Some Indications of the Reinforcement Effects of Cooperative Extension Programs Broadcast from KOTA-TV, Rapid City, South Dakota, a Commercial Television Station

Francis Elizabeth Maierhauser
SOME INDICATIONS OF THE REINFORCEMENT EFFECTS
OF COOPERATIVE EXTENSION PROGRAMS BROADCAST
FROM KOTA-TV, RAPID CITY, SOUTH DAKOTA,
A COMMERCIAL TELEVISION STATION

BY
FRANCIS ELIZABETH MAIERHAUSER

A thesis submitted
in partial fulfillment of the requirements for the
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SOME INDICATIONS OF THE REINFORCEMENT EFFECTS
OF COOPERATIVE EXTENSION PROGRAMS BROADCAST
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This thesis is approved as a creditable and independent
investigation by a candidate for the degree, Master of Science,
and is acceptable as meeting the thesis requirements for this
degree, but without implying that the conclusions reached by the
candidate are necessarily the conclusions of the major department.

Thesis Adviser:
Date

Head, Journalism Department
Date
Francis Elizabeth (Dougherty) Maierhauser was born to Joseph and Elizabeth Dougherty on October 4, 1919, in Manfred Township, Lac Qui Parle County, Minnesota. She completed the first two years of her formal elementary education in Minnesota. Then her family moved to Sioux Falls, South Dakota, where she attended St. Joseph's Cathedral School. She graduated from Cathedral High School in 1937. She received the degree, Bachelor of Arts, from Sioux Falls College in June, 1940, graduating summa cum laude.

From 1940 to 1950, she taught in various secondary schools in South Dakota. On December 28, 1950, she married Francis John Maierhauser.

In 1952, she returned to the field of education as a home economics teacher in Irene, South Dakota. She enrolled in courses in home economics at South Dakota State College, University of South Dakota and, by correspondence, University of Minnesota, completing her work toward a home economics major in 1958.

In May, 1957, Francis Elizabeth Maierhauser joined the staff of the home service department of Northern States Power Company, Sioux Falls, South Dakota. She resigned in September, 1958, to initiate a home service program at Sioux Valley Empire Electric Association, Inc., Colman, South Dakota. In addition to the usual
home service activities, she wrote a newspaper column, "Electric Living with Fran," which was published in weekly newspapers in the area. She also prepared and voiced two different series of tri-weekly radio shows for radio stations KERK, Brookings, and KJAM, Madison, both in South Dakota.

On April 1, 1964, she joined the South Dakota State University Extension Staff as Home Economics Editor. In this position, her responsibilities included writing for daily and weekly newspapers and for magazines. She planned, scheduled and implemented two different daily radio series. She also planned, acted as consultant and implemented television programs. These programs were produced for, and broadcast from, commercial television stations.

In February, 1968, she resigned from the staff of South Dakota State University to accept the position of Home Economist with Kentucky Rural Electric Cooperative Corporation, Louisville, Kentucky, which position she now holds.
ACKNOWLEDGMENT

The author wishes to express her appreciation to the Federal Cooperative Extension Service of South Dakota State University for making funds available for this study.

She is grateful to Dr. George H. Phillips, head of the Department of Journalism at South Dakota State University, for his advice and assistance in designing this study and supervising its interpretation.

To Mrs. Ernst Mehl (nee Janice Laidig), Extension Specialist in Food and Nutrition, Mrs. Iva Grubl, Extension Home Economics Agent in Meade County, and the members and non-members of Extension Clubs in Meade County who responded to the questionnaires, the author expresses her deepest thanks for their cooperation.

To Station KOTA-TV, Rapid City, South Dakota, the author acknowledges her debt of gratitude for the professional and technical assistance provided in the preparation and presentation of the five television programs which were a part of this study, and for the sense of civic responsibility which prompted Dr. Dan Lesmeister, program director, and the KOTA-TV staff to make the public service time available.
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A. Coverage Area of KOTA-TV and Satellites
CHAPTER I

INTRODUCTION

Joseph T. Klapper in the Introduction to The Effects of Mass Communication points out that "if research is to provide meaningful answers to questions about the effects of mass communication, it must inquire into the relative prevalence of the different conditions under which mass communications has different effects." He says, "Unfortunately, communication research has not often addressed itself to such questions."¹ From an exhaustive study of the research completed prior to the publication of the above mentioned work, Klapper makes five generalizations. These two are included:

1. Mass communication ordinarily does not serve as a necessary and sufficient cause of audience effects, but rather functions among and through a nexus of mediating factors and influences.

2. These mediating factors are such that they typically render mass communication a contributory agent, but not the sole cause, in a process of reinforcing the existing conditions.²

This study was undertaken in an attempt to determine to what extent commercial television—an example of mass communication—acts as a contributory agent in the process of reinforcing existing

² Klapper, p. 8.
learning experiences, and in an attempt to isolate some of the other factors that may act as mediating influences to reinforcing effects.

The subjects of this research consisted of members of the Extension Clubs in Meade County, South Dakota. A second audience of the same approximate size of non-members of Extension Clubs in the same county was used as a control group for purposes of comparison.

This problem was chosen for study because reinforcement of adult learning retention acquired during a regularly broadcast program on commercial television—where the audience viewed the programs on a volunteer basis—had not been the object of any previous research. F. M. Dwyer Jr. in a recently completed doctoral dissertation at Pennsylvania State University compared the effects on student learning of several varieties of visual illustrations as a supplement to verbal instruction using a research design similar to this one.3 Robert B. Hayes, in his master's thesis, studied the effectiveness of immediate reinforcement on learning a complex mental-motor skill [driving a car] using an integrated approach where stimulator instruction in the form of motion picture films was interwoven with dual-control car instruction.4


B. R. Bugelski points out that "learning consists of at least three stages of categories of phenomena: acquisition, transfer, and retention."5

Many studies have been performed with animals as subjects in an attempt to discover all the facets involved with the process of learning. However, as James Deese and Stewart H. Hulse explain,

Human behavior is much too complicated, and far too little is yet known and understood about it, to make the development of general theories of learning a fruitful undertaking. ... Instead, the modern theorist attacks a rather specific bit of behavior, collects a lot of data about it, teases it apart, and then attempts to put it back together in some form of necessarily limited theoretical structure.6

A large number of variables are related to the field of adult human learning retention. Bugelski notes the following variables in particular:

1. Time and what occurs in time—the question of disuse or interference.
2. The stimulus situation during learning and testing:
   a. The criterion of learning,
   b. The role of set.
3. The nature of the responses learned.
4. The nature of the test of retention.
5. The effects of intervening activities:
   a. Relative inactivity,
   b. Other learning experiences.
6. The effective character of the material:
   a. Pleasant and unpleasant material,
   b. Ego-involvement,
   c. Traumatic experiences.7

---


7 Bugelski, p. 307.
The above noted problems concerning the understanding of the learning process may account for the fact that the author of this research was unable to discover any report of research dealing with learning retention which was conducted using adults as subjects—either in a laboratory situation or under other conditions. All reported research of the reinforcement effect (other than the two studies cited on page 2 by Dwyer and Hayes) involved the study of animals or, if human behavior was studied, the subjects consisted of slow-learners of elementary school age, retarded children, or average children of pre-school and kindergarten age.

Objectives

The first objective of this study was to attempt to determine what reinforcing effects are observable in the use of commercial television broadcasting, as an example of the mass media, when used to supplement instruction given by volunteer non-professional teachers.

The second objective was to attempt to determine if the age, education or place of residence of the adult are contributing factors, among others, that mediate the effectiveness of the reinforcing medium.

The final objective was to attempt to discover the most effective means of presenting information in this specific medium of mass communication (commercial television) in the subject matter area of home economics.
Major Hypothesis

A regularly scheduled broadcast on commercial television by a Federal Cooperative Extension Specialist can reinforce the teaching given by non-professional volunteer Extension Club leaders in fundamental subject matter.

Specific Hypotheses

The age of the subject is a mediating factor in adult human learning retention.

The educational level of the subject is a mediating factor in adult human learning retention.

The place where the subject resides is a mediating factor in adult human learning retention.

The type of program presentation used in television will have an observable effect on the strength and direction of the reinforcement produced by the medium on adult human learning retention.
CHAPTER II

METHODOLOGY

In selecting the subjects to be used in this study, Extension Club members were chosen because the Federal Cooperative Extension Service makes extensive use of non-professional volunteer teachers in its adult program. An Extension Specialist in a subject-matter area conducts a training meeting for non-professional volunteer Extension Club leaders. These leaders take the information and materials they receive at the training meeting to their respective Extension Club meetings. There they teach the individual members of the club the subject matter they were taught at the "leader-training" meeting.

Definition of Terms

In order to have a better understanding of the implications and limitations of this research, a definition of the terms used in the major hypothesis are given below.

A "regularly scheduled broadcast" in this study refers to a program presented at the same hour of the day on the same station for a given period of time. The broadcast used in this research was presented at 2:30 p.m., Monday through Friday, February 13-17, 1967, on KOTA-TV, Rapid City, South Dakota.
A "commercial television" station refers to one which is owned and operated by an individual or corporation for the purpose of making a profit.

A "Federal Cooperative Extension Specialist" is a member of the faculty of the state land-grant college or university. This individual is a bona-fide member of the faculty in every respect. The principal responsibility of the Extension Specialist is that of conducting a continuing education program for adults.

The College Edition of Webster's New World Dictionary defines "reinforce" as "to strengthen or make more compelling." Deese and Hulse define a reinforcer as "a stimulus event which, if it occurs in the proper temporal relation with a response, tends to maintain or increase the strength of a response or of a stimulus-response connection." In this study the reinforcing effects of the communication medium were determined by the strength and direction of percentage change in scores between the pre-test and post-test of the experimental group (members of Extension Clubs in Meade County).

"Non-professional volunteer Extension Club leaders" are Extension Club members who volunteer their time and effort to attend the "leader-training" meetings conducted by the professional Extension

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9 Deese and Hulse, p. 25.
Specialist and bring the information and materials they receive there to their respective clubs where they, in turn, teach their fellow club members.

"Fundamental subject matter" in this study is limited to material which is both simple and basic to the area of learning. In this research, the subject-matter concerned food and nutrition. In the previously cited doctoral dissertation by Dyer, his analysis "supported the conclusion that simpler line drawings and stick figures [used for reinforcement purposes] produced achievement far superior to that of slides containing more realistic details."\(^{10}\)

**Study Area**

Meade County, South Dakota, was selected as the study area. Except for the type of agricultural activity in the rural area—ranch rather than farm—this county is one of the most typical within the state. The differences in distribution of population into urban, rural non-farm and rural groups, and the proportion of females to the total population compares favorably to that of the state as a whole, as shown in Table 1. The United States statistics are included merely as a point of reference.

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\(^{10}\) Wodtke, pp. 32-33.
TABLE 1
DISTRIBUTION OF POPULATION
BY PLACE OF RESIDENCE

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural Non-Farm</th>
<th>Rural</th>
<th>Proportion of Females to Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Statesa</td>
<td>53.5</td>
<td>16.4</td>
<td>30.1</td>
<td>49.9</td>
</tr>
<tr>
<td>South Dakotab</td>
<td>39.3</td>
<td>30.5</td>
<td>30.2</td>
<td>49.6</td>
</tr>
<tr>
<td>Meade Countyc</td>
<td>38.5</td>
<td>31.4</td>
<td>30.1</td>
<td>42.2</td>
</tr>
</tbody>
</table>

b U. S. Bureau of the Census, I-43, p. 120.
c U. S. Bureau of the Census, I-43, p. 120.

The only figures available for comparison of the ages of the female population of Meade County to the female population of the entire state were those of the rural farm group. Figures for this group of the United States were not available to the author. Hence, Table 2, concerning the distribution of the population by age lists the median age of all residents of the United States and of South Dakota. On the second line of the table, the median age group of rural farm females is listed for both Meade County and the state of South Dakota.
### TABLE 2

**DISTRIBUTION OF POPULATION BY AGE**

<table>
<thead>
<tr>
<th></th>
<th>U. S.</th>
<th>S. Dak.</th>
<th>Meade Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median Age</strong></td>
<td>35.1</td>
<td>35.2</td>
<td></td>
</tr>
<tr>
<td>Rural Farm (Female) Median Age Group*</td>
<td>25-29</td>
<td>25-29</td>
<td></td>
</tr>
</tbody>
</table>

*Only figures available for comparison.


b U. S. Bureau of the Census, PC(2)-2D, p. 98.


### TABLE 3

**DISTRIBUTION OF POPULATION BY MEDIAN SCHOOL YEARS COMPLETED**

<table>
<thead>
<tr>
<th></th>
<th>U. S.</th>
<th>S. Dak.</th>
<th>Meade Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Population</strong></td>
<td>10.6</td>
<td>10.4</td>
<td>10.6</td>
</tr>
<tr>
<td><strong>Females Only</strong></td>
<td>10.9</td>
<td>11.6</td>
<td>12.1</td>
</tr>
</tbody>
</table>


c U. S. Bureau of the Census, I-43, pp. 120-128.
Table 3 compares the educational level of the total population and of the female population of Meade County to that of the state of South Dakota. (See page 10.) Note that the educational level of females is higher than that of the total population.

Because both groups of respondents involved in this study are females, note that the statistics provided in the three tables above include those of the female population. The total population distribution is included for purposes of comparison.

The median family income in Meade County is 20.4 per cent higher than the median family income for the state of South Dakota. The average disposable personal income per household, after taxes, in 1966, for Meade County was $8,947. The average disposable income per household for the state during the same year was $7,432.11

Communication Medium

A commercial television station was selected as the communication medium to be used in this study of the effects of reinforcement because television offers both audible and visible information to the audience and because a commercial television station was the only available type of television coverage in the geographical area included in the study.

Television station KOTA-TV, Rapid City, South Dakota, was chosen because it provided a "Grade A" signal to Meade County. A "Grade A" signal supplies the best possible reception for the coverage area so designated. Station KOTA-TV also broadcasts its programs simultaneously from its main studio in Rapid City through both its Rapid City tower and its Terry Peak tower satellite in Lawrence County. (For station coverage see map on following page.) This television station also offered professional and technical assistance in the preparation and production of the programs.

Selection of Respondents

The human subjects in this study of how reinforcement through the mass medium of television affects the retention of information were members of Extension Clubs in Meade County. They comprised the experimental group. The total number of members enrolled in Extension Clubs in that county at the time the data for the study were collected was 278. The complete county Extension Club membership was contacted in the collection of data for the study.

Data were also collected from non-members of Extension Clubs in Meade County. The respondents in this control group were a sampling of female homemakers in Meade County who were listed in the three telephone exchanges covering the county. A systematic sampling method was used to select the respondents, using every eighth name (omitting businesses) in the telephone directories. The first name was selected randomly from the first eight names listed. The three
serving 30 counties
in 5 states.
with the best of CBS, ABC and local programming in full color.

The Duhamel Stations
telephone directories were numbered, with the first directory to be consulted randomly by number. The names so selected were then checked against the list of enrolled Extension Club members to ascertain whether or not they were members. If a name selected in the control group appeared on the Meade County Extension Club membership roll, the name preceding it in the directory was used. If this person also was an Extension Club member, the name of the individual listed following the original selection was chosen for the control group. When the compilation of non-members of Extension Clubs sample was completed, it consisted of 313 subjects.

As Deese and Hulse point out, human behavior is complicated and far too little is known and understood about it. (See page 3.) Bugelski notes that many variables are related to adult human learning retention. (See page 3.) Consequently, no attempt was made to match the characteristics of the control group with the characteristics of the experimental group in drawing the sample, except that all members of each group should be females over the age of 18. The control group was used only as a reference to indicate if influences and/or factors unknown or uncontrollable by the author were present in the area being studied. Since both groups were residing in this area, each would be exposed to the same outside influences and/or factors.

Data from both the experimental group (Extension Club members) and the control group (non-members) were collected by means of mailed questionnaires. The pre-test and post-test method was used to determine the observable effects of reinforcement. Each respondent
in both groups was assigned a number so the pre-test and post-test could be matched in determining results. Both questionnaires were mailed from the Meade County Extension Office with a letter of instructions signed by the Meade County Extension Home Economics Agent, Mrs. Iva Grubl. (See Appendix for copies of letters and questionnaires.)

The color-coded pre-test was mailed January 20, 1967, so the respondents would receive it at least three weeks before the television series was broadcast. None of these questionnaires postmarked after 12:00 noon, February 13, were usable as pre-tests. The post-test was mailed after 2:30 p.m. on February 17, 1967, the final day of the television series broadcast. Both tests were self-administered and returned in a postage-free envelope addressed to the data collector at the State University Extension Office.

Prior to January 20, 1967, non-professional Extension Club leaders "taught" their fellow members the information they received on food and nutrition at a "leader-training" meeting held in December. This "leader-training" meeting was conducted by Miss Janice Laidig, Extension Specialist in Food and Nutrition. Miss Laidig and Mrs. Francis E. Maierhauser, Extension Home Economics Editor, used the same information in preparing and presenting the television series, "Food Can Be Fascinating," on KOTA-TV, at 2:30 p.m., February 13 through 17, 1967. Each program was fifteen minutes long.
The television series was publicized thus: (1) a publicity release was sent with Miss Laidig's picture to the Rapid City daily newspaper and to the weekly newspapers in Sturgis and Faith; (2) the Meade County Home Economics Agent, Mrs. Iva Grubl, commented about the content of the series in her weekly newspaper column and mentioned the time and station on which it would be broadcast; (3) Mrs. Grubl sent a personal letter to each member of the experimental group, the Extension Club members, reminding them of the series and encouraging them to watch it, and (4) Station KOTA-TV broadcast twenty-two promotional "spots" advertising the series in a number of time periods both before the series began and while it was in progress.

Twelve specific questions in the questionnaires were identified by the Extension Specialist in Food and Nutrition as being "key questions" in the subject-matter which had been presented in both the "leader-training" meeting (which had later been taught by Extension Club leaders to their fellow club members) and the television series. These questions were marked to indicate whether or not the respondent had checked the correct answer. The percentages of difference of correct answers between the pre-test and post-test were tabulated with reference to the number of television programs the respondents indicated they had seen.

The percentages of television programs watched, as indicated by the respondents, were tabulated by age, education, and place of residence. An additional tabulation was made of the differences in
percentages between the pre-test and post-test, keyed to the questions pertaining to each of the individual television programs and the number of programs the respondents had indicated they had seen.

Identification of Subject-Matter Used

The "leader-training" meeting in Meade County included information about basic nutrition, family meal planning, vegetable cookery, food fads and fallacies, weight control, and food buymanship as it related to the above topics, according to Miss Janice Laidig, Extension Specialist in Food and Nutrition.

The five programs in the "Food Can Be Fascinating" television series and a brief description of the information they covered follows.

1. "Focus on Food Cents" - Ways to save when buying food, penny-saving hints, tips on how to shop, ways to stretch your food dollar.

2. "Cook by Color" - How to prepare vegetables so they will taste good, retain their food value, and give variety to meals. Also, what cooking does to vegetables and why.

3. "Variety Is the Spice of Life" - The key nutrients that are needed for good health, why each is needed, and foods that are good sources of each nutrient.

4. "Meals That Please" - How to plan meals that will appeal to all the members of your family and at the same time provide them with the nutrients they need.

5. "What to Believe about Food" - Some food facts, fads, and fallacies, how to recognize half-truths and misleading statements, and what to do about them.
Limitations of Data

It is to be noted that the respondents in both the experimental groups and the control group were women only. They ranged in age from 18 to more than 65, with the median age group being 40-44 when all who responded to the questionnaire were considered. If this group is compared with the median age of the total population of South Dakota as indicated in Table 2, page 10, the median age of the respondents was from five to nine years above that of the state figure, 35.2 years. In the experimental group, the median age of rural respondents fell in the 50-54 age group. In the control group, the median age of the rural respondents fell in the 40-44 age group. The median age, then, of both groups of respondents is appreciably higher than the only data available from the 1960 census concerning the female population age in Meade County which showed the median age group of rural farm females to be within the 25-29 age group. This median age indicated by the census, however, includes all females living in the county—not just those 18 years of age or older. (See Table 2, page 10.)

The pre-test and post-test were mailed to both the experimental and control groups from whom the data were to be collected. As a result the data collector had no control over (1) the conditions under which the questionnaires were received and filled out, (2) the time period when the questionnaires were completed, (3) the actual individual who filled out the questionnaire—although a particular individual was specified as the desired respondent, and (4) the
possible differences between the characteristics of the individuals who filled out the questionnaires—especially those differences not identified in the demographic information included in the questionnaire.

In a mailed questionnaire, there is also the possibility of bias and/or prejudice on the part of the respondent. It is possible, too, that the respondent may not have understood the question in terms of the information it was devised to elicit.

Because of the above listed limitations, both the experimental group and the control group were purposely large in constructing the research design. It was hoped that the size of the two groups would tend to increase the validity of the data collected. In addition, averages and summation of scores were used in analyzing the data in an attempt to achieve greater validity.

This study does not, moreover, propose to attempt to reach general conclusions which will be applicable to all subject-matter areas in all parts of the United States or even in all parts of South Dakota. It attempts only to point out some indications of the reinforcement effects observable as a result of a series of commercial television broadcasts in one county which seemed to be typical of the state of South Dakota.
CHAPTER III

FINDINGS

Of the questionnaires mailed to the 278 members of Extension Clubs in Meade County, 145 or 52.2 per cent of the pre-test and 174 or 62.6 per cent of the post-test questionnaires were returned. There were 313 questionnaires mailed to the control group—non-members of Extension Clubs. Of this total, 103 or 33.0 per cent were respondents to the pre-test and 137 or 43.8 per cent were respondents to the post-test. The questionnaires returned from the pre-test and the post-test were matched by means of a number assigned to each respondent when the questionnaires were mailed. In the experimental group—the Extension Club members—137 or 46.8 per cent of the total questionnaires returned were usable. In the control group—non-members of Extension Clubs—85 or 27.1 per cent of the total mailed questionnaires were usable.

Identification of Respondents

All respondents in both the experimental group and the control group were women over the age of 18. For purposes of comparison, since the only available figures for the state of South Dakota concern the median age grouping of rural females, this segment of the respondents will be considered first. The median age grouping of rural
South Dakota females in 1960 was 25-29 (see Table 2, page 10), but this figure included all females in the state, not just those above the age of 18. The median age grouping of the rural members of Extension Clubs, the experimental group, was 50-54. The median age of rural non-members, the control group, was 40-44. The median age of all respondents in both the experimental and control groups respectively, when not classified by place of residence, was 40-44.

In 1960, the population of South Dakota, classified according to place of residence, was 39.3 per cent urban, 30.5 per cent rural non-farm, and 30.2 per cent rural. The same census revealed the following classifications for Meade County: 38.5 per cent urban, 31.4 per cent rural non-farm, and 30.1 per cent rural. (See Table 1, page 9.) For comparison, the matched respondents in the experimental group, Extension Club members, were classified as follows: 43.8 per cent urban, 8.7 per cent rural non-farm, and 43.1 per cent rural. The same classifications of the control group, non-members of Extension Clubs, were 47.5 per cent urban, 11.4 per cent rural non-farm, and 42.2 per cent rural.

In South Dakota, the median school years completed by females only was 11.6 in 1960. The median school years completed by females only in Meade County in the same census was 12.1 (see Table 3, page 10). The median school years completed by both the experimental group and the control group respectively was 12 years.
Identification of Questions Indicating Learning

Of the five television programs presented on KOTA-TV, the following key items were identified by Miss Janice Laidig, Extension Specialist in Food and Nutrition, as an indication of learning in each of the specific areas.

1. "Focus on Food Cents" - (food buymanship)
   46: Which one of the following is the best preparation for your regular food shopping spree?
   ___ 1. Make out a list and buy only what is on it.
   ___ 2. Check the ads to see what and where the best buys are.
   ___ 3. Walk around the store and buy whatever appeals to you.
   ___ 4. Don't keep a regular pattern of shopping.

2. "Cook by Color" - (vegetable cookery)
   27: Fresh vegetables cook faster than frozen ones.
       __True __False __Don't know.
   28: Cooking vegetables a long time improves the flavor.
       __True __False __Don't know.
   29: Cook strong flavored vegetables in a covered pan for the entire cooking period.
       __True __False __Don't know.

3. "Variety Is the Spice of Life" - (key nutrients)
   Soda, added to the water in which green vegetables are cooked, does what?
   48: Affects the color of the vegetables.
   49: Changes the texture of the vegetables.
   50: Destroys vitamins in the vegetables.
   51: Has no effect on the vegetables.

4. "Meals that Please" - (meal planning)
   47: What are the food groups which should be used to plan adequate meals?
   55: (Check these statements below which apply to your family.)
       It is necessary for us to take vitamin supplements to be well fed and keep healthy.
5. "What to Believe about Food" - (weight control)

64: A 'perfect meal' can be purchased in liquid form.  
   True  False  Don't know.

65: Breads and cereals should be included in reducing diets.  True  False  Don't know.

Only the key items were scored in both the pre-test and post-test.

**Method of Determining the Observable Effects of Reinforcement**

Since the Federal Cooperative Extension Service is concerned with Extension Club groups as units rather than each individual club member as a unit, the degree of change of learning retention reinforcement of the subjects in this study was considered using groups as units. The experimental and control groups were divided into units according to the number of television shows the respondents indicated they had watched.

On both the pre-test and the post-test each "key question" was marked to indicate whether or not the respondent had checked the correct answer. The percentage of correct answers to the "key questions" in each group unit was calculated and totaled. In each experimental group unit, this totaled degree of change was used as an indicator of the direction and strength of the reinforcement of adult learning retention. In each control group, the totaled degree of change was used as an indication of evidence of influences and/or factors operating in the study area of which the author had no knowledge or over which she had no control.
TABLE 4

STRENGTH AND DIRECTION OF OBSERVABLE EFFECTS OF REINFORCEMENT OF LEARNING OF CONTROL AND EXPERIMENTAL GROUPS*

<table>
<thead>
<tr>
<th>Number of Shows Seen:</th>
<th>None</th>
<th>One</th>
<th>Two</th>
<th>Three</th>
<th>4 or 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>-65.4</td>
<td>+112.0</td>
<td>+98.0</td>
<td>+49.9</td>
<td>+60.0</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td></td>
<td>+177.4</td>
<td>-14.0</td>
<td>-48.1</td>
<td>+10.1</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>-31.2</td>
<td>+16.2</td>
<td>+41.9</td>
<td>+62.1</td>
<td>+106.0</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td></td>
<td>+47.4</td>
<td>+25.7</td>
<td>+20.2</td>
<td>+43.9</td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

In separating the respondents into groups, the number of respondents in the control group who indicated they had watched five programs was very small. Therefore, to increase the validity of the study, this group was combined with the group indicating they had watched four television programs. For purposes of comparison between the control group and the experimental group, it then became necessary to combine the groups of respondents in the experimental grouping in the same manner.
Note in Table 4, page 24, that no general trend is observable in either the strength or direction of change in the scores of the control group of non-members of Extension Clubs in Meade County. The amount of change in the scores of the experimental group, the Extension Club members, however, is always in the positive direction. The strength of the amount of change in the scores of the experimental group shows no general tendency to increase in any direct ratio to the number of programs the respondents indicated they watched. In fact, the greatest change noted is that observed among the respondents indicating they watched only one program. A change of almost equal strength is observable between the respondents indicating they watched three programs and those indicating they watched four or five programs.

**Mediating Factors**

This study has postulated only three of the many possible mediating factors which affect human adult learning retention--age, education and place of residence.

One hypothesis stated that the age of the subject was a mediating factor in adult human learning retention.

The score change shown in Table 5 shows only a pattern of irregularity in both the control group, consisting of non-members of Extension Clubs, and the experimental group--Extension Club members who had the advantage of reinforcement of their learning experience of information on food and nutrition by watching the television series
on the same subject as their volunteer Extension Club leaders had taught them before the series.

**TABLE 5**

**AGE AS A MEDIATING FACTOR IN LEARNING RETENTION**

<table>
<thead>
<tr>
<th>Age Groups:</th>
<th>18-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65 plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>11</td>
<td>13</td>
<td>28</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Change*</td>
<td>-83.4</td>
<td>+48.8</td>
<td>-5.0</td>
<td>+32.1</td>
<td>-50.8</td>
<td>-250.0</td>
</tr>
<tr>
<td>Experimental Group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>7</td>
<td>20</td>
<td>26</td>
<td>39</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>Change</td>
<td>-24.9</td>
<td>+29.9</td>
<td>-42.2</td>
<td>+30.3</td>
<td>+29.6</td>
<td>+45.8</td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

This study also postulated that the educational level of the subject was a mediating factor in adult human learning retention. Table 6 shows the difference as classified by the educational level indicated by both the control group and the experimental group of respondents.
TABLE 6
EDUCATION AS A MEDIATING FACTOR IN LEARNING RETENTION

<table>
<thead>
<tr>
<th>Education:</th>
<th>Under 8 yrs.</th>
<th>8 yrs.</th>
<th>1-3 H.S.</th>
<th>4 H.S.</th>
<th>1-3 Col.</th>
<th>4 Col. or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>0</td>
<td>10</td>
<td>15</td>
<td>30</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>Change*</td>
<td></td>
<td>-78.2</td>
<td>-20.1</td>
<td>-13.2</td>
<td>+104.7</td>
<td>+50.0</td>
</tr>
<tr>
<td>Experimental Group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>2</td>
<td>17</td>
<td>27</td>
<td>43</td>
<td>32</td>
<td>7</td>
</tr>
<tr>
<td>Change*</td>
<td></td>
<td>+50.0</td>
<td>+31.0</td>
<td>+7.6</td>
<td>-3.0</td>
<td>+17.0</td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

The difference in scores in both groups in Table 6 tends to follow a trend or pattern. In the control group, the differences in scores show a trend in the positive direction as the level of education increases—until the level of education reached the college graduate. In the experimental group, the differences in scores show a trend in the negative direction as the level of education increases until the subject reaches the high school graduate level. At this point the trend begins to point in the positive direction. The differences between the direction of the pattern shown in the
two groups could be attributed to the reinforcement effect of the television programs. There is no positive evidence of this, however, in this study.

The last of the mediating factors in adult human learning retention which was considered by this study was that of the location of the subject's residence. Both the control group and the experimental group are classified below according to place of residence as indicated by the respondents.

TABLE 7
RESIDENCE AS A MEDIATING FACTOR IN LEARNING RETENTION*

<table>
<thead>
<tr>
<th>Place of Residence:</th>
<th>Urban</th>
<th>Rural Non-Farm</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>+13.1</td>
<td>+20.0</td>
<td>-1.9</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>-31.6</td>
<td>+22.2</td>
<td>+20.0</td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

There is no observable pattern or trend to the difference in scores of either the control group or the experimental group in Table 7.
Effect of Type of Program Presentation

Each of the television programs which were used as a means to reinforce the teaching given by non-professional volunteer Extension Club leaders in food and nutrition was prepared using a different type of format or presentation. Listed below are each of the programs, by title, followed by the type of format or presentation used for each:

1. "Focus on Food Cents" - informal dialogue with a minimum amount of visual aids;
2. "Cook by Color" - single person presenting a demonstration using actual materials;
3. "Variety Is the Spice of Life" - formal question and answer presentation using simple, explanatory visual aids;
4. "Meals that Please" - an active presentation involving two people using actual materials;
5. "What to Believe about Food" - a self-test, followed by an explanation of the correct answers.

Table 8 on the following page shows what percentage of each group indicated they had watched a given number of programs. For ease of comparison, Table 8 also shows the total number of individuals included in both the control group and the experimental group. The percentage of respondents who did not answer this question is not included in the table because there was no way of determining how many shows, if any, they watched.

Note that the largest percentage of the control group indicated they watched two programs, while the largest percentage of the experimental group indicated they watched three programs. Note, too,
that the percentages in each classification of the control group varied widely, while the percentages of each classification of the experimental group were more evenly distributed.

### TABLE 8

CLASSIFICATION OF RESPONDENTS ACCORDING TO NUMBER OF TELEVISION PROGRAMS WATCHED

<table>
<thead>
<tr>
<th>Percentage:</th>
<th>One Show</th>
<th>Two Shows</th>
<th>Three Shows</th>
<th>4 or 5 Shows</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>9.6</td>
<td>13.3</td>
<td>8.4</td>
<td>6.0</td>
<td>85</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>13.8</td>
<td>10.0</td>
<td>14.6</td>
<td>13.0</td>
<td>137</td>
</tr>
</tbody>
</table>

In item 25 of the post-test, each respondent was requested to indicate which one of the programs she found most helpful. In the opinion of Miss Janice Laidig, the program which a homemaker found most helpful would also be one which interested her the most or that attracted her attention more than the others she saw. The results indicated by the respondents will be found in Table 9.

A higher percentage of respondents in the control group indicated they found the program on meal planning (Number 4, Table 9) "most helpful," while more of the experimental group found the program on key nutrients (Number 3, Table 9), as judged by their answers to item 25, "most helpful."
TABLE 9

CLASSIFICATION OF PROGRAM INDICATED "MOST HELPFUL"

<table>
<thead>
<tr>
<th>Program:*</th>
<th>No. 1</th>
<th>No. 2</th>
<th>No. 3</th>
<th>No. 4</th>
<th>No. 5</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>2.4</td>
<td>2.4</td>
<td>7.2</td>
<td>10.8</td>
<td>7.2</td>
<td>85</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>5.4</td>
<td>2.3</td>
<td>10.8</td>
<td>7.7</td>
<td>9.2</td>
<td>137</td>
</tr>
</tbody>
</table>

*See pages 22 and 23 for title of each program.

Observable Effects of Reinforcement Classified by Program Type

The following data were analyzed from the "key" items identified by Miss Janice Laidig, Extension Specialist in Food and Nutrition, as indicating learning reinforcement for each of the five television programs presented.

Table 10 which follows compares the reinforcement observable in a television program presented as an informal dialogue with a minimum amount of visual aids—the type used in presenting "Focus on Food Cents."

No trend in direction is observable in the difference in scores of the control group, nor is there any observable trend in the strength of the change in scores of this group. A general negative trend in direction is observable in the scores of the experimental
group, although the final scores of this group indicate a directional change. The strength of the difference in scores of this same group shows a general tendency to decrease, but not at a constant rate. The final scores in this experimental group are again an exception to the general trend.

TABLE 10
DIFFERENCES IN SCORES BY PROGRAM:
"FOCUS ON FOOD CENTS"*

<table>
<thead>
<tr>
<th>Programs Seen:</th>
<th>No Show</th>
<th>One Show</th>
<th>Two Shows</th>
<th>Three Shows</th>
<th>4 or 5 Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>-11.2</td>
<td>+12.0</td>
<td>-21.9</td>
<td>-16.7</td>
<td>-20.0</td>
</tr>
<tr>
<td>Strength and Direction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of Change</td>
<td>+23.0</td>
<td>-33.9</td>
<td>+5.2</td>
<td>-3.7</td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>-4.4</td>
<td>+5.6</td>
<td>+7.7</td>
<td>-5.5</td>
<td>-11.7</td>
</tr>
<tr>
<td>Strength and Direction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of Change</td>
<td>+10.0</td>
<td>+2.1</td>
<td>-13.2</td>
<td>-6.2</td>
<td></td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

The format of the program "Cook by Color" used a lone individual presenting a demonstration using actual materials. Table 11 shows how the difference in scores between the pre-test and post-test reflected the reinforcement effect.
TABLE 11
DIFFERENCES IN SCORES BY PROGRAM:
"COOK BY COLOR"*

<table>
<thead>
<tr>
<th>Programs Seen:</th>
<th>No Show</th>
<th>One Show</th>
<th>Two Shows</th>
<th>Three Shows</th>
<th>4 or 5 Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>-22.2</td>
<td>+62.5</td>
<td>+27.3</td>
<td>-33.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td>+84.7</td>
<td>-35.2</td>
<td>-60.6</td>
<td>+33.3</td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>-11.5</td>
<td>-11.1</td>
<td>0.0</td>
<td>+38.8</td>
<td>+58.8</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td>+0.4</td>
<td>+11.1</td>
<td>+38.8</td>
<td>+20.0</td>
<td></td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

There is no observable trend in either the direction or strength of the scores of the control group in Table 11. The difference in scores of the experimental group, as this table shows, is constant in the positive direction.

The formal question-and-answer type of presentation with simple, explanatory visual aids was used in preparing the program "Variety Is the Spice of Life." Table 12 shows the reinforcement effects of this type of presentation as observed by the difference in scores between the post-test and the pre-test.
TABLE 12

DIFFERENCES IN SCORES BY PROGRAM:
"VARIETY IS THE SPICE OF LIFE"*

<table>
<thead>
<tr>
<th>Programs Seen:</th>
<th>No Show</th>
<th>One Show</th>
<th>Two Shows</th>
<th>Three Shows</th>
<th>4 or 5 Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>-16.2</td>
<td>-12.5</td>
<td>+56.3</td>
<td>+33.3</td>
<td>+20.0</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td>+3.7</td>
<td>+68.8</td>
<td>-23.0</td>
<td>-13.2</td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>-18.5</td>
<td>+11.1</td>
<td>+11.1</td>
<td>0.0</td>
<td>+23.6</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td>+29.6</td>
<td>0.0</td>
<td>-11.1</td>
<td>+23.6</td>
<td></td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

Neither the strength nor the direction of the difference in scores of the control group show any general pattern or trend in Table 12. Although the experimental group indicated that they found this program "most helpful," the general trend of their scores is in a negative direction, with the exception of the final score.

"Meals that Please" was a very "busy" program. It involved two people giving an active demonstration using actual materials. Table 13 shows what effect this type of format had upon the audiences as reflected by the differences in scores.
TABLE 13
DIFFERENCES IN SCORES BY PROGRAM:
"MEALS THAT PLEASE"*

<table>
<thead>
<tr>
<th>Programs Seen:</th>
<th>No Show</th>
<th>One Show</th>
<th>Two Shows</th>
<th>Three Shows</th>
<th>4 or 5 Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>+6.2</td>
<td>0.0</td>
<td>0.0</td>
<td>-16.7</td>
<td>-20.0</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td>-6.2</td>
<td>0.0</td>
<td>-16.7</td>
<td>-3.3</td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>+6.2</td>
<td>+10.9</td>
<td>0.0</td>
<td>0.0</td>
<td>+5.9</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td>+4.7</td>
<td>-10.9</td>
<td>0.0</td>
<td></td>
<td>+5.9</td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

This program was the one which the greatest per cent of the control group indicated they found "most helpful." However, their scores show no general trend in either direction or strength, consistently. There is a negative "cast" to the scores of this group. No general trend is observable in the score differences of the experimental group.

In the final program "What to Believe about Food," information was presented through a self-test in which the audience was invited to participate. Miss Laidig, Extension Specialist in Food and Nutrition,
gave the correct answers and the reasons for them, following the test. During the self-test and the answer period an overlay with the questions printed on it was used on the screen in addition to the visuals.

Table 14 shows the results of the audience response as reflected in the difference in scores.

**TABLE 14**

**DIFFERENCES IN SCORES BY PROGRAM: "WHAT TO BELIEVE ABOUT FOOD"**

<table>
<thead>
<tr>
<th>Programs Seen:</th>
<th>No Show</th>
<th>One Show</th>
<th>Two Shows</th>
<th>Three Shows</th>
<th>4 or 5 Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>-22.0</td>
<td>+50.0</td>
<td>+36.3</td>
<td>+83.3</td>
<td>+80.0</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>-3.0</td>
<td>+0.1</td>
<td>+23.1</td>
<td>+28.8</td>
<td>+29.4</td>
</tr>
<tr>
<td>Strength and Direction of Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figures indicate the difference in percentage scores between the post-test and the pre-test.

The self-test, followed by an explanation of the correct answers, is very popular today and is used on nation-wide television as a method of presenting information. It might be expected then
that the strength and direction of change in the scores of the control group would show some general trend. Table 14, however, shows no such trend. There is a general positive trend in the direction of the scores of the experimental group, but the strength of the change is not constant in relation to the number of programs the respondents indicated they had watched.
CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

This research was undertaken to attempt to determine if a regularly scheduled broadcast by a Federal Cooperative Extension Specialist could reinforce the teaching given by non-professional volunteer Extension Club leaders. This subject was chosen for study because reinforcement of adult learning retention acquired during a regularly broadcast program on commercial television—where the audience viewed the programs on a volunteer basis—had not been the object of any known previous research.

The objectives of the study were to attempt to determine what reinforcing effects were observable in the use of commercial television broadcasting, as an example of the mass media, when used to supplement instruction given by non-professional teachers; to attempt to determine if the age, educational level or place of residence of the subjects were among the contributing factors that mediate the effectiveness of the reinforcing medium; and to attempt to discover the most effective means of presenting information on commercial television.

The study was conducted in Meade County, a typical county in South Dakota, using 278 members of Extension Clubs as the experimental
A control group of 313 non-members of Extension Clubs—females from the same county—was used in the study as an indicator of evidence of influences and/or factors operating in the study area of which the author had no knowledge or over which she had no control. Station KOTA-TV, Rapid City, South Dakota, which provides a "Grade A" signal to Meade County, broadcast a series of five television programs daily at 2:30 p.m. from February 13 through 17, 1967.

The pre-test and post-test survey method was used in the study. Data were collected from the respondents by means of mailed questionnaires. Twelve "key questions" in the questionnaires were selected by the Extension Specialist in Food and Nutrition as a test of learning retention. Subject matter which was taught by the Extension Specialist in Food and Nutrition to non-professional volunteer Extension Club leaders at "leader training" meetings, then "taught" by these leaders to their fellow Extension Club members, was used in preparing and presenting the television programs.

On both the pre-test and the post-test each "key question" was marked to indicate whether or not the respondent had checked the correct answer. The percentage of correct answers to the "key questions" in each group of respondents who indicated they had watched the same number of programs on television was calculated and totaled. This totaled degree of change was used as an indicator of the direction and strength of reinforcement of adult learning retention in each experimental group unit.
Conclusions

The evidence shown by the data collected and analyzed in this research indicates that the major hypothesis postulated in this study—"A regularly scheduled broadcast on commercial television by a Federal Cooperative Extension Specialist can reinforce the teaching given by non-professional volunteer Extension Club leaders in fundamental subject matter"—is correct. As the data in this survey were analyzed, the difference in percentage scores of the experimental group was constant in the positive direction. This would seem to indicate that the more television programs in the series the respondents stated they had watched, the greater the reinforcement effects they experienced from their earlier instruction in food and nutrition. One might expect that the amount of difference in the percentage scores between the post-test and the pre-test would increase at a constant rate in relationship to the number of television programs the respondents indicated they had viewed. The data collected in this research, however, showed a variation in the strength or amount of reinforcement in relationship to the number of programs viewed. Consequently, the amount of reinforcement to be expected from a program in a series or from the series itself cannot be predicted as a result of this study.

There could be several reasons why the difference in percentage scores was not constant. Each of the five programs was presented using a different type of format, certain ones of which might lack
audience appeal or even be confusing to the audience. In fact, as D. E. Berlyne explains, "Retention depends on at least two distinct factors, among others, one being intelligence and the other being some kind of motivational disposition."12 Perhaps the intelligence of the experimental groups varied in relationship to the number of programs they watched. No attempt was made to elicit any information concerning the intelligence of either group in the study.

Another possible reason for the lack of a constant in the amount of difference in percentage scores could be the fact that the individuals in each of these groups viewed the programs on a voluntary basis in the privacy of her own home. She could have been interrupted or distracted in the time period during which she was attempting to watch the program. It is interesting to note, however, that despite the fact that this research was not carried on under laboratory or controlled conditions the differences in percentage scores is in the positive direction. Because one of the objectives of this study was to attempt to determine if Extension Club members would learn and retain more of what they were "taught" by non-professional volunteer leaders in their own clubs if they could have an opportunity to be "exposed" to the information a second time through commercial television broadcasts, the research was deliberately designed in an attempt to equate this situation.

In considering the many possible factors which could be measured under the conditions mentioned above, the author chose three—age, educational level and place of residence—as probable influences which might mediate the reinforcement effect of the television series.

Two of these factors—age and place of residence—may have an influence in mediating the reinforcement effects expected from the television series on the experimental group but this research did not produce sufficient evidence to indicate that they were definite mediating factors. The other factor, the educational level of the experimental group, showed an observable trend or pattern in each of the two groups—both the control group and the experimental group. Therefore it would seem possible to conclude that the educational level of the adult female may be a mediating factor in adult human learning retention.

The five television programs presented in the series on KOTA-TV were each prepared using a different format, in an attempt to determine if one type of presentation is more effective in producing reinforcing effects than another type. Of the five different presentations used in this research, the most effective appeared to be that where one person presented a demonstration on camera. The strength of the differences in percentage scores between the post-test and the pre-test for the questions "keyed" to this program showed a tendency to increase with the number of programs viewed. However, the final
figure—indicating the respondent had watched four or five programs—showed less of an increase than was observable between those who watched one show and those who indicated they watched two shows, or between those indicating they watched three shows instead of two shows. This evidence may indicate that a "point of diminishing returns" can be reached if this type of program, with one person demonstrating, is the only type presented and is continued beyond a definite period of time.

The self-test presentation, which involves audience participation if the subject chooses, also showed observable evidence of continued reinforcement in relationship to the number of programs the respondents indicated they had viewed. However, the strength of the reinforcement, as indicated by the difference in percentage scores between the post-test and the pre-test, was not as large as that of the program using the demonstration type of format. Hence, it would seem that, while this is an effective way to reinforce volunteer non-professional teaching, it should not be used exclusively.

Although the type of program which involved two people using many actual materials was that indicated as "preferred" by the control group, the difference in their percentage scores between the post-test and the pre-test did not indicate an increase in learning among the groups who viewed any number of shows. There was also no observable general trend in the strength and direction of change in the experimental groups. This may be an indication that a "busy" type of program—such as this one was—tends to confuse rather than inform
an audience. According to the evidence gathered and analyzed in this study, this type of program would be least effective as a reinforcing agent.

As a result of the observations of this study, the other two program types—informal dialogue and formal question and answer formats—have some reinforcing effects but neither one is as effective as the demonstration or the self-test.

It is interesting to note that both the control group and the experimental group "lost ground" between the pre-test and the post-test, as indicated by the difference in percentage scores between the two tests. There is no evidence to account for this factor, but the possibility of such evidence led to the manner in which the research was designed. Because this difference in percentage scores was observable in both the control groups and the experimental groups, influences and/or factors of which the author had no knowledge or over which she had no control could be assumed to be operating in the area and responsible for this evidence.

Suggestions for Further Study

Further research is needed to determine whether the evidence indicated in this study concerning the reinforcement effects of commercial television broadcasts on adult women is also applicable to adult males.
More evidence is required to determine whether the age or place of residence of the adult is a mediating factor on his learning retention.

No effort was made in this study to determine what effect, if any, the time of day during which the programs were broadcast would have on the learning retention of the respondents. The respondents were requested to indicate which time period they "preferred" to have information programs scheduled on television. The largest percentage of the control group of non-members of Extension Clubs (25.3 per cent) indicated they preferred the time period from 5:30 to 6:30 p.m. The largest percentage of the experimental group, Extension Club members, (38.5 per cent) indicated they preferred the time period between 1:00 and 5:30 p.m.

No effort was made in this research to determine what effect, if any, the broadcast of the programs in color—in comparison to broadcast in black and white—would have on the learning retention of the respondents. The respondents did indicate how many and what type of television sets they had in their homes. In the experimental group, the Extension Club members, 6.9 per cent owned two black and white television sets and 6.2 per cent owned a color set. In the non-members of Extension Clubs, the control group, 9.6 per cent owned two black and white television sets and 1.2 per cent owned more than three. A larger percentage of the control group (8.4 per cent) also owned color television sets.
There is need for further study, too, of the types of program presentation that are most effective as reinforcers of learning. This research was concerned with only five of the many possible types of program presentation.

Sources of Information

Information provided by the Federal Extension Specialist in Food and Nutrition concerning the lessons taught at the leader-training meeting was used as a part of this study. The same individual identified the twelve "key questions" in the pre-test and post-test which were used as indications of learning retention and reinforcement.

The Meade County Home Economics Agent provided the information concerning the time period during which the non-professional volunteer leader taught the lessons to her own Extension Club members.

Suggestions for Use of This Research

The evidence produced by this research may be useful to the Federal Cooperative Extension Service (1) as a criterion to use in judging how to reinforce the information now being transmitted through its usual channels of dissemination, (2) as a justification for making use of available "public service time" on commercial television stations, and (3) as a basis for determining the type of programs to present on both commercial and educational television broadcasts.
Other organizations who make use of non-professional volunteer teachers in the field of education may find information of value in the area of reinforcement of adult learning and retention in this study, particularly if they wish to reach female audiences. They may also use this research as a basis for determining the most effective type of presentation to use on television programs.
**APPENDIXES**

<table>
<thead>
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<th>Appendix</th>
<th>Page</th>
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</thead>
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<td>B. Pre-test</td>
<td>50</td>
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<tr>
<td>C. Letter Accompanying Post-test</td>
<td>52</td>
</tr>
<tr>
<td>D. Post-test</td>
<td>53</td>
</tr>
</tbody>
</table>
Dear Homemaker,

Miss Janice Laidig, extension nutrition specialist at South Dakota State University, is scheduled to teach a series on food and nutrition in several West River counties this spring. To help her in planning the series, she has asked me to send you this questionnaire on your family food habits.

Miss Laidig and I would certainly appreciate it if you would take the time to fill out the enclosed questionnaire and return it in the addressed postage-free envelope.

Fran Maierhauser, our extension home economics editor, is helping Miss Laidig compile the results of the questionnaire. You will notice the return envelope is addressed to her.

With the returned questionnaires, Miss Laidig can plan the series to fit the needs of families in your area. To make the information meaningful to Miss Laidig, please answer the questions as completely and accurately as you can. It is not necessary that we know your name and you need not sign the form.

We appreciated the cooperation some homemakers gave us last spring in helping Mrs. Moore develop her lesson on credit by completing the questionnaire she prepared—and will look forward to your help for Miss Laidig. Could you complete this questionnaire and return it by February 17?

Sincerely,

Iva E. Grubl
Home Economics Agent

P. S. NO STAMP is needed on the return envelope.

Encl.
### APPENDIX B

#### Pre-test

**QUESTIONNAIRE**

*(Use pen or pencil — DO NOT type)*

In answering the following questions, put a check in the proper column to indicate your answer.

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>C27. Fresh vegetables cook faster than frozen ones.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C28. Cooking vegetables a long time improves the flavor.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C29. Cook strong flavored vegetables in a covered pan for the entire cooking period.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Which of the following foods did your family eat yesterday? (Check the ones you served.)

- [ ] apricots
- [ ] asparagus
- [ ] broccoli
- [ ] cabbage (raw)
- [ ] cantaloupe
- [ ] carrots
- [ ] grapefruit or juice
- [ ] greens (turnip, chard, spinach, beet, wild)
- [ ] green peppers
- [ ] oranges or orange juice
- [ ] peaches
- [ ] pumpkin
- [ ] squash
- [ ] strawberries (fresh)
- [ ] sweet potatoes
- [ ] fresh tomatoes or tomato juice

C46. Which one of the following is the best preparation for your regular food shopping spree? (Check one.)

1. Make out a list and buy only what is on it.
2. Check the ads to see what and where the best buys are.
3. Walk around the store and buy whatever appeals to you.
4. Don’t keep a regular pattern of shopping.

What are the food groups which should be used to plan adequate meals? (Use as many blanks as you need.)

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100. 

Soda, added to the water in which green vegetables are cooked, does what? (Check the statements you think are true.)

1. affects the color of the vegetables
2. changes the texture of the vegetables
3. destroys vitamins in the vegetables
4. has no effect on the vegetables

Check these statements below which apply to your family. (You may check more than one statement.)

1. Vitamin supplements are taken under the advice of the doctor.
2. Vitamin supplements are taken occasionally or regularly.
3. Our family doesn’t take vitamin supplements.
4. It is necessary for us to take vitamin supplements to be well fed and keep healthy.

Do you recall how much you spent at the grocery store last week? (Check one.)

1. under $5.00
2. $5.00 to $9.99
3. $10.00 to $14.99
4. $15.00 to $19.99
5. $20.00 to $24.99
6. $25.00 to $29.99
7. $30.00 to $34.99
8. $35.00 or more
**QUESTIONNAIRE (Use pen or pencil — DO NOT type)**

Which of the following items were included in your grocery shopping? (Check as many as you purchased.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C57.</td>
<td>soft drinks</td>
</tr>
<tr>
<td>C58.</td>
<td>potato chips</td>
</tr>
<tr>
<td>C59.</td>
<td>paper goods (paper towels, napkins, toilet tissue)</td>
</tr>
<tr>
<td>C60.</td>
<td>hosiery</td>
</tr>
<tr>
<td>C61.</td>
<td>tooth paste</td>
</tr>
<tr>
<td>C62.</td>
<td>cigarettes</td>
</tr>
<tr>
<td>C63.</td>
<td>cleaning supplies (detergent, soap, wax, polish)</td>
</tr>
</tbody>
</table>

In answering the following questions, put a check in the proper column to indicate your answer.

<table>
<thead>
<tr>
<th>Question</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>C64. A perfect meal can be purchased in liquid form</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C65. Breads and cereals should be included in reducing diets</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What would you like to learn more about? (You may check more than one.)

- Food buying (C66)
- Weight control (C67)
- Food fads and fallacies (C68)
- Importance and sources of body nutrients (C69)
- Children’s food and food habits (C70)

C71. Where do you live? (Check one.)

1. in a town or city
2. in a rural non-farm residence
3. on a farm or ranch

C72. Check the group in which your age occurs.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.</td>
<td>18 - 24</td>
</tr>
<tr>
<td>1.</td>
<td>25 - 29</td>
</tr>
<tr>
<td>2.</td>
<td>30 - 34</td>
</tr>
<tr>
<td>3.</td>
<td>35 - 39</td>
</tr>
<tr>
<td>4.</td>
<td>40 - 44</td>
</tr>
<tr>
<td>5.</td>
<td>45 - 49</td>
</tr>
<tr>
<td>6.</td>
<td>50 - 54</td>
</tr>
<tr>
<td>7.</td>
<td>55 - 59</td>
</tr>
<tr>
<td>8.</td>
<td>60 - 64</td>
</tr>
<tr>
<td>9.</td>
<td>over 65</td>
</tr>
</tbody>
</table>

C73. How many years did you attend school? (Check one.)

1. less than 8 years
2. 8 years
3. 1 thru 3 years high school
4. 4 years high school
5. 1 thru 3 years college
6. 4 years or more of college

C74. How many people eat regularly (at least 2 meals a day) at your home? (Check one.)

1. one
2. two
3. three
4. four
5. five
6. six
7. seven
8. eight
9. nine or more

C75. How many children do you have in your home under 18? (Check one.)

1. no children
2. 1 to 3 children
3. 4 to 6 children
4. 7 to 9 children
5. 10 or more children

C76. An indication of your approximate annual family income (or net income after expenses if on a farm or ranch) for 1965 would be helpful. (Please check one.)

0. Under $3,000
1. $3,000 to $3,999
2. $4,000 to $4,999
3. $5,000 to $5,999
4. $6,000 to $6,999
5. $7,000 to $7,999
6. $8,000 to $8,999
7. $9,000 to $9,999
8. $10,000 to $14,999
9. $15,000 and over.
Dear Homemaker,

Will you help us up-date our information on television and radio listening habits for the people in your area? New radio stations have been authorized and a satellite TV station--KHSD-TV--has been activated recently.

Mrs. Fran Maierhauser, our extension home economics editor, asked me to send you this questionnaire which I hope you will take the time to fill out. We know the information you will provide us will help us to schedule programs at times and on stations best suited to your viewing patterns.

Perhaps you had an opportunity to see the series of television programs, "Food Can Be Fascinating," recently. Whether or not you saw any of those programs, would you complete the part of the enclosed questionnaire on your family's food patterns? By relating this information to that furnished on a recent food questionnaire, we can determine variations in family eating habits.

To make the information meaningful, please answer all the questions as completely and accurately as you can. It is not necessary that we know your name and you need not sign the form.

We appreciated your cooperation in completing previous questionnaires--and will look forward to your help with the final one in the series. Could you return the completed questionnaire by March 1? You will note that the return postage-free envelope is addressed to Mrs. Maierhauser.

Sincerely,

Iva E. Grubl
Home Economics Agent

P. S. NO STAMP is needed on the return envelope.

Encl.
APPENDIX D

Post-Test

RADIO & TELEVISION QUESTIONNAIRE
(Use pen or pencil — DO NOT type.)

When did you (not members of your family) watch television yesterday? (Check all of the periods you watched, even if you watched only for a part of the period.)

C1. ______ 7:00 a.m. to 8:00 a.m.
C2. ______ 8:00 a.m. to 12:00 noon
C3. ______ 12:00 noon to 1:00 p.m.
C4. ______ 1:00 p.m. to 5:30 p.m.
C5. ______ 5:30 p.m. to 6:30 p.m.
C6. ______ 6:30 p.m. to 10:30 p.m.
C7. ______ after 10:30 p.m.

C8. Which day of the week are you filling out this questionnaire? (Check one.)

1. ______ Monday
2. ______ Tuesday
3. ______ Wednesday
4. ______ Thursday
5. ______ Friday
6. ______ Saturday
7. ______ Sunday

Which of the following periods of a week day, (Monday through Friday) do you USUALLY watch television? (Check all of the periods you usually watch.)

C9. ______ 7:00 a.m. to 8:00 a.m.
C10. ______ 8:00 a.m. to 12:00 noon
C11. ______ 12:00 noon to 1:00 p.m.
C12. ______ 1:00 p.m. to 5:30 p.m.
C13. ______ 5:30 p.m. to 6:30 p.m.
C14. ______ 6:30 p.m. to 10:30 p.m.
C15. ______ after 10:30 p.m.

C16. How many black and white television sets are there in your home? (Check one.)

1. ______ none
2. ______ one
3. ______ two
4. ______ three
5. ______ more than three

C17. How many color television sets are there in your home? (Check one.)

1. ______ none
2. ______ one
3. ______ two
4. ______ three
5. ______ more than three

Most television programming can be classified either as entertainment or information. Under programming classed as information are the usual news and weather programs, but also included in this category are programs explaining HOW TO DO things and WHY certain things are done.

C18. If you could have your choice, what one time of day would you most prefer to have information programs scheduled on television? (Check only one—the time you would most prefer.)

1. ______ 7:00 a.m. to 8:00 a.m.
2. ______ 8:00 a.m. to 12:00 noon
3. ______ 12:00 noon to 1:00 p.m.
4. ______ 1:00 p.m. to 5:30 p.m.
5. ______ 5:30 p.m. to 6:30 p.m.
6. ______ 6:30 p.m. to 10:30 p.m.
7. ______ after 10:30 p.m.

C19. If you could have your choice, what one time of day would you most prefer to have entertainment programs scheduled on television? (Check only one—the time you would most prefer.)

1. ______ 7:00 a.m. to 8:00 a.m.
2. ______ 8:00 a.m. to 12:00 noon
3. ______ 12:00 noon to 1:00 p.m.
4. ______ 1:00 p.m. to 5:30 p.m.
5. ______ 5:30 p.m. to 6:30 p.m.
6. ______ 6:30 p.m. to 10:30 p.m.
7. ______ after 10:30 p.m.
QUESTIONNAIRE
(Use pen or pencil -- DO NOT type)

C20. Which television station do you USUALLY watch? (Check only one. Check the station that you watch the greatest number of hours a day.)

1. ____ KOTA-TV--Channel 3--Rapid City
2. ____ KRSD-TV--Channel 7--Rapid City
3. ____ KHSD-TV--Channel 11--Deadwood
4. ____ KDSJ-TV--Channel 5--Deadwood
5. ____ KDUH-TV--Channel 4--Hay Springs
6. ____ KPLO-TV--Channel 6--Reliance
7. ____ Other (specify) __________

Miss Janice Laidig, nutrition specialist at South Dakota State University, presented 5 television shows on "Food Can Be Fascinating" at 2:30 p.m. on KOTA-TV (Channel 3), KDUH-TV (Channel 4), and KHSD-TV (Channel 11) February 10-17.

C21-22. Which radio station do you USUALLY listen to? (Check only one. Check the station that you listen to the greatest number of hours a day.)

1. ____ KOTA, Rapid City
2. ____ KRSD, Rapid City
3. ____ KEZU, Rapid City
4. ____ KIMM, Rapid City
5. ____ KBFS, Pelle Fourche
6. ____ KDSJ, Deadwood
7. ____ KBHB, Sturgis
8. ____ KOBH, Hot Springs
9. ____ KWYF, Winner
10. ____ KOLY, Mobridge
11. ____ KCCR, Pierre
12. ____ KGFX, Pierre
13. ____ KEJM, Lemmon
14. ____ KNDC, Hettinger, N. Dak.
15. ____ KVSH, Valentine, Nebr.
16. ____ KCSR, Chadron, Nebr.
17. ____ WNAX, Yankton
18. ____ Other (specify) __________

C24. Did you see any of these programs on one of these channels? (Check the number of shows you saw.)

1. ____ saw one show
2. ____ saw two shows
3. ____ saw three shows
4. ____ saw four shows
5. ____ saw five shows
6. ____ Didn't see any of the shows

C25. If you saw more than one of Miss Laidig's television series, which one did you find the most helpful? (Check one.)

1. ____ Focus on Food Cents
2. ____ Cook by Color
3. ____ Variety is the Spice of Life
4. ____ Meals that Please
5. ____ What to Believe about Food

C26. Whether or not you watched the programs Miss Laidig presented on television, do you recall having heard or read an announcement that they were going to be presented? Do you recall where you FIRST heard or read the announcement that they were going to be presented? (Check only the place where you first learned about the shows.)

1. ____ received a letter from the extension agent
2. ____ read about them in an agent's column
3. ____ read about them in an item in the local newspaper
4. ____ read about them in an article in the Rapid City Journal
5. ____ heard an announcement about them during the day on KOTA-TV, KDUH-TV, or KHSD-TV
6. ____ a friend or relative told me about them
7. ____ just happened to be watching when the program came on
8. ____ learned about them from another source
9. ____ didn't know they were going to be shown
QUESTIONNAIRE
(Use pen or pencil — DO NOT type)

In answering the following questions, put a check in the proper column to indicate your answer.

C27. Fresh vegetables cook faster than frozen ones.
C28. Cooking vegetables a long time improves the flavor.
C29. Cook strong flavored vegetables in a covered pan for the entire cooking period.

C27. True False Don't know
C28. True False Don't know
C29. True False Don't know

Which of the following foods did your family eat yesterday? (Check the ones you served.)

C30. apricots
C31. asparagus
C32. broccoli
C33. cabbage (raw)
C34. cantaloupe
C35. carrots
C36. grapefruit or juice
C37. greens (turnip, chard, spinach, beet, wild)
C38. green peppers
C39. oranges or orange juice
C40. peaches
C41. pumpkin
C42. squash
C43. strawberries (fresh)
C44. sweet potatoes
C45. fresh tomatoes or tomato juice

C46. Which one of the following is the best preparation for your regular food shopping spree? (Check one.)

1. Make out a list and buy only what is on it.
2. Check the ads to see what and where the best buys are.
3. Walk around the store and buy whatever appeals to you.
4. Don't keep a regular pattern of shopping.

C47. What are the food groups which should be used to plan adequate meals? (Use as many blanks as you need.)

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

Soda, added to the water in which green vegetables are cooked, does what? (Check the statements you think are true.)

C48. affects the color of the vegetables
C49. changes the texture of the vegetables
C50. destroys vitamins in the vegetables
C51. has no effect on the vegetables

Check these statements below which apply to your family. (You may check more than one statement.)

C52. Vitamin supplements are taken under the advice of the doctor.
C53. Vitamin supplements are taken occasionally or regularly.
C54. Our family doesn't take vitamin supplements.
C55. It is necessary for us to take vitamin supplements to be well fed and keep healthy.

C56. Do you recall how much you spent at the grocery store last week? (Check one.)

1. under $5.00
2. $5.00 to $9.99
3. $10.00 to $14.99
4. $15.00 to $19.99
5. $20.00 to $24.99
6. $25.00 to $29.99
7. $30.00 to $34.99
8. $35.00 or more
QUESTIONNAIRE (Use pen or pencil — DO NOT type)

Which of the following items were included in your grocery shopping? (Check as many as you purchased.)

- C57. soft drinks
- C58. potato chips
- C59. paper goods (paper towels, napkins, toilet tissue)
- C60. hosiery
- C61. tooth paste
- C62. cigarettes
- C63. cleaning supplies (detergent, soap, wax, polish)

In answering the following questions, put a check in the proper column to indicate your answer.

- True
- False
- Don't Know

C64. A “perfect meal can be purchased in liquid form.

C65. Breads and cereals should be included in reducing diets.

What would you like to learn more about? (You may check more than one.)

- C66. Food buying
- C67. Weight control
- C68. Food fads and fallacies
- C69. Importance and sources of body nutrients
- C70. Children’s food and food habits

C71. Where do you live? (Check one.)

1. In a town or city
2. In a rural non-farm residence
3. On a farm or ranch

C72. Check the group in which your age occurs.

0. 18 - 24
1. 25 - 29
2. 30 - 34
3. 35 - 39
4. 40 - 44
5. 45 - 49
6. 50 - 54
7. 55 - 59
8. 60 - 64
9. Over 65

C73. How many years did you attend school? (Check one.)

1. less than 8 years
2. 8 years
3. 1 thru 3 years high school
4. 4 years high school
5. 1 thru 3 years college
6. 4 years or more of college

C74. How many people eat regularly (at least 2 meals a day) at your home? (Check one.)

1. one
2. two
3. three
4. four
5. five
6. six
7. seven
8. eight
9. nine or more

C75. How many children do you have in your home under 18? (Check one.)

1. no children
2. 1 to 3 children
3. 4 to 6 children
4. 7 to 9 children
5. 10 or more children

C76. An indication of your approximate annual family income (or net income after expenses if on a farm or ranch) for 1965 would be helpful. (Please check one.)

0. Under $3,000
1. $3,000 to $3,999
2. $4,000 to $4,999
3. $5,000 to $5,999
4. $6,000 to $6,999
5. $7,000 to $7,999
6. $8,000 to $8,999
7. $9,000 to $9,999
8. $10,000 to $14,999
9. $15,000 and over.
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