletin 472, Agricultural Experiment Station, College of Agriculture, University of Missouri, 1951, pp. 9-18.

helpful information; however, this is not true for newspapers.¹²

Figure 1 shows the sources of information farmers find most helpful in learning about new farming practices. Farmers were asked to check on a list of sources of farm information all the sources from which they usually get helpful information. They were also asked to double check the two sources which they considered most helpful.

Inspection of Figure 1 shows that farm papers and farm magazines are considered by far the most helpful source of farm information. This is true in spite of the fact that most of the studies which deal with the comparative effect of the various media have shown that personal address is superior in persuasive power to mechanical oral appeal, which is in turn superior to printed appeal.¹³ Local or outside newspapers are mentioned only as secondary sources of farm information. Neighbors, friends, and relatives are mentioned second as a primary source; however, they rate the highest as secondary sources.

Individual talks with the county agent, South Dakota State College bulletins, and circular letters from the county agent have been mentioned as the third, fourth, and fifth important sources of helpful information in adopting new practices. However, the differences in rating among these three media are very small.

Among secondary sources of farm information, South Dakota

State College bulletins were rated higher than the other two sources. The rest of the professional agricultural workers in the county (all workers, excluding the county agent), along with seed and fertilizer dealers and salesmen, have been mentioned sixth and seventh as sources of most helpful farm information. Extension meetings and demonstrations were eighth.

Finally, radio, television, newspapers coming into the county, and the county newspaper were the last mentioned sources of primary information. With the exception of the local newspaper, which had been mentioned by only 31.3% of the farmers in the county, each of the other three sources had been mentioned by nearly half of the respondents as secondary sources of helpful information.

It has been mentioned that the present inquiry does not deal with sources of helpful information referring to specific farm practices, but to all farm practices. The only exception is soil testing. Figure 2

¹²It is difficult to compare the findings of the existing studies because some of them are concerned with the relative importance of sources of information for specific practices, while others are concerned with general sources of farm information. Furthermore, in some areas studied, certain diffusion media were not available to the population studied and the classification of diffusion media was not the same.

¹³Joseph T. Klapper, "The Comparative Effects of the Various Media," in Wilbur Schramm, *The Process and Effects of Mass Communication*, University of Illinois Press, Urbana, Illinois, 1960, pp. 93-95.

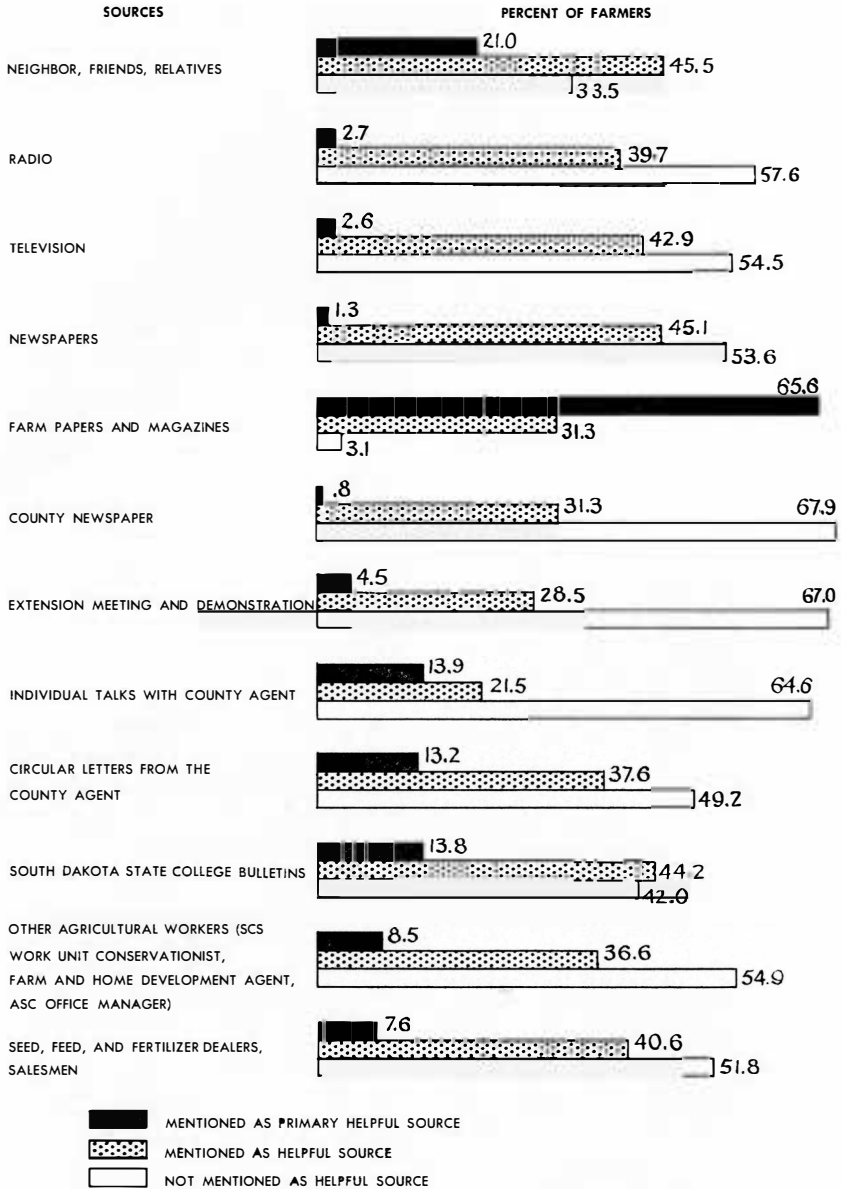


Figure 1. Sources of information farmers have found most helpful in learning about new farming practices.

shows the sources of information farmers have mentioned the Extension Service as a source of helpful information. More than half the

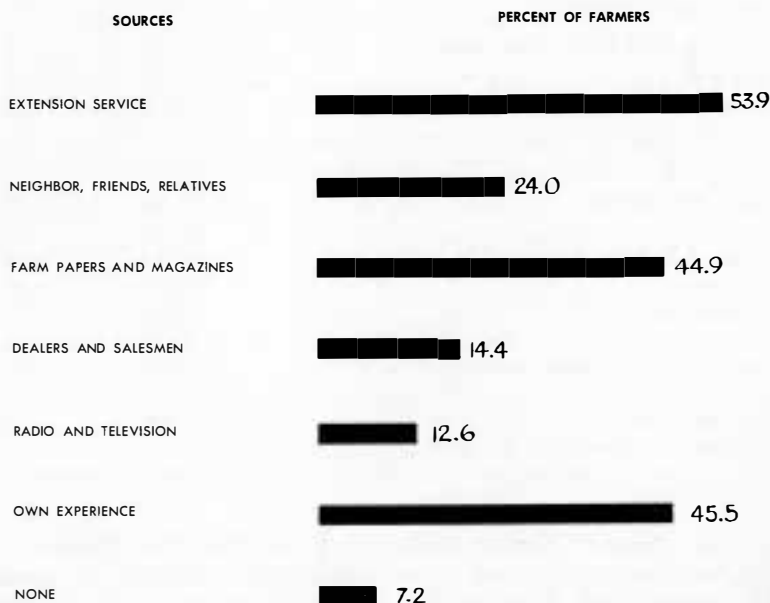


Figure 2. Sources of information farmers have found most useful in soil testing.

Relationship Between Contacts with Agricultural Workers and Sources of Helpful Information

It has been shown that certain sources of farm information are considered more helpful than others. Previous studies have indicated also that people with different socio-economic characteristics mention different sources of helpful farm information.¹⁴ Concerning specific farm practices, such studies have indicated that for

certain practices there are specific sources which are mentioned more

¹⁴Herbert Lionberger, *op. cit.*, Research Bulletin 441 and 472. E. A. Wilkening, "Sources of Information for Improved Farm Practices," *Rural Sociology*, Vol. XV, (March, 1950), No. 1, pp. 19-30. Bryce Ryan, "A Study in Technological Diffusion," *Rural Sociology*, Vol. XIII, (September, 1948), No. 3, pp. 273-285.

Table 3. Relationships Between Contacts with Professional Agricultural Workers and Mentioned Sources of Helpful Information on Farming

Source of helpful information	Level of signif. χ^2	Amount of assn. Phi
Individual talks with county agent.....	P<.01	.47
Farm tours.....	P<.01	.41
Extension meetings and demonstrations.....	P<.01	.31
Individual talks with other agricultural workers (SCS work unit conservationist, ASC office manager).....	P<.01	.28
County newspaper.....	P<.01	.26
Television.....	P<.01	.20
Circular letters.....	P<.01	.19
Newspapers.....	P<.05	.16
Neighbors and friends.....	N.S.	—
Radio.....	N.S.	—
Seed, feed and fertilizer dealers.....	N.S.	—
Farmer papers.....	N.S.	—
SDSC bulletins.....	P<.01	-.40
Agricultural teachers and schools*.....	—	—

*Not enough cases.

often than others.¹⁵ Finally, such studies have also shown that users of the county agent, other institutionalized sources, and no institutionalized sources have mentioned different sources of helpful information.¹⁶ The present portion of this inquiry also deals with sources which have been found most helpful by farmers having different amounts of contacts with all agricultural workers.

Table 3 demonstrates first, sources of helpful information which are related to contacts with agricultural workers; and second, the rank order of these sources in reference to their relationship to contacts.

Inspection of this table shows that individual talks with the county agent, farm tours, Extension meetings and demonstrations, and

local newspapers are positively and significantly related to contacts with agricultural workers. This implies that farmers who have more contacts with agricultural workers have found these sources more useful than farmers with fewer contacts.

No relationship was found between contacts and sources such as neighbors and friends, radio, farm papers, and seed and fertilizer dealers. South Dakota State College bulletins have been found negatively and significantly related to contacts with these workers. Farmers, then, with fewer or no contacts, find South Dakota State

¹⁵Herbert Lionberger, *op. cit.*, Research Bulletins 441 and 472.

¹⁶Herbert Lionberger, *op. cit.*, Research Bulletins 441 and 472.

College bulletins more useful than farmers with more contacts.

The last column of Table 3 shows the amount of association which exists between contacts and sources of most helpful information in farming (as measured by Phi coefficient¹⁷) and also the rank order of the various sources, ranked according to their usefulness to those who have more contacts with agricultural workers. Individual talks with the county agent are shown to be, for those with more contacts, the most helpful source of farm information; farm tours are shown second; Extension meetings and demonstrations third; individual talks with the other agricultural workers (all workers, excluding the county agent) fourth; local newspapers fifth; television sixth; and circular letters seventh.

Sources of helpful information on soil testing have been treated separately in the previous pages from practices which refer to farming in general. To determine the sources of information on soil testing which have been found more useful to farmers with varying degrees of contacts, each source of helpful information had been correlated with the variable (contacts with professional agricultural workers). These relationships have shown that the only source of helpful information which is related

significantly to contacts with agricultural workers is the Extension Service. It can be said, then, that farmers who have more contacts with agricultural workers find the Extension Service more helpful than farmers with fewer contacts.

Concerning friends and neighbors and farm papers and magazines, no significant differences have been found between those who have more contacts with agricultural workers and those who have fewer or no contacts with them. The rest of the sources have not been included in this testing due to the small number of farmers who checked them.

¹⁷Phi coefficient (Mean Square Contingency), which is used throughout this paper, is a measurement of association appropriate for four-cell tables. The formula $\Phi = \frac{(ad-bc)}{\sqrt{(a+b)(c+d)(a+c)(b+d)}}$

is used in this study. (For more information see Wert, Neidt, and Ahman, *Statistical Methods*, Appleton-Century Crofts, Inc., New York, 1953, p. 153.) However, data secured with the use of this measurement should not be considered absolute. Goodman and Krusal, reviewing measurements of association, state, "There are no convincing published defenses of χ^2 like statistics (such as Phi, C. T., etc.) as measure of association, and the reason is that it is difficult to compare meaningfully their values for two cross-classifications." ("Measurements of Association," *American Statistical Association*, Vol. 49, December 1954.)

Relationship Between Contacts with Agricultural Workers and Other Types of Contacts

Contacts with agricultural workers have been previously conceptualized as a latent behavioral predisposition influenced by a number of personal, social, and economic factors. If this predisposition exists with reference to contacts with agricultural workers, then it should be expected that this predisposition would have similar influence on contacts referring to the number of sources of farm information used, to contacts with farm organizations, and probably to contacts with other formal organizations (church or secular).¹⁸

Table 4 shows how people with high frequency of contacts with agricultural workers behave in reference to their formal participation and in reference to the use of sources of farm information. Inspection of this table shows that the relationship between contacts with agricultural workers and formal participation for all three types of participation is positive and statistically significant. Farmers, then, who have wider contacts with agricultural agencies also have wider contacts with formal organizations.

Lionberger has also found that farmers who use agricultural workers participate more in formal organizations; however, he also found that those who had contacts with the county agent had much more

formal participation than those who had contacts with other institutionalized agencies.¹⁹ Similar relationships were also found in relation to the use of communication media. The farmers who have wider contacts with agricultural workers use more media to secure information about farming.

The third column in Table 4 shows the amount of association which exists between contacts with agricultural workers and the three types of formal participation. Inspection of this table shows that

Table 4. Relationships Between Contacts with Workers and Other Types of Contacts

Other types of contact	Level of signif. χ^2	Amount of assn. Phi
Farm organization participation	P<.01	.451
Church participation	P<.01	.243
Secular participation	P<.01	.179
Number of sources used for farm information	P<.01	.451
Number of sources used for soil testing*	P<.05	.243

*Only those who had their soil tested were asked to answer the question on the sources they use to receive information on soil testing.

¹⁸The F. Chapin scale has been used to compute participation scores.

¹⁹Herbert Lionberger, *op. cit.*, Research Bulletin 581.

the association between farm participation and contacts is higher than the association between secular nonfarm or church participation and contacts. Participation in farm organizations, then, is probably more important to people with higher contacts, not only for the reasons which make them participate in formal organizations in general, but also for other reasons.

Church participation is also shown to be more closely related to contacts with agricultural workers than is secular participation. This could be because those with higher contacts are either people with stronger religious convictions, or that church attendance is a group norm and these are people who conform more to such norms than those with low contacts. Concluding, then, we could say that

farmers who have more contacts with agricultural workers also have wider contacts with formal organization, primarily farm organizations; and they use more communication media to secure information on soil testing and farming in general.

There are other types of contacts which could be explored to determine existing patterns referring at least to the local setting, such as informal contacts. However, such data have not been included in this inquiry. There is one statement, though, about informal contacts which our previous data allow us to make—farmers who have more contacts with agricultural workers rely less on their informal contacts concerning farm information than people who come in less or no contact with these workers.

Relationship Between Contacts with Agricultural Workers and Adoption, Knowledge, and Attitudes Toward Recommended Farm Practices

The relationship between communication of farm information and adoption has been primarily studied under three forms:²⁰ actual contacts with agricultural workers, use of information media, and informal contacts. The last has been most meaningfully investigated in studies dealing with the process through which the farm information reaches farm people, the so-called diffusion process.

The present study deals with the relationship between adoption of farm practices and the first of these three areas—contacts with professional agricultural workers. However, besides adoption of farm practices, as has been explained in the section on methodology, an attempt has been made to explore the relationship between contacts and attitudes toward recommended farm practices and also contact and basic knowledge about farming.

Table 5 shows that all three—adoption, knowledge, and attitudes toward recommended farm practices—are positively and significantly related to contacts with agricultural workers in the county.²¹ Knowledge about farming, however, is less closely related to contacts than are attitudes toward

recommended farm practice and actual adoption. When contacts were related to total of adoption, knowledge, and attitudes, a higher relationship was found. As has been mentioned previously, this type of technological change, which includes changes in three aspects of behavior—skills, knowledge, and attitudes—according to Extension theorists is the most desirable type of change.

When contacts with each of the

²⁰See: issue of *Rural Sociology* dealing with adoption of farm practices, *Rural Sociology*, Vol. XXIII, (June, 1958), No. 2. *Sociological Research on the Diffusion and Adoption of New Farm Practices*, Report of the Subcommittee on the Diffusion and Adoption of Farm Practices, The Rural Sociological Society, Kentucky Agricultural Experiment Station, University of Kentucky, Department of Rural Sociology, Lexington, Kentucky, 1952. *Social Factors in the Adoption of Farm Practices*, Research bibliography, North Central Rural Sociology Committee, Iowa State College, 1959.

²¹Several studies which deal with contacts with agricultural workers and adoption have shown that there is a significant relationship between these variables. However a few, such as E. Rogers, have studied the variables which intervene and the spuriousness of the relationship. E. Rogers, "A Conceptual Variable Analysis of Technological Change," *Rural Sociology*, Vol. XXIII, (June, 1958), No. 2, p. 136.

Table 5. Relationships Between Contacts with Professional Agricultural Workers and Adoption, Knowledge, and Attitudes Toward Farm Practices

Variable expected to be influenced by contacts	Relationship between adoption, knowledge, attitudes and contact	
	Level of signif. χ^2	Amount of assn. Phi
Adoption	P<.01	.298
Knowledge	P<.05	.141
Attitudes toward farm practices	P<.01	.270
Total of adoption, knowledge, and attitudes toward recommended farm practices	P<.01	.334

three workers—county agent, SCS work unit conservationist, and ASC office manager—were related to total of adoption, knowledge, and attitudes, all three relationships were found positive and significant. The relationship with the county agent was highest (Phi=.244), with the SCS work unit conservationist second (Phi=.197), and the ASC office manager third (Phi=.172) (See Table 6).

As has been stated, this information cannot be used for comparison among workers because of the type and objectives of their work. Herbert Lionberger, however, has also found that users of the county agent had higher scores than farmers who used all the other institutionalized sources together, and much higher scores than those who did not use any institutionalized sources.²²

The present study and others dealing with contacts and adop-

Table 6. Relationships Between Total of Adoption, Knowledge, and Contact with Specific Professional Agricultural Workers

Workers*	Level of signif. χ^2	Amount of assn. Phi
County agent	P<.01	.224
SCS work unit conservationist	P<.01	.197
ASC office manager	P<.05	.172

*Contacts with other workers are not included in this table due to the small number of cases involved in the corresponding relationships.

tion indicate that the extent to which farmers have contacts with agricultural workers, and particularly with the Extension staff, determines to a great extent the adoption of recommended farm practices. However, participation in Extension activities, calls at the office, and requests that the agent visit the farm are voluntary. Thus it is obvious that people who seek contact with agricultural workers are motivated differently from those who do not seek contact with them.

Differences in adoption, then, between those who come in contact and those who do not should not be attributed entirely to direct Extension efforts because these people were different to start with. On the other hand, these farmers would probably not have acquired this knowledge if the agricultural agencies had not created opportunities and situations in which people gain the abilities necessary to successfully meet their needs and interests in line with their objectives.

²²Herbert Lionberger, *op. cit.*, Research Bulletin 581.

Another area where motivational factors could affect adoption is the motivation of a person who finds himself in a learning situation. Given that any type of contact could be considered as a learning situation, it is logical to expect that persons with different motivations, such as more money invested in their farm enterprise or persons with more education, would acquire different learning experiences from persons who are not so motivated.

The relationship, then, between contacts and adoption should not be viewed independently but as a part of a motivational framework which involves a number of personal, social, and economic factors.

These motivational factors are hypothesized to affect the relationship between contacts and total of adoption, knowledge and attitudes in two ways: (1) It is hypothesized that they force more persons with particular characteristics to seek contacts with agricultural workers; and (2) It is hypothesized that persons with such characteristics absorb and utilize more effectively the information given by the workers, regardless of the fact that they might have the same number of contacts.

An attempt has been made to test these two hypotheses. The testing on the first hypothesis is presented next, with the second hypothesis on page 32.

Relationship Between Contacts with Agricultural Workers and Selected Factors

Motivation has been mentioned as an essential condition of contacts. Motive-incentive conditions include interests, attitudes, needs, and purposes. Such factors as these energize behavior, make it selective, and direct it toward certain ends. Motive-incentive conditions, in the case of contacts with agricultural workers (but mostly with Extension agents), have been found to be determined by: (a) the demands which the environment makes upon the individual and (b) the constitution of the individual. More specifically, the former deals primarily with social

and economic demands, while the latter deals primarily with the personality of the individual, encompassing aspects such as education, values, and attitudes.

In the present study, factors dealing with both environmental and constitutional demands are used in order to investigate their influence on three types of contacts: (a) total of all contacts, (b) personal, group, and mass contacts, and (c) specific contacts. Besides factors which affect contacts, a number of factors which are expected to be affected by contacts and a number of factors

which are probably mutually dependent with contacts are studied. Assuming, then, that different directions exist in the relationship between these factors and contacts, the best way to express this relationship using a single term would probably be "characteristics of persons who come in contact with agricultural workers."

The characteristics of people who come in contact with agricultural workers, and primarily the county agent, have been discussed by a number of investigators.²³ However, besides studies which deal with the clientele of the agricultural agencies, there are other studies which deal with audiences in general or audiences classified according to education, occupation, or in terms of other characteristics which may correspond to special interest groupings.²⁴

In summarizing such research, Larzarsfeld concluded that what he calls primary social characteristics—such as sex, age, education, and status—make a considerable difference, not only in channels of communication used, but in the particular programs listened to and newspaper items read. This suggests that the effectiveness of a particular communication channel relative to alternative channels depends on the audience as well as upon the type of communication or the purpose of the communicator.

TOTAL OF ALL CONTACTS

Table 7 shows the way certain factors are related to the total of

Table 7. Relationships Between Selected Factors and Contacts with Professional Agricultural Workers

Selected factors	Level of signif. χ^2	Amount of assn. Phi
Acres you farm (including pastures)	P<.01	.352*
Acres you own.....	N.S.	....
Acres in crop this year	P<.05	.161
Tenure	N.S.	....
Value of livestock.....	P<.01	.227
Value of machinery..	P<.01	.176
Net worth	†	.128
Gross farm income....	P<.01	.318
Level of living	P<.01	.199
Years as farm operator	N.S.	....
Size of family.....	P<.05	.159
Education	P<.01	.282
Age	N.S.	....
Attitude toward the Extension Service ..	P<.01	.282

*Due to the fact that in this particular relationship the middle categories have been eliminated, the presented Phi coefficient should not be used for comparison with the rest of the Phi coefficients which are presented in this table.

†Relationship approaches the 5% level.

²³D. L. Gibson, *The Clientele of the Agricultural Extension Service*, Michigan Agriculture Experiment Quarterly Bulletin, 1944, Vol. 26, No. 4, pp. 237-246. Herbert Lionberger, *op. cit.*, Research Bulletin 441, Helen C. Abell, Olaf F. Larson, and Elizabeth R. Dickerson, *Communication of Agricultural Information in a South-Central New York County*, Cornell University Agricultural Experiment Station, Mimeographed Bulletin 49, 1957. Milton Coughenour, *op. cit.*, Progress Report 82.

²⁴P. F. Lazarsfeld, "Audience Research," in Bernard Berelson and Morris Janowitz, *Reader in Public Opinion and Communication*, the Free Press, Glencoe, Illinois, 1950, pp. 337-46.

all contacts with agricultural workers. As have the previous tables, this table shows factors which are significantly related to contacts with agricultural workers and also the amount of relationship which exists between contacts and each of these factors.

Acres farmed, owned, in crops.

Acres farmed and acres in crops, as in other studies, have been found to be factors positively related to the total of all contacts with agricultural workers. However, number of acres owned has not been found related to such contacts, possibly because a number of landowners lease some of their land to other operators.

Tenure. Recent studies in Iowa have shown that when tenure is controlled a number of known relationships change direction. However, the present data along with data elsewhere have shown that there is no significant difference between tenants and owners concerning contacts with agricultural workers.

Net worth and gross farm income.

Net worth is a factor which has often been found moderately related to contacts with agricultural workers and also to other status factors, such as participation in formal organizations. The motivation behind this variable, however, could be both social and economic. Gross farm income, on the other hand, is a factor which is also both economic and social but its eco-

nomie aspect is directly related to agricultural technology. This is probably the reason farmers with higher gross farm income seek more contacts with agricultural workers.

Value of livestock and machinery.

Money invested in both livestock and machinery is related to contacts with agricultural workers. Similarly, positive relationships have been found with acres farmed and acres in crops. It becomes obvious, then, that the more money farmers invest in the farm enterprise the more they seek contacts with agricultural workers.

Education. Education is a factor which is highly related to contacts with agricultural workers. This has been found to be the case in any study dealing with contacts with agricultural workers and with variables dealing with technological change, such as adoption of farm practices, knowledge, attitudes toward recommended farm practices, and attitudes toward the Extension Service and the Experiment Station. This, however, as discussed in a chapter which follows, has not always been found to be true when other intervening variables are controlled.

Age and years as a farm operator. Neither age nor number of years a farmer has spent as a farm operator is significantly related to contacts. However, the direction of the relationship is negative. This same direction has been found

statistically significant in other similar studies.

Level of living.²⁵ As in other studies, level of living has been found positively related to contacts. Often the function of this variable is explained as social. The farmer who has a high level of living probably has high status in the community, and in his attempt to retain or improve this status, he seeks more contacts and adopts more recommended practices.

Size of family. Size of the family has often been found negatively related to contacts and to adoption. In the present inquiry, however, the relationship is positive and statistically significant.

Attitudes toward the Extension Service and Experiment Station.²⁶

Attitudes toward the Extension Service and the Experiment Station have been found positively and significantly related to contacts with agricultural agents.

Comparison of the Various Factors as to Their Influence on Contacts

The right column in Tables 5, 6, and 7 shows the degree of relationship that exists between contacts and a number of variables which are treated in the present inquiry. Phi coefficient, the measurement of association which is used to show the amount of relationship that exists between two variables, like any other x^2 type measurement of association, is not completely reli-

able. However, when it is used with discretion it can give a fairly accurate indication of the amount of association that exists between two variables.

Inspection of this column in all three tables shows there is considerable variation in the relationship of contacts with these other variables. Explaining these associations in terms of characteristics of people who have more contacts with agricultural workers, we could say that these are people who participated in farm organizations more than those who have fewer or no contacts. Their technological competence is higher, their gross farm income is higher, they have more formal education, and they have more favorable attitudes toward the Extension Service and the Experiment Station.

²⁵This index is a modified form of the Sewell Scale (T. C. Belcher and E. F. Sharp, *A Short Scale for Measuring Farm Family Living: A Modification of Sewell's Socio-Economic Scale*, Oklahoma Agricultural Experiment Station Technical Bulletin T-46, Stillwater, 1952). Included are 24 items on household facilities, equipment and furnishings, and also on transportation and communication. Participation items are treated separately.

²⁶Seven questions dealing with attitudes toward the Extension Service and the Experiment Station were used to define the variable—attitudes toward the Extension Service and the Experiment Station. Six of these questions were found unidimensional and were used to develop an index measuring these attitudes. Unidimensionality was tested with the use of the Guttman technique. A .908 coefficient of reproducibility showed that these items could be considered scalable.

Other characteristics which differentiate those with more from those with fewer contacts, but which are not as distinguishable, refer to people who invest more money in livestock and machinery. They farm more acres, they have more acres in crops, they have a higher level of living, and they participate more in formal organizations, particularly church organizations.

Age, years as farm operator, and tenure, as in studies conducted elsewhere, have not been found to be characteristics which differentiate farmers with more contacts from those with fewer contacts.²⁷

PERSONAL, GROUP, AND MASS CONTACTS

The main reason we classify contacts into personal, group, and mass in most studies is to determine their effectiveness. However, from the theoretical point of view, a number of meaningful interpretations derived from such classification have been attained with the use of principles of social psychology, educational psychology, and sociology.

In the present study no attempt has been made to advance any basic theory but only to show characteristics of people who use each of these contacts. Table 8 shows the relationship between these three types of contacts and characteristics which have been used in the previous pages.

Personal contacts. The same factors which are related to contacts

in general are also related to personal contacts. The only exception is the variable, acres owned, which has not been found related to contacts in general. The same similarity appears when the various factors are compared as to their association with contacts. Factors, such as formal participation, acres farmed, gross farm income, total of adoption, knowledge, and attitudes toward recommended farm practices, which have shown the highest association with contacts in general, have also shown the highest association with personal contacts.

Group contacts. Again the same factors which have been found related to contacts in general have also been found related to group contacts. This is also true concerning factors which have been found more related to contacts in general; the same factors show the highest relationship with group contacts with the exception of the variable, acres farmed, which has been found less associated with group contacts.

Mass contacts. The only factors which have been found related to contacts but not to mass contacts are value of livestock and size of family. Concerning factors which have been found more closely re-

²⁷Herbert Lionberger, *op. cit.*, Research Bulletin 441. E. A. Wilkening, *op. cit.*, *Rural Sociology*. Lee Coleman, "Differential Contact with Extension Work in a New York Rural Community," *Rural Sociology*, XVI, (September 1951), pp. 208-216.

Table 8. Relationships Between Selected Factors and Personal, Group, and Mass Contacts with Professional Agricultural Workers

Selected factors	Personal		Group		Mass	
	Level of signif. χ^2	Amount of assn. Phi	Level of signif. χ^2	Amount of assn. Phi	Level of signif. χ^2	Amount of assn. Phi
Acres you farm (including pasture)	P<.01	.504	P<.05	.131	P<.01	.255
Acres you own	P<.01	.365	N.S.	—	N.S.	—
Acres in crops this year	P<.01	.238	P<.05	.130	P<.05	.158
Tenure	N.S.	—	N.S.	—	N.S.	—
Value of livestock.....	P<.01	.198	P<.05	.156	N.S.	—
Value of machinery.....	P<.01	.169	P<.05	.164	P<.05	.144
Net worth	P<.05	.160	P<.05	.178	P<.05	.135
Gross farm income.....	P<.01	.387	P<.01	.297	P<.01	.345
Level of living	P<.01	.178	P<.05	.130	P<.05	.137
Farm participation	P<.01	.360	P<.01	.312	P<.01	.254
Formal participation	P<.01	.477	P<.01	.317	P<.01	.350
Size of family.....	P<.05	.162	P<.05	.144	N.S.	—
Years as farm operator....	N.S.	—	N.S.	—	N.S.	—
Education	P<.01	.210	P<.05	.163	P<.05	.134
Age	N.S.	—	N.S.	—	N.S.	—
Total of adoption, knowl- edge, attitudes	P<.01	.368	P<.01	.207	P<.01	.243
Attitudes toward the Ex- tension Service and Ex- periment Station	P<.01	.357	P<.01	.333	P<.01	.366

lated to contacts, those which have been found related to contacts in general have also been found more related to mass contacts.

Comparison of the three types of contacts. In almost all cases the relationship between each of the selected factors and personal contacts is higher than the relationship between the same factors and group and mass contacts. With certain factors this difference becomes more significant. For instance, in number of acres owned, there is a strong relationship with personal contacts, while there is no relationship with group and mass contacts.

When the differences in association within the three columns are compared, the differences become smaller for group and mass than for personal contacts. This is true with almost all factors, although with some factors the relationship with group contacts is higher when compared with mass contacts, while for other factors it is lower. The smaller differences among the three types of contacts appear in relationships with factors which have been found more highly related to contacts in general, such as gross farm income, formal participation, and attitudes toward the Extension Service.

Concerning education and the index which measures the total of adoption, knowledge, and attitudes toward recommended farm practices, the association is higher with personal contacts. The latter is not in accord with findings presented by Wilson and Gallup²⁸ who have found that group contacts accounted for the larger part of the adoption of farm practices (32.8% due to group contacts, 24.8% individual contacts, 23.3% mass media, and 19.0% indirect influence). This may be because the data presented by Wilson and Gallup refer to studies conducted a number of years ago when group methods such as test and result demonstrations were very common; it may also be that effectiveness of contacts had been measured not by correlating actual variables but by asking people through what media they had received the information about the practice.

Lionberger, on the other hand, in agreement with the results of the present study, has found differences in the effectiveness of personal sources of information as compared with impersonal sources.²⁹ There was a higher correlation between the use of personal sources and adoption of approved practices than between the use of impersonal sources and adoption.

In the present study, personal contacts have not only been found more effective concerning actual adoption, knowledge, and attitudes toward recommended farm practices, but, as has been shown in

the previous pages, they have also been mentioned as the most useful sources of farm information by the farmers in the county.

This is probably in contrast with expressed opinions that the new communication media combined with effective group methods can replace personal contacts, which are comparatively expensive. As Moser indicates: "No matter how much emphasis may be placed on group methods in various programs, it is still true that much of the education of the farmers for agricultural development must be carried on through personal conversations and demonstrations between the Extension or community development worker and individual farmers."³⁰

SPECIFIC CONTACTS³¹

Since calls at the office, requests that the agent visit the farm to discuss some problem, and the visits to demonstration plots are entirely voluntary, it has been said that such contacts are a question of

²⁸Wilson and Gallup, *op. cit.*, p. 14.

²⁹Herbert Lionberger, *op. cit.*, Research Bulletin 472.

³⁰Arthur Moser, *Interrelationships Between Agricultural Development, Social Organization, and Personal Attitudes and Values*, Cooperative Extension Publication, No. 12, Cornell University, Ithaca, New York, 1960, p. 21.

³¹Of the 13 types of specific contacts which have been investigated in the present inquiry, only seven have been treated under the present heading. The remaining six have not been included due to the small number of farmers who had such contacts.

motivation. The question of how these motivational factors affect specific contacts and how these contacts affect other factors will now be discussed. Table 9 shows, first, which factors are related to each specific contact, and second, which factors are related most to each of these specific contacts. Since some of these factors condition contacts, some are conditioned by contacts, and others are probably mutually dependent, the direction of these relationships is not presented; but factors which are related to specific contacts are presented as characteristics of farmers who have often had this particular contact.

Farm visit. Farmers who are visited by agricultural workers usually have a high score in the scale which measures total of adoption, knowledge, and attitudes toward recommended farm practices. Besides this, these farmers are high participants in formal organizations—primarily farm organizations.

Concerning total of adoption, knowledge, and attitudes toward recommended farm practices, the only type of contact which is highly related to this variable is farm visits. Office visits and letters and cards from the agricultural worker are also related to the total of adoption, knowledge, and attitudes towards recommended farm practices but both relationships are only close to being significant at the 5% level.

Other characteristics of people who are visited often by agricul-

tural workers are higher level of living, higher gross farm income, higher education, and more favorable attitudes towards the Experiment Station and the Extension Service. Characteristics such as larger number of acres in crops, more money invested in livestock, and higher net worth have also been found related to farm visits; the relationships, however, were only close to being significant at the 5% level.

Smaller farmers usually complain that agricultural workers visit the larger farmer more often. This has not been shown in the present data because number of acres farmed and number of acres owned have not been factors related to farm visits. Other factors which have not been found related to farm visits are age and number of years as a farm operator. This again does not seem to be in accord with the theory that agricultural workers, when they start in a county, start with a particular age group and continue working with this same group all the years they remain. At least this is not true in Deuel County where the same county agent has worked close to 20 years.

Group meetings. The only definite characteristic of people who attend group meetings organized by agricultural workers is that they have favorable attitudes toward the Extension Service and the Experiment Station. There are a few other factors, such as acres in crops, gross farm income, and formal

Table 9. Relationships Between Selected Factors and Specific Contacts with Professional Agricultural Workers*

Selected Factors	Farm visit by worker		Attend group meetings		Read letters or cards		Office visit		Obtain bulletin		Visit demonstration plots†		Attend annual meetings‡	
	Level of signif. x ²	Amount of assn Phi	Level of signif. x ²	Amount of assn Phi	Level of signif. x ²	Amount of assn Phi	Level of signif. x ²	Amount of assn Phi	Level of signif. x ²	Amount of assn Phi	Level of signif. x ²	Amount of assn Phi	Level of signif. x ²	Amount of assn Phi
Acres you farm (including pasture)	N.S.	.....	N.S.	.....	N.S.	.....	P<.01	.256	N.S.	.....	N.S.	.....	N.S.	.....
Acres you own	N.S.	.....	N.S.	.....	N.S.	.....	‡	.135	N.S.	.....	N.S.	.....	‡	.139
Acres in crops this year	‡	.154	‡	.154	N.S.	.....	P<.01	.211	N.S.	.....	N.S.	.....	N.S.	.....
Tenure	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....
Value of livestock	‡	.162	N.S.	.....	N.S.	.....	P<.01	.221	N.S.	.....	N.S.	.....	N.S.	.....
Value of machinery	N.S.	.....	N.S.	.....	N.S.	.....	‡	.132	N.S.	.....	‡	.170	N.S.	.....
Net worth	‡	.140	N.S.	.....	‡	.152	‡	.152	N.S.	.....	N.S.	.....	P<.01	.322
Gross farm income	P<.01	.214	‡	.146	‡	.166	P<.01	.386	‡	.170	N.S.	.....	N.S.	.....
Level of living	P<.01	.232	N.S.	.....	N.S.	.....	‡	.137	N.S.	.....	N.S.	.....	N.S.	.....
Farm organization participation	P<.01	.329	N.S.	.....	P<.01	.218	P<.01	.247	‡	.147	‡	.170	P<.01	.232
Formal organization participation	P<.01	.262	‡	.161	P<.01	.308	P<.01	.344	P<.01	.244	P<.01	.246	P<.01	.190
Size of family	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	P<.01	.203	N.S.	.....	N.S.	.....
Years as farm operator	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	N.S.	.....	‡	.140
Education	P<.01	.199	N.S.	.....	N.S.	.....	‡	.150	N.S.	.....	P<.01	.194	N.S.	.....
Age	N.S.	.....	N.S.	.....	N.S.	.....	‡	-.144	N.S.	.....	N.S.	.....	P<.01	.258
Total of adoption, knowledge, attitudes	P<.01	.361	N.S.	.....	‡	.151	‡	.173	N.S.	.....	N.S.	.....	P<.01	.183
Attitudes toward the Extension Service and Experiment Station	P<.01	.188	P<.01	.216	P<.01	.212	P<.01	.286	P<.01	.273	P<.01	.229	P<.01	.334

*Certain types of contacts have not been included in this table due to the small number of respondents who had such contacts.

†Due to the fact that close to two-thirds of the respondents did not have this particular contact, the measurements of association should be used only for comparisons inside the column and not between columns.

‡Relationship approaches the 5% level.

participation, which are positively related to group meeting attendance. These relationships, however, are only close to being significant at the 5% level.

The remaining factors which have been found related to contacts in general—such as education, total of adoption, knowledge, and attitudes towards recommended farm practices, money invested in livestock and machinery, and acres farmed—have not been found related to group meeting attendance.

Read letters and cards sent by the agent. Concerning this type of contact, farmers were not asked if they receive letters and cards from the agricultural workers, but if they read them. Farmers who read such letters and cards primarily are high participants in farm and non-farm organizations, they have more favorable attitudes toward the Extension Service and the Experiment Station, and they have more years as farm operators. This is the only type of contact which is positively and significantly related to longer years as farm operator.

Other factors—such as gross farm income, net worth, and total of adoption, knowledge, and attitudes—only approach significance at the 5% level. The remaining factors among those which have been treated in this inquiry have not been found significantly related to this type of contact.

Office visit. Office visit is a type of contact which is related to approximately the same selected fac-

tors as contacts in general. If internal criteria were to be used in selecting specific types of contact in order to construct an index measuring contacts with agricultural workers, this would probably be the most reliable item.

As in the case of contacts in general, farmers who visit the worker's office usually have high gross farm income and high formal participation. However, the relationship with the index which measures total of adoption, knowledge, and attitudes towards recommended farm practices which are highly related to contacts in general only approaches the 5% level. Number of acres farmed, on the other hand, is highly related to office visits. When these last two relationships are compared as to the contacts with particular workers, the association is much higher with the index total when this visit refers to the county agent's office, while acres farmed becomes higher when this visit refers to the ASC manager's office.

Office visit is the only type of contact which has been found related to acres farmed; and as has been stated previously, this is much more operative when the visit is paid to the ASC office manager's office. Age, on the other hand, has been found negatively related to office visit.

Obtain bulletins from the worker. It has been shown previously that farmers with more favorable attitudes towards the Extension Service and the Experiment Station

consider South Dakota State College bulletins a more useful source of farm information than other farmers. Farmers with such attitudes are also the ones who obtain more bulletins from the agricultural worker.

Another variable which is positively related to this type of contact is size of the family. This is the only type of contact which is positively related to the size of the family. Formal participation, farm participation, and gross farm income are also related to obtaining bulletins from the worker. The last two, however, are only close to being significant at the 5% level. The remaining factors have not been found related to this type of contact.

Visit demonstration plots. Farmers who visit demonstration plots usually have high formal participa-

tion, favorable attitudes toward the Extension Service and the Experiment Station, and have higher education. Farm participation and value of machinery are also related to this type of contact. These relationships, however, only approach significance at the 5% level.

Attend annual meetings. With the exception of characteristics such as attitudes toward the Extension Service and the Experiment Station, the total of adoption, knowledge, and attitudes toward recommended farm practices, and attendance at formal organizations, farmers who attend annual meetings have some characteristics which have not been found related to any of the specific contacts discussed. These characteristics are high net worth, older age, and greater number of years as farm operator.

Factors Influencing the Relationship Between Contacts with Agricultural Workers and Adoption, Knowledge, and Attitudes Toward Recommended Farm Practices

It has been shown in the previous pages that the extent to which farmers make contacts with professional agricultural workers depends on certain motivational factors. It has also been shown

that contacts are closely related to total of adoption, knowledge, and attitudes toward recommended farm practices.

The higher competence of those who have more contacts, as has

been mentioned previously, should not be attributed entirely to direct efforts of the agricultural agencies, because these farmers were different to start with. It is true, however, that these skills, knowledge, and attitudes would probably not have been acquired if the agricultural agencies had not created opportunities and situations in which these farmers gained the abilities necessary to successfully meet their needs and interests in line with their objectives.

Besides the fact that these motivational factors influence the frequency of contacts of these people, theory suggests that such motivational factors would also influence the learning situation, and as a consequence the learning experiences of those who are exposed to the various teaching methods.

Because learning is a modification of behavior through experience, what man learns is determined on the one hand by his constitution, and on the other by the demands which the environment makes upon him.³² It is hypothesized, then, that individuals with the same number of contacts would be higher or lower in the scale which measures total of adoption, knowledge, and attitudes toward recommended farm practices, depending on their motivation.

The motivational factors which have been used to test this hypothesis refer both to the environment and to the constitution of the individual. Motivational factors referring to the former deal with

money invested in livestock and machinery, net worth, and social status.³³ Factors referring to the latter deal with education and age. Table 10 has been developed to test this hypothesis.

Inspection of this table shows that in the group with the stronger social and economic motivation—that is, the group with more money invested in livestock and machinery, higher net worth, and higher social status—the relationship between contacts with agricultural workers and adoption, knowledge, and attitudes toward recommended farm practices is higher in comparison with the group of people with lower motivation. The difference between the two zero order correlations, as is shown in the last column to the right of the table, is significant at the 10% level (the minimum accepted for such comparisons) for social status and net worth and at a higher level for money invested in livestock and machinery. Farmers with more motivation, then, not only have more contacts with agricultural workers, as has been shown previously, but they also get more out of these contacts in comparison with farmers with less motivation.

³²Gates, Jersild, McConnell, and Challman, *Educational Psychology*, The MacMillan Co., New York, 1949, p. 307.

³³In an attempt to explore social motivation separately from economic motivation, instead of the commonly used S.E.S. index, an index related more to social motivation has been used. This index includes formal participation and level of living.

Table 10. Relationships Between Contacts and Total of Adoption, Knowledge, and Attitudes When Structural Variables Are Controlled*

Control variable	Control Variable							
	High			Low			Significance of difference†	
	N	r	P	N	r	P		
Net worth (low \$0-28,000) ..	88	.388	P<.01	90	.202	P<.05	1.224	P<.10‡
Social status (low 0-31)	93	.417	P<.01	90	.239	P<.01	1.326	P<.10
Money invested in livestock and machinery (low \$0-13,500)	89	.423	P<.01	96	.315	P<.01	0.647	N.S.
Education (low 0-8 gr.)	62	.316	P<.01	120	.333	P<.01	0.119	N.S.
Age,|| 25-50 (low 25-40)	63	.219	P<.05	56	.333	P<.01	0.656	N.S.
Age over 40 (low 40-50)	56	.470	P<.01	63	.219	P<.05	1.525	P<.10

*Due to the fact that the number of cases has been diminished under the two dimensions of the control variable, r is used instead of Phi as a more reliable measurement of association.

†When normal curve is assumed, Z can be used in measuring significance of the difference between zero correlations and a standard score of 1.282 is required in order to secure differences significant at the 10% level.

‡Approaches the 10% level.

||Age is divided into two groups because when age is introduced as the control variable the relationship between contacts and total of adoption, knowledge, and attitudes becomes curvilinear.

Because these three economic factors are usually related to education, it could probably be assumed that education has a latent function in these relationships. When education, however, is introduced as a control variable, the relationship between contacts with agricultural workers and total of adoption, knowledge, and attitudes toward recommended farm practices is slightly higher under low education.

Farmers with more contacts, then, are higher on the scale which

measures total of adoption, knowledge, and attitudes toward recommended farm practices regardless of their education. However, in spite of the fact that the relationship is about the same under both high and low education, we cannot necessarily say that the two groups absorb and put into practice this information in the same way; it is quite probable that farmers who have more education but not as many contacts with agricultural workers are high in the scale which measures total of adoption, know-

ledge, and attitudes toward recommended farm practices because they receive this information from some other source outside the county.

It has been shown in previous studies that farmers with more education use more sources of farm information both inside and outside the county.³⁴ If this assumption is true, then it becomes obvious that contacts with agricultural workers help more and are needed more by farmers with less education. Dean, Aurbach, and Marsh, using rationality instead of education, have found similarly that there was no significant relationship between contacts with the Extension Service and adoption of corn practices recommended by this agency among "high rationality" farm operators. However, among "low rationality" farmers there was a positive relationship between contact with Extension Service and adoption of recommended farm practices.³⁵

Age also seems to be a factor which affects the relationship between contact and total of adoption, knowledge, and attitudes toward recommended farm practices. Inspection of Table 10 shows that this relationship is higher ($r=.333$) for the group including people 25 to 40 years of age, as compared with the group which includes people who are 40 to 50 years of age ($r=.219$). However,

the difference between these two zero order correlations is not significant at the 10% level, which is the minimum level of significance presented in this table.

When the 40 to 50 years of age group is compared with the group of people over 50, then the relationship between contacts and the total of adoption, knowledge, and attitudes toward recommended farm practices becomes higher ($r=.470$) for the group of people over 50 as compared with the group of people who are between 40 and 50 ($r=.219$). The difference between these two zero order correlations is significant at the 10% level.

Concerning the application, then, of this finding in program planning, we could say that people over 50 get more out of their contacts with agricultural workers than farmers who are younger.

This is particularly true when they are between the ages of 40 and 50. Or we could say they depend more on the agricultural workers, probably due to limited outside contacts, which is the more probable of the two explanations.

³⁴Herbert Lionberger, *op. cit.*, Research Bulletin 581.

³⁵A. Dean, H. Aurbach, and P. Marsh, "Some Factors Related to Rationality in Decision Making Among Farm Operators," *Rural Sociology*, Vol. XXIII, (June, 1958), No. 2, p. 134.

APPENDIX I. CONTACTS WITH THE VARIOUS PROFESSIONAL AGRICULTURAL WORKERS

What contacts have you had with the various agricultural workers in the county? In what ways have you participated in their programs? During 1958, about how many times did (did you) . . . (Don't ask questions concerning contacts with the Farm and Home Agent to those who are not in the program.)

Types of Contact or Participation	Number of Times				
	Farm and home agent	County agent	SCS work unit conservationist	ASC office manager	FHA county supervisor
1. Worker visit your farm?.....	_____	_____	_____	_____	_____
2. Attend group meetings called by the worker?.....	_____	_____	_____	_____	_____
3. Read circular letters or cards from the worker?.....	_____	_____	_____	_____	_____
4. Visit the worker's office?.....	_____	_____	_____	_____	_____
5. Obtain bulletins from the worker (through the mail, at his office, or brought by worker?.....	_____	_____	_____	_____	_____
6. Have phone conversations with the worker?.....	_____	_____	_____	_____	_____
7. Visit demonstration plots or attend other demonstrations?.....	_____	_____	_____	_____	_____
8. Make an individual farm analysis with the worker?.....	_____	_____	_____	_____	_____
9. Participate in group farm and home planning procedure with the worker?.....	_____	_____	_____	_____	_____
10. Make a trip with the worker?.....	_____	_____	_____	_____	_____
11. Attend farm tours in the Township or County?.....	_____	_____	_____	_____	_____
12. Attend annual meeting?.....	_____	_____	_____	_____	_____
13. Attend Extension program planning meetings?.....	_____	_____	_____	_____	_____
14. Are there any other contacts that you have had with the Farm and Home Agent? (Specify) _____	_____	_____	_____	_____	_____
With the County Agent?.....					
With the Soil Conservation work unit conservationist?.....					
With the Agricultural Stabilization and Conservation office manager?.....					
With the Farmers Home Administration County supervisor?.....					