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A COMPARISON OF PARTICIPATING AND NONPARTICIPATING FAMILIES IN FARM AND HOME DEVELOPMENT

by

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Preface

This is a preliminary report on the bench mark phase of a five-year evaluation study of the Farm and Home Development approach to Agricultural Extension Service work. This study is financed jointly by the Kellogg Foundation, the North Carolina Agricultural Extension Service, and the North Carolina Agricultural Experiment Station.

The basic design of the study is to compare changes in two samples of farm families over a five year period: the experimental group -- a sample of families who are being worked with through the Farm and Home Development approach, and a control group -- a sample of families in the same counties who are not participating in this work.

The intensive educational approach is the independent variables. The dependent variables are such items as adoption of recommended farming practices, income, adoption of recommended homemaking practices, levels of living, and leadership.

It is recognized that a number of other variables will probably influence the "effect" of the "treatment" (i.e., Farm and Home Development) on the dependent variables. For example, previous research indicates that farm operators with higher levels of education respond more favorably to the educational efforts of the Agricultural Extension Service than do farmers with less education. This report is concerned primarily with the comparison of the two samples on these intervening variables.

The families to receive educational assistance were selected at the county level. (The research team had nothing to do with selection.) They were not selected by probability sampling procedures, and it was obvious from preliminary study that they varied quite widely from the general farm population on a number of characteristics that might be expected to be important intervening variables.

It was a simple matter to select the experimental group sample randomly since lists were available. However, it was felt that the control group should be as similar to the experimental group as possible. Thus, an attempt was made to roughly match the experimental group on certain characteristics -- age, tenure, and size of operation.

This report will attempt to evaluate the differences and similarities found between the experimental and control groups, and where possible, between the experimental group and the general farm population.

The evaluation study at the present time is under the leadership of Mr. C. Paul Marsh. When the investigation reported herein was made, the project leader was Dr. Frederick L. Bates, now at Louisana State University. William W. Linder and Herbert A. Aurbach were graduate research assistant and research associate on the study, respectively.

The authors wish to express their appreciation to Dr. C. Horace Hamilton, Head of the Rural Sociology Department, under whose general direction this project is being conducted; to Mrs. Mary Frances Coxe, the project secretary, who typed this manuscript; to the Agricultural Extension Service personnel at both the county and state level for their cooperation in all phases of the study, and to the Department of Experimental Statistics for their advice regarding sampling and tabulation procedures and for doing the machine tabulations.

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A Preliminary Study of Selected Characteristics in Three North Carolina Counties[1], 1954-1955

by

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and C. Paul Marsh

On the basis of a recently completed study by one of the authors of this report[2], it is now possible to suggest certain hypotheses concerning the families who are being studied as an experimental group in an evaluation of the Farm and Home Development approach to Agricultural Extension education in three North Carolina counties. In particular, the experimental group of participating families have been compared to a control group of nonparticipating families and with the general population on the basis of those variables that were considered most important to control: age of farm operator, tenure of operator, and size of farm operation. Furthermore, the experimental group has been compared with the control group in terms of their participation in some of the activities sponsored by the Agricultural Extension Service and their contact with personnel of the Extension Service and other agricultural agencies. Since changes in the rate of adoption of recommended agricultural practices is one of the major factors which will be considered in evaluating Farm and Home Development work, brief

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[1] Wayne, Person, and Macon Counties.

[2] William W. Linder, Characteristics of Certain Participating and Nonparticipating Families Relative to the Farm and Home Development Approach of Doing Extension Work in Three North Carolina Counties (unpublished Masters thesis, Department of Rural Sociology, North Carolina State College, 1956).

consideration will be given to the relationship between the variables under consideration and the rate of adoption.

I. Comparison of Experimental Group with the Control Group and General Population on Control Variables

Because of the gross measures used in matching the control group with the experimental group (see Appendix A for a description of the sampling procedures), it was evident some differences between the experimental and control groups might exist even on the variables used to match the two groups. If these differences proved to be significantly great, they would have to be considered in evaluating the changes that take place from the time that the bench mark study was made until the time that a follow-up study is made. Furthermore, it is necessary to recognize that if considerable differences exist between the farm operators in the experimental group and the general white rural-farm population, these differences will have to be taken into consideration if any generalizations are to be made about the effectiveness of applying the Farm and Home Development approach to a population other than that which was sampled.

Age of Operator

From the studies reviewed, no definite general conclusion can be drawn relative to the effect of age on the acceptance of improved practices. Yet, in working with action programs, age cannot be ignored. It was one of the criteria used to select families to participate in Farm and Home Development in North Carolina. It was felt that the older couples probably would soon be gone and the future of the farm uncertain, unless sons and daughters are to carry on.[1] An examination

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[1] North Carolina Agricultural Extension Service, "The Redirected and Expanded Extension Program in North Carolina: Farm and Home Development," (Raleigh: North Carolina State College, June 1955), p. 6.

of the age distribution of the farm operator in the three counties under consideration (Table 1) revealed that the proportion of young (less than 40 years of age) operators in the experimental group was greater but not significantly so.

Table 1. Distribution of Farm Operators in Experimental and Control Groups by Age, Three North Carolina Counties.

Operator's Age	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
Under 30	23	15.3	12	8.4
30 - 39	56	37.3	55	38.4
40 - 49	44	29.4	41	28.7
50 - 59	21	14.0	28	19.6
60 and over	6	4.0	7	4.9

$X^2 = 4.480$ with 4 d.f. Not significant at the .05 level.

Age then will not be a critical factor to consider in analyzing differences between the two groups either now or at a later time. Nor did age prove to be a critical factor when the experimental group was compared to the expected age distribution if the white male rural-farm population had been sampled proportionately (Table 2).[1] The experimental group had a greater proportion of younger farm operators especially age 30 to 39 and there were fewer old operators age 60 or more; but the difference between the age distribution of the experi-

[1] The expected age distribution was obtained by computing the percentage of white male rural-farm population of the three counties in each age group in the 1950 United States Census of Population and multiplying the percentage in each class by 141 -- the number of farm operators in the experimental group between ages 25 to 59. Those below 25 years of age and 60 years or more were eliminated because they represented so few of the experimental group. It is assumed that changes in age distribution between the time the 1950 Census was made and the bench mark study was made were not great enough to affect these findings.

mental group and the age distribution expected was not statistically significant.

Table 2. Distribution by Age of Experimental Group Farm Operator as Compared to the Expected Distribution Based on the White Male Rural-Farm Population, 25 to 59 Years of Age in 1950*, Three North Carolina Counties.

Operator's Age	Observed		Expected	
	Number	Percent	Number	Percent
Total	141	100.0	141	100.0
25 - 29	20	14.2	23	16.0
30 - 39	56	39.7	47	33.1
40 - 49	44	31.2	41	29.3
50 - 59	21	14.9	30	21.6
Less than 25	6	-----	---	-----
60 and over	3	-----	---	-----

$X^2 = 5.034$ with 3 d.f. Not significant at the .05 level.

* 1950 United States Census of Population

Tenure of Operator

Farm ownership generally has been found to be positively associated with the adoption of improved farm practices.[1] In North Carolina, Wilkening[2] found that tenants tended to adopt significantly fewer improved farm practices than owners. After further analysis, however, he found that there was no significant difference between small owners (less than 40 acres of cropland) and tenants when the effect of other

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[1]The Rural Sociological Society, Sociological Research on the Differences and Adoption of New Farm Practices, report of the Subcommittee on the Diffusion and Adoption of Farm Practices (Lexington: Kentucky Agricultural Experiment Station, RS-2, June 1952), p. 3.

[2]Eugene A. Wilkening, Acceptance of Improved Farm Practices in Three Coastal Plain Counties, (Raleigh: North Carolina Agricultural Experiment Station Technical Bulletin, No. 98, May 1952), pp. 40 - 41.

factors (age, level of living, and favor toward institutionalized agencies of farm information) were held constant. He concludes, "The higher adoption indexes of all owners as compared with all tenants are, therefore, likely due to the higher adoption of large farm owners over small farm owners and to the lower socio-economic status of tenants than owners."[1]

For purposes of this study, farm operators were divided into two tenure categories -- owners and tenants. The former includes both full and part owners. The distribution of farm operators in this study by tenure is given in Table 3.

Table 3. Distribution of Farm Operators in Experimental and Control Groups by Tenure, Three North Carolina Counties.

Tenure	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	148	100.0
Owner	131	87.3	122	82.4
Tenant	19	12.7	26	17.6

$X^2 = 1.40$ with 1 d.f. Not significant at the .05 level.

Although the proportion of tenants in the control group was somewhat higher than in the experimental group, the difference was not statistically significant. However, when compared to the expected tenure distribution based on the 1954 Census of Agriculture (Table 4), the proportion of farm ownership in the experimental group is much higher than is generally true among white operators in the three counties.

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[1] Ibid., p. 50.

Table 4. Distribution by Tenure of Experimental Group Farm Operators as compared to the Expected Distribution Based on White Farm Operators in 1954*, Three North Carolina Counties.

Tenure	Observed		Expected	
	Number	Percent	Number	Percent
Total	150	100.0	150	100.0
Owner	131	87.3	90	60.1
Tenant	19	12.7	60	39.9

$X^2 = 46.69$ with 1 d.f. Significant at the .001 level.

* 1954 Census of Agriculture

The difference is highly significant statistically. As a result any generalization made from this study to the total farm population will have to take into consideration this disproportionately high rate of ownership. It can be expected that rates of adoption among farmers being studied would be higher in the experimental group because of this variable.

Size of Operation

As was the case with tenure, size of farm has generally been found to be positively associated with the adoption of improved practices.[1] The adoption of improved practices in the North Carolina Coastal Plains was found also to vary directly with size of farm operation by Wilkening.[2] This coupled with the point already made above that differences between small owners and tenants were not significant would indicate that large owners in particular would be expected to have significantly higher rates of adoption. From an examination of Table 5, it is obvious that the sampling procedure used in selecting

[1] The Rural Sociological Society, p. 3

[2] Pp. 41 - 43.

the farm operators in the control group did not adequately control either the size of farm or the amount of cropland harvested and improved pastures. In both cases, differences between the experimental and control groups were significant, but more highly so in the case of total land.

Table 5. Distribution of Farm Operators in Experimental and Control Groups by Size of Farm and Land in Crops and Improved Pastures, Three North Carolina Counties.

Farm Operators with:	Experimental		Control	
	Number	Percent	Number	Percent
Total lnad in farm (acres)				
Total	150	100.0	148	100.0
0 - 29	12	8.0	32	21.6
30 - 49	22	14.7	16	10.8
50 - 69	25	16.7	14	9.5
70 - 99	25	16.7	18	12.2
100 - 139	25	16.7	19	12.8
140 - 219	24	16.0	19	12.8
220 or more	17	11.3	30	20.3
$X^2 = 19.24$ with 6 d.f. Significant at the .01 level.				
Land in crops harvested and improved pastures (acres)				
Total	150	100.0	148	100.0
0 - 9	22	14.7	27	18.2
10 - 19	18	12.0	25	16.9
20 - 29	28	18.7	22	14.9
30 - 49	33	22.0	17	11.5
50 - 99	30	24.0	31	20.9
100 or more	13	8.7	26	17.6
$X^2 = 12.17$ with 5 d.f. Significant at the .05 level.				

The control group in the three counties examined here include a considerably greater proportion of very large (over 220 acres) and very small (under 30 acres) farms and a considerably smaller proportion

of median size (50 - 99 acres) farms. The same relationship was true as far as crop and pasture land was concerned, but the differences were not as great.

It seems evident that the sampling procedures were too gross to adequately control this very important variable. When comparisons are made between the experimental and control groups, it will be most important to take this fact into consideration and to use statistical controls on size of farm operation to compensate for it. An examination of Table 6 reveals even a greater variance by county.

Table 6. Distribution of Farm Operators in Experimental and Control Groups by Size of Farm and Land in Crops and Improved Pastures in Three North Carolina Counties.

Farm Operators with	County A		County B		County C	
	Experi-mental	Control	Experi-mental	Control	Experi-mental	Control
Total land in farm (acres)	(N=50)	(N=50)	(N=50)	(N=50)	(N=50)	(N=48)
0 - 29	14.0	32.0	4.0	18.0	6.0	14.6
30 - 49	16.0	14.0	8.0	10.0	20.0	8.3
50 - 69	18.0	4.0	18.0	4.0	14.0	20.8
70 - 99	14.0	8.0	14.0	16.0	22.0	12.5
100 - 139	14.0	14.0	20.0	16.0	16.0	8.3
140 - 219	14.0	10.0	22.0	10.0	12.0	18.8
220 or more	10.0	18.0	14.0	26.0	10.0	16.7
Land in crops harvested and improved pastures (acres)						
0 - 9	22.0	22.0	6.0	0.0	22.0	27.1
10 - 19	20.0	34.0	12.0	14.0	2.0	4.2
20 - 29	24.0	8.0	26.0	26.0	6.0	10.4
30 - 49	4.0	2.0	16.0	18.0	34.0	16.6
50 - 99	14.0	22.0	30.0	32.0	26.0	10.4
100 or more	6.0	12.0	10.0	10.0	6.0	31.2

There were considerable differences between the control and experimental groups in all three counties in total acreage per farm. There were greater proportions of control group farms in the very small and very large categories, although the variance between the groups in the middle categories differed from county to county. The differences between the two groups in acres of crop and pasture land per farm were not great in County B, but varied greatly in the other counties, particularly in regard to the large size categories.

Data are not available in the 1954 Census of Agriculture to examine the statistical significance of differences between the experimental group and the total white population of the three counties on these variables. However, an examination of Table 7 shows that the farms in the experimental group are considerably larger in total size and in acreage of cropland harvested than is generally true for the operation of white farmers in the county. Thus, any generalizations to the general population of farm operators will be subject to considerable qualification in regards to size of operation.

Table 7. Total Acres per Farm and Acres of Cropland Harvested per Farm by County, Experimental Group, and White Farm Operators in 1954*, Three North Carolina Counties.

	County A	County B	County C	Three Counties
Total land per farm (acres)				
Experimental	102.4	143.5	102.2	116.0
1954 Census	60.6	77.9	67.8	68.0
Cropland per farm (acres)				
Experimental	21.5	38.0	49.8	36.4
1954 Census	8.6	16.6	32.5	21.8

* 1954 United States Census of Agriculture

Conclusions Regarding Control Variables

Despite attempts to control key variables, differences between the experimental and control groups of farm operators indicate that one of

the control variables, size of farm operation, was not satisfactorily controlled. Since in other studies larger farm operators generally have been found to adopt approved agricultural practices more readily than smaller operators, it will be most important to statistically control this factor in any analysis of the change in farm operations which might take place during the period in which this evaluation study is being carried on. Generalizations made from the experimental group to the general population of white farm operators will have to be highly qualified, since differences in tenure, which has been also a significant variable in other studies, was found to be statistically significant; and differences in size of operation between the experimental group and the general population appear great enough to be important. These differences between the experimental group and the control group general population seems to indicate that larger operators and owners are represented in a higher proportion among farm operators being worked with through Farm and Home Development than are smaller operators and tenants. It could be expected, therefore, that participants in Farm and Home Development would more readily adopt new and approved practices than would be expected for the general population of farm operators even though they were not participating on the intensive programs.

II. Other Important Socio-cultural Characteristics

Education

The degree of education attained influences the behavior of people in many ways. It constitutes a fundamental factor which should be considered in any educational program. A number of studies indicate that farm operators with more education more readily adopt practices than operators with less education.[1] The educational distribution for the

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[1]Some of the more important studies in this area have been:

(a) Bryce Ryan and Neal Gross, Acceptance and Diffusion of Hybrid Corn Seed in Two Iowa Communities (Ames: Iowa Agricultural Experiment

three counties for operators and homemakers is presented in Tables 8 and 9.

Table 8. Distribution of Farm Operators in Experimental and Control Groups by Education, Three North Carolina Counties.

Grade of School Completed	Operator			
	Experimental		Control	
	Number	Percent	Number	Percent
Total	148	100.0	140	100.0
6 and under	19	12.7	26	18.2
7 - 8	49	32.7	52	36.3
9 - 10	29	19.3	18	12.6
11 - 12	46	30.7	38	26.6
13 or more	5	3.3	6	4.2
Median Grade Completed	9.4		8.7	

$X^2 = 1.44$ with 4 d.f. Not significant at the .05 level.

Cont. Station Research Bulletin 372, January, 1950).

(b) C. R. Hoffer, Acceptance of Approved Farming Practices Among Farmers of Dutch Decent (East Lansing: Michigan Agricultural Experiment Station Bulletin 361, 1942).

(c) A. Lee Coleman, "Differential Contact with Extension Work in a New York Rural Community," Rural Sociology, 16: (September 1951), p. 213.

(d) M. C. Wilson, How and to What Extent Is the Extension Service Reaching Low Income Farm Families (Washington: Extension Service, United States Department of Agriculture, Circular 375, December 1941), p. 12.

Table 9. Distribution of Farm Homemakers in Experimental and Control Groups by Education, Three North Carolina Counties.

Grade of School Completed	Homemaker			
	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	141	100.0
6 and under	7	4.7	21	14.7
7 - 8	35	23.4	44	30.8
9 - 10	23	15.3	17	11.9
11 - 12	65	43.4	42	29.4
13 or more	20	13.3	17	11.9
Median Grade Completed	11.3		9.6	

$X^2 = 15.944$ with 4 d.f. Significant at the .01 level.

In grades of school completed by farm operators, there was no significant difference between the experimental and control groups; but, there is a highly significant difference between homemakers of the experimental and the control groups. These findings indicate that one should expect homemakers of the experimental group to accept and make changes more readily than those of the control group, while one would not expect to find any significant difference between farm operators on rates of adoption. In the case of the farm operators, since there is no significant difference between the two groups in education, and if education were the only intervening variable, any differences in the adoption of farm practices may be directly related to participation on the program. Whereas, with the homemakers one would have to hold education constant to determine if the progress was related to participation on the program.[1]

[1]This higher educational level of the experimental group homemakers might have some effect upon the receptivity of the experimental group operators. No reference has been found to any research that examined the relationship between adoption of farm practices and education of homemaker.

Level of Living

Level of living as used here refers merely to the extent to which certain equipment and facilities are owned by the family.[1] For example, if a family owns all items included in the questionnaire, their level of living score is 26.

Previous research has shown that families with higher levels of living tend to make changes more rapidly and to accept new farm practices more quickly.

The distribution of level of living scores for the three counties in this study are as follows:

Table 10. Distribution of Farm Families in Experimental and Control Groups by Level of Living Index Score, Three North Carolina Counties.

Level of Living Index Score	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
0 - 10	25	16.6	32	22.4
11 - 14	43	28.7	37	25.9
15 - 19	60	40.0	43	30.0
20 and above	22	14.7	31	21.7
Median Index Score	15.6		15.3	

$X^2 = 5.480$ with 3 d.f. Not significant at the .05 level.

There is no significant difference between the experimental group and the control group in level of living index score. Forty-five percent of the experimental group have scores of 14 or below as compared to 48 percent of the control group. The difference between these groups is only three percentage points. This might be explained by the

[1] See Appendix B for a list of these items.

fact that size of farm and farm tenure were controlled in selecting the groups. However, since there is no significant difference between the experimental and control groups in level of living, any progress that is made relative to changes and acceptance would likely be related to participation on the program; provided, level of living and participation were the only two variables being considered.

A comparison between certain of the indices in the level of living scale and the general farm operator population of the counties as reported in the 1954 Census of Agriculture would be derivable if breakdowns by color were available in the Census data; but since breakdowns are not available, such comparisons would be of little value.

Social Participation

"Participation is a social process in which an individual identifies himself with a particular activity or program. It may involve mere passive membership or attendance at meetings to intense participation; such as, preparing programs and leading discussions or even office holding."[1] In the schedule used in this study, participation was broken down into three parts. The persons interviewed were asked if they were members, if they attended meetings, and if they held an office. It was felt that the more active participants would be more likely to receive scores for the latter two. For scoring purposes, a score of one was given for membership; two, for attending meetings; and three, for holding office.

In the report of the subcommittee on Diffusion and Adoption of Farm Practices of the Rural Sociological Society, it was pointed out in the review of literature that social participation was positively

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[1]Charles R. Hoffer, Selected Social Factors Affecting Participation of Farmers in Agricultural Extension Work (East Lansing: Michigan Agricultural Experiment Station Special Bulletin 331, June 1944).

associated with the adoption of farm practices. Since participation seems to be related so closely to adoption, and adoption of new ideas and practices is one of the goals of Farm and Home Development, the percentage distribution of the social participation scores for the experimental and control groups in the three counties was examined (Table 11).

Table 11. Distribution of Farm Families in Experimental and Control Groups by Combined Social Participation Score of Operator and Homemaker, Three North Carolina Counties.

Combined Operator and Homemaker Social Participation Score	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
Under 12	25	16.7	58	40.5
13 - 16	27	18.0	22	15.4
17 - 23	31	20.7	21	14.7
24 - 30	23	15.3	18	12.6
31 and above	44	29.3	24	16.8

$X^2 = 21.880$ with 4 d.f. Significant at the .01 level.

It is evident that the experimental group participates more than does the control group. The differences between the two groups was significant at the .01 probability level. A chi-square test was computed also on the differences between the operators of the two groups and the homemakers of the two groups taken separately. In both instances, the differences were significant at the .01 probability level. In both cases, the control group had significantly lower participation scores than did the experimental group. This indicates that the higher participants in organized activities are more highly represented in the experimental group.

In terms of the success of the Farm and Home Development approach, this high participation indicates that the Extension agents in these three counties being studied, could probably expect the families they

are working with to adopt recommended practices and make changes relatively faster than those in the control group even if they were not receiving special educational help through the unit approach. This points up the failure to control another possibly important intervening variable and emphasizes the necessity of controlling on this variable in the final analysis. This may be accomplished by dividing the experimental and control groups into several strata based on level of social participation. In this way, the affect of social participation would be eliminated for the comparison and any differences observed for specific strata could be related to participation on the program.

Conclusions Regarding Other Important Socio-cultural Characteristics

Three important socio-cultural characteristics other than the control variables were examined in considering differences between the experimental and control groups. They were: (1) education, (2) level of living, and (3) social participation. Although there were no significant educational differences between farm operators in the two groups, the educational level of the homemakers in the experimental group was higher to statistically significant degree. The average farm operator in both groups had completed grade school, but had little high school education. This also was true of homemakers in the control group, but in the experimental group, the average homemaker had completed eleven grades of school. Since education is a particularly crucial variable in adopting new practices, the homemakers in the experimental group can be expected to be more receptive to new ideas than those in the control group.

No significant differences in level of living were found between the experimental and control groups. Since a higher proportion of large operators and owners were in the experimental group than in the general population, it would seem probably that the level of living of the experimental group was higher also. Unfortunately the Census data on level of living items were not available for white farm families only, and this hypothesis could not be adequately tested.

The extent of social participation by the farm families in the experimental group was greater than that of the control group to a highly significant degree. Since the degree of social participation is closely related to the adoption of new and approved farm and home practices, this provides further evidence of the basic differences between the two groups and points up another important factor to control statistically in any comparative analysis.

III. Contact with Extension

The data presented in this section are based on several questions asked of both the operator and homemaker about contact with the Agricultural Extension Service. Five indices were used to determine the difference, if any, between the experimental and control groups. These were: (1) attendance of meetings in which the agents participated; (2) visits to the agent's office; (3) farm demonstrations conducted in cooperation with the county agent; (4) contact of the homemaker with the Home Demonstration Agent or Club; (5) contact of children with 4-H Club work. (All of these -- except for conducting demonstrations -- were contacts in which the respondent had to take the initiative. For this reason, farm and home visits by Extension agents were not included.)

Attendance at Meetings

Meetings are widely used by Extension agents in their educational work. However, they also require enough motivation on the part of the farm operator for attendance. Thus, the extent to which a farm operator attends Extension meetings may be considered one index of motivation for seeking new information as well as an index of contact with Extension (Table 12).

A higher number of the experimental group families attended meetings in which the county agent participated in 1954, which indicates that there might have been some tendency for families to be selected on this basis. A likely explanation of this would be that those who selected families for participation (usually an advisory committee, or

the Extension agents themselves) would have a better opportunity to know those who attended meetings. It should be noted further, as shown in Table 13, that the percentage of the experimental group attending meetings increased in 1955 while the percentage of the control group attending meetings remained relatively constant. Since a few of the participating families were selected in early 1955, this increase might have been partly a result of exposure to the Farm and Home Development approach.

Table 12. Distribution of Farm Operators in Experimental and Control Groups by Attendance at Farm Meetings in 1954 in Which the County Agents or Assistant Agents Participated, Three North Carolina Counties.

Did Attend Meetings	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
Yes	110	73.3	87	60.8
No	40	26.7	56	39.2

$X^2 = 5.20$ with 1 d.f. Significant at the .05 level.

Table 13. Distribution of Farm Operators in Experimental and Control Groups by Attendance at Farm Meetings in 1955 in Which the County Agent Participated, Three North Carolina Counties.

Did Attend Meetings	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
Yes	123	82.0	87	60.8
No	27	18.0	56	39.2

$X^2 = 16.16$ with 1 d.f. Significant at the .01 level.

The experimental group also attended a higher number of meetings per person during 1955 than did the control group (Table 14). Again,

this indicates (1) that in general persons with more frequent contact may have been selected and (2) this contact may have been increased even more by participation in Farm and Home Development.

Table 14. Distribution of Farm Operators in Experimental and Control Groups by Number of Meetings Attended During 1955 in Which the County Agent Participated, Three North Carolina Counties.

Number of Meetings Attended	Experimental		Control	
	Number	Percent	Number	Percent
Total	149	100.0	142	100.0
None	27	18.1	56	39.4
1 - 2	36	24.2	34	24.0
3 - 4	47	31.5	27	19.0
5 or more	39	26.2	25	17.6

$X^2 = 18.50$ with 3 d.f. Significant at the .01 level.

Visits to Agent's Office

Two aspects of this situation were looked at: (1) had they ever visited the Agent's office, and (2) the number of times they visited it in 1955. In both instances, the difference between the control and experimental groups was significant at the .05 probability level.

Table 15. Distribution of Farm Operators in Experimental and Control Groups by Whether or Not They Had Ever Visited Agent's Office, Three North Carolina Counties.

Ever Visited Agent's Office	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
Yes	143	95.3	126	88.1
No	7	4.7	17	11.9

$X^2 = 5.120$ with 1 d.f. Significant at the .05 level.

Table 16. Distribution of Farm Operators in Experimental and Control Groups by the Number of Visits Made to the County Agent's Office during 1955, Three North Carolina Counties.

Number Visits Made During 1955	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
None	14	9.3	20	14.0
1 - 2	25	16.7	26	25.1
3 - 4	24	16.0	21	14.7
5 - 7	27	18.0	31	21.7
8 or more	60	40.0	35	24.5

$X^2 = 9.92$ with 4 d.f. Significant at the .05 level.

There is a significant difference between the experimental group and the control group relative to those who ever visited the Agent's office. Again, it seems evident that the families selected were those who, prior to selection, had a higher contact with Extension than the control group. The number of visits per person to the County Agent's office in 1955 is also significantly different between the two groups. This evidence seems to support the probability that the families with higher contact were selected; and that, since selection, participation on the program has increased this contact.

Farm Demonstrations

There was also a significant difference between the groups on whether the farmer had ever conducted a farm demonstration in cooperation with the County Agent. Twenty-nine percent of the experimental group had conducted a demonstration with the Agent as compared to 19 percent of the control group. These differences were significant at the .05 probability level. Again a tendency to select families who had previous contact with Extension is indicated.

Homemaker's Contact with Extension

Visiting the home demonstration office and belonging to the Home

Demonstration Club were the two main variables used as indices of the homemaker's contact with Extension. Here, again, the relationship was in the same direction -- more of the experimental group wives visited the Agent's office and more belonged to the Home Demonstration Clubs. Tables 17 and 18 show the distribution of the two groups.

Table 17. Distribution of Homemakers in Experimental and Control Groups by Whether or Not the Home Demonstration Agent's Office Was Visited During 1955, Three North Carolina Counties.

Did You Visit Agent's Office During 1955	Experimental Number	Experimental Percent	Control Number	Control Percent
Total	150	100.0	143	100.0
Yes	41	27.3	22	15.4
No	109	72.7	121	84.6

$X^2 = 6.2$ with 1 d.f. Significant at the .05 level.

Table 18. Distribution of Homemakers in Experimental and Control Groups by Membership in the Home Demonstration Club, Three North Carolina Counties.

Member of Home Demonstration Club	Experimental Number	Experimental Percent	Control Number	Control Percent
Total	150	100.0	143	100.0
Yes	48	32.0	26	18.2
No	102	68.0	117	81.8

$X^2 = 7.4$ with 1 d.f. Significant at the .01 level.

If data were available for 1954 on the homemakers' contact with Extension, one could distinguish between the causal factors involved in this higher contact of experimental homemakers. However, with available data, one cannot determine if families with higher contacts prior to selection were chosen or if the program has caused this

difference. It is felt, that both of these have had some effect -- especially since most participating families were not selected before mid-1955 and many were selected late in 1955.

The participation of the wives in home demonstration activity varies, too. Of the 293 cases in this study, only 15 percent are on any committee. Of the two groups, 18 percent of the experimental as compared to 13 percent of the control are committee members. However, this is not a significant difference at the .05 probability level. There is a significant difference, however, among those holding offices. In the experimental group, 21 percent hold an office as compared to only 12 percent of those in the control group. This is significant at the .05 probability level. In general, it appears that a higher percentage of those with previous contact were selected for the experimental group.

Youth Contact with 4-H Club Work

More of the experimental group youth belong to the 4-H Clubs. Over 55 percent of the experimental group and almost 50 percent of the control group did not have any youth of 4-H Club age, but the experimental group has a higher percentage of its youth of 4-H Club age who were members of a 4-H Club. The following table presents the data.

Table 19. Distribution of Farm Operators Who Had Youth of 4-H Club Age in Experimental and Control Groups by Whether or Not Their Youth Were Members of a 4-H Club, Three North Carolina Counties.

Were Youth between 10 and 20 Years Old Members of 4-H Club	Experimental		Control	
	Number	Percent	Number	Percent
Total	67	100.0	75	100.0
Yes	52	77.6	36	48.0
No	15	22.4	39	52.0

$X^2 = 13.22$ with 1 d.f. Significant at the .01 level.

These findings further support the previous ones, that there is a tendency for families with higher Extension contacts to be selected. Of course, participation in Farm and Home Development may have increased membership from the experimental group, but both of these factors are probably involved. This could have been verified only if data had been available on the families before they began participating on the program. However, again it should be remembered that most participating families were worked with for only a part of 1955.

Summary

When the experimental and control groups were compared relative to contact with Extension, it was found that:

1. Experimental families attended more meetings in which the county farm agents participated in during 1954 and 1955.
2. A larger proportion of the experimental families had visited the farm agents' offices.
3. The experimental families made more visits per person to the agents' offices than the control group.
4. The experimental families had conducted more farm demonstrations in cooperation with the farm agents.
5. Of the homemakers of the experimental group, more made visits to the agents' offices, a larger percentage belonged to Home Demonstration Clubs, and more frequently held offices in Home Demonstration Clubs than did the homemakers of the control group.
6. Of children eligible for 4-H Club membership, the experimental group has a higher percentage enrolled in 4-H Clubs.

Discussion

Every measurement on contact with Extension is significant except membership on committees of the Home Demonstration Club for the homemakers, which, although not statistically significant, was in a similar direction. Since such a large proportion of the differences between the two groups were significant in favor of the experimental group, one

might reach the following conclusions:

1. Most likely a higher proportion of the families selected were from the group having higher contact with Extension prior to selection.[1]
2. Participation on the program may have had some influence in measuring the amount of contact among the experimental families although it is doubtful that this influence was very great since the agents worked with most of these families only for a part of 1955.
3. Since both of these situations could cause higher participation, at this point it is impossible to tell definitely which of the above aspects has the most influence.

As might be expected, previous research has indicated that people who have most contact with Extension are usually quicker to make changes and adopt more practices. Thus, here too we are faced with evidence that suggests that the experimental group may have been more prone to accept new ideas from the beginning than the control group.

IV. Contact with Other Agencies

Farm families who are high participants in the activities of the Agricultural Extension Service usually also have more contact with other agricultural agencies.

Farm Organizations

In most cases, County Extension workers participate in the various farm organizations and the organizations help "push" various recommenda-

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[1] Families were usually "selected" as Farm and Home Development families by local committees or by local agents. However, if the agents felt after a number of visits that it would be impossible to accomplish anything with these families, they could "drop" them.

tions by the Extension Service. Therefore, it might be possible that this would be one way in which some farmers receive information. In these three counties being studied, there seems to be no significant differences between membership in farm organizations and participation in the experimental group. Although the differences were not significant, they were in the direction of the experimental group.

Soil Conservation Service

Farm operators were asked if they had ever gotten any information, ideas, or help from the Soil Conservation Service in the past two years. The responses to this question are shown in Table 20.

Table 20. Distribution of Farm Operators in Experimental and Control Groups by Whether or Not There Had Been Contact with the Soil Conservation Service, Three North Carolina Counties.

Received any information in past two years from the Soil Conservation Service	Experimental		Control	
	Number	Percent	Number	Percent
Total	150	100.0	143	100.0
Yes	119	79.3	77	53.8
No	31	20.7	66	46.2

$X^2 = 21.48$ with 1 d.f. Significant at the .01 level.

This distribution indicates that the families in the experimental group have had more contact with the Soil Conservation Service than those in the control group. This may be the result of participation in the intensive program or the result of having a higher social participation status. Again, it may be that the higher participating families have been selected for the experimental group.

Vocational Agriculture

Another question was asked relative to personal contact with the Vocational Agricultural teacher. The amount of personal contact between the two groups was not significant at the .05 probability

level, although the experimental group had more contact than the control group.

Summary

On the basis of evidence presented in this section, the following might be concluded:

1. There are no significant differences between the experimental and control groups relative to membership in farm organizations.
2. Families in the experimental group have had more contact with the Soil Conservation Service.
3. Although, the experimental group had slightly more contact with the Vocational Agricultural teacher, the difference was not statistically significant.

V. Summary and Conclusions

Summary

This is a report of a study made in three North Carolina counties in which certain comparisons were made between an experimental group of farm families participating in an Agricultural Extension Service educational program utilizing the Farm and Home Development approach as compared to a control group of nonparticipating families. Comparisons were made also between the experimental group and the general farm populations on selected characteristics. The findings are summarized below:

1. Despite attempts to control key variables including age of operator, tenure, and size of farm, in selecting the families for the experimental and control groups, significant differences were still found between the two groups even on one of the control variables. The size of farm operation of the experimental group (as measured by either the total acreage per farm or by cropland harvested and improved pasture land per farm) was significantly greater. Although data were not available for adequate statistical tests, the experimental group

seems to have significantly larger farm operation than was generally found for farms in the counties in the study. The experimental group also included a significantly larger proportion of owners than were found in the general population of farm operators.

2. Educational differences between farm operator in the experimental and control groups were not significantly different, but homemakers in the former group had a significantly higher level of education than in the latter. No differences between the two groups were found in level of living. However, the extent of social participation was significantly higher in the experimental group than in the control group.

3. The experimental group had a significantly higher degree of participation in all Extension Service activities in which they were compared to the control group. These activities included; attendance at farm meetings, in which the county agent participated, visits to the agent's office, conducting farm demonstrations with the agent, participation of homemakers in Home Demonstration Club activities, and participation of youth in 4-H Club activities.

4. Although there were no significant differences between the two groups in membership in farm organizations or in contact with the Vocational Agriculture teacher, the experimental group had significantly greater contact with the Soil Conservation Service.

Conclusions

Several tentative conclusions may be drawn on the basis of this study that are of considerable importance in any future analyses which would compare the experimental group with either the control group or with the general population.

1. The experimental group is not representative of the general farm population in the counties studied. They have larger farm operations, tney are more likely to be owners, they probably have a

higher level of living, and they are probably better educated. The experimental group families can be expected to be somewhat more receptive to any Extension education program, regardless of approach, than would the general farm population. They would be also more likely to adopt approved agricultural practices regardless of their exposure to a special educational program.

2. In evaluating any changes that take place in the experimental and control groups during the five year period during which this study will take place, certain precautions will have to be taken. In particular, in order to compensate for the fact that the experimental group farms are larger, it would be necessary to stratify the two groups by size of farm in comparing any changes in the farm enterprises. In comparing changes in homemaking practices, the education of the homemaker will have to be held constant since the homemakers in the experimental group have a significantly greater education.

3. It will have to be recognized that despite attempts to select families who represented all strata of the farm population for participation in Farm and Home Development, in all probability there was a tendency to choose disproportionately from those who already had greater contact with the Extension Service. Although the indications of a greater contact with Extension might be, and probably is to some extent due to the fact that most of the families in the experimental group had already been exposed to the Farm and Home Development approach for a short time before they were interviewed, it is highly unlikely that the considerable and consistent differences found between the experimental and control groups were due to that factor alone during such a short period of time. Since contact with Extension is an important variable in the adoption of new agricultural and homemaking practices, and since the experimental families were apparently more likely to seek or at least to be exposed to such contact, it could be expected that as a group they also would be more likely to adopt recommended practices regardless of the approach used in Extension education. Therefore, any evaluation of changes occurring in adoption rates of the experimental and control groups will have to take this fact into consideration.

APPENDIX A
SAMPLING PROCEDURES

Before the sample of families in Farm and Home Development work was selected, the Extension agents in the study counties were requested to supply a list of families who were participating in this work. After the farm operators who were more than 65 years old were eliminated, 50 participating families in each study county were selected from these lists by simple random sampling procedures.

It was apparent from preliminary data supplied by the agents that the families with whom Farm and Home Development work was being carried on were not representative of farm families in general in these counties. For example, more Farm and Home Development families were young, owner families with larger operations than were farm families in general.

Since a high proportion of participating families were drawn from the strata of the population that could be expected to respond more favorably to an educational program, some type of matching of control families with the experimental families appeared necessary. It was decided to attempt to approximately match on tenure, age of operator, and size of operation (as measured by acres of cropland and improved pasture).

Since no list of farm operators including all this information was available, the problem of selection of control group families was a difficult one. Paired matching did not appear feasible, so a gross statistical matching was attempted. For example, in one county the experimental sample contained 13 owner-operators who were under 40 years of age and who operated less than 45 acres of cropland and improved pasture, and an attempt was made to obtain the same number of nonparticipating families in the same category for the control group. Similarly, an attempt was made to get the same number of control as experimental families in the other categories: owner-operator under 40 years of age and with 45 acres or more of cropland and improved

pasture, owner-operator 40 years old or older with less than 45 acres of cropland and improved pasture, owner-operator 40 years old or older with 45 acres or more of cropland and improved pasture; and tenants in the same age and acreage categories.

Since the age of operators and size of operations varied widely among counties, different breaking points were used for setting up categories in each county. In one county the age categories were under 45 years and 45 to 65, and in the other two, cutting point for age was 40 years. In one county the following acreage categories were used: under 25 acres of cropland and improved pasture, and 25 acres or more. In another, the cutting point was at 40 acres and in the other at 45 acres.

The sampling procedure settled upon after consultation with members of the Department of Experimental Statistics was to draw random area samples with each county and to screen the areas in the order drawn until the required number of families were obtained.

This procedure was followed in each county insofar as possible. In each of the three counties from 35 to 40 control group families were obtained in this manner. However, in none of the counties was it possible to complete the selection of the control group sample in this manner. It simply became too expensive. It began to appear that screening of the entire counties would be required if the sample were to be completed -- especially if the required number of younger owner-operators with larger operations were to be filled.

For the last 10 to 15 cases in each county, other procedures were followed. The Agricultural Statistician's office, North Carolina Department of Agriculture, had lists showing acreages of cropland and pasture. Similarly, the tax rolls in each of the various counties showed the ages of owners. From these lists, the final families were selected in as systematic a manner as was possible. This procedure was not a clear-cut probability sampling procedure, but more nearly

approaches a quota sampling procedure.

As may be seen in this report, matching was only approximated. This was partly because of inadequate procedures and partly because of the characteristics of the families with whom Farm and Home Development work is being carried out. For example, in one county the experimental sample contained 16 owner families in which the owner-operator was under 45 years of age and operated 25 or more acres of cropland and improved pasture. However, through all the procedures mentioned above, only 12 control group families could be located. Apparently, in this county, Farm and Home Development work is being carried on with almost all operators in this age-acreage category.

APPENDIX B
LEVEL OF LIVING INDEX

In this research we have used a level of living index. Research workers chose indices which, in their opinion, were representative of the type of things most farmers possessed. Certain items were included on either extreme to give a wide range of possible scores. It is hoped that this will present a true picture of the level of living of those studied.

Every item on the rating sheet was given a score of one with three exceptions. These are: room per person ratio, type of heating, and type of washing machine. The room per person ratio was computed by dividing the number of persons residing in the home into the number of rooms. If a family had a ratio of less than one, no credit was given. For a ratio between one and two, one point was scored; and all that had a ratio of two or above received a score of two.

Scores for the heating system were given on the basis of the type of system. For an oil space heater, one point was scored; two points for a floor furnace, and three points for a central heating system. No credit was given for open fireplaces and other types of heaters.

It was felt that there was a relatively low probability of many of the families having automatic washers, but if they did possess them, they should receive a heavier weight than a regular washer. Therefore, if a family possessed a regular washing machine, one point was scored; if it happened to be automatic, another point was scored. This gave a possibility of receiving two points on this item.

There was a possible total score of 25 which families could make. The scale used, with the points allowed for each item inserted, is presented below. It appeared in Section III of the Homemakers Schedule.

Level of Living Scale

1. What kind of house is this? (INTERVIEWER CAN ANSWER FROM OBSERVATION)

   1. __1__ Brick, stucco, or painted frame
   2. __0__ Unpainted frame or other

2. How many rooms do you have in this house? (Not counting bath, pantry, attic, etc.)

   ___ Score based on Room/Person Ratio -- possibility of 0 to 2 points

3. What kind of lighting do you have?

   1. __1__ Electric
   2. __0__ Other

4. Do you have a washing machine?

   __1__ Yes Is it automatic?

   1. __1__ Yes
   2. __0__ No

   __0__ No

5. What kind of refrigeration do you have?

   1. __0__ None
   2. __1__ Electric
   3. __0__ Ice
   4. __1__ Other Specify If gas, one point was scored

6. Do you have a radio?

   1. __1__ Yes
   2. __0__ No

7. Do you have television?

   1. __1__ Yes
   2. __0__ No

8. Do you have a telephone?

   1. __1__ Yes
   2. __0__ No

9. Do you have water piped into your house?

   1. __1__ Yes
   2. __0__ No

IF NO, SKIP TO QUESTION 13

10. Do you have a bathtub or shower?
    1. __1__ Yes
    2. __0__ No
11. Do you have a kitchen sink?
    1. __1__ Yes
    2. __0__ No
12. Do you have an electric water heater?
    1. __1__ Yes
    2. __0__ No
13. Do you have a home freezer?
    1. __1__ Yes
    2. __0__ No
14. What kind of cooking stove do you have?
    1. __1__ Electric
    2. __1__ Gas
    3. __0__ Coal
    4. __0__ Wood
    5. __0__ Other
15. What kind of heating do you have?
    1. __0__ Fireplace only
    2. __0__ Wood or coal heater
    3. __1__ Oil space heater
    4. __2__ Floor furnace
    5. __3__ Central heat
16. Do you have a separate living room?
    1. __1__ Yes
    2. __0__ No
17. Do you have an automobile?
    1. __1__ Yes
    2. __0__ No
18. What about a truck?
    1. __1__ Yes
    2. __0__ No

19. Do you take a daily newspaper?

    1. __1__ Yes
    2. __0__ No

20. Do you subscribe to any farm magazine?

    1. __1__ Yes Which ones? __One point is scored if they subscribe to two or more farm magazines__
    2. __0__ No

21. What other magazines do you subscribe to?

    __One point is scored if they subscribe to two or more__