Negative microfilm 65-10,943
received from university

DICE, Eugene Frederick, 1922-
THE INFLUENCE OF AN EDUCATIONAL AWARENESS EXPERIENCE ON COMPONENTS OF PSYCHOLOGICAL POSITION TOWARD AN ISSUE IN CONSERVATION; A METHODOLOGICAL STUDY.

The University of Michigan, Ed.D., 1965
Education, adult

University Microfilms, Inc., Ann Arbor, Michigan

THE INFLUENCE OF AN EDUCATIONAL AWARENESS EXPERIENCE ON COMPONENTS OF PSYCHOLOGICAL POSITION TOWARD AN ISSUE IN CONSERVATION; A METHODOLOGICAL STUDY

by
Eugene Frederick Dice

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education in Education and Conservation in the University of Michigan
1965

Doctoral Committee:

Professor Gale E. Jensen, Chairman
Professor Lyle E. Craine
Professor Justin Leonard
Professor Howard Y. McClusky
Professor Richard L. Weaver

Acknowledgements

It is beyond human achievement to appropriately express appreciation for all the kindnesses, thoughtfulness, and assistance rendered by individuals and institutions in the pursuit of this investigation. One must, therefore, content himself with calling attention to a small few and then generally cover the remaining in one grand gesture of gratitude.

Special appreciation is due the Michigan Cooperative Extension Service for a policy of study leaves without which the writer would not have been able to entertain the doctoral program.

Appreciation is expressed to the members of the doctoral committee for its direction of the program, its assistance with the subject matter of the experiment, and words of advice throughout. A special note of gratitude is due the chairman for insistance upon a professional and scholarly approach at all times.

Gratitude is expressed to the chairmen of the Departments of Adult Education and Conservation at the University of Michigan for the opportunity to embark upon an interdisciplinary degree program in fields not previously offering a joint doctoral program.

It is noted with gratitude that the faculties of the two above departments were very kind and helpful to the

student in the conduct of the program. And a special note is due Dr. M. Clements Johnson for assistance in the development of the statistical design and analysis of data and the use of computing facilities.

The Michigan Conservation Department, the Wayne County Sportsmen's Clubs and the Wayne County Farm Bureau were genuinely interested and helpful in making arrangements for the research and in providing a roster of club leaders from which the samples were derived. Edgar Kidd, Wayne County Agricultural Agent assisted in the acquisition of physical facilities and in conducting the preliminary activities. Everett Tucker, before his untimely death, and Herman Haedicke, both from the Michigan Conservation Department, and Charles Shick, Game Management Specialist at Michigan State University, all performed in the best of professional tradition in presenting the subject matter in the educational treatment. Mr. Dan Reed, the Legislative Counsel for the Michigan Farm Bureau, and Mr. Jim Rouman, Executive Director of the Michigan United Conservation Clubs, admirably presented the hunter-owner policies of their respective state organizations as an important part of the educational experience for the subjects.

Appreciation is expressed to the faculties of Conservation at the University of Michigan and Michigan State University, and the staff members of the Michigan Conservation Department for constructive criticism of the instrument. Likewise to the many respondents in the preliminary

testing program and to the subjects of the final experiment.

Lastly, it is not a simple unemotional experience for a father at the age of 40 to seek the support of his family in the decision to return to the classrom for a period of two or more years. Yet this decision was a family one, and the writer is humbly grateful that these dear ones would absent themselves from life's normalcy to this end. Sons Stephen, Scott, and Ronald have had appreciably less than full time parental attention. My able and considerate wife Emergene returned to the practice of her profession as a dietician, undergoing both emotional and professional pressures in order that the family might exist during the period of study. Without her willingness to sacrifice, the entire program would have been an impossibility. To these most dear to me then goes the greatest expression of personal gratitude.

A personal sadness is expressed in concluding these remarks in reference to the untimely death of Dr. R.L. Weaver during the final stages of this investigation. Dr. Weaver, a pioneer in the field of conservation education, had been most helpful in this present program.

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS..... ii

LIST OF TABLES..... vii

LIST OF APPENDICES..... x

Chapter

I. INTRODUCTION AND BACKGROUND..... 1

Background Considerations
Relevance to Adult Education and Conservation
Relevant Research
Summary of Relevant Research

II. CONCEPTUAL FOUNDATIONS..... 20

Concepts Developed for Investigation
Discussion of Variables
Emotion Feeling
Disposition to Act
Perception Appropriate Action
Perception of Facts
Educational Awareness Experience
Review of Variables Established for Study
Statement of the Research Problem
Nature of the Hunting Situation in Michigan
Research Hypotheses for Study

III. DEVELOPMENT OF DATA COLLECTION INSTRUMENT. 54

Theory of Instrument
Scaling Theory
Instrument Development
The Examination of Scalogram Items by Experts
Problems of Validity and Reliability
Directions for Scoring and Using the Instrument
Extraneous Variables to be Considered

IV. RESEARCH DESIGN AND PROCEDURES..... 92

Description of the Design
Brief Review of Experimental Design Literature
Sampling Problems and Procedures
Application of the Independent Variable
Content of Training School Meetings

Chapter
IV. CONT.

Data Analysis Plan and Procedures
Test for Normal Score Distributions

V. DATA ANALYSIS RESULTS..... 122

Correlation of Personal Profile Characteristics and the Response Scores for Five Variables Under Observation
Analysis of Variable I
Analysis of Variable II
Analysis of Variable III
Analysis of Variable IV
Analysis of Variable V
Summary of Data Analysis Results

VI. IMPLICATIONS AND CONCLUSIONS..... 140

A Theoretical Model for Educational Awareness Programs
Expected and Unexpected Results
Summary--Conclusions

VII. LIMITATIONS AND RECOMMENDATIONS..... 152

Limitations
Recommendations

APPENDIX..... 158

BIBLIOGRAPHY..... 188

LIST OF TABLES

Table		Page
1.	Coefficients of Reproducibility for Items in the Preliminary Test on Scalogram Items With Three Respondent Groups.....	66
2.	The Responses of 15 Conservation Experts in Approving the Original Rank Order of Scalogram Items for Final Test.....	71
3.	Means and Standard Deviations for Three Respondent Groups in a Trial Test of the Preliminary Instrument.....	76
4.	Score Differences from Responses Obtained on Preliminary Pre and Post Tests of the Measurement Instrument.....	81
5.	Changes in Group Scores Between the First and Second Applications of the Preliminary Instrument as Compared with the Maximum Possible Score for the Five Variables.....	82
6.	Pre Test and Post Test Means and Standard Deviations for Five Variables Derived from Control Group Scores.....	82
7.	Score Means and F.ratios on Five Variables Comparing the Experimental and Control Groups on Pre Test Scores.....	100
8.	Comparison of Means for Experimental and Control Groups on Five Factors in the Social Profile of Individuals.....	101
9.	F. Test of Homogeniety of Variance for Experimental and Control Groups on Initial and Final Tests of Five Variables.	113
10.	Skewness and Kurtosis in the Distribution of Original Scores for 40 Experimental and Control Group Subjects on Initial and Final Tests for Five Variables of position.....	119
11.	Comparison of Original and Normalized Score F.Ratios After Analysis of Covariance on Five Variables for 40 Subjects.....	120

LIST OF TABLES

Table		Page
12.	Correlation Tests for Five Variables of Personal Characteristics and Five Variables of Position Using Pre Test Scores	123
13.	Group Means and Standard Deviations for Scores on Initial and Final Tests for Variable I by Experimental and Control Samples	124
14.	Analysis of Variance, Variable I, Using Initial and Final Test Means of Experimental and Control Groups	125
15.	Initial, Final, and Adjusted Group Means for Variable I	126
16.	Analysis of Covariance Using Experimental and Control Group Means on the Post Test Scores for Variable I	126
17.	Experimental and Control Group Means and Standard Deviations for Scores on Initial and Final Tests, Variable II	12
18.	Analysis of Variance for Initial and Final Tests on Variable II with Experimental and Control Group Means	128
19.	Initial, Final and Adjusted Means for Variable II	128
20.	Analysis of Covariance for the Final Measure on Variable II	129
21.	Group Means and Standard Deviations for Initial and Final Tests for Variable III by Experimental and Control Groups	130
22.	Analysis of Variance with Scores of Experimental and Control Groups from Initial and Final Tests of Variable III	131
23.	Adjusted Means for Experimental and Control Groups on Variable III for the Final Test	131
24.	Analysis of Covariance of Mean Differences on Variable III by Experimental and Control Groups	132

LIST OF TABLES

Table		Page
25.	Group Means and Standard Deviations for Initial and Final Tests on Variable IV by Experimental and Control Groups.....	133
26.	Analysis of Variance on Initial and Final Tests of Variable IV by Score Means of the Experimental and Control Groups.....	134
27.	Initial, Final, and Adjusted Means on Variable IV.....	135
28.	Analysis of Covariance on Group Means for Variable IV by Experimental and Control Group Scores.....	135
29.	Group Means and Standard Deviations on Initial and Final Tests for Variable V by Experimental and Control Groups.....	136
30.	Analysis of Variance on Initial and Final Tests for Variable V by the Experimental and Control Group Samples.....	137
31.	Initial, Final, and Adjusted Means for Variable V.....	137
32.	Analysis of Covariance for Variable V for Experimental and Control Group Mean Scores.....	138
33.	Responses of 20 Experimental Group Members to the Question of how Much Change was Effected for each Variable by the Experimental Training School Methods.....	139
34.	Theoretical Construct for Determination of Program Content Needs to Achieve Action Level Proportionately for the five Variable Components of Position.....	141
35.	Change in Group Score Means as a Percentage of Maximum Possible Scores on Five Variables by the Experimental Group (N-24) on Initial and Final Tests (final adjusted mean).....	146

LIST OF APPENDICES

Appendix		Page
A.	Preliminary Instrument.....	158
B.	Differences Between Low 1/3 and High 1/3 Means for each Three Groups Responding to the Preliminary Instrument.....	164
C.	Hunter Group, Owner Group, and Faculty Student Group Response Scores to 49 Likert Items on Trial Instrument.....	166
D.	Questionnaire to Expert Quasi-panel.....	167
E.	Correlations Between Group Score Means for Five Variables Observed.....	170
F.	Final Instrument.....	171
G.	Plans and Ground Rules Presented to Subjects.	176
H.	Summary of the First Training Meeting Discussion.....	178
I.	Instructions to Experimental Subjects for a Take Home Problem to be Answered Before Third Meeting.....	180
J.	Summary Review of Coverage in First Two Meetings Presented at the Start of the Third Meeting.....	181
K.	Instructions for Responding to the General Question of What Kind of Change is Felt as a Result of Participating in the Hunter-Owner Relations Training Meeting...	183
L.	Analysis of Covariance Using the Normalized Scores for Each Variable on Pre Test and Post Test Results.....	184
M.	Scores of Respondents for each Variable on Pre Test and Post Test by the Control and the Experimental Group Subjects.....	185
N.	Preliminary Test Responses to Six Scalogram Items for Variable I & II by Three Groups of Subjects.....	187

CHAPTER I

Introduction and Background

The adult education programs of many institutions and agencies involve a responsibility to provide clients with the kind of subject matter that relates to community growth and development problems. Likewise, numerous adult education programs deal with the conservation, use, and development of natural resources. Enough effort has been extended in these interests to establish community and resource development as significant categories in the adult education movement in this country.

It may be proposed that the objective of most of the adult education community and resource development programs is to generate action or contemplation of action on part of the clients. Further, the direction of action resulting from these programs is toward some orderly and systematic plan for development of community, social, or natural resources. It is typical of these programs that group learning methodology is utilized; i.e., whole groups or representatives of many groups become the learning clients. Action is then contemplated or actually initiated by the group or groups as a result of their

participation in the educational program. A group of citizens may enter an adult education program in order to learn the procedure for establishing a community council which is to pursue certain courses of action in improving the community. Or, an interested group or an officially appointed body may meet with technical experts in a planned educational program to explore the needs and possibilities for land use studies, for the possible development of recreational areas, or for the study of a community water supply system.

The practical problem for this investigation is provided by the fact that there is increasing need, in the affluent society, for educational programs of awareness upon which decision making adults may build a conscience for community and resource development. The objective of desirable alternative courses of action in community and resource development is not always achieved after well planned and executed educational programs. The outcome is not always commensurate with the energies expended, nor in keeping with orderly development of resources.

The effective instruction of client groups, an enthusiastic response to the educational experience, and the clear logic of alternative solutions all may be to no avail when the final decision is made by the community. The facts of the situation and alternative courses of action may be presented in the most plausible manner, yet other dimensions or properties of the client group and

the larger community may block the courses of action which seem workable and effective. Clients regress to pre-educational experience positions relative to the development needs of the community.

The practical problem is one of exploring the dimensions of client position. On the premise that client position may be reduced to component dimensions, it may then be possible to design adult education programs that will maximize the treatment of dimensional needs. The expected result would be that the educational treatment would influence a positive change in the dimensions of position exhibited by client groups.

Background Considerations

The writer had been employed in an urban area in Michigan as a County Extension Agent for Community and Resource Development. This position was with the Michigan Cooperative Extension Service. The work consisted principally of the planning of educational programs for those adult clients who desired assistance in community analysis, community planning, land use surveys, and the provision of services by local units of government. Both private citizens and elected officials were included in the client groups. The objective was to provide instruction in systematic analysis and planning for the development and use of resources available to the community.

The typical Extension Agent is not himself a technical expert, though he is expected to possess abilities within subject matter fields. The role is one of helping agent, and the function is to provide such educational programs and technical assistance as may be called for in specific situations. His real job may be called the management of educational enterprises, sometimes being called upon to play the teacher role, but ordinarily acting as the coordinator of the educational events which accrue to his subject matter area. Technical assistance is recruited from departmental specialists or from the economic and social resources of the community itself.

One of the persistant problems encountered was the evident skepticism with which technical specialists(experts) were generally regarded by the public. This present investigation is not concerned with evaluation of this premise, but it is very pertinent to the intent of the experiment to refer to it here. It was not unusual to hear it said of the expert that,"He seems like a nice enough guy, but he doesn't understand our problems", or "He better get away from the books awhile".

Another observation filled with questions for study was the propensity for so many public decisions to be made without proper consideration of the consequences. As an example, housing developments were allowed in poorly drained areas despite health department warnings that eventually there would be the problem of spread of moisture borne diseases. In this regard, the premise is made that

the urgency of day to day needs and politics draws all attention and energy from the much needed examination of long range growth problems and consequent pressures upon available resources. This circumstance was especially evident in those areas of local government where it was neither feasible nor possible to maintain the kind of specialist performers who could assist the officials in community planning problems. This is taken as evidence that adult awareness educational activities are needed as an adjunct to public information, in assisting the citizen in the understanding of urban growth problems, management of community affairs, and the comprehensive development of the natural resources available.

These brief considerations of a practical situation form the basic foundation for conceptualizing an investigation dealing with adult education needs. The adult educator, in the pursuit of his daily tasks, becomes immersed in a wealth of experiences from which flows an abundant opportunity to identify researchable events and objects. If he is inclined to evaluation of behaviors and situations, then these practical experiences produce in great profusion such questions as, "Why is this so ?", " What really is going on ?", "Why did this come about?", and, "What is it that is holding things up ?". If his perceptions penetrate beyond the surface evidence, the adult educator finds underneath a fertile field of basic educational and psychological factors for investigation.

The operational inquisitiveness of the practicing adult educator suggests a fruitful intimacy between the practioner and the research theoretician. The practioner may provide, from his experiences, the symptoms and clues of the needful situation, while the theoretician may formulate the structure by which research may be elaborated and sophisticated. Among the many opportunities, perhaps the richest is for the practioner to absent himself from practice long enough to, himself, become the theoretician. For, no other than he can inject into research so much of the feeling of need and anxiety for the specific situation. To no other is the situation at once so significant and yet so homely.

Relevance to Adult Education and Conservation

There are many developments of recent decades in the society and culture of the United States which have generated the need for expanding educational experiences for adults. Among these, prominently, is the need for community and resource development learning experiences.* The conditions of change in the society bearing most directly upon this research program derive from the impact

* As used in this investigation, the definition of community and resource development refers to a social educational experience of learning by individuals and groups, not to the technical aspects of development as perceived by the professional planner.

of dramatic population increases upon traditional communities and the available natural resources. Almost suddenly, the slow transition from rural to urban society has climaxed within a generation and the massing of great populations in limited spatial areas has greatly increased problems for which the confronted generation has had no preparatory education. A profusion of specialist roles has emerged within the management structure of urban areas. It is their task to solve complex problems of community growth, but the public has the final decision making task before enactment of solutions. The lines of communication between the public and the hired technician is indirect and interspersed with indiscriminate popular proposals for solutions. Because of the conflicts and confusions evolving from the milieu, the private citizen does not orient to the dramatic and critical community internal problems and the potential contribution of the specialist. Sower [2] and associates have expressed the following as a relationship emerging. "With the rapid development of modern technology and science, no problem in social science is more important than the linkage between the professionals, who function through various health, educational, agricultural, commercial, and other agencies and bureaucracies in which they are employed or affiliated, and the citizens of all class levels in their respective communities."

Sower, Christopher; Holland, J; and Freeman. W. Community Involvement. (Glenco, Ill.: The Free Press, 1957) page 5.

However, the technical expert is often generally regarded by the public as just another servant receiving dole from the public payroll, not as a trained specialist capable of solving complex problems in the community. Riesman [3] suggests, in this regard, that a triangle exists including the male expert, the female client, and the client's husband calling attention to the fact that the homebound wife has interests in suburban, school, family, and neighborhood problems which leaves her receptive to the advice of the male expert; whereas the job-bound husband is receptive to expert advice relating to occupation, but has a skeptical attitude toward the expert in community, school, family, and municiple problems.

These premises may be taken as evidence that there is a growing need for adult educational experiences in which the private citizen may orient more directly to the complex community and to the technical expert. It may be suggested that this kind of experience will stimulate a more direct appreciation of the needs of changing communities and their resources.

It is in a similiar rationale that the impact of increased population is seen as generating new needs for adult education efforts in relation to the conservation, the development, and the use of natural resources. The

---

[3] Riesman, David. "The Researcher and His Audience," The Planning of Change, ed. Warren Bennis, Kenneth Benne, and Robert Chin. (New York: Holt, Rinehart & Winston, Inc, 1961) Chapter 11, page 685.

function of specific resources changes over time, and consequently, the need for public understanding of the changing function of resources must be updated. The generation now making decisions in the development, allocation, conservation, and use of natural resources was largely educated in a pre-technical age attitude toward resources and their conservation. For one thing, the early attempts were directed toward an attitude of preserving or conserving the natural resources, whereas it is now more and more evident that the attitude of development and use of resources must also be considered. The current issue-deciders will not return to the classrooms where they were first oriented to conservation; rather, they will have to derive a more modern concept of conservation and development of resources through casually found information and by adult education programs.

In the conservation and development of natural resources, as in meeting urban change needs, a profusion of technical experts has been introduced. Their talents and skills are the insurance by which maximum benefits and provision for resources in the future is made possible. Again however, the public exhibits more skepticism than interest in the potential contribution of the trained resource expert to the welfare of the society.

There are basic psychological and behaviorial involvements in the community and resource development conditions heretofore discussed from which educational

needs emerge. These needs will be elaborated and developed in succeeding chapters. They are outlined here as follows;

1- the dramatic changes resulting from the increase of population and technology place the citizen in a position of having to make modern decisions while his educational preparation for making these decisions is a pre-technical age model,
2- swift changes in mobility, in residential habits, in time away from occupation, and urbanization, have generated changing attitudes and ideological perspectives in regards to community problems and utilization of natural resources,
3- proliferation of knowledge has been a characteristic of the technical era; the capacity to learn and store knowledge has been extended, but there are practical limits for each individual; therefore, each must depend on extra-personal sources for knowledge, information, and for interpretation of social and political events,
4- the specialist possesses extensive knowledge and skill within a limited subject matter field, but interpretation of the store of his technical knowledge for the public is fraught with conflicting emissions of sub-groups within the community, each of which claims to have the one true set of facts and the one logical solution to any given problem,
5- cultural changes and procedural changes act together and the achievement of desirable change rests upon different methodology in different periods of time, the perceptions of the decision making public in relation to appropriate alternative solutions to problems and issues needs to be as transitional as technology.

These identified psychological and behavioral involvements provide evidence of the relevance of the anticipated research problem to the methodology of adult education, and as well, to the subject matter content of community and resource development. The condition may be simply briefed as; today's citizens while fortified with a pre-technical age orientation, are confronted with technical and space age issues.

The question is not whether citizens were well educated and oriented in the pre-technical age, but rather

what can be learned about implementing whatever quality or standard they did achieve with a more modern rationale for problem confrontation. A change in orientations in line with time and circumstance, a change that nonetheless retains all the philosophical and social values of education within a democracy, is necessary to assist in keeping the public citizen prepared for his important role in public decision making.

Others have considered the great demand for a space-age overlay for the machine-age education. Counts [4] points out that we enter the atomic age with minds formed largely in the day of the hoe, the horse, the spinning wheel, and the sailing ship. He argues that:

"Our functional ideas, moral conceptions, and social organization lag seriously behind our modes of living, forms of communication, use of mechanical energy, and scientific knowledge. This lag is doubtless responsible for many of the troubles and conflicts of the time. The task of bringing our minds and our practices into harmony with the physical conditions of the new age is a gigantic and urgent educational undertaking".

Paranthetically, one may reflect that today adults are troubled and in conflict over whether or where sanitary sewers shall be provided, in the near future they will be troubled and in conflict over how and to whom fresh water shall be distributed, and in the visible but unclear horizons of present day science, over how much control and by whom, in the matter of human heredity and life itself.

---

[4] Counts, George S. "The Impact of Technological Change," The Planning of Change, ed. Warren Bennis, Kenneth Benne, and Robert Chin (New York: Holt, Rinehart & Winston, Inc. 1961) pages 20-28.

There is relevance of magnitude in exploring the community and resource development potentials as adult education areas. The solving of complex social and economic problems in today's community and resource situations calls for an updated rationale. This is interpreted as the theoretical basis of the adult educational awareness experience conceptualized in this study. It is an experience planned to consciously integrate mobility of ideologies, attitudes, perceptions, knowledge and procedures as a learning experience for the client groups, toward the development of a new rationale. Rogers [5] sees such a process as one which includes an evaluation of meaning and consequences, alternative lines of conduct, an observation of the problem, deciding upon available courses of action, choosing among them, and accepting the consequences of the decision.

Relevant Research

The search for, and examination of research related to the practical problem as heretofore outlined was limited to studies in three general areas of investigation. These included recent educational experiments in subject behavior change, attitude change, and adoption of new practices. Involved in these investigations is the

---

[5]Rogers, Everett M. Diffusion of Innovations. (New York: The Free Press of Glenco, 1962. page 7.

diffusion of knowledge, representing significant contributions to this educational area. The attempt was made to review investigations dealing with the use of specific educational methods as means of bringing about change with regard to problem solving rationale. The specific nature of the present study was not identified among the references reviewed, rather inferences were drawn from literature as related methods and results were located. These each bear upon one or more of the aspects under observation in this investigation.

This course of action resulted in examination of adoption studies which involve the diffusion of knowledge. Since adoption represents a form of behavior change, it was assumed that other characteristics or dimensions of personality would also be active. It was in the possibility that there were identifiable underlying properties activating the adoption impulse that the present investigation established an interest. Cartwright [6], for example, identifies group influence upon an individual as a variable which is significant in the individual's propensity for change. He argues that the behavior, the beliefs, attitudes and values of individuals are products of the groups in which membership is held. This is an indication that group influence is important to the present study.

---

[6] Cartwright, Dorwin, "Achieving Change in People." The Planning of Change, ed. Warren Bennis, Kenneth Benne, and Robert Chin (New York: Holt, Rinehart, and Winston, Inc, 1961) pages 698-706.

Novak [7], in an experiment comparing two methods of teaching college botany found that under the specific methods used in his research the variable of scientific attitude did not change significantly. While there was a slight positive shift on scientific attitude, as measured by mean scores in response to the items used, neither the conventional method of teaching nor the project centered method achieved significant levels of change. Rumford[8] experimentally examined the results of closed circuit television by use of experimental and control groups. He measured retention four weeks after the final treatment and found no significant differences.

Brunner[9] and associates, in reviewing many studies conclude that individuals differ greatly in readiness to accept new ideas and practices. Some come to the decision quickly. A few never shift their position nor adopt new practices as a result of teaching experiments. Brunner notes that it is known that exposure to a single brief communication can produce opinion effects that last several months. In the real and relevant event, these authors see

---

[7] Novak, Joseph D. "An Experimental Comparison of a Project Centered Method of Teaching a College Botany Course," Journal of Experimental Education, XXVI (Sept. 1957-June 1958) pages 217-230.

[8] Rumford, Herbert P., "An Experiment in Teaching Elementary School Methods via Closed Circuit Television," Journal of Educational Research, vol. 56, no 3, (Nov. 1962) pp. 139-143.

[9] Brunner, Edmund, An Overview of Adult Education Research, (Chicago : The Adult Education Association) 1959, page 15.

a cluster of stimuli effecting changes in such opinions which are sharply different from those built up by the previous communication. A final point is made in regards to the influence of the credibility of the source communicator, the new opinion or idea being retained for longer periods if the source is perceived as credible.

Gibb [10], in reporting a survey of research in adult learning groups cites a finding by McKeachie of significant relationships between attitude changes and changes in the perception of group norms. An additional finding was that those individuals who maintained face to face contact with the parent groups retained beliefs even after these beliefs were proven without foundation. This latter finding is an important factor to be mindful of as possible barriers to change in opinions and attitudes.

Hillson [11], using both control and experimental groups examined the effect of the field trip upon attitude change. This report showed that the experimental group scores on attitude variables significantly improved following the field trip. The field trip presents the client group with a higher level of reality than can be gained in the classroom and is a methodology of importance in adult education.

---

[10] Gibb, Jack. "Learning in the Adult Group," Review of Educational Research, vol. 29, no.3, (June 1954) pp. 256-261.

[11] Hillson, Joseph, Alexander Wylie, and P. Wolfensberger, "The Field Trip as a Supplement to Teaching: An Experimental Study," Journal of Educational Research, vol 53, no.1 (Sept. 1959) pp. 19-22.

Seven concepts of attitudes toward safe driving were tested experimentally by McAshan [12]. The method used was the showing of a film followed immediately by testing the subjects. Six weeks later, another test was given to the same subjects. In the immediate test, no significant differences were found between experimental and control groups. In the second test, however, there was a significant difference between groups on two of the seven attitude variables. This finding indicates that the impact of the learning situation is not always immediate, but that it may be recalled when the real life experience relates to the lesson.

Welch and Verner [13] studied the effectiveness of two diffusion processes by a before and after measurement of learning. Three methods were used to diffuse information: an adult education group method, a mass communication method, and a combination of the two. The group method was described as a workshop of four half-day sessions. The mass communication method consisted of a specially prepared bulletin covering the workshop subject matter. The combined method utilized a sub-sample from the workshop

---

[12] McAshan, H.H., "An Experimental Study of Traffic Safety Films," Journal of Experimental Education, vol. 31, no 1, (Sept. 1962) pp. 43-53.

[13] Welch, John M., and Coolie Verner, "A Study of Two Methods for the Diffusion of Knowledge," Adult Education XII, no.4, (Summer 1962) pp. 231-237.

group which also received the bulletin. The treatments were administered and the adoption scores were measured at the end of an impact period of about two months following the treatment. At that point, the workshop only group scored a 2.98 percent increase in adoption, the the workshop-bulletin sub-sample a 2.50 percent increase, and the bulletin only group a .99 percent increase. Since the procedures used had accounted for prior influence, these increases were assigned to the treatment methods alone.

In another study of changes in subject behavior as a result of experimental treatment, Hill [14] sought to assess the relative effectiveness of discussion group methods and lecture methods. This test of methods had the objective of development of skills, changes in attitudes, and increased knowledge by the clients. The subjects in the experiment participated in a series of 11 two hour class sessions. A comparison of their pre test and post test scores did not identify a significant superiority of one method over the other. However, the author concluded that the discussion method was more effective so far as retention of information and changing attitudes and abilities were concerned. The slight change observed was in a positive direction for both methods of presentation.

---

[14] Hill, Richard J. A comparative Study of Lecture and Discussion Methods (Chicago: The Adult Education Association, 1960) 153 pages.

In an investigation of film alone and combined film-discussion methods of influencing ethnocentrism, Mitnick [15] found that stability of attitude was related to the experimental conditions. One month after the educational experience the film-discussion subjects had maintained their initial changes while the film-alone subjects gave evidence of regressing toward prior positions. Jennes [16], who studied the influence of discussion methods in bringing about changes in opinion and in reference to a matter of fact, decided that discussion alone does not effectively lead to changed attitudes. The additional criterion suggested is that subjects must also become aware of differences in opinion before discussion methods effect changes in attitudes.

Summary of Relevant Research

This brief review of research gives evidence that: it is possible by a variety of educational methods to bring about changes in attitudes and opinions, it is possible to alter behavioral and skill variables through different educational methods, retention is dependent

---

[15] Mitnick, L.L. "Influencing Ethnocentrism in Small Groups through a Film Communication." Unpublished Ph.D. Dissertation, University of Maryland, 1956.

[16] Jennes, A. "Social Influence in the Change of Opinion: The Role of Discussion in Changing Opinion Regarding a Matter of Fact." Journal of Abnormal Social Psychology, vol. 27, pp. 29-34, 279-296.

upon methods used to convey the change and upon post treatment conditions, and the change in attitudinal variables, while in a positive direction, is often less than significant when experimentally stimulated.

Chapter II

Conceptual Foundations

Concepts Developed for Investigation

There are two main areas of interest from which the concepts for this investigation are derived. One area is represented by the educational experiences which it has been posited, are needed by adults to assist them in the development of a rationale for confronting community and resource development issues. The second area is that of the internal structure of stand or position taken by an individual who is facing an issue of importance in his environment. The latter interest prevails for groups as well as for individuals.

The greater significance, from an experimental standpoint, rests with the concept Position. A position in this investigation is expressed as a stand or a posture, in relation to an issue of significance, which is representative of an individual or a group. It involves a for-or-against relationship between client or client group and the confronted issue. It can also be viewed as a location or point on a continuum running from strongly favorable to strongly unfavorable in relation to the issue.

In the practical situation, the individual is faced with two alternatives as he approaches the decision making stage. He must assume a stand which is either for or against the issue. A third possible alternative is to refrain from making a decision either way. However, among those choosing the "for" position are all those individuals or groups ranging in conviction from strongly for to just weakly for. Thus there are many positions of for each of which may be represented by a point position or location on the "for" side of the continuum. On the opposite end of the continuum is a like range of categories representing all individuals or groups who are assuming an "against" position. These categories or degrees of for or against establish a horizontal plane of position, the continuum.

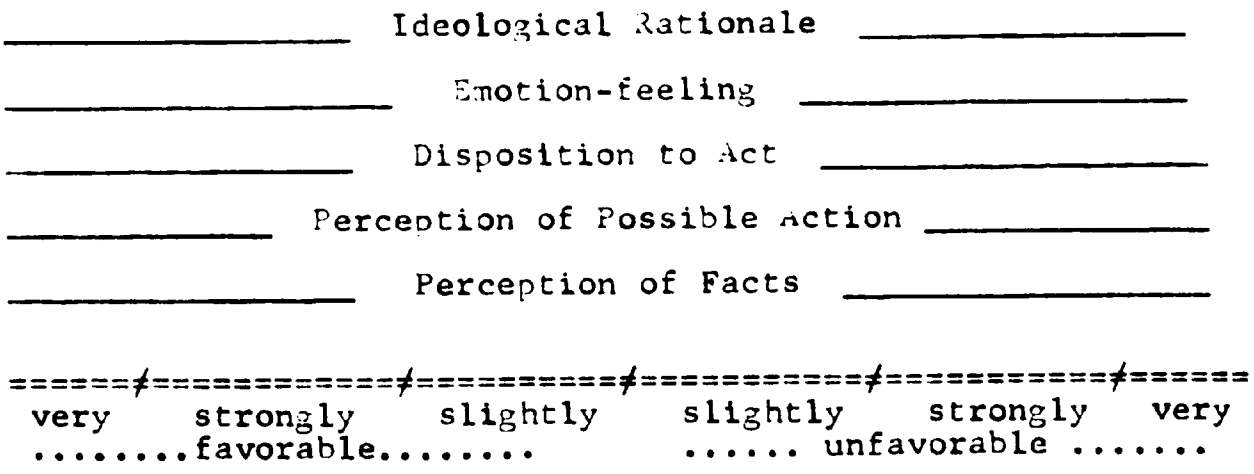
Position may also be conceptualized as containing a perpendicular arrangement in the form of a profile. This concept of position introduces the premise that position is not really a singular phenomenon, but that it is rather a complex of sub-parts whose cumulative strengths establish the individual or group posture as being either for or against or some degree of one or the other.

The premise that position is really a profile of component variables provides a basic structure with which the assumed components may be identified. Five have been identified for this study. These include: an ideological

rationale for understanding the issue, a general emotion or feeling toward the issue, a disposition to act, a perception of possible actions, and a perception of the facts involved with the issue.

It is acknowledged that these assumed component variables of position may be seen as rather tenuous, or that they might better be postulated in terms of precise psychological phenomena. In the interest of this study, however, it is argued that they relate to psychological and behaviorial phenomena which can be, from a practical standpoint, isolated as distinctions which may be treated educationally.

The profile structure and the horizontal continuum may be joined to form a schematic construct as follows, with the base representing the continuum and the perpendicular representing the profile components.



This design makes it possible to locate on each of the component variable planes the position of client groups.

For example, individuals or groups may be tested to determine the relative favorable-unfavorable positions for each component in relation to a community improvement program. Scores from the test may then be assigned to their appropriate locations on the continuum. The investigator or educator thereby determines the educational needs for each component and plans his educational event accordingly.

It is toward the educational design for fulfilling the component needs that leads to the other interest area above. This is the concept that an Educational Awareness Experience can be planned for these purposes. Such a method or procedure is defined as a planned sequence of educational events whose objective is a thorough examination of the issue being confronted. The educational awareness experience, as here referred to, is a method for adult education programming, but it is not necessarily limited to adult learning. As a planned sequence, it is distinguished from casual, non-organized, or unplanned acquisition of knowledge or information. Either group or individual learning may follow in this pattern.

The educational awareness experience has two clear purposes. The first is the diffusion of information and knowledge from experts to learners and among learners. In this respect, teacher-learner relations, and inter-learner relations are important. The second purpose is

that the educational awareness experience function as a learning experience for the client group in which a new position on each component variable is achieved. As a result of participating in a sequence of educational awareness experiences, the client group should gradually develop a new rationale for confronting issues. To this end, the educational awareness experience incorporates methods of problem identification and analysis, introduction of competing or conflicting "sides" of issues, the consideration of alternative appropriate actions for the solution of issues, and an examination of social or cultural causes of the issue situation.

It may be argued that the purpose of typical adult education programs is the imparting of knowledge or facts and/or the development of skills. Either by intent of purpose or as a consequence of the method of instruction, many adult education programs are action stimulators. It is the suggestion of the concepts of this study that the educational awareness experience provides a more comprehensive learning experience for its clients which teaches a procedure for examination of underlying causes and conflicts, as well as exploring solutions.

Discussion of Variables

Ideological rationale for understanding

This variable of position represents one of the

conditions which function in the formation of the posture assumed by an individual or group toward an issue or a decision. It is viewed as the basic ideology from which the individual perceives an issue and designs his behavior toward it. The ideological rationale may be the most important component by which the individual assimilates or rejects what is observed in relation to the confronted issue. For example, when confronted with a new issue, the individual may be inclined to weigh its merits in a logical and rational manner, or he may be inclined to accept or reject it by placing it within a system of categories established from previous experiences. If it is by the logical-rational method, he may verbalize by saying,"Let's look into this and see what its all about". If, on the other hand, he is inclined to categorize he is apt to verbalize by saying,"I'm against anything that means more taxes", or, "If they are for it, I'm against it". This may be called an ideology clue system with which certain types of individuals categorize issues and it is a good indication that such an individual is not going to "make up his own mind", but rather borrows position clues from others.

It is suggested in this study that an individual has not one ideology but many ideologies for understanding issues or problems of his environment. Each ideology has its own reference object, but there is a differential degree of interaction among one individual's ideologies.

Each has an ideology in reference to religion, one in relation to occupation or profession, one to politics, one to education, and so forth. One, for example religion, may be more or less overriding in the strength of the other ideologies for a given individual while for some individuals two or more ideologies may "team up" as an overriding force over all others. Likewise, different occupational or nationality groups may have different ideologies in relation to a common reference object. As an example of this phenomenon, business groups and farm groups will be expected to have differing ideologies for understanding rural electrification. Open conflict of ideologies precedes the enactment of legislation and local government activities. The deliberations preceding the passage of the Civil Rights Act is one example. Once enacted, the new measure may meet with long periods of contesting by the conflicting ideological groups. However, over time the legislated ideology may well become incorporated into the group ideologies. As a case in point, there is much less contesting by farm groups over whether there should be subsidies for farmers than in the early days of this legislation. The present generation of farmers are more concerned over what kind of subsidies are appropriate rather than whether there should be subsidies.

It is also evident that real and ideal ideologies are sometimes in conflict. Ideal ideologies in reference to small community and family sized farm value systems

are far from practical in the real life situation.

The point to be made in reference to conflicting ideologies is that, when they involve social and environment issues, some degree of convergence among ideologies is necessary if a desirable course of action is to occur. Sower [1] and his associates, using the term interest where ideology may be substituted, argue that,

"In order for action to take place at all, there must be some convergence of those actors in the social system who had appropriate sentiments, beliefs, and/or rationally calculated purposes with reference to the problem."

Ideology is viewed as the strongest among the five components of position for purposes of this study. It also is expected to be one of the most difficult to alter since it derives from prior experiences and perceptions and represents a deep seated composite of all previous experience and exposure to environment. While knowledge and stimulation to act may be conveyed in a singular event, it can be expected that ideology can only be influenced when a sequence of experiences has occurred. The obvious exception to this last statement is the singular dramatic or tragic event which may have the power to alter the ideology of the individual.

Emotion-feeling

It may be argued that an outward general feeling

---

[1] Sower, Christopher; John Holland; and Walter Freeman. Community Involvement(Glenco,Ill., The Free Press,1957) page 302.

for or against an event or an issue is a behaviorial manifestation of the underlying ideological rational of an individual. When an individual exclaims that "those (for example, democrats, or republicans, or farmers, or labor unions, or etc.) make me mad!", that individual is giving a manifest expression to the underlying ideological conflicts existing between him and the other groups. It is then observed that this individual has a certain "feeling" toward the object. The underlying ideology may therefore be likened to an unobserved root system of a psychological property, and the manifest feeling may be referred to as the observable stem. This observed stem exposes certain insights into the nature of the psychological root system, but it fails to specify its true nature in full.

The observable stem then branches out to touch or be touched by many related aspects of the issue or problem. For example, hunter privileges in seeking wild game and the landowner's rights to protect his property on which game is found may be introduced as conflicting ideologies. For a hunter, feeling is a function of the many digital aspects of the hunting situation, i.e., how much game may be taken in a day, the cost of a hunting license, presence of favorable or unfavorable conditions, actions of game wardens, landowner attitudes, and many more. If conditions act to favor the hunter, he may be expected to exhibit one feeling. A completely different feeling may be expected if continued frustrations occur. His feelings

in reference to one situation will influence his feelings in reference to another situation in hunting. For example, if he fails to find game, he may convert his frustration to criticizing the game managers. Being additive, his manifest feelings will reveal a general overall feeling toward the total problem. These digital conditions may be used in the investigation and determination of total feeling .

It may also be argued that the feelings derived from the digital situations, if persistant over time, funnel and flow back to influence the ideological rationale of the hunter. Under these conditions, a change in the ideology for understanding the situation may be expected.

Disposition to Act

As a component of position, a disposition to act becomes a behaviorial variable. It is explained simply as the desire of the client to do something about a given problem or issue. It may also be defined as the function of the interaction of the other identified component variables. Whether or not an individual is disposed to take action is dependent on the composite of his ideological rationale for understanding, his emotion or feeling, his perception of appropriate action, and his perception of facts. It must be acknowledged, however, that for a given individual the disposition to act as represented by the characteristics of aggressiveness on the one hand

and lack of action on the other hand, may be a controlling factor which influences all other variables of position.

When confronted with an issue or problem of significance to his interests, a client will have a disposition to act which may be expressed as a point on a scale. Such a scale runs from a desire to do nothing at one extreme to an intense desire to do something at the other extreme. He may be inclined only to join in when significant others identify a course of action, or he may be inclined to assume an aggressive role in attempting to establish and lead such action as he perceives to be appropriate to the situation. Or he may completely refrain from the action process.

It is assumed that, when confronted with the problems of hunting on privately owned lands, a hunter will exhibit a disposition to act that may be determined by a carefully planned and pretested instrument. His disposition to act is expected to be measurably different from that of the landowner on whose land he prefers to do his hunting. A hunter who has never encountered significant problems in his hunting experiences will not have the same disposition to act as the hunter who has, for example, been denied access to land on which to hunt. Nor would the land owner who has experienced economic or personal damage at the hands of hunters have the same disposition to act as that land owner who has enjoyed good relations with hunters. At the same time, confronted with regulatory interference with his

own ideas about hunting laws, the hunter may want to take action only to be denied relief by not knowing what kinds of action would lead to solution of the problem. Frustrations of this nature would be expected to lead to some relief seeking aggression, vocal or physical, toward some related object. The substitute object might well be the careless hunter upon whom is heaped all the blame for undesirable hunter-landowner relations. Or the object might consist of the game warden, the game management specialist, or some farm group.

Perception of Appropriate Action

The fourth component variable of position conceptualized for this investigation is that of the client's perception of the kinds of actions which will aid in solving his problem or issue. It can be described as the property of knowing, or of having a reasonably clear idea of, what kinds of action is legally, morally, wisely, or efficiently suited to the issue. The client who "knows" what actions are appropriate will assume a different posture toward an issue than the client who neither knows nor accurately perceives just what it is that can be done to alleviate the problem. The client who knows, for example, that stronger laws will not curtail carelessness on the part of hunters will seek other ways of solving the problems of careless hunters. But the individual who believes more laws are the best way to solve the problem will promote law making.

The differing client perceptions of the best ways to take action will result in different postures in relation to the issue or problem being confronted. The client who believes that only the legislature can solve problems will assume a different posture than the client who believes that the legislature will take action only after initial action by individuals and groups at the local level of government. Divergent perceptions of how action should proceed results in divergent positions relative to the issue. A landowner may want license fees increased for hunting because he believes this will eliminate some of the careless hunters. A hunter may be strongly opposed to increased license fees believing that careful hunters would also be victimized. The conservation leaders may have learned from experience that increased license fees is not a predictor of more careful hunting. Yet the three different interest groups all seek to reduce carelessness in hunting. It seems rather obvious that a convergence of perceptions of appropriate action is required before any effective action is initiated.

The educational awareness experience, in its planned exposure and interaction among different aspects of the issue, has two essential functions to perform in relation to the perception of appropriate action. One is an open and thorough examination of existing divergent perceptions of what action is best. The second function is to introduce the more rational or logical action procedures that best

suit the issue. The latter may be the contribution of an expert or technician, an agent or operative, not directly involved in the decision on the real issue, i.e., an outsider, who is utilized because of his skills or knowledge pertaining to the issue and its solution. The procedure which follows the introduction of both practical and studied ideas about what action is best, is one of gradually eliminating the inappropriate and improving the more appropriate actions. The purpose of this procedure is the development of a learning experience for the client.

The relationship of the component perception of appropriate action to the component disposition to act, as a functional relationship, may be explained by examination of the hypothetical case of an individual being trapped inside a burning building. The disposition to act, represented by an intense desire to get away from danger, is set in motion by the realization of danger and the fear of injury. Getting away from the source of danger, however, is dependent upon the individual's perception of appropriate ways of fleeing the danger. The first impulse for a course of action may be the thought of opening the nearest door. However, that particular door may actually be serving as a barrier preventing smoke and flames from entering the room. Under these conditions, opening the door would invite greater danger, obviously not an appropriate action. More appropriate action might include testing the door for unusually high temperature or checking for outdoor fire

escapes, fire extinguishers, etc.

This drama is evidence that a relationship of magnitude exists between the variables of disposition to act and the perception of appropriate action. In the less dramatic and emotional task of deciding upon an issue position, the relationship is also significant.

Perception of Facts

The final component of position identified for this investigation is perception of facts. Two distinct assumptions are made in regards to this component. The first is that perception of facts is an important factor in establishing an individual's position on an issue. The second is that a perception of facts is at least as influencial in establishing an individual's position as is a precise knowledge of facts.

A distinction between perception of facts and a precise knowledge of facts has been made for the purpose of this study. The two concepts differ appreciably. If the latter is considered as reflecting exact and precise knowledge of real and true facts, then perception of the facts can be considered as a state not necessarily precise, but rather inclining toward exactness. While it is quite possible to have a negative perception of facts, the use of the term in this study relates to a positive but imprecise perception of what the real true facts are in the issue involved. It is one of the tasks of the educational awareness experience to make it possible for

the client to develop a more positive perception of facts than he previously held. Rogers[2] believes that:

"Even though a stimulus may be presented to a total audience, only certain individuals will receive it. Their reception or non-reception depends upon such factors as their past experiences, social values, mental set, and state of knowledge. The way in which an individual perceives a new idea and whether or not he retains knowledge of it also depends upon opinions and attitudes".

The difference in the concepts of perception of facts and precise knowledge of facts can be demonstrated with practical examples. If an individual can state that there are now 6,000 more people in his community than there were in 1944, it can be said of him that he possesses precise or presumably exact knowledge of facts. If, however, he can only say that there are now several thousand more residents in his community than in 1944, it can be said that he has a positive perception of facts which lacks preciseness. A negative perception of the same factual situation is represented by an individual who says there really hasn't been much increase in the population of his community in the last twenty years.

The relative level of positive-negative perception of the facts is of more operational importance to this investigation than the quality of precise exactness. The precise knowledge of facts is perhaps more difficult for the adult learner to assimilate than is a positive

---

[2]Rogers, Everett M. Diffusion of Innovations. (New York, The Free Press of Glenco, 1962) page 110.

perception of facts. While precise and exact knowledge is necessary under specific educational situations, it is evident that imprecise perceptions are sufficiently motivational in many adult education situations. This is not to be presumed as an argument for imprecise knowledge, but rather an argument in favor of educational treatment which is able to alter the perception from one level of preciseness to a more positive level.

This investigation treats the positive-negative levels of perceptions of fact as client properties, and postulates that the educational awareness experience will influence a change to a more positive level. The improved level then becomes an influencing factor in the position of clients on the other four variable components of position under observation.

Educational Awareness Experience

The educational awareness experience has been described as a planned sequence of educational events with a special reference in this investigation to adult education in community and resource development. It has been further specified that it is primarily a group method, although it may be altered to fit individual learning needs. Verner[3], in attempting to classify adult education teaching methods, believes that group methods may be used for what is essentially individual learning.

---

[3]Verner, Coolie. Adult Education Theory and Method (Chicago: Adult Education Association, 1962) pages 15-17.

The method or methods used to convey content in the educational awareness experience is not in question in this study. The subject of methods of content presentation has been the focus of many worthwhile investigations. It is consistant with the concept of the educational awareness experience that each kind of methodology has a potential place in this procedure. It may be suggested that a combination of methods of presentation of content offers appealing and effective variety in the educational awareness experience. Lecture, motion pictures, film strips, group discussion, panel presentations, literature reviews and reports each may be employed depending upon the specific educational situation. The one methodology which is required in the educational awareness experience is the provision for maximum interaction of individuals and ideas.

The duration of any one planned educational awareness experience is dependent upon the specific issue, the client group, and the subject matter content. Additional research is needed to better define the duration requirements for achieving desired levels of change in the clients. It can be expected that the length of time necessary to achieve desirable levels for one component variable of position will differ from that needed in changing other component variables.

The usual role of the adult educator in the educational awareness experience is that of general manager of the educational enterprise. While he may, depending upon his

subject matter abilities, perform in the role of teacher, he is not considered to be the full time teacher. Nor is he typically the subject matter expert or specialist. He is the catalyst or the helping agent in the process.

Review of Variables Established for Study

The major and sub-variables for study emerge from the preceding discussion of concepts. They include the following:

Independent Variable	The Educational Awareness Experience
Dependent Variable	Position on an Issue, as consisting of five parts
I	Ideological Rationale for Understanding
II	Emotion-or feeling toward an Issue
III	Disposition to Act
IV	Perception of Appropriate Action
V	Perception of Facts
Extraneous Variables	Individual Characteristics Social Activities

In the operational phases of the research, the independent variable will be controlled by specification of subject matter content, constant classroom conditions, and the relationships between teacher and subjects. The dependent variables will be measured by initial and final tests using the same forms. The personal characteristics included in the extraneous variable will be measured in those aspects which could influence results. The five to be measured in this study are: age grouping, educational grouping, length of residence, number of organizations belonged to as an active participant, and length of

hunting experience. The social life characteristics of the extraneous variable group are beyond control in this study. These include possible legislative or organizational decisions regarding the issue, the exposure of related information by mass media, the personal contacts with influentials who have biases related to the issue, and any accidental events with biasing potential.

Statement of the Research Problem

The problem to which this research is directed is the measurement of the influence of the educational awareness experience on five component variables of position. The following stages are involved in the research problem:

Specification of the issue
Construction of a measurement instrument
Obtaining a test population and samples
Preparation of the educational treatment
Presentation of the educational treatment
Data collection and analysis
Reporting the findings.

The problem recommended for study is not specific only to the issue chosen in this investigation. It is assumed to represent in model form the type of community and resource conservation issue in which adult educators and resource administrators have an active concern almost daily.

The extent to which the issue is representative of community and resource conservation and development issues is one of the criteria of the problem. A second consists

of the degree to which the position of subjects on the issue is measurable in terms of the five identified component variables of position. The task of the research under these conditions is to demonstrate the approach and method rather than to attempt to solve the problem or issue which is being observed.

The issue to be used for observation in this study is that of hunter and landowner relations. It may be defined as the right or privilege to hunt wild game on privately owned land belonging to someone else. Wild game, like naturally occurring water, like air, space, and natural scenes, may be considered as a property held in common by all the people of the state. While it exists freely in nature, the public attaches a value to its continued presence and use. The public, through methods of collective action, has declared an interest in perpetuating the benefits and enjoyment of wild game.

The issue of hunting game on private lands arises from the fact that access to this common property resource rests in the hands of the land owner. By the common property characteristics of wildlife, the private land owner has no right to interfere with the hunting of game per se, but may deny access if the game is to be taken on his private land. The hunter has a qualified right to game but does not have a right to infringe upon land ownership rights. In the absolute and fundamental sense the conflict is irreconcilable, except that by mutual adjustments, the actual infringements on each may

be reduced to a point where relative harmony may be expected. This study is based upon a presumption that the opportunity for adjustment is improved by a common understanding of the situation in which both groups find themselves. Therefore, progress in in resolving the controversy may be advanced by the introduction of an educational treatment designed to improve the perception of the mutual concerns. This study examines the effectiveness of specifically designed educational experiences on selected attitudes basic to hunter-landowner relations. If it can be demonstrated that such experiences are capable of influencing a change in positions on this issue, then it suggests that the use of educational awareness experiences for other community and resource development issues in which there is evidence that controversy stems largely from the lack of mutual appreciation of the concerns of each group.

Private rights and privileges must, under some circumstances, yield to the public in order that the benefits of common property may be realized. It is the task of all publics concerned to determine the levels at which private and common property rights are commensurate with each other. It is at this point, where educational preparation for the confrontation of social and environmental problem rationale becomes necessary that the educational awareness experience is directed.

One of the products of the rapid change technical age has been the proliferation of common property and

private rights conflicts. The ancestry of these issues threads back through the nation's history. It encompasses the struggles over the public domain and private rights, private grazing rights to public lands, the harvest of forest products on public lands, to homesteading and land grant activities. The issue may be identified with a mythical place called Sherwood Forest, for it was there, as mythology goes, that the men of Robin Hood struggled to establish a common property right to game that was held by officialdom to be the private property of the king.

The magnitude and intensity of the common property-private rights issues is heightened, in this stage of the development of the nation, by the very fact that the settlement of land and space has been intensified. From a relatively sparse condition of settlement only a few decades ago, the transition to a basically urban culture has influenced the function of specific resources in the society.

The utilization of wild game, owned in common by all the people, is typical of the change in the function of a natural resource. In what may be referred to as the pioneer era in the nation's history, it was often quite necessary to harvest wild game animals as a source of food. The flesh of the wild game was essential to survival itself. The furs and pelts of the same and other animals found in the public lands were used to clothe and shelter

the growing population. Under such conditions, a "right to" wild game had an important value connotation which it cannot retain today. Obviously, it is not now normally a survival motivation that stimulates hunters to seek wild game. The modern function of hunting, based upon the natural resource of wild game, has a recreational rather than a survival orientation.

This change in function of a resource is by no means an isolated example from the total field of conservation. The small stream that served the many needs of the isolated family for water in generations past may now serve a thriving community as a source of water for human consumption. But in addition, it may also serve as a necessary resource for industry and as a media for the transportation of wastes. In this transition, the stream may have yielded its function as a habitat for fish life. Competing uses have been introduced for the annual fresh water supply. The natural supply itself does not change appreciably over time. Ultimately, a public decision must be made as to whom or what shall have priority to use the natural supply. This becomes a directed change in function.

It may be suggested, therefore, that since the function of a specific resource changes, then it is also appropriate that education serve in changing the attitudes and perceptions of individuals and groups relative to resources. Change in attitudes and perceptions about resources do indeed change over time as a normal reflex

to changing conditions. It is the argument of this study, however, that attitudes and perceptions do not change today in proportion to the speed with which the function either changes or is directed by society. The kind of long crusade for an attitude change toward a resource which characterized Gifford Pinchot's efforts in behalf of forestry conservation does not hold much promise for the scientist or agency of government concerned with the conservation of fissionable materials today. To further complicate the casual perceptions of the public, the concern today is for resource complexes,i.e., the inter-related functions and benefits of resource groups. This represents a change from a commodity centered focus to a focus on total environment. In this changed concept, the common property characteristics of issues takes on additional meaning.

The time span necessary for the effective adoption of new attitudes and perceptions regarding conservation and development of many resources is impractical for the present era. It is both the challenge and the mandate for adult education that scientific evaluation be made of the methods by which reduced time consumption may be achieved. It is imperative that the objective of the resultant methodology remain that of a useful learning experience and not develop into a prescription for a manipulative device for decision making.

Using the issue of hunting privileges on privately owned land as the case in point for study, it may be predicted that hunters will express a position which is different from landowner positions. The position representing the hunters could also be expected to differ from that of any "general" public. Further, it could be expected that a position representative of hunter organizations would be somewhat different from the position of non-organized hunters.

The hypothesis may be derived that, if positions of groups and of individuals regarding a natural resource issue can be described as being different, then position may be regarded as a measurable dimension. Therefore, the attempted measurement of resource issue position representing a group becomes one of the tasks of this investigation. Furthermore, if issue position is measurable, then it is to be assumed that position may be reduced to measurable sub-units. The examination of identified sub-units(or components) of position is a second task of this study. Then, if as has been stated, positions regarding resource issues are observed to be different at different times, this is a suggestion that position can be influenced to change. A third task of this study is to assess the ability of a planned educational treatment to influence a change in hunter position relative to hunting on the privately owned lands of another person. The task is to measure the influence on five components of position.

The design for this experiment follows, therefore, from the concepts and the unrefined hypotheses. It shall consist of an initial measurement to establish group means representing position on each of five sub-units of position. This measurement will be followed by the educational treatment for the experiemntal group, after which measurement will again be made for each sub-unit. The educational treatment may be expressed as the independent variable, while the sub-units of position become the dependent variables (see page 38 for listing of titles for variables).

An experiment using the hunting issue outlined heretofore may be considered as a model for testing the ability of the educational treatment to influence change in position on the variables. From the model it is then possible to make inferences to the broad range of conservation and community issues. For example, if it can be demonstrated that the educational treatment has resulted in a positive change in subject responses on the five dependent variables in the hunting issue, then it may be inferred that the method can be used to treat an issue of activating a water conservation program, for a recreational development, or for a community planning council. Obviously, the subject matter content for each example would differ, but the educational treatment method would remain constant over all the above issues.

Under these conditions, the issue of hunting rights or privileges on privately owned land becomes the vehicle

for demonstrating the educational method which may be applied under many other issue situations. It is further designed to demonstrate that the concept of position may be divided into sub-units, that these sub-units are measurable, and that the educational treatment can be planned to effect the sub-units of position according to observed proportionate needs.

Nature of the Hunting Situation in Michigan

In this state, it is evident that the sport of hunting small game has become a popular form of recreation. Over successive years there has been a gradual increase in the number of hunters. The highway systems have provided urban and suburban residents with easy access to the out-state hunting areas. There has, however, been a constant increase in the pressure of hunter numbers in the farming areas near urban centers.

While the number of hunters has been increasing, the area of land for hunting has been decreasing under the pressures of urbanization. Farm lands and other privately owned acreages have receded as the metropolitan areas have spread outward. The state has purchased and set aside large areas of lands as public hunting sites. It is quite impossible, however, to provide from state funds sufficient land areas for everyone to hunt upon. There is therefore a relative shortage of land on which to hunt.

It is legal to hunt small game in this state on

lands owned privately by other persons. A small license fee is required of each hunter. Seasons for legal taking of game animals, specification of which species may be taken, the bag limits, and boundaries of legal hunting areas are established by the state legislature acting upon the advice of a state conservation department and a state conservation commission.

The one act which is specific to hunting upon the private lands of another party is called the Horton Trespass Act. This law makes it an act of trespass to hunt on the fields and associated woodlots of farms and on the enclosed wild lands owned by hunting clubs, unless prior permission has been obtained from owners. In other words, this is an act legislated in behalf of maintaining access to a common property(wild game) which also establishes conditions by which the access is obtained from the private owner of the land. The owner has the privilege of denying access when his investment is endangered.

While the Horton Act is widely considered as a very good law, enforcement and prosecution of offenders has not always been effective. Both the land owner and the courts are in busy season when it is legal to hunt. The private owner is not inclined to spend the uncertain and prolonged amount of time necessary to carry out a prosecution when it is possible that the only punishment of the offender may be to pay a small trespass fine. The owners generally are not opposed to having others hunt

the wild game on their property, but rather their concern is over the possible damages to fences, crops, livestock, buildings, and equipment, as well as possible personal harm. For example, it is of major economic concern to the landowner that a beverage bottle carelessly left or broken by a hunter may result in the destruction of a tractor tire costing $130.00. Or, the same broken bottle, if accidentally picked up in harvesting equipment, may end up inside the stomachs of cattle valued at $250.00 each.

It is only upon witnessed action that conviction of the accused and recovery of economic loss can be achieved. The owner is unable to personally arrest the offending party even when he does witness the offense. By the time a peace officer can be summoned, the offender may have left the scene, or if still present, it is a matter of the owner's word against the accused. This amounts to only hearsay evidence in the courts. It is necessary for the peace officer to observe the offending act, or to gain the confession of the accused in order to lodge a case likely of successful prosecution and recovery of losses.

The act of carelessness itself may, of course, have been committed in ignorance of the potential damage. Again this consequence is a representative example of the intercourse of common property and private rights issues in the conservation, development, and use of the natural

resources in the community. There is, if not a conflict, then at least a difference in the public position and the private position. These position differences are functionally related to the differences in the component sub-units of position identified for study, i.e., the ideological rationale for understanding, the emotion-feeling for or against, the disposition to act, the perception of any appropriate actions, and the perception of facts.

Hunters must assume some responsibility for the maintenance of good relations with landowners. Generally, the hunter organizations attempt to inform their own members and others in ways of establishing good relations. Most landowners are actively interested in hunting and frequently engage in the sport. They usually also "post" their lands with signs indicating the need of obtaining permission to hunt there. However, near the urban centers the hunters are so numerous as to create a nusiance when so many make the requests.

Both hunter and owner organizations have identified the small percentage of careless hunters as the cause of most of the problems between landowners and hunters. Not only have frequent property damages occurred, but there has been an increasing incidence of threats to bodily harm owners who refuse permission to hunt. At conflict, of course, is the desire for access to common property in the form of wild game, and the legal rights of the owner of the land upon which the game is found. This type

of hunter believes he has a "right" to the game which is superior to the rights of the owner to protect his economic interests(an ideological conflict between rights and privileges perceived differently by the different parties involved).

Some attempts have been made by hunter and landowner organizations to get together to examine problems and possible solutions. Because of increased incidence of offenses to private property, increasing numbers of land owners are joining together to "close off" adjoining privately owned property to prevent unwanted hunters from entering. Some of these lands have then been leased to approved hunter organizations who join in the effort to police the closed areas to prevent unauthorized hunters from entering. The overall result is a still further reduced area for the individual non-organized hunter to use for hunting purposes.

The conditions of increased hunter numbers and of carelessness by some hunters has led to some proposals for closing whole townships or counties to prevent hunting. Such an effort was proposed in the agricultural areas of Wayne County. This possibility of closing the area has stimulated many of the Detroit area hunter clubs to an increased program of improving hunter-landowner relations.

This situation presents the basic needs which have been identified for purposes of the present study. First, there is a basic difference in ideological rationale for

understanding the issue. There are differing emotions or feelings expressed, and a difference in disposition to act. Perception of appropriate action and perception of facts are assumed to be capable of improvement.

Research Hypotheses for Study

The major hypothesis for investigation may be expressed as follows: The educational awareness experience will bring about a positive change in the position of experimental group subjects on the issue of hunting on private lands. A null hypothesis for this major hypothesis may be stated as: The position of subjects in the experiment will not be changed under the influence of the educational awareness experience.

The measurement of position is to be made in terms of the five component variables identified for study. The major hypothesis is therefore restated as follows:

I Responses of the experimental subjects with reference to the ideological rationale for understanding will be changed in a positive direction as a result of the educational awareness experience.

II Responses of the experimental subjects with reference to the emotion-feeling variable will change in a positive direction as a result of the educational awareness experience.

III Responses of the experimental subjects with reference to the variable of disposition to act will change in a positive direction as a result of the educational awareness experience.

IV Responses of the experimental group subjects with respect to the variable of perception of appropriate action will change in a positive direction as a result of the educational awareness experience.

V Responses of the experimental subjects with respect to the variable of perception of facts will change in a positive direction as a result of the educational awareness experience.

The change hypothesized for the experimental group in each of the variables must be achieved at a significant level. Also, for each of the sub-hypotheses, there is a null hypothesis of no change of significance.

Chapter III

Development of the Data Collection Instrument

The task of the data collection instrument is to provide a measure of favorableness or unfavorableness in subject responses for each of the five dependent variables being observed. Such a measurement must be made for each subject in the experimental and control group in order that group means may be determined. The test must be made both before and after the experimental treatment.

There was no available instrument to serve the purposes of this study in measuring the responses. Neither was there a scaling procedure of standard form that could be used. It was therefore a major task of this study to prepare a measurement instrument with appropriate scales.

Theory of Measurement

According to Scott and Wertheimer [1] a psychological test is:

"......basically a stimulus, or a set of stimuli, designed to elicit responses which are presumed to reflect fairly enduring characteristics of the subject."

---

[1] Scott, Wm. A., and Michael Wertheimer. Introduction to Psychological Research (New York: John Wiley & Sons, Inc. 1962) page 126.

The stimuli contained in the test items are made up and presented so as to disturb as little as possible the attributes they are expected to test. This aim can only be partially obtained since enough disturbance must be present in the item to elicit the response. Such tests must meet the requirement of testing what it is that they are intending to test. In other words, the item must represent the attribute to be tested.

Torgerson [2] states that measurement itself

> "....concerns the assignment of numbers to objects to represent amounts or degrees of a property possessed by all of the objects. An important characteristic of measurement is its power to enable us to decide, within limits, which of the inexhaustible number of sets of numbers that might be assigned to the set of objects is appropriate".

Assessment and measurement are often used interchangeably, according to Scott and Wertheimer [3], when numbers are used to report the magnitude of variables. Both involve a degree of judgement relative to the attribute and its presence or strength.

It is basic to the nature of any meaningful measurement that formulation of the research question be adequate and that definitions and concepts be clearly defined, according to Selltiz,et.al. [4]. In scientific research

---

[2] Torgerson, Warren S. Theory and Methods of Scaling (New York: John Wiley & Sons,Inc.1958) page 19.

[3] Scott & Wertheimer, op.cit. page 101.

[4] Selltiz, Claire; Marie Jahoda; Morton Deutsch: and Stuart Cook. Research Methods in Social Relations,rev. (New York: Holt, Rinehart, & Winston,Inc. 1963) page 146.

it is necessary to specify both what is being measured and how it is to be measured. The clarification of the what and the how often involves a major portion of the plans for the research project. It is necessary to produce worthwhile evidence that empirical relationships exist relative to the research attributes. This often means considerable exploratory preparation prior to the final experimentation.

Strictly in terms of measurement, it may be posited that the instrument for this research must perform two basic functions. First, it must stimulate the subjects to respond to items chosen to represent the attributes. Second, it must provide a system for numbering the responses so that ranking of individuals may occur. Inherent in the achievement of these tasks, however, is the development or utilization of scale types and scaling techniques appropriate to the study.

Scaling Theory

The types of scales used in psychological research are variously referred to under different titles. There seems to be a majority of sentiment for naming four basic types: nominal, ordinal, interval, and ratio. The second, third, and fourth possess the characteristics of the types preceding them and have additional characteristics. The nominal type possesses categories which are mutually exclusive in that an object may be named to only one of

the possible categories. The ordinal type adds a ranking characteristic which is derived from the amounts of the attribute possessed by the different objects. The interval adds to these characteristics the quality of a uniform interval between scores or numbers assigned to the responses. To the interval relationship, the ratio scale type adds a proportional relationship among the categories of the response attributes.

The investigator, according to the specific nature of the problem, has the significant task of choosing which type of scale is appropriate to the research problem. This decision is basic to the preparation of the measurement instrument chosen to obtain the data.

By scaling methods, the investigator assigns the subjects to scale types and establishes scale positions for the strength of the attributes possessed. This involves the allocation of numbers to represent the subjects. The numbers are derived from subject responses to the items on the measurement instrument.

Scaling methods identified for this investigation are of two kinds as described by Selltiz, et.al.[5]. These consist of summated scales and cumulative scales. In the summated scales, subjects are asked to respond to the items by indicating degrees of agreement or disagreement. Typical of the summated scale types is one devised by

---

[5]Selltiz, et.al. op.cit. pages 366-373.

Likert. The Likert type scales usually contain five categories of response with strongly approve and strongly disapprove the usual scale extremes. Numbers representing the responses are assigned to the corresponding categories chosen by the subject. The complete scale is made up of a series of items to which the subjects respond.

In the cumulative scale, items are arranged in such a way that, ideally, an individual who responds favorably with item 2 also has a favorable response for item 1. Further, for each successive item the individual who endorses it also favors the preceding items. Thus the interrelationship among the items is of basic importance to the entire procedure. The individual's score is computed by counting the number of items he favors. This score places him on the appropriate scale position and indicates the strength of the attribute possessed by the individual.

It is an advantage of the cumulative scale method that the technique of scalogram analysis has been added to the original theory. Scalogram analysis provides a method of validating the assumed scale. The technique requires that all the items or statements to which the subject responds for a given attribute consist of a single continuum or single dimension. By trial testing, it is possible to identify and reject multi-dimensional items.

This brief discussion of theories and methods of of measurement and scaling explores only those possible aspects which relate to use in the present study. An

exhaustive review of measurement and scaling is beyond the scope of the study. The technical references cited and otherwise extensively cover this topic.

The discussion to this point in this chapter clarifies the task of the instrument as that of stimulating responses to the items and providing scale values by assigning numbers to the responses. The scales have the task of representing the attributes being investigated and of differentiating among subjects according to the amounts of each attribute possessed. With these tasks in perspective the procedure for development of the instrument for this study is reported in succeeding sections of this chapter.

Instrument Development

The psychological traits or dimensions to be measured in this investigation are the five identified component variables of position. The issue for which these variables of position are to be measured is that of development of better hunter-landowner relations. Therefore, the issue and positions on the issue are the two basic elements around which the measurement instrument must be constructed. The items chosen must stimulate responses to the variables of position and provide the basis of discriminating between the experiemntal and the control group following the experiment.

The first task for the investigator, following the selection of an issue for observation, was to assemble

a universe of statements according to the above criteria. Scott and Wertheimer [6] suggest alternative approaches to the method of selecting statements or items. The first is for the researcher to define the attributes theoretically and then write statements that seem to represent them plausably. The second is to administer a large number of haphazardly selected items to two or more samples of subjects who can be independently distinguished on some criterion attribute. It is the suggestion of these writers that a combination of the above two methods is a preferred approach with superior success potential over a single method.

Edwards [7], among others, suggests that the investigator start with a large universe of items representing the attributes and then procede with efforts at refining them until reliability and validity are assured. The procedure for refinement includes the use of subject matter experts or judges who evaluate the items after intuition has yielded the initial universe. Appropriate statistical procedures are utilized in the refinement attempts.

The above cited methods for selection and refinement of test items have been used as a foundation for the development of an instrument for the present study. A large universe of statements was assembled after a review

---

[6] Scott & Wertheimer, op.cit. page 133.

[7] Edwards, Allen L. Techniques of Attitude Scale Construction (New York: Appelton-Century- Crofts, 1957) page 9.

of the hunter-landowner relations situation. These were then sorted into five groupings to represent the five dependent variables of the investigation. The original statements were refined with the assistance of faculty experts in the conservation disciplines. An instrument containing 83 items was constructed and again submitted to conservation experts. The items were constructed as summated scales with five categories of possible response. The instrument was then administered individually to 43 subjects representing hunter organizations and farmer organizations.

The responses were then scored and results placed on punch cards. A computor program for factor analysis was used to examine the degree of discrimination among variables. The results of this factor analysis were not sufficient to establish the desired discrimination. The emergence of ten factors with very low level of significance was observed, but only a small percentage of the variance could be attributed to these ten factors.

When the individual items were cross checked with the ten factors, only one factor showed clustering tendencies when matched with the five dependent variables. By a frequency count, it was observed that of the three most highly scoring factors, factor 1 clustered for dependent variable II. Factors 1, 2, and 3 predominated in connection with dependent variable III, equally dividing 30 of a possible count of 48. Factors 1 and 5 scored 9

each for a combined total of 18 out of a possible count of 51 for the dependent variable I. For the dependent variable V factors 1 and 8 scored 8 times each for a total of 16 with a possible count of 54 while factors 1, 4, and 8 each scored 8 times out of a possible count of 51 for dependent variable IV. Results of summing response scores for each variable by each of the two groups of respondents showed detectable but not significant differences.

These results indicated lack of success in the initial attempt to construct usful items. It was possible to determine some of the mistakes which could be corrected. In addition to the value of the statistical analysis, the initial trial provided important contact with client groups and new insights into the issue itself.

In the revision of the instrument, a decision was made to utilize cumulative scales and scalogram analysis for the first two dependent variables. It was assumed that these methods were appropriate since these two variables, ideological rationale for understanding and emotion or feeling toward the issue, could be classed as typical of psychological dimensions while the three remaining dependent variables represented behaviorial dimensions. Thus, it was the logical conclusion that the different dimensional characteristics could be tested by different scaling methods.

The strategy or concept of the scalogram method for cumulative types of items differs in certain basic

respects from the summated types. The subject is asked to choose from a set of statements or items those which best represent his feelings relative to the attribute which is being observed. Through prior refinements, the set of statements is assumed to represent a scale of intensity of the quality of the dimension. The items are derived from a universe of content statements. The subject is assigned a position on the scale represented by the score for his responses. The scale is therefore cumulative, and an interval is assumed to exist between the scores unless a specific interval quality has been specified.

The scalogram items are uni-dimensional since a single continuum is a requirement of the method. Ambiguous statements, those which may be interpreted in more than one way, will destroy the scaling pattern. Factual statements may be endorsed by individuals with unfavorable attitudes as well as by individuals with favorable attitudes. Therefore, attitudinal rather than factual statements should be used in this method, and different scaling methods have been employed for the non-attitudinal dependent variables in this study.

Green [8] describes the method of assigning rank and scale in the scalogram technique. The rank order of the items becomes the scale for the items. Subjects are

---

[8] Green, Bert F., "Attitude Measurement," Handbook of Social Psychology, ed. Gardner Lindzey (Reading, Mass.: Addison-Wesley Publishing Company, Inc., 1954) page 353.

arranged in order according to the highest rank order of the items checked, which is equivalent to the number of the positive responses in a perfect scale.

The ideal scale is important in the scalogram analysis concept. The ideal type for five individuals responding to five items takes the following shape.

x=positive response, -=negative response

Statement	1	2	3	4	5
Individual					
a	x	x	x	x	x
b	-	x	x	x	x
c	-	-	x	x	x
d	-	-	-	-	x
e	-	-	-	-	-

In the construction of a scalogram item the scaling ability of the item depends upon how well responses fit the above pattern. If too much error or deviation from ideal occurs in the initial responses, the item must be either discarded or revised until a near ideal pattern of response occurs.

A strategy of scale reproducibility has been developed to determine the scalability of an item. A coefficient of reproducibility is determined by the following formula:

$$\text{Reproducibility} = 1 - \frac{\text{total number of errors}}{\text{total number of responses}}$$

Errors are scored in scalogram analysis according to the deviation from the nearest ideal type scale pattern. Generally, a level of at least .90 reproducibility is taken as an acceptable substitute for an ideal scale.

Lower levels of reproducibility are accepted as quasi-scales. The minimum requirement is that there be more errorless than error responses. In four-item scales, the ideal and error patterns occur as in the following examples;

Ideal type				1-error				2-error			
x	x	x	x	x	x	-	x	x	-	x	-
-	x	x	x	x	-	-	x	x	x	-	-
-	-	x	x	-	x	x	-				
-	-	-	x	x	-	x	x				
-	-	-	-	-	-	x	-				

Following the decision to include scalogram analysis the revised instrument was then administered to a combined group of more than 30 hunters and landowners in a preliminary experiment. This preliminary experiment was designed to approximate the conditions of the final experiment. It consisted of three meetings over a one month period. The raw scores obtained were utilized in improving the instrument for later applications. The scaling tendencies improved over the previous original trial instrument. A similated control group also received both initial and final tests using this instrument.

The items showing best scaling possibilities in the preliminary experiment were retained as a universe for the preparation of a final instrument. This third revision was presented to a total of 37 respondents. In the 37 respondents were 22 faculty and student subjects, 8 landowner subjects, and 7 hunter subjects. The scalogram items were analyzed by the method of coefficient of reproducibility(the responses are reported in appendix N)

while the Likert type were analyzed by a computor program for rating scales. The computor results for the Likert type items are reported in appendix B and appendix C.

The scores on the scalogram items were found to fall in the levels of acceptablility for quasi-scale and ideal scale types. The results of this analysis are given in the following table;

TABLE 1

Coefficients of Reproducibility for Items in the preliminary test on Scalogram Items with three respondent groups

Group	Item	Coefficients of Reproducibility A	B	C	D	E	F
Farmers, N=8	.....	.95	.83	.75	.84	.95	.88
Hunters, N=7	.....	.89	.83	.77	.79	.86	.80
Student & Faculty, N=22	....	.87	.79	.73	.82	.83	.80
Total		.88	.81	.74	.82	.86	.82

It may be noted in the table above that the farmer group achieved consistantly higherreproducibility over all test items than the other two groups. Acknowledging the limitations resulting from the small sample size, it still may be observed that this result suggests that the continuum underlying the attributes was more effectively related to farmer attitudes. The useful finding is that the attempted scale showed some differences between groups in responses obtained.

In this trial instrument, five or more statements were assigned to each item. Each item was individually

examined following the analysis by reproducibility. The purpose of the individual analysis of the responses to item statements was to identify malfunctions which influenced the lower reproducibility levels. Two items (for this study, an item consists of a set of statements rather than each statement being called an item by itself) were considered to be the minimum needs for each of the two variables using scalogram analysis. Thus, if the rejection of one of the statements in an item set would result in an acceptable scaling level, then the item set could be retained as part of the test for the given variable.

The evidence obtained indicated that the first statement in item set A was ambiguous as used in the preliminary test. This first statement in the set resulted in the most error. It was therefore deleted and a four statement item set was retained for the final instrument.

In item set B(appendix A consists of a copy of the entire trial instrument,appendix F a copy of the final instrument) there was a consistant pattern of endorsement of the middle(third) statement.Because of this, there was also a consistant pattern of one error responses in this set. The observation resulting from this response pattern was that the third statement was an easy answer for the respondents while the remaining statements were more difficult. The alternative of rejecting the statement and retaining the set was based upon the contention that the item content was important to the overall instrument.

The low reproducibility level achieved in the three respondent groups on item set C indicates that some very basic faults were present. In the hunter group there was a strong tendency to endorse only statement three and this resulted in one error responses. Since there was no further opportunity to test the item after repairs, it was decided that the entire item set should be rejected.

The three item sets discussed above represent the dependent variable of ideological rationale for understanding. As a result of the trial test, sets A and B were retained for the final instrument and given improvement in wording. Set C was eliminated from further use.

The next three item sets, D,E, and F represented the dependent variable emotion-feeling toward the issue. In item set D only one case in 37 endorsed the first statement, indicating the possibility that this statement belonged in some other continuum. There also was a consistant pattern for all 37 respondents to endorse the last statement in the set.

The reproducibility coefficient for item set E was very high for the farmer group and somewhat lower for the other two groups. Examination of the responses on an individual basis showed that there was a tendency to overendorse statement three, and that it was possibly an obvious and easy response for all individuals to favor. This evidence indicated the need to reject statement three and retain and repair the rest of the item set.

Item set F, like the previous set, was endorsed with a higher reproducibility by the farmer group than for the other two groups. As in some of the previous sets, one statement seemed to attract a majority of the favorable responses. This one statement possibly represented a different continuum to the respondents, or perhaps it seemed to them to be an easy choice to favor. It was observed that the elimination of this one statement would greatly improve the level of reproducibility so the statement was rejected while the remainder of the set was retained.

These six item sets representing the two dependent variables for which scalogram analysis was used was reduced to five sets as a result of analysis. In each of the sets retained, the statements contributing most to the scale patterns were retained and attempts made at improving the wording. The number of statements for each item set was reduced from five to four. Thus while the trial test results indicated at least quasi-scale patterns, improvements mentioned heretofore were considered to have increased the scale patterns to an acceptable level.

Item set G represents an additional variable which also was tested by summated scale in the actual experiemnt. Also, the instrument contained a set of agree-disagree statements after each of the first three variables which were not part of the scoring in the final test.

The Examination of Scalogram Items by Experts

It is to be recalled that the original statements in the construction of the measurement instrument were reviewed by conservation experts. In order to obtain evidence that experts accepted the content as representing a continuum for each item, the scalogram type items were submitted to a quasi-panel of 20 persons in the Michigan Conservation Department and conservation faculty members at the University of Michigan and Michigan State University. A total of 15 replies were received in response to the request that they examine the items.

These conservation experts were requested to evaluate the item sets for validation of the underlying single dimension for each attribute. The letter of request and other forms are included in appendix D. They were asked to report any doubts and then suggest any improvement in the rank order of any which they questioned.

The responses to this request are presented in table form on page 71. Overall, out of a total of 90 possible responses(15 judges and 6 items) there were 78 endorsements of approval of the rank order for the items as presented. Two suggestions for completely reversing the rank order, each for a different item, were also received. These two individuals would have changed the order of the statements from a,b,c,d, to a d,c,b,a, order. Three judges, each referring to a different item,

would have reversed the order of two of the four statements in the set. Four suggestions for other changes and three no response (for specific items) were also received.

TABLE 2
The responses of 15 conservation experts in approving the original rank order of scalogram items for final test

Item	Responses to Items				
	Approve as is	Suggest complete reverse	Suggest partial reverse	Suggest other changes	No response
A	12	1	1	0	1
B	12	0	0	2	1
C	13	0	1	1	0
D	13	1	0	0	1
E	13	0	1	1	0
F	15	0	0	0	0
Total	78	2	3	4	3

Voluntary comments by three of the experts indicated that their reasons for suggestions to change the rank order were not based upon the concept of a continuum. In response to the statement that wild game belongs to no one, one judge noted that everything must belong to some one. This is accepted as an indication that this judge was preoccupied with precise information rather than the question of attitude involvement in the item. Actually, the legal opinion is that wild game exists freely in nature, in other words, without ownership.

The evidence represented by these responses of conservation experts, plus the error analysis in the trial

affords justifiable argument for retaining the five scalogram items for the final instrument. The final form of the instrument is reported in appendix F. It is to be noted that, in the final instrument use was made of a series of agree-disagree statements following the scalogram items. This represents an attempt to obtain any additional information or insight which would aid in interpreting the results. These statements are not included in the analysis of data.

Analysis of Preliminary Likert type Scale Items

There were 49 statements assigned to the task of measurement of the three behaviorial variables in the preliminary instrument. These statements, reported in appendix A, were designed to function as Likert type scales containing six categories of response. The objective was to obtain a minimum of about tem item statements for each of the three dependent variables. The respondents were asked to choose the one category which would best indicate their beliefs relative to the given statement. The categories ranged from very strong agreement with the statement to very strong disagreement with it. Responses were scored by assigning numbers from 1 through 6 to the choices. A score of 1 would indicate very low strength in the attribute while a score of 6 would indicate high strength in the attribute as a characteristic of the respondent.

The agreement end of the scale included the

following categories: agree a little, agree strongly, and, agree very strongly. The disagreement end of the scale included the categories following: disagree a little, disagree strongly, and, disagree very strongly. The move to add a sixth category resulted from an observed tendency for the respondents in the earlier trials of the test to endorse a middle category which was designated as "undecided". In a sense, this is a useful method of forcing the respondent into a favorable or unfavorable choice when he is a bit reluctant. This also eliminates the problem for the investigator of what quality to assign to an undecided response.

The procedure for improving Likert type scale items in this study is derived from the discussion of scale improvement by Selltiz,et.al. [9]. The usual method is to start with a universe of statements greater than the number anticipated for the final measurement instrument. This is followed by using appropriate methods of reducing the universe to the required number through identification of superior items. For example, a trial test using real respondents may be made with the original universe of relevant statements. The statements which do not perform well in this test are then repaired or removed. Or, a group of judges may be utilized to examine the universe for content and ambiguity.

---

[9] Selltiz,et.al.,op.cit. page 367

The three dependent variables for which the Likert type of scale items were developed are: Disposition to Act, Perception of Appropriate Action, and Perception of Facts. A consideration suggested by Selltiz [10] is that the definitions of appropriate action frequently have two components: the ethical standards of what should be done, and the practical considerations of what is feasible to do. It is further suggested that the "should-ought" question provides an indication of idealized policies of the individual while the "would" question involves a personal prediction with respect to one's behavior in a given situation.

In the preliminary instrument, there were 16 item statements for the variable of Disposition to Act. The variable Perception of Appropriate Action had 14 item statements, and the variable Perception of Facts had 19 item statements. These 49 item statements had been retained after the first trials of the original universe of test statements and the re-examination by conservation experts. The preliminary tests were given to a total of about 150 volunteer respondents whose assistance was invaluable in the analysis of the items.

There were two major criteria for retaining those statements which could be used in the final instrument. The first was the ability of the statement to be able to

---

[10] Seltiz, et.al., ibid. page 249.

differentiate among respondents. Any statement was considered to have low functional value if it was endorsed favorably by most all respondents in the different groups. Also, any statement was questioned which was endorsed with high variation by individuals within groups. The second reason for retaining any given statement was the obvious content interrelationship with other statements. Thus a statement could be retained on the basis of its function in relation to the educational purpose of the experiment even though its discriminating function was not of the highest level. The major consideration was that there not be more than three statements so chosen among the total of at least ten statements for each variable in the final test.

This attempt to retain items with utility value beyond the objective of discrimination is assumed to contribute less than significant influence upon mean scores. This does not suggest, however, that any statement with glaring faults would be retained just to serve the function of stimulating interaction on the content. The actual selections were made in accord with the suggestion by Edwards [11] that:

"One of the major assumptions involved in the construction of attitude scales is that there will be differences in the belief and disbelief systems of those with favorable attitudes toward some psychological object and those with unfavorable attitudes".

---

[11] Edwards, op.cit., page 11.

It is to be recalled that the respondents in this test included 24 students and faculty in conservation, 8 landowners, and 7 hunters. A computor program utilizing the scores for each subject as input data was used to analyze the results. Output data consisted of total scores and T scores for each subject,means and standard deviations for each item by groups, frequency distributions of the responses to each item, and means and upper and lower third means for each item by groups. These results are reported in appendix B.

One of the objectives of the preliminary test was to determine if the total scores over the entire test, as well as scores for each variable and each item, would show the ability to discriminate among the sample groups. Table 3 below presents the means and standard deviations by groups.

TABLE 3

Means and Standard Deviations for three respondent groups in a trial test of the preliminary instrument

Group	Number	Mean	Stand. Dev.
Faculty-students	24	193.50	16.084
Landowners	8	202.25	16.918
Hunters	7	206.85	17.995

A pattern of responses suggesting a reluctance to endorse extreme upper end of the scales appeared to account for the lower mean for the student-faculty group. The fact that hunter groups have promoted informational and educational efforts may partially account for the

higher score means by the hunter sample. The small sample size must be considered also in analysis of these results.

With the information gained in the computor analysis each item was examined to determine its usefulness in the final instrument. The possibility of content rearrangement was also considered for specific item statements. The differences between the low third means and the high third means for each group on each item, and the scoring distribution for each group on each item was used as a basis of rejecting or retaining items. In appendix C the rejected statements are noted by asterisk. If the difference between low and high third means for any item was less than .50 for any group, or if the pattern of responses indicated a clustering about one or two categories of response, then the usefulness of that item was questioned. A total of 16 items were rejected leaving a total of 33 for the final instrument. Ten items were left in the dependent variables of Disposition to Act and Perception of Appropriate Action. This left 13 for the dependent variable of Perception of Facts. The complete final instrument is reported in appendix F.

Problems of Validity and Reliability

Generally, validity of an instrument refers to the ability it has to test what it professes to test in terms of the attributes being observed. Reliability refers to the ability to elicit the same or highly similiar results

on repeated applications with the same subjects. Both validity and reliability represent very important aspects of the development of a testing instrument.

Validity has been explained by many titles referring to the operational procedure for its establishment. For example, Lindzey [12] makes the following suggestions: "A description of the attitude universe is necessary in order to determine whether the scale measures this universe. Essentially, this means characterizing the items which might have been used in the questionnaire. Many investigators would say that, as a representation of the attitude universe, the scale is valid by definition, or has face validity." Elsewhere, this has also been referred to as intrinsic validity.

Cronbach [13] lists several types of validation. He refers to content validation as answering the question of whether the content of the test is actually the content of the instruction. This involves checking the items against the course content. Construct validation refers to a process of validating the interpretation of performance on the test by the concepts described in the study. By administering the test to persons whose criterion performance can be observed immediately, concurrent validation is achieved.

This review of validation types does not exhaust the

---

[12] Lindzey, Gardner.(ed.) Handbook of Social Psychology. (Reading, Mass: Addison-Wesley Publishing Company, Inc., 1954) page 340.

[13] Cronbach, L.J. Essentials of Psychological Testing. (New York: Harper & Brothers Publishers,1960) 2nd.ed. pages 104-117.

field of definitions. Others have been described as logical validation, jury opinion validation, known groups validation, validity by independent criteria, convergent validity, and discriminant validity. But those described herein provide useful measures for the present investigation.

The principle form of validation for this study involves some of the aspects of face validation and content validation. As discussed in previous sections, liberal use of experts in the field of conservation was possible in the continual refinement of the instrument content. This followed the original compiling of a large universe of item statements by logic and knowledge of the field. Experts were also used in confirming the scale properties of two variables(Table 2, page 71). The performance scores of respondents representing different groups provided an analysis which contributes to construct validity. The presumed differences in attitudes by groups sampled in regards to the variables being observed is supported by the results of the preliminary trials of the instrument.

The major problems in further validation of this instrument derive from the fact that this has been an initial investigation of the concepts of position components and the educational awareness experience. It is deemed appropriate to suggest that, beyond the scope of the present investigation, further methods of validation should be entertained.

One further attempt to examine validity in the

present study was made. It was assumed that if the five variables failed to correlate by using the responses of subjects to the test items this would be supportive evidence that the attributes actually represented different underlying properties. Or, if the items for the variables stimulated different responses for the different assumed properties it would indicate different dimensions of position were represented in the unlike scores.

A correlation test was made to examine the differences or the correlations among the five variables. The report of this test is included in appendix E. Both the pretest and the post test results were examined. In this test, it was found that the only significant (at the 5% level) correlation occurred with the variable of Perception of Facts. In the control group, this variable correlated significantly on both the pre test and the post test with the variable of Ideological Rationale for Understanding. In the experimental group, the same two variables correlated on the pre test. Also, for the experimental group, Perception of Facts correlated with Disposition to Act on the post test.

Reliability constitutes a major problem for this study. In field experiments, the subject samples are not readily available or willing to participate in test-retest procedures. In one of the preliminary trials of the test in this study, however, it was possible to obtain initial and final tests one month apart for small samples of both hunters and landowners. The scores for the two

groups were combined and differences obtained between the initial and final tests. These are shown in the following table:

TABLE 4

Score differences from responses obtained on preliminary pre and post tests of the measurement instrument

Variable	N	Responses	Error	% Agreement tests 1 & 2
I	19	95	10	.89
II	20	180	7	.96
III	20	180	41	.77
IV	20	220	37	.83
V	20	280	65	.77
Totals		955	160	.83

These results are to be regarded as initial findings only. The content of these items remained the same, basically, as that used in subsequent refinement of the instrument. However, the scale types were changed for the first two variables after this preliminary test. Included in the error between the pre test and post test above includes methodological errors.

The same source of responses, considered a control group in the preliminary experiment, was used to examine the relationship between pre test and post test as group totals for each of the five variables. These are reported in the table following. The respondent groups approached the maximum possible score for the first two variables. These variables were tested by scalogram items and a later test

for normal distribution of scores with the experimental samples indicated a peaked distribution pattern for these same variables. As is revealed in the table, the accuracy of responses for the remaining variables was lower.

TABLE 5
Changes in group scores between the first and second applications of the preliminary instrument as compared with the maximum possible score for the five variables

Variable	N	Maximum score	Scores	
			First test	Second test
I	20	100	93	95
II	20	180	168	165
III	20	180	69	69
IV	20	120	68	85
V	20	280	130	132

The control sample for the final experiment was pre tested and post tested without the intervening educational treatment. In the following table, results from this group are utilized as test-retest measures.

TABLE 6
Pre test and post test means and standard deviations for five variables derived from control group scores

Variable	Pretest		Posttest	
	mean	st.dev.	mean	st.dev.
I	7.38	1.17	7.13	1.22
II	10.06	1.52	9.81	2.04
III	49.00	6.61	48.00	7.42
IV	46.19	3.32	44.56	5.22
V	52.44	7.23	53.94	5.68

The presentations derived from responses by two separate samples who used two different versions of the

instrument are evidence of the degree of stability which was attained for the five variables. Further retesting as a means of establishing reliability were beyond the scope of the present study.

Both validity and reliability have been influenced by the repeated attempts to improve the item statements from the standpoint of content and scalability. In addition to actual tests of each successive trial instrument with samples similiar to the sample to be used in the actual experiment, validity was served in a major way by the contributions of experts in conservation. Reliability was chiefly examined through the use of respondent scores on each variable obtained from initial and second tests.

Directions for Scoring and using the Instrument

The scoring of responses on the instrument which has been developed for this study is not a complicated task, but it calls for close observation and methodological accuracy. For the scalogram items, the subject is assigned the score which corresponds with the highest statement in the item set which he approves. The statements in an item set are arranged in rank order according to the strength of the attribute they represent. There are four statements in each item set. A subject who endorses the first two statements is given a score of two for that item set. The endorsement of the third statement in any set earns the subject a score of three for that set, and the endorsement

of the fourth statement results in a score of four. This scoring system is used for all scalogram items in the test on both pre test and post test except for item sets E and F on the post test.

For sets E and F, a regression in endorsement of the statements on post test as compared with pre test endorsement by the same subject actually indicates an improvement in the attribute being observed. If as a result of the educational treatment, a subject endorses only a lower rank for these two sets in the post test, his change in endorsement has been in a positive direction. Therefore, for each regression to a lower rank statement on the post test, the subject gains one score over his pre test score for the same set. This scoring procedure is outlined as follows:

Item	Statement	pretest endorsement	posttest endorsement
E	1	x	x
	2	x	x
	3	x	-
	4	-	-
Score		3	4

In this example, the highest rank endorsed on the post test is one rank less than the highest ranking statement endorsed on the pre test. Therefore, his post test score is one greater than his pre test score for this item set.

The scores for all item sets for a single variable measured by scalogram analysis by one subject are then

added together to obtain a score for the variable. To obtain an initial indication of the change attributed to the independent variable influence, the difference between the pre test and post test scores for a dependent variable can be calculated by subtracting one from the other.

The Likert type scales used for the last three dependent variables each has six categories of response on this instrument. Numerical values from 1 to 6 are assigned to these categories depending upon agreement of the response to the correctness of the statement. Some statements in each variable are true while others are untrue. An endorsement of a category for a true statement receives a score corresponding to the choice. Very strong agreement receives the maximum score of 6 while very strong disagreement receives the minimum score of 1. The scoring is reversed in the event that a subject indicates agreement with a false statement, a very strong agreement with an untrue statement receiving a score of 1. This scoring system takes the following shape:

True item	6	5	4	3	2	1
False item	1	2	3	4	5	6
	agree very strongly	agree strongly	agree a little	disagree a little	disagree strongly	disagree very strongly

As in the scalogram items, scores for each individual are added together to obtain a total score for a given dependent variable. Group scores consist of all individual

scores for that variable.

This instrument has been developed for use as a group administered test. With minor modifications and alterations in instructions to subjects, it also can be useful as an individually administered or mail-in test. It was prepared to be administered to the same subjects on a pre test-post test basis in an assembled group situation. This provision requires that some of the instruction to subjects be verbally presented rather than entirely written out in the instruction.

The first instruction to subjects is that they place either their name or an assigned number in the identification space in the upper right hand corner of the first or cover page. In the present study, the educational treatment was designed as a training school, so the identification system included a student number. Different identifying symbols are assigned to the control group sample and the experimental group sample.

The nature of the response forms should then be discussed with the subjects. In this it is important that the two types of answering styles be identified within the questionnaire itself for the subjects. The methods of response for each type of scale should be demonstrated visually. This is easily accomplished through the use of substitute content. The instruction relating to the response style is important since failure to properly endorse the preferred statement effects subject scores

and the total results adversely.

The subjects should be instructed to indicate their choices among the statements by placing x or some other symbol in the appropriate spaces. Statements not favored or endorsed by the subject should be left unmarked. This style of indicating endorsement of scalogram type items should be differentiated from the agree-disagree categories used for the Likert type items. In the latter, the subject should first choose which category of the scale best tells his feeling toward the statement and then enter in the appropriate space the number corresponding to the category he has chosen. The two systems should also be demonstrated to subjects since failure to clarify this point will result in the opportunity of biased results.

It should then be impressed upon the subjects of the investigation that they should work individually and avoid interfering with their neighboring subjects. They must also be impressed with the need for making the response that seems most meaningful to then individually rather than to try to anticipate what response some one else would want then to make. The subjects in the present study were aware that they were participating in a training school and that the approach was experimental. This was made known to them in an attempt to obtain greatest possible confidence and cooperation in the needs of the study. The training school was therefore looked upon by the subjects as a useful event from the standpoint of their

club programs and they expressed interest in the use of the questionnaires as a means of evaluating the plan. The nature of the variables was not revealed to the subjects of either the experimental or the control groups. Each was promised a report of their own and group scores for both pre test and post test following the completion of the program.

The planning for the data collection and the educational treatment provided for administering the initial and final tests to both the experimental and control samples jointly or on the same occasion. Monitorship of the test event by the investigator was made possible and test conditions were not only observable but also constant for both samples.

The instrument developed for this study has been designed for testing of subje cts in hunter organizations who may be described as having leader-level characteristics. The population used for the study was a leadership roster from the hunter organizations in a specific area. It should not be expected, therefore, that this instrument has validity and reliability per se for groups of subjects other than leaders in hunter organizations or in widely separated locations. The basic problem in instrument design, according to Doby [14], is to tailor it to the problem, thus

---

[14] Doby, John T., Edward Suchman, Ray Francis, John C. McKinney, and John Dean. Introduction to Social Research. (Harrisburg, Pa., The Stackpole Company, 1954) page 264.

relating it directly to the hypothesis. Selltiz [15] warns that a given scale may be uni-dimensional for one group of persons but not for a different group.

Extraneous Variables to be Considered

There are a number of extraneous variables which must be acknowledged as operative throughout the tests and the educational treatment. Because of the possible effect of extraneous variables on these events, attention is directed to them in this section devoted to instruction for use of the instrument.

The anticipated extraneous variables are included in three general types in this study. They include: those that originate in or during the operation of the experiment, those originating within the differential characteristics and attributes of the subjects, and those originating in the social milieu of the different subjects. The first type includes those emanating from the personal interactions between individuals and especially between the planning group and the subjects. This type also includes the impacts made upon the different subjects by the physical conditions, the order of events, rules and other administrative events. Not all subjects will react in similiar ways to these variables, but the strategy is that the conditions will be uniform over all subjects. Any

[15] Selltiz, et.al., op. cit., page 376.

influence upon subjects, as a result of these variables, will be random.

The second type of extraneous variables includes the educational levels, the age groupings, length of residence, the participation in organizations, the number of years of hunting experience, and others as individual attributes of the subjects. An inventory or profile of these social attributes is included in the questionnaire. These are expected to be randomly distributed among the subjects of both the experimental and the control samples. The additional variable related to this type is that of committee leadership and this was specified in the procurement of the population roster.

The third type of extraneous variable identified in this section is relatively more difficult to observe and control in a field investigation of the scope of the present study. This type includes the possible emergence of events or information relating directly to the content of the experiment originating from sources other than the experimental program. Representative of this type would be such circumstances as legislative action relating to the hunting situation, any undesirable experiences in the hunter-landowner relations field, news breaks related to the hunter-owner relations, conflicts among the area hunter clubs, and many other similiar possible uncontrolled events which could influence results more than the experiment itself.

There were two methods anticipated to account for this type of possible influence by extraneous variables. The first was the use of a control group against which the experimental group dependent variable changes could be measured. In this procedure, any unobserved influence by extraneous variables would occur randomly throughout both the experimental and the control samples and would be accounted for in the analysis of results. The second procedure planned was to bring into the educational treatment itself, any of the above events or situations which developed outside the experiment. This is logical in the consideration of the educational awareness experience as well as in the experimental design.

In the use of this instrument in a practical field experiment, it is necessary to avoid contamination of the control group variables by relationships with the experimental group. If the experimental group subjects reveal to control group subjects the content of the experimental treatment the results on the post test could contain bias. Two things seem practical as guards against such an eventuality. The first is a direct and forceful appeal to the subjects themselves to avoid discussion of the training meetings with other than the experimental group during the period of the experiment. The other is an appeal to the leaders of the organizations represented to prevent any discussion of the training school at club meetings.

Chapter IV

Research Design and Procedures

A research design for any investigation is dependent upon the conditions and facilities for research, the hypothesis formulated for observation, and certain known and unknown attributes of the respondents. It is therefore to the point that the general conditions of this research be recalled in order to establish the reason for choosing the specific design.

It has been conceptualized that the position held by individuals and/or groups could be viewed as a composite of underlying components. Five possible components of position were isolated and described to function as the dependent variables in this investigation.

It was hypothesized that an educational awareness experience could be designed which could serve as the independent variable to bring about a positive change in subject position variables. Such an educational treatment was defined as a planned sequence of educational events related to thorough examination of the issue for which

or on which position is being observed.

These two preliminary assumptions embody a casual hypothesis to the effect that an educational awareness experience will cause a positive direction change in the subject positions on five variable components of their position toward the issue. Such a casual hypothesis might then be tested through an appropriate experimental design, given that an efficient testing instrument and conditions for research were possible.

It was suggested that the issue of hunting wild game on privately owned land would serve as a model to demonstrate the research design. The approach to the issue would be called a training school for hunter-landowner relations in which leaders of hunter organizations would become the respondents. The issue chosen was described as being typical of issues which arise when access to a common property interacts with private ownership privileges.

In experimental research with adult groups, there is frequently no available criteria by which potential respondents can be measured. In this event, it is quite necessary for the investigator to arrange for an initial test with an instrument constructed for the purpose of classifying potential respondents. Then by the use of a control group, a criterion is available from which the comparisons between experimental and control group change on the observed variables are made possible. It was a necessity to do this in the present study.

Description of the Design

The above conditions were the considerations used in the choice of an experimental design for the present study. The design is presented in the following diagram:

$$O_1 \quad X \quad O_2$$
$$O_3 \qquad O_4$$

The symbol O_1 represents the experimental group at the pre test stage; O_2 represents the experimental group at post test; X represents the use of an independent variable treatment; O_3 represents the control group as pretested; and the O_4 represents the control group at post test.

The time schedule for the design is as follows;

Time 1.....Pretest.....Aug. 24
Time 2.....Class 1.....Aug. 31
Time 3.....Class 2.....Sept. 14
Time 4.....Class 3.....Sept. 21
Post test....Sept. 21

The population from which both experimental and control samples were obtained consisted of a roster of leaders in hunter organizations in the Detroit area. All completed the pre test and the selection of samples was derived from a rank ordering of the respondent scores. The experimental group then participated in the three training school classes. At the close of the final class meeting, all subjects completed the post test using the pre test instrument. Responses were then converted to scores and analysis of results followed.

Brief Review of Experimental Design Literature

The investigator needs to be consciously alert to means of keeping the design in good function throughout the period of observation. This includes the need to be on the look out for outside influences which may also have an influence upon the observations in the experiment. The combination of prior professional advice and the early experiences in the preliminary stages of research will provide the investigator with the necessary sensitivity for maintaining command of the observations.

Scott and Wertheimer [1] have observed that : "..... ...; subjects must be exposed to certain critical conditions before(or while) their scores on the dependent variable are obtained. It is this step which, for many researchers, makes an experiment a more convincing study than either a naturalistic observation or systematic assessment. When the investigator himself manipulates the independent variable, and standardizes other features of the experimental conditions, then he is in a better position to conclude that the manipulated variable, and not some other extraneous influence, is responsible for observed systematic differences in behavior."

The manipulation of the independent variable is seen by these authors as a way of referring to the systematic assignment of subjects to the experimental conditions. This is, in their opinion, the essential feature of an experiment.

The strategy of the pre test- post test design with one control group is described as an attempt to take an

---

[1] Scott, Wm. A., and Michael Wertheimer. Introduction to Psychological Research. (New York: John Wiley & Sons Inc. 1962) page 236

account of the effects of both initial measurement and the contemporaneous factors by Selltiz [2]. He explains that:

"In such a study, both the experimental and the control group are measured at the beginning and at the end of the experimental period. The experimental variable, of course, is introduced in the experimental group only. Since the control group as well as the experimental group is subjected both to the initial measurement and to the contemporaneous influences, the difference between the scores of the two groups should constitute a measure of the effectiveness of the experimental variable alone. For this purpose, either the final scores of the two groups, or their change scores may be compared."

It is an established fact that the introduction of the instrument itself in the initial test has a variable degree of influence on the post test scores. For example, a given statement will stimulate different subjects to a different extent. This stimulation has a different influence upon the memory and recall systems of the different subjects. In the one control group design, however, the random variation of this effect can be expected to occur with experimental and control samples.

Good [3] argues that it is no longer logical to think of holding everything constant except the experimental variable and declares that:

"The newer statistical methods at the same time facilitates more efficient use of data, make possible greater economy in design, and require that the statistician shall have a part in the initial planning before the data are gathered."

---

[2] Selltiz, Claire et.al. Research Methods in Social Relations. (rev. edition; New York: Holt, Rinehart, and Winston Inc., 1963) pages 117-118.

[3] Good, Carter V. Introduction to Educational Research (New York: Appelton-Century-Crofts Inc., 1959) page 15.

Cochran and Cox [4], in discussing methods for increasing the accuracy of experiments, make the point that in addition to the effect of the treatment itself, the experimental results are affected by extraneous variations which may be grouped under the title of experimental errors. This use of the term error does not refer to mistakes but rather to extraneous events which are not controlled or accounted for in the plans. Two principal sources of experimental error are cited by the authors. These are identified as those errors which occur as a result of the inherent variability in the experimental material to which the treatment is applied, and those resulting from lack of uniformity in the physical conduct of the experiment.

This very brief review of literature on experimental design shows that the pre test-post test design with one control group is a useful and accepted design for an experimental investigation. In adopting any design, the investigator must give careful attention to detail in both the measurement and interpretation of results.

Sampling Problems and Procedures

There were two basic objectives in selection of samples for this investigation. The first was that the subjects must be chosen from a population which was

---

[4] Cochran, Wm.G., and Gertrude M. Cox. Experimental Designs (2nd.ed., New York: John Wylie & Sons Inc. 1960) page 15.

confronted with the issue of hunter-owner relations. The second was that the samples be composed of individuals having leadership or decision making responsibilities within the hunter organizations.

These requirements indicated that the sample population and subjects should represent a specific part of the total of all hunters. This, for practical purposes, directed the use of selective population from which the experimental and control subjects could be randomly drawn. This requirement limited the population from which the selection of samples could be made. The use of naturally occurring groups is often practical in the field experiment but this method was discounted in this study for the reason that leader-level subjects were desired. It may be argued that the use of leaders from several natural groups has a desirable broadening of interest and reaction that is superior to the use of limited numbers from within a single group. In the event that the scope of the research is great enough so that many natural groups may be included in the experiment then the use of the naturally occurring groups has advantages.

The sampling procedure started with the development of a roster of 70 names from leadership ranks in the Detroit area hunter organizations. These leaders were invited to attend an opening social meeting in which the training school was explained and the initial test was administered.

Some 50 individuals completed the initial test and more than 40 completed forms were scored. The total scores over the entire test were placed in a rank order from the highest score to the lowest score. A coin toss was used as a method of random selection of subjects for the control and experimental groups. After elimination of the individuals who could not participate further, there were 40 usable cases. The control group consisted of 16 individuals and the experimental group received 24.

The procedure for the coin toss was based upon the prior decision to obtain an equal number of respondents for the control and experimental groups, or to place twice as many in the experimental group as in the control group if the available numbers were extremely small. The compromise made was to strive for one third of the total to comprise the control group. After eliminations, there were 16 for the control group and 24 for the experimental group. From the rank order of the original group, one out of each three in the successive ranks should become a control group subject. The coin was tossed to determine which multiple of three would be used to identify this one third: first, fourth, seventh, or second, fifth, eighth,etc, or third, sixth, ninth,etc. The process was then completed by making substitutions for those who would be able to participate in alternate groups.

A statistical examination was then made to determine

whether or not the control group and the experimental group were represented differently by their scores on the five dependent variables under observation.

TABLE 7

Score means and F.ratios on five variables comparing the experimental and control groups on pretest scores

	Variables				
Group	I	II	III	IV	V
Experimental	7.13	9.79	48.54	43.92	54.04
Control	7.38	10.06	49.00	46.19	52.44
Difference	.25	.27	.46	2.27	1.60
F.ratio	.42	.29	.05	2.47	.52

The critical figure for the F.ratio at the .01 level of significance for 1 and 38 degrees of freedom is 7.35. Using this test of significance, it is discovered that the control and experimental samples do not differ significantly in pre test scores for the five variables. In other words, the groups may be considered equal at the start of the experiment on the properties being observed.

In explanation of the use of 38 degrees of freedom, the statistical procedures for arriving at F. values involves two sample variances(as the control group and the experimental group), Thus there is one degree of freedom for each sample(n-1), for a total of 2 degrees of freedom in this study. The tables of F. ratios have been arranged so that N_1-1 is the numerator for F and N_2-1 is the denominator. In the present study, there were 24 subjects in the experimental group and 16 subjects in the

control group for a total of 40. Accounting for one degree of freedom for each group, the totals are 23 and 15 or a total of 38 degrees of freedom for the combined samples.

The two samples were then compared on the basis of five factors of social profile. Subjects were asked to indicate on the questionnaire which of four groupings for age, education, length of residence in the area, number of organizations belonged to, and the number of years they had been hunting small game, would be their appropriate classification. The next table presents the results.

TABLE 8

Comparison of means for experimental and control groups on five factors in the social profile of individuals

	Means for social factors				
Group	age	educ.	resid.	organiz.	years hunt.
Experimental	2.5	2.04	3.87	1.7	3.5
Control	2.6	1.75	3.37	1.3	3.5
difference	0.1	0.29	0.50	0.4	0.0
nearest equivalent	48 years	High school grad.	20 years	2.5 clubs	17+ years

The results displayed in the above table indicate that the social profiles representative of the two groups of subjects do not vary significantly. Only in the factor of education was the difference enough to place the two groups in different classifications, and in this the difference was only from just less than to just more than

a high school graduate level.

Application of the Independent Variable

The educational awareness experience, operating as the independent variable, was administered to the experimental group in a series of three meetings held in the calendar month following the pre test. The investigator assumed the role of teacher-organizer, with the intent that a teacher-learner relationship be established in the pursuit of the educational objective. It is explained by Bradford [5] as a situation in which:

".....the teaching-learning process is a human transaction involving the teacher, learner, and learning groups in a set of dynamic interrelationships. Teaching is a human relational problem. Teachers and learners engage together in a complex process of exploration and diagnosis of needs for and resistances to learning and change; of experimentation and fact-finding;of testing and planning for utilization of learning and change in the life of the individual. The relationships among learners and between teacher and learners have a great deal to do with the ultimate learning."

Bradford then adds that:

"The target of education is change and growth in the individual and his behavior; and thus in his worlds. This is a deeper and broader goal than cognitive learning only."

In further discussion of learning and change, Bradford also argues that though cognitive and attitudinal learning is basic to individual growth and change, it nevertheless does not guarantee that growth and change will occur. He sees each individual as continually facing

---

[5]Bradford, Leland. "The Teaching-Learning Transaction", The Planning of Change, ed. Warren Bennis, Kenneth Benne, and Robert Chin(New York: Holt,Rinehart, Winston,1961) pages 20-28.

the task of reorganizing, remaking, and relating his internal and external worlds. It is to this task that learning should be directed because any learning which remains merely cognitive and does not become a part of internal systems and external behaviors becomes compartmentalized without successfully affecting his every day problems of living.

David Jenkins [6] contributes the thought that efforts to change subjects through educational methods involves both driving forces and restraining forces. Driving forces are seen as the factors pushing in a particular direction, initiating change, or keeping it going. The restraining forces consist of barriers which prevent or retard movement in the direction of desired change. As an example, a desire to improve one's skills in a given profession would represent a driving force while a lack of skill for a particular task would be representative of a restraining force.

Jenkins also contributes the suggestion that education can result in change through a process of reducing or removing forces, through strengthening or adding forces, and through changing the direction of forces. Further, he emphasizes the need for stabilization of change once it has been achieved. Unless attention is given to maintaining the changed condition, the pre-change forces will gradually effect a return to the prior condition.

---

[6] Jenkins, David. op.cit. pages 238-244

These references to the achievement of change by the use of teacher-learner and forces of drive and restraint strategies present important opportunities in the manipulation of the educational treatment. By using prior observation of the relative strengths of the dependent variables as properties of the client learners, the investigator or educator may then apportion the content of the educational treatment according to needs. A working-together relationship may be established between teacher and learner for the contemplation of the issue. It is frequently helpful in the attainment of the educational and change objectives that the process or method of actual change be demonstrated or acted out.

Of major concern in the practical application of a researchable manipulation of the independent variable is a planned relating of the educational events to the real life situation of the client learners. Then the initiation of the teacher-learner relationship may be interwoven with the identification of the problem, an identification of conflicting attitudes and ideologies, an elaboration of a rationale for concluding that actions are needed, an examination of the most appropriate actions to take, and a clarification of the true basic facts of the issue. The fact that increased selectivity of what is to be learned has been identified as being associated with increasing age of the client emphasizes the need for relating the educational event to real life issues and

problems. The educational objective in seeking change can be described as growth in the client's ability, over time, to develop a rationale for confronting issues which is similiar to development of the ability to solve problems.

In an educational enterprise whose objective is change in learner ability, the driving forces and the restraining forces can be identified. Driving forces include the acceptance of the idea that a problem exists, an acknowledgement that action should be taken, or an expressed desire to change or improve the situation. In the present study, these forces have been identified among the hunter population. On the other hand, the present study issue also involves such restraining forces as conflicts in attitudes and ideologies, inadequate perceptions of fact and appropriate action, and a tendency to leave action to others.

The educational treatment may be directed toward a strengthening of the appropriate driving forces, altering the direction of action, and toward correction of the restraining forces represented by false perceptions. The philosophy of the educational objective must be founded upon the premise that change is meaningful, functional, and desirable for the benefit of society.

Content of Training School Meetings

At the first meeting of the training school group the investigator explained the plans, objectives, and the

ground rules for the training school. Herman Haedicke, a District Supervisor for the Michigan Conservation Department, was introduced to present a discussion of legal and historical aspects of the sport of hunting. The objective of this presentation was to generate interaction among the subjects and with the speaker which would aid the dependent variables of ideological rationale for understanding and general emotion-feeling. The speaker represented an authority figure with which the clients could communicate personally.

Following the speaker's presentation and his response to several questions from the subjects, four small discussion groups were formed to react to the topic as presented. Assignments for two of these sub-groups to discuss and make conclusions regarding one aspect of the topic while the two remaining sub-groups addressed another aspect of the topic. Each sub-group was required to summarize and report their discussions. Note taking and discussion with the speaker were encouraged. This meeting format was used for each of the three meetings of the experimental group.

The investigator opened the second class meeting by reviewing the problems and conclusions discussed at the first training meeting, an outline of which occurs in appendix H. Following a pre-planned approach for focusing upon relevant aspects of the dependent variables, the change from utilization of wild game in a pioneer

society to utilization of game in the contemporary society was demonstrated as an example of the need for changes in attitudes toward resources. Then Charles Shick, Game Management Specialist from the Michigan State University Cooperative Extension Service, was introduced for the purpose of presenting a discussion of the general conditions for hunting in Michigan at the present time. His discussion also covered the rise in the number of hunters, the space available for hunting, hunter and owner attitudes toward the problems, and the activities which have been designed for improving hunter-owner relations.

The format for the balance of the meetings was the same as that for the first training meeting. Then the subjects were given a "take home" problem. This problem called for each subject to assume the role of a landowner who had suffered economic damage because of hunters the previous season. The second aspect of the problem was that each subject should prepare a reply to succeeding hunters who stopped on the first day of the present hunting season to ask permission to hunt. The full description of the problem is included in appendix I.

Both the experimental and control groups were assembled for the third and final meeting of the training school. They were separated before the meeting started with the control group going into another part of the hall to complete the post test. Under the monitorship

of one of the club officers, the control group completed their post test at the opening of the period, and when completed, they were invited to occupy the back of the classroom for the experimental group and listen in on the instruction.

During the time the control group was completing the post test, the experimental group reported its response to the take home problem and discussed questions related to the previous meetings. The investigator outlined the summary of the first two meetings, as shown in appendix J, again following a pre-planned approach for covering specific aspects of reference to the variables of position. Then Mr. Dan Reed, Legislative Counsel for the Michigan Farm Bureau, and Mr. James Rouman, the Executive Director of the Michigan United Conservation Clubs, presented the topic for discussion. This was directed toward open review and discussion of the state organizational policies of these two involved groups. This presentation fulfilled the educational awareness objective of planned interaction of the conflicting sides or organizations in respect to the issue. The positions of the two organizations were presented as well as the legislative policies regarding the hunter-landowner relations issue.

Opportunity for the subjects to react to the statements of policy by these speakers was provided. Then preparations were made for the experimental group to

complete the post test. During this period, the control group had an opportunity to enter discussion with the speakers in another portion of the hall. The experimental group was asked to respond to whether or not they felt they had made any changes in the way they regarded the issue as a result of the training school. This question was asked in reference to each of the five variables being observed. The response categories included: no change, a little change, and changed a lot. The full form is presented as appendix K. The completed post test marked the close of the training school.

The actions reported in this section constitute an outline of the manipulation of the independent variable in this study as it applied to the conduct of the meetings.

Data Analysis Plan and Procedures

The task of the data in research is to provide evidence in support of the hypothesis. Such data must be obtained through the proper use of appropriate measurement and data analysis.

The major hypothesis for this study is that the independent variable will result in improved group scores for the attributes or components of position. Position is represented in the form of five components of position which act as dependent variables. Each is to be measured independently. Improvement in experimental group scores alone will not provide sufficient evidence that the

educational treatment is largely responsible for changes is response scores. The control group, originating from the same score rank order on the pretest, aids in the assessment of the change in scores.

The major hypothesis for this study is restated in two parts as follows:

A. The experimental group score means for each of the five dependent variables will not differ significantly from the control group score means on the same variables at pre test time.

B. The independent variable will result in a significant change in the experimental group means for each of the five dependent variables.

C. The post test means for the experimental group will be significantly greater than the post test means for the control group for each of the five variables.

The null hypothesis holds that the independent variable will not result in significantly different post test means for the five variables, or that the post test means of the experimental and control groups will not be significantly different.

There are certain assumptions and acknowledgements which should be stated because of their influence on the choice of analysis procedures. Included in these are the following: the samples are of small size; the

control and experimental samples are drawn from the same pre test rank order on variable scores; a coin toss was used to establish the order of drawing for the samples for control and experimental groups; the scores of the two groups did not achieve normal distribution but the normalized scores did not achieve different significance levels for F. than the original score distributions; any experimental error will occur randomly among subjects; that it is not necessary to start with equal sized samples for the control and experimental groups. While the raw data can be given ordinal scale status, the assumption of interval scale will be used since any quantity(number) has the same relative meaning throughout all the data processing.

This research essentially involved two phases of investigation for which statistical analysis was necessary. The first phase was devoted to the development of an instrument to measure the assumed attributes of the study. This development has been discussed in previous sections of the report. The second phase was the use of the instrument to obtain reaserch data.

The statistics are required to account for, or give some measurement of the error involved both within and between the experimental and control groups. It is also a requirement of the statistics that a test of the hypothesis of no difference between means. Meeting these two requirements will result in an indication of the

extent to which the change in scores on the variables can be attributed to the independent variable.

Generally, the more powerful the test the more the confidence which can be placed in interpreting the results in terms of the hypothesis. Parametric statistics are considered as a most powerful test of the hypothesis. The procedures for the use of parametric statistics, however, is based upon certain conditions. These conditions include: random assignment of subjects, normal distribution of observations, homogeniety of variance, interval scales, and in the case of the use of analysis of variance, the effects must be additive. In using parametric statistics it is an accepted pattern to assume some of these conditions when the assumtions may be based upon reasonable expectations. For example, the interval scale may be assumed from ordinal conditions without having knowledge of the actual interval quantity.

The condition of homogeniety of variance is of importance in the interpretation of the significance obtained in the F. ratios. Since other conditions for the use of parametric statistics were met or assumed as explained above, a test of the homogeniety for the control and experimental samples in this study was also made. The formula for this test is: $F = \frac{S_1}{S_2}$. In this formula, the S_1 represents the experimental group, and the S_2 represents the control group.

The results of the test for homogeniety of variance is shown in the following table. There it is shown that the data reveal the hypothesis of equal variance is accepted on all variables except for Variable I. The rejection of the hypothesis of equal variance occurs for this one variable only on the post test results.

TABLE 9

F. test of homogeniety of variance for experimental and control groups on initial and final tests of five variables

Variable	Experimental group, N=24	Control group, N=16	F.*
	Initial test variance		
I	1.37	1.37	1.00
II	2.25	2.31	.974
III	36.36	43.69	.832
IV	24.30	11.02	2.205
V	40.19	52.27	.768
	Final test variance		
I	.08	1.49	.05
II	3.61	4.16	.867
III	25.30	55.05	.459
IV	22.46	27.24	.824
V	45.15	32.26	1.399

* Region of acceptance for F. at the .05 level is .41 to 2.70, and at the .01 level is .31 to 3.79.

The characteristics of the problem which have been outlined in the preceding discussion are the determining factors in the choice of procedures with which to examine the data collected in this investigation. The procedures chosen include the analysis of variance and analysis of

covariance. The procedures for analysis of variance and analysis of covariance have been detailed by a number of writers. Among them are Dixon and Massey[6], Walker and Lev[7], and Edwards[8]. In a discussion of analysis of covariance, Cochran and Cox[9] say that:

"....we may estimate from the data the extent to which the observations were influenced by the variations in these supplementary measurements. The average response to each treatment can then be adjusted so as to remove the experimental error arising from this source. Thus the effects of variations in the initial weights are largely eliminated from the experimental error, without the necessity of equalizing the initial weights in the planning of the experiment."

"Its purpose is to remove experimental errors arising from extraneous sources of variation which it is impractical or too costly to control by a more refined technique. Cases are fairly common where use of covariance has more than doubled the efficiency of the experiment".

The pre test scores for the groups on each of the five dependent variables may be used as control variables in the covariance analysis. This provision makes it possible to assess the educational treatment, rather than the differences in pre test scores, as being chiefly responsible for a gain in scores in the post test.

---

[6] Dixon, W.J., and F.J. Massey, Jr. Introduction to Statistical Analysis (New York: McGraw-Hill Book Company, Inc. 1957) pages 209-221.

[7] Walker, Helen, and Joseph Lev. Statistical Inferences (New York: Henry Holt and Company, 1953) pages 386-412.

[8] Edwards, Allen L. Experimental Design in Psychological Research (New York: Holt, Rinehart, and Winston, 1962) pages 117-135.

[9] Cochran, Wm G., and Gertrude M. Cox. Experimental Designs (2nd.ed., New York: John Wiley & Sons Inc. 1960) page 37.

The analysis of covariance is a procedure which leads to a test for differences in means by separation of a sum of products into several portions and then tests for a difference in means of residuals. The residuals are the differences of the actual observations and a regression quantity based on the associated second variable. The following computation formulae are derived from the work of Dixon and Massey[10]:

1) Expression for the sums of products: (The capital S is substituted for the large symbol for Sum used in the original reference)

$$\sum_i \sum_j (X_{ij} - \bar{X}_{..})(Y_{ij} - \bar{Y}_{..}) =$$

$$\sum_i \sum_j (X_{ij} - \bar{X}_{i.}) + n\sum_i (\bar{X}_i - \bar{X}_{..})(\bar{Y}_i - \bar{Y}..)$$

The n represents the number of observations in each k group. Any of these sums of products divided by their degrees of freedom is called variance.

2) The computing form for the quantity on the left, the total sum of products is;

$$\sum \sum x_{ij}\, y_{ij} - \frac{T_{x++}\, T_{y++}}{nk}$$

In this expression, the T_{x++} symbol = total scores on X variable for all groups and Y_{x++} = the total of scores on the Y variable, n the number in each group, and k the number of groups. In the present study, the X variable is the pre test scores and the Y variable the post test scores. The n would represent the total number of subjects

[10] Dixon and Massey, op. cit., pages 211-212.

in the experimental and control groups, and the k the number of groups which is two in this case.

3) The computing form for the first quantity on the right in the previous form, the sum of products within groups is:

$$\sum_{ij} x_{ij} y_{ij} - \frac{\sum_i T_{xi} + T_{i+}}{n}$$

4) The computing form for the second expression on the right in 3) above, the among groups or among means sum of products is:

$$\frac{\sum_i T_{xi+} T_{yi+}}{n} - \frac{T_{x++} T_{y++}}{nk}$$

The above forms can be verified algebraically in a manner similiar to the derivation of the corresponding formulas for sums of squares. However, it can be seen from the computing forms that the first is the sum of the second and the third. These computing forms for the sums of products are similiar to those for the sums of squares expressed as follows:

$$\sum_{i=1}^{k} \frac{T_{i+}^2}{ni} - \frac{T_{++}^2}{N}$$

In this expression, X_{ij} is the score of the jth individual in the ith group on the X variable and the expression Y_{ij} is the score of the jth individual in the ith group on the Y variable.

Dixon and Massey[11] discuss the hypothesis and assumptions as follows:

"The analysis of variance discussed above applies when it is known that the regression curves of the k populations are parallel straight lines. The hypothesis states that the parallel lines coincide,i.e., the populations have the same Y means when the same X is used for each population(Y means are equal after adjustment for X values). The population variance.....about the regression lines are assumed to be equal in each of the k populations."

A computor program at the University of Michigan computing center was utilized to perform the analysis of variance and analysis of covariance. The output data from this program includes the following applications to the present study:

a- means, standard deviations, and sample sizes for both the initial and the final measures,

b- analysis of variance for initial and final measures,

c- a final adjusted mean for each group on each variable,

d- analysis of covariance.

Test for Normal Score Distributions

Prior to the actual experiment there was no knowledge relative to the scores resulting from the tests assuming a normal distribution. While assuming normalcy of score distributions as part of the analysis was taken into consideration, it was nevertheless deemed helpful to provide evidence of the actual score distribution. An

---

[11] ibid., page 215.

examination for normalcy and a normalizing program was therefore utilized to perform this task.

It is pointed out by Johnson[12] that:

".... a large part of statistical theory is built upon the assumption that the observations are distributed normally and that variance is constant. It is often important, therefore, for the research worker to show that his measurements are distributed normally or to transform them into a form that is normally distributed, or at least into a form that has the best possible chance of being so distributed."

The importance of obtaining evidence of the distribution form for test scores lies in the fact that the tests of significance become more valid and sensitive when the distribution is normal. The analysis of covariance, however, is relatively insensitive to skewness.

A computor program for the analysis of the distribution form was used to examine the distribution of the original data. Skewness and kurtosis were tested against the theoretical normal curve. The program identified the amount of variance from normal and then transformed all scores to normalized T-scores having a mean of 50 and a standard deviation of 10. This procedure involved the rank ordering of all original scores for the variables, computing the percentile ranks using the number of cases below a score plus 1/2 the cases at that score, fitting the percentile ranks into the theoretical normal distribution and finding the(normalized) Z-scores,

---

[12] Johnson, Palmer O. Statistical Methods in Research 2nd. print.(New York: Prentice Hall Inc., 1950) page 155.

and transforming the Z-scores into T-scores using the relationship: T= 50 + 10Z.

This test for normal distribution of original scores revealed skewness and kurtosis in the first and fourth variables at significant levels. The results are shown in the following table. The selected level of significance was .05 and the critical value for skewness or kurtosis was 1.96.

TABLE 10

Skewness and kurtosis in the distribution of original scores for 40 experimental and control group subjects on initial and final tests for five variables of position

Pretest Variables	Mean	Stand.Dev.	Skewness	Kurtosis
I	7.22	1.19	-4.60***	3.05***
II	9.90	1.53	-1.57	.15
III	48.72	6.36	- .89	- .91
IV	44.82	4.56	-1.92	2.46***
V	53.40	6.84	- .59	-.69
Posttest				
I	7.60	.90	-7.08***	9.76***
II	10.38	2.03	6.78	.17
III	50.20	6.44	-1.89	.29
IV	46.13	5.16	-3.03***	4.21***
V	59.45	7.86	.35	.06

*** Significant beyond the .05 level

The skewness, indicated by the algebraic signs, is to the right of normal in all cases and the kurtosis is peaked in all significant cases. Two of the five variables have significantly non-normal distribution of scores.

The next step in the normalizing procedure was to transform the original scores into normal distributions. In explaining this procedure, Johnson[13] says that:

"Where the assumptions underlying the order of ranking are fulfilled, namely, the assumptions that the underlying trait may be regarded as continuous and normally distributed, the transformation of ordinal data to a form that is made amenable to further analysis (for example, to the analysis of variance) sometimes may be definitely advantageous. The transformation needed is one which normalizes the data and can be obtained by assigning to each item in a series of given size a score equal to the expected value for an observation of corresponding rank in a normal population with zero mean and unit standard deviation."

The normalized scores were then analyzed for variance and covariance analysis as the original scores had been. The F.ratios for the original and normalized scores after covariance analysis are compared in the next table:

TABLE 11

Comparison of original and normalized score F.ratios after analysis of covariance on five variables for 40 subjects

Variable	Original F.ratio	Significant	Normalized F.ratio	Significant
I	12.85	yes	14.32	yes
II	8.98	yes	8.75	yes
III	7.25	no	5.05	no
IV	10.09	yes	7.72	yes
V	19.00	yes	17.80	yes

The level of significance chosen was .01. In the above table, it may be observed that the one variable on which the .01 level was not achieved, both the original and normalized F.ratios exceeded the .05 level. It is to be concluded that normalizing the original scores did not

[13] Ibid, page 156.

change the category of significance for any variable in this study. While there were observed changes in the numbers for the F.ratios for each variable when the original scores were normalized, nevertheless the same variables that showed significant F.ratios on the original scores did so on the normalized scores, and the one variable in the non-significant category on originals was non-significant on the normalized scores.

As a result of the above analysis, the original data, rather than normalized data, is presented in the data analysis of this report. The computations for the analysis of covariance using normalized scores may be observed in appendix L.

Chapter 5

Data Analysis Results

Correlation of personal profile characteristics and the response scores for five variables under observation

There was no prior evidence of the social profile characteristics of the subjects. Therefore, information was obtained on the initial test which provided a measure for five characteristics relevant to performance of the subjects on the tests. The five include: age, education, length of residence, participation in organizations, and number of years experience as a hunter. The responses were grouped into four categories of each of the above characteristics and respondents asked to indicate which of the four categories fitted their situation. These were computed on basis of a group mean in order to compare the experimental and control groups and to attempt to discover if the characteristics were related to responses on the variables being tested.

It is to be observed in the next table that those few correlations which do occur are randomly distributed

over the two samples and throughout the variables. The failure of the two groups, whose origin is the same score rank order, to show correlations of similiar patterns may be taken as evidence that the profiles do not have an identifiable influence in this study.

TABLE 12

Correlation tests for five variables of personal characteristics and five variables of position using pretest scores

Profile variables	Correlations by Variable I	II	II	IV	V
Experimental group N=24					
age	-.07	-.31	-.53*	-.05	-.02
educa.	.15	.27	.36	.59*	-.01
resid.	.09	-.22	-.26	-.21	-.13
organiz.	.87*	-.19	.21	.26	.59*
yrs.hunt.	-.33	-.08	-.02	-.01	.37
Control group N=16					
age	-.23	-.39	-.13	-.01	-.31
educa.	-.09	.06	-.15	-.15	-.29
resid.	.09	.16	-.15	-.08	-.00
organiz.	-.23	.02	-.23	-.10	-.37
yrs.hunt.	.96*	-.11	-.29	.25	.42

With 22 degrees of freedon in the experimental group, a correlation of + or - .515 is significant at the .01 level. In the control group whose degrees of freedom is 14, a correlation of + or - .623 is significant at the .01 level.

Analysis of Variable I

The hypothesis for this variable was stated as: Scores of the experimental group will improve as a result

of the educational awareness experience. For the purpose of analysis, the hypothesis may be restated as: The experimental group mean will be significantly greater at post test than it was at pre test. This implies that the experimental and control group means at post test will be significantly different also since the two group means were found to be alike at pre test.

The data for means and standard deviations for both groups on this variable gives an indication of the differences from initial to final tests.

TABLE 13

Group means and standard deviations for scores on initial and final tests for variable I by experimental and control samples.

Initial test Group	Means	Standard deviations
Experimental- N=24	7.13	1.17
Control- N=16	7.38	1.17
Final test		
Experimental group	7.92	.28
Control group	7.13	1.22

It is evident from this analysis that the experimental group increased and thecontrol group decreased in mean score values between initial and final tests. Also, the standard deviation for the experimental group was smaller for the final test than for the initial test while the standard deviation for the control group increased between the two tests.

An analysis of variance for the initial and final tests by both groups for this variable was then computed. A significance test for differences in means was the objective in this analysis.

TABLE 14

Analysis of variance, Variable I, using initial and final test means of experimental and control groups

Source of Variance	d.f.	sum sq.	mean sq.	F.ratio
initial test				
Between groups	1	.60	.60	.42*
Within groups	38	54.38	1.43	
Total	39	54.98		
final test				
Between groups	1	6.02	6.02	8.94*
Within groups	38	25.58	.67	
Total	39	31.60		

*The F.ratio critical figure for 1 and 38 d.f. at the .01 level of significance is 7.35

The analysis of variance reveals that the experimental and control groups do not differ significantly on the measure of pre test means for this variable. At the post test the difference in group means was significant at the .01 level.

The observed gain in scores is a result of the educational treatment plus extraneous error. The next step in analysis was to determine the residual gain which could be assigned to the educational treatment after accounting for extraneous error, or experimental error.

The analysis of covariance was used to examine this aspect of the analysis of data. In the next table a continued improvement in the experimental group mean and a continued regression in the control group mean is evident. The

TABLE 15

Initial, final, and adjusted group means for Variable I

	Means		
Group	initial	final	adjusted
Experimental-N=24	7.13	7.92	7.95
Control-N=16	7.38	7.13	7.08

experimental group mean gained in both procedures while the control group mean lost value in each step.

The analysis of covariance, the results of which are shown in the following table, indicate an improved F.ratio over the analysis of variance results. This observation supports the hypothesis

TABLE 16

Analysis of covariance using experimental and control group means on the post test scores for Variable I

Source of Variation	d.f.	adj.sumsq.	meansq.	F.ratio
Between groups	1	7.15	7.15	12.85*
Within groups	37	20.58	.56	
Total	38	27.72		

* F.ratio for 1 and 38 d.f. for .01 level=7.35

that the experimental group mean would be significantly different at post test, and the null hypothesis is rejected.

Analysis of Variable II

The stated hypothesis for this variable is that: The response score mean for the experimental group will be improved as a result of the educational treatment. This hypothesis is interpreted as a data function as: The experimental group mean will be significantly greater at post test when compared with pre test and with the pre-post means of the control group. The null hypothesis of no significant change in means is inferred.

The means and standard deviations for the initial and final test score means were first computed for both groups. These data(Table 17) show that the experimental

TABLE 17

Experimental and control group means and standard deviations for scores on initial and final tests,VariableII

Group	Means	Stand. Dev.
initial test		
Experimental,N=24	9.79	1.50
Control, N=16	10.06	1.52
final test		
Experimental	10.75	1.90
Control	9.81	2.04

group mean improved by 1.04 while the control group mean decreased by .25. The greater standard deviation at post test for both groups is in part due to the fact that a lower rank endorsement at post test for two of the items results in an increased score for the variable. This makes possible a greater range of scores on post test.

The next table presents the results of the analysis of variance for Variable II. The results of this analysis

TABLE 18

Analysis of variance for initial and final tests on Variable II with experimental and control group means

Source of variance	d.f.	sumsq.	meansq.	F.ratio
initial test				
Between groups	1	.70	.70	.29
Within groups	38	90.90	2.39	
Total	39	91.60		
final test				
Between groups	1	8.44	8.44	2.10*
Within groups	38	152.94	4.02	
Total	39	161.38		

*F.ratio for 1 and 38 d.f. at .01 level = 7.35

indicate that that the means of the experimental and control groups did not differ significantly on initial or final tests. While the change was in a positive direction, it did not achieve significant levels. At this point of analysis, the null hypothesis would be accepted.

The adjustment of the final means was the next step in the analysis of Variable II. In the following table,

TABLE 19

Initial, final, and adjusted means for Variable II

	Means		
Groups	initial	final	adjusted
Experimental, N=24	9.79	10.75	10.86
Control, N=16	10.06	9.81	9.65

the initial, final, and adjusted means indicate a gain for the experimental group and a regression for the control group.

The final step in the analysis of the scores for Variable II was the analysis of covariance. The results show continued improvement in the experimental group.

TABLE 20

Analysis of covariance for the final measure on VariableII

Source of variance	d.f.	adj.sumsq.	meansq.	F.ratio
Between groups	1	14.05	14.05	8.98*
Within groups	37	57.91	1.57	
Total	38	71.96		

*F.ratio for 1 and 38 d.f. at .01 level = 7.35

The hypothesis that score means of the experimental group would change significantly is rejected on the basis of analysis of variance but is accepted when analysis of covariance is used. The null hypothesis is rejected as a result of the analysis of covariance.

Analysis of Variable III

A working hypothesis for this variable has been presented as follows:Response scores for the experimental group on Variable III will be greater at post test than at pre test as a result of the educational treatment. When this hypothesis is presented in terms of data analysis it becomes: The post test mean will differ significantly from the pre test mean and from the control group mean. The

null hypothesis then reads that there will not be a significant change in score means as a result of the educational treatment.

The same sequence of analysis that was used for the first two variables was used for VariableIII. The first step was the calculation of means and standard deviations for both groups on initial and final tests. The results, shown in the following table indicate a continuation of the same pattern of gain in means as was present in the two previous variables, i.e., the experimental group mean improved while the control group mean regressed after the educational treatment.

TABLE 21

Group means and standard deviations for initial and final tests for Variable III by experimental and control groups

Group	Means	Stand. dev.
initial test		
Experimental, N=24	48.54	6.03
Control, N=16	49.00	6.61
final test		
Experimental	51.67	5.03
Control	48.00	7.42

The difference in pre and post test means for the experimental group was plus 3.13 while that for the control group was a minus 1.00. It is also observed that the standard deviation among scores grew smaller for the experimental group and larger for the control group from the time of the initial test to the final test.

The next step in analyzing Variable III was the computation of analysis of variance for initial and final means by the experimental and control groups. It may be observed in Table 22 that the mean differences did not achieve significant levels for either initial or final tests. The direction of gain remained the same for the experimental group as in previous variables.

TABLE 22

Analysis of variance with scores of experimental and control groups from initial and final tests of Variable III

Source of variance	d.f.	sumsq.	meansq.	F.ratio
initial test				
Between groups	1	2.02	2.02	.05*
Within groups	38	1573.96	41.42	
Total	39	1575.98		
final test				
Between groups	1	129.07	129.07	3.30*
Within groups	38	1487.33	39.14	
Total	39	1616.40		

*F.ratio for 1 and 38 d.f. at .01 = 7.35

The final means were then adjusted holding initial means constant. The adjusted means, as shown in Table 23,

TABLE 23

Adjusted means for experimental and control groups on Variable III for the final test

Groups	Means		
	initial	final	adjusted
Experimental	48.54	51.67	51.79
Control	49.00	48.00	47.81

again show the tendency for the experimental and control group means to move farther apart from initial to final and adjusted stages.

The analysis of covariance, as presented in Table 24, indicates that the difference in means does not achieve significance at the .01 level. The difference is greater than the .05 level.

TABLE 24

Analysis of covariance of mean differences on Variable III by experimental and control groups

Source of variance	d.f.	adj.sumsq.	meansq.	F.ratio
Between groups	1	151.53	151.53	7.25*
Within groups	37	773.02	20.89	
Total	38	924.54		

* F. ratio for 1 and 38 d.f. at .01 level-7.35

It may be concluded from data analysis for Variable III that the change from initial to final and adjusted means did not achieve the .01 level of significance for either the variance or the covariance analysis procedures. The direction of change was positive and the significance figure was between the .01 and .05 levels, just.10 short of the .01 critical figure of 7.35.

Thus, the data does not support the hypothesis at the .01 significance level, a point at which the null hypothesis is accepted. The null hypothesis would be rejected at the .05 level after covariance analysis for

this variable.

Analysis of Variable IV

The hypothesis for Variable IV states that: Response scores for the experimental group on Variable IV will be increased as a result of the educational treatment. This may be restated for data analysis as: The mean for the experimental group will differ significantly from pre test to post test. The null hypothesis is given as: The means of the experimental group on Variable IV will not differ significantly between the initial and final test.

As a first measure of the hypotheses for Variable IV, the means and standard deviations were computed for the experimental and control groups for initial and final tests. These data are displayed in Table 25. The means of the

TABLE 25

Group means and standard deviations for initial and final tests on Variable IV by experimental and control groups

Group	Means	Standard Deviations
initial test		
Experimental, N=24	43.92	4.93
Control, N=16	46.19	3.32
final test		
Experimental	47.17	4.74
Control	44.56	5.22

experimental group are significantly different while the standard deviation is again smaller at the post test period.

The reverse is true for the control group, the mean being smaller and the standard deviation larger at post test.

The next examination of Variable IV was made by analysis of variance for the initial and final tests for both groups.

TABLE 26

Analysis of variance on initial and final tests of Variable IV by score means of the experimental and control groups

Source of variance	d.f.	sumsq.	meansq.	F.ratio
initial test				
Between groups	1	49.50	49.50	2.47*
Within groups	38	760.27	20.01	
Total	39	809.78		
final test				
Between groups	1	65.10	65.10	2.54*
Within groups	38	975.27	25.67	
Total	39	1040.38		

*F.ratio for 1 and 38 d.f. at .01 level = 7.35

The results of the analysis of variance indicate that the change in means did not achieve significant levels at either pre or post test. The hypothesis of significant change is therefore rejected on the basis of the analysis of variance while the null hypothesis of no significant change is accepted.

The next computation for Variable IV consisted of adjustment of the final mean while holding the initial mean constant. As presented in Table 27, the data show improvement in the experimental group mean and regression

in the mean of the control group. This is similiar to the pattern for the previous variables analyzed.

TABLE 27

Initial, final, and adjusted means on Variable IV

	Means		
	initial	final	adjusted
Group			
Experimental,N=24	43.92	47.17	47.81
Control,N=16	46.19	44.56	43.59

The next step in the analysis of Variable IV was the analysis of covariance. As presented in Table 28, the results support the hypothesis of significant change in the mean of the experimental group. This result also rejects the null hypothesis of non-significant change.

TABLE 28

Analysis of covariance on group means for Variable IV by experimental and control group scores

Source of Variance	d.f.	adjsumsq	meansq.	F.ratio
Between groups	1	160.66	160.60	10.09*
Within groups	37	589.38	15.93	
Total	38	750.04		

*F.ratio for 1 and 38 d.f. at .01 level = 7.35

Analysis for Variable V

The general hypothesis for this variable states that: The response scores for the experimental group will improve significantly as a result of the independent variable. In terms of data analysis, this hypothesis may be restated as: The experimental group mean for Variable V

will improve significantly over the pre test mean and the mean of the control group. The null hypothesis then becomes: The initial and final test means will not differ significantly for Variable V.

Group means and standard deviations for initial and final tests on Variable V by experimental and control groups were compared as the first step in the examination of this variable. As presented in the following table, these data show that the means of both groups were larger on post test than on pre test. The increase in standard

TABLE 29

Group means and standard deviations on initial and final tests for Variable V by experimental and control groups

Group	Means	Stand. Dev.
initial test		
Experimental, N=24	54.04	6.34
Control, N=16	52.44	7.23
final test		
Experimental	63.13	6.72
Control	53.94	5.68

deviations from initial to final test by the experimental group is, in part, accounted for by the fact that some subjects had lower post test scores on this variable than they did on pre test.

The next examination of this variable was by use of analysis of variance. The results of this analysis, as presented in the next table, show that there was no significant difference between experimental and control groups at the time of the initial test. However, at the

time of the final test there was an appreciable difference in means.

TABLE 30

Analysis of variance on initial and final tests for Variable V by the experimental and control group samples

Source of variance	d.f.	sumsq.	meansq.	F.ratio
initial test				
Between groups	1	24.70	24.70	.52*
Within groups	38	1800.00	47.39	
Total	39	1825.60		
final test				
Between groups	1	810.34	810.34	19.25*
Within groups	38	1599.56	42.09	
Total	39	2409.90		

*F.ratio for 1 and 38 d.f. at .01 level = 7.35

It may be observed that a high F.ratio number was achieved in this analysis of variance. The means of both increased over the pre test, but as revealed in the following table, the increase in the experimental mean was much superior to that in the control group mean.

TABLE 31

Initial, final, and adjusted means for Variable V

Group	Means		
	initial	final	adjusted
Experimental,N=24	54.04	63.13	62.90
Control,N=16	52.44	53.94	54.28

The final step in the analysis of Variable V was the analysis of covariance. The results obtained by this procedure are presented in the following table.

TABLE 32

Analysis of covariance for Variable V for experimental and control group mean scores

Source of variation	d.f.	adj.sumsq.	meansq.	F.ratio
Between groups	1	702.47	702.47	19.00*
Within groups	37	1368.33	36.98	
Total	38	2070.80		

*F.ratio for 1 and 38 d.f. at .01 level = 7.35

The results of the analysis of covariance on Variable V indicate that the hypothesis of significant change in means is accepted. The change was significant also when the analysis of variance was used. In both cases, therefore, the null hypothesis is rejected.

Summary of Data Analysis Results

In summary, the data analysis provide valuable information on many aspects of the stated hypotheses. These will be reviewed briefly in relation to the entire investigation. Under the stated conditions of the observations, these will serve to establish the results of the present experiment.

First, there was an overall tendency for the means of the experimental sample to gain between initial and final tests. At the same time, the means of the control group decreased from initial to final tests on four of the five dependent variables under observation. On the remaining variable, the control group mean increased.

The data analysis has established that there was no significant difference in means of the experimental and control groups at pre test. With the initial means as criterion, the two groups may be considered as equal. The examination of five personal or social profile factors also indicated that the groups were essentially equal at the start of the experiment.

Under analysis of variance, the posttest means of experimental and control groups differed significantly on the first and fifth variables. On the basis of adjusted means as compared with initial means, the experimental group showed an increase in all the dependent variables.

When the analysis of covariance was used, the experimental group had significantly larger final test means at the .01 level on all but the third variable. This variable was significantly larger between the .01 and.05 level, failing by .10 of achieving the .01 level.

An attempt was made at the conclusion of the experimental training period to evaluate the reaction of the experimental subjects to the value of the educational treatment. Five questions covering the content of the five dependent variables were asked. The questions are presented in appendix K. Response categories to the question of:"How much change do you feel in each of the following areas", included no change, changed a little, and changed a lot. Results are presented in the next table.

TABLE 33

Responses of 20 experimental group members to the question of how much change was effected for each variable by the experimental training school methods

Variable number	Change		
	none	a little	a lot
I	1	10	9
II	1	13	6
III	2	5	13
IV	1	8	11
V	0	6	14
total	5	42	53

Accepted as an informal frequency measure of reaction, these results indicate generally that experimental subjects perceived some change in the attributes under study as a result of the educational awareness experience.

Chapter 6

Implications and Conclusions

This has been an investigation into the possible influence of an educational treatment upon five assumed components of client position. Position has been used and described as a posture or stand relative to an issue of significance to the client group. It was posited that the educational treatment would result in a positive change in the response scores of experimental subjects relative to the five variables of position. This hypothesis was supported by the data collected.

A Theoretical Model for Educational Awareness Programs

The major implication resulting from this study is the argument that the format for the educational awareness experience, as employed in the present study, is useful as an adult education method. Its focus is upon the content areas of community and resource development. Theoretically, if the ideal or necessary level for action can be achieved in the five variables of position, the

client group is both stimulated and prepared to confront the issues existing in the environment.

As a theoretical model for determination of the content formula for the educational awareness experience, the following is suggested:

ideal condition— existing condition = formula

If the necessary or ideal condition for solution or consideration of the issue is known or can be obtained by observation, the program formula can be derived. Assuming a theoretical equal level is needed in all variables of position, the following table presents a method of determination of the educational formula needed:

TABLE 34

Theoretical construct for determination of program content needs to achieve action level proportionately for the five variable components of position

Variables	necessary condition		existing condition		educational formula
I	20%		10%		10%
II	20%		10%		10%
III	20%		15%		05%
IV	20%		15%		05%
V	20%		15%		05%
total	100%	---	65%	=	35%

In this theoretical example, the existing level for the first two components, as properties of the client group, is lower than for the last three. The formula for planning the content of the educational awareness experience, therefore, calls for greater concentration

in the first two component areas. Looking at the construct in another way, it may be suggested that the lower existing levels in the first two components,i.e., ideological rationale for understanding and general emotion-feeling toward the issue, may act as barriers which block any further stimulation to rationally approach the issue. The program planner, or the manager of the educational enterprise, on the basis of this example, would shift the content to cover the conflicting ideologies and feelings about the issue more heavily than the three remaining components. He would build his program around the rational reasons for the proposed change of action and a better understanding of why certain elements in the society are in conflict over the issue; why there is a need to consider alternatives for action.

In relation to the intercourse of knowledge and values, Lewin and Grabbe[1] believe that:

"Since action is ruled by perception, a change in conduct presupposes that new facts and values are perceived. These have to be accepted not merely verbally as an official ideology, but as an action-ideology, involving that particular, frequently nonconscious system of values which guides conduct."

They argue further that social action is steered by perception. In any situation, action is a result of the field perceived by the actor, and the field consists of

---

[1]Lewin, Kurt; and Paul Grabbe."Principles of Re-Education", The Planning of Change, ed. Warren Bennis, Kenneth Benne, and Robert Chin,(New York: Holt, Rinehart, and Winston, 1961) page 504 .

facts and values. But the possession of correct knowledge does not suffice to rectify false perceptions, and changes in sentiments do not always follow changes in cognitive structure.

There is an implication from this investigation that the strategies of teacher-learner relations and driving-restraining forces (pages 102 and 103) provide practical applications in the manipulation of the independent variable (educational treatment) in field experimentation. These strategies are important contributions to adult education and are deserving of further experimental use in the area of community and resource development.

It is obvious that these strategies should be embraced as important components of the concept of educational awareness experience. They may be utilized by the educator in planning the educational event, and they may well be utilized by the investigator in manipulation of the independent variable. They imply a conscious evaluation of the educational needs of the specific situation prior to preparation of the educational treatment, or a need to formulate the content to fit the specific situation. Therefore, it is an implication of the present investigation that both practical adult education programs and experimental investigations of community and resource development may be improved through utilization of these strategies.

A companion implication from this initial investigation into the component concept of position is the

opportunity to identify additional components. For example, it may be suggested that economic cost involvement is a component. Further identification of components, however, implies the tailoring of the component structure to the specific task of the research. For example, in the present investigation, it was specific to the component structure that the three dealing with behavior, i.e., disposition to act, perception of appropriate action, and perception of facts, were not as critical to change and issue solving in the needs of space age community and resource development as were the time bound attitudes toward change and the opinions toward the technical advice relative to change by talented experts. Conflicts were seen to arise due to the differing ideologies and feelings of the involved client groups. Hence, ideological rationale and emotion-feeling were conceptualized as additional components of position formation.

There is the residual implication from this discussion that the theoretical concept for position components may be modified and used for issues other than that used for this investigation. For example, a component structure could be developed around the need for a community to expand its water supply, or the need for a community wide planning unit, or the development of a community recreation area.

These implications suggest also that the instrument

utilized in similiar research be modified to comply with the specific task. A new universe of attribute statements is necessary as the issue content changes from which universe scaling measure and methods may be developed. In the present investigation the difference in the nature of behaviorial and psycho-attidudinal components suggested different methods of scaling.

Caution is implied in the interpretation of results of the data analysis. The samples utilized in the investigation reported here were small by statistical standards. The unmeasured influence resulting from differences in speakers and order of presentations can be assumed to be randomly responded to by the subjects in the test. That these conditions were standardized and constant over the sample for the period of the tests does not imply that rigid controls over extraneous variables would lead to similiar results.

Expected and Unexpected Results

Utilizing the results obtained from the experimental sample the following table shows the differences in scores as a percentage of maximum possible score for each of the five variables. These data are drawn from group means and indicate that the expected results were not fully attained in the actual experiment.

This table presentation suggests that the achievement of a high percentage of possible score on the initial test

did not influence the percentage gain. Thus the effects of different ranges in possible scores are erased when the percentages are computed.

TABLE 35

Change in group score means as a percentage of maximum possible scores on five variables by the experimental group (N-24) on initial and final tests (final adjusted mean)

Variable	Initial	final adj.	gain	F.ratio
I	.89	.99	.10	12.85
II	.81	.90	.09	8.89
III	.81	.86	.05	7.25
IV	.73	.79	.06	10.09
V	.69	.80	.11	19.00

F.ratio for 1 and 38 d.f. at 1% level = 7.35

On the basis of conditions of this experiment and the small sample size the variable of perception of facts (5) achieved the greatest percentage gain over initial test results, while starting from the lowest percentage score on initial test. The variable of ideological rational for understanding (I) started from the highest percentage of possible score on the pretest, yet was second highest on the final adjusted mean score. Variable V represents an expected event, while variable I represents an unexpected event.

The results for Variable II were unexpectedly higher than for Variables III and IV (except for the F.ratio sizes). It may be suggested that the unexpected relative higher percentage change represented in Variables I and II

are a direct result of the attempt to clarify ideologies in the course of the educational treatment. Perhaps, confronted with a clarification of ideologies and feelings associated with different interest groups in the issue, the subjects accepted them at face value. Beyond the scope of this investigation, the variables could be examined over time to determine the extent of retention. If, on the other hand educational treatment clarifying ideologies and feelings presents the client group with new perceptions of these two variables, continued exposure to the new perceptions may lead to retention as part of the learning experience.

It was explained in the discussion of concepts that perhaps education is best fitted, in the short run, to disseminate information or facts. Or it could be expected that, normally, educational programs result in more gain by clients in the area of information and knowledge under established methods of evaluation. In so far as the conditions of this investigation are representative of educational programs in total, the expected result was achieved in the present study in the factual variables.

It had been expected that the gain for the disposition to act variable would be similiar to those for the factual variable. This expectation was not supported by the results. While starting with a higher percentage of maximum score on the initial test, as compared with the factual variable, the final score percentage of maximum also was

greater for the disposition to act variable. The unexpected difference was in the percentage of gain. There is no evident explanation for this failure to meet with the expectations. Additional research, beyond the scope of this study, is suggested as a means of clarifying this finding.

In an attempt to measure reaction of the experimental group subjects to the educational treatment, each was asked to indicate if he felt any changes as a result of participating in the training school. The results of this question suggest that a high percentage felt they had experienced some change. Their responses, on a variable to variable relationship with the expectations outlined for the study, perfectly matched those expectations. In other words, what the researcher anticipated as possible outcomes for each order of change among variables matched with the perceptions of the subjects as to what they got out of the experience.

Summary-Conclusions

This has been an experimental investigation to assess the influence of an educational treatment upon five variables of position. The educational awareness experience was utilized as the independent variable in the study. It was administered in three separate meetings as a training school in hunter-landowner relations. The five components of position were used as dependent variables. Both the experimental and control samples were

measured through responses on an instrument designed for this study.

The population sampled consisted of a selected roster of leaders within the hunting organizations in the Detroit area. Following the completion of the pre test, a rank order of scores was arranged. From this rank order, the experimental and control samples were identified by a coin toss procedure. The experimental sample consisted of 24 individuals after attrition while the control sample at completion of the experiment consisted of 16 men.

It was necessary to develop an instrument for this investigation. The initial stage consisted of building a universe of statements dealing with the attributes to be measured. Five-category response items were used in the initial trials of the instrument. Later, the first two variables were given scalogram type items while the other three variables were designed as six-category Likert type scales. A preliminary experiment was conducted using this revised instrument. A control group also was utilized in the preliminary experiment.

Throughout the development and revision of the testing instrument, the advice and counsel of experts in conservation was used to supplement the findings in the trial efforts. The final instrument was reviewed by a quasi-panel of such experts.

The attempts to test reliability of the instrument

included initial and second tests by subjects, correlations among responses to the test for each variable, responses by groups of subjects expected to have different attitudes regarding the issue, and repeated attempts to improve the items. As indicated above, validity was examined by a group of experts in conservation. The preliminary attempts at testing the instrument indicated the ability to differentiate among respondents and among variables.

Experts were obtained to present the subject matter at the training school. The investigator played the role of teacher-organizer for the educational treatment. The methods used followed problem solving styles.

The statistical procedures used to examine the data collected consisted primarily of the analysis of variance and analysis of covariance. These methods of analysis perform the function of testing the hypothesis of difference of means. The original data was also tested for normal score distribution and then was normalized by statististical procedures. The means for the experimental sample were larger at post test than at pre test for all variables. Only in the third variable was the change in mean resulting from the educational treatment less than significant at the .01 level. For this variable, the change was significant between the .01 and .05 levels.

The major conclusion to be drawn from this study is that, as an initial study of the concepts put forth, the study contributes to the methodology of adult education

an approach which needs further clarification. Both the method of observation and the evidence obtained, while they led to acceptance of the hypotheses in the present study, stand to be improved by further review and testing beyond the scope of the present study. The present investigation has served the purpose of concentrated and theoretical observation of a practical field problem.

It has been stated in the background for this study that there is a highly significant need to research the phenomenon of issue-solving rationale in social conflict issues that must be confronted by adults in this generation. Likewise, the educational procedures used by all manner of adult education agencies and institutions, in relation to issues of community and resource development, must be researched in the interest of efficiency, and in the interests of efficient use of the resources available to educational enterprises.

Specifically, the data analysis used under the conditions of this study, may be interpreted as evidence that it is possible to:a) develop educational awareness experiences around the concepts of the components of position, and b) that use of such an educational treatment will result in a gain or improvement in position toward an issue when position is represented by the components identified for study.

Chapter 7

Limitations and Recommendations

Limitations

The nature of scientific research is such that it cannot be all encompassing. Investigations are prone to have limitations. This is a product of the complexity of experimental activities in which the investigator must, in so far as is practical with the specific problem, control, account for, or specify the many variables of subjects, events, equipment and methodology. The complexities do not "hold still" or remain constant especially in the field experiment over the period of time the observations are being made. Time itself becomes an important and significant variable.

One of the practical limitations of the present investigation has been the fact that experimental observations were time limited. The treatment which has been reported, and related research, can be expected to have a differential influence upon subjects over extended periods of time. An immediately observed effect of the educational treatment will not necessarily correlate with

an observation of the same attribute one week later, or a month later, or six months later. In some cases, the immediate effect is stronger than in later observations, but it is also possible that postponed observations reveal strengthening of the dimension over time.

In the present problem, two of the variable components of position were held to be in the nature of psycho-attitudinal attributes. In the short run experimental treatment it cannot be expected that changes in the strength of these dimensions will be deeply internalized by the clients. The treatment itself may generate new perceptions of these dimensions which may act as the initiators of long range deeper internalizations.

The treatment directed toward the more behaviorial and factual dimensions of the study may be expected to have a more immediate effect upon the subjects. It is to be expected that the new information and procedure for taking action represented in these dimensions are more easily assimilated into the real life problem facing structure than the psycho-attitudinal dimensions treated in this study.

A second limitation of the investigation reported here derives from the field setting of the experiment, together with the utilization of existing group members as subjects. This limitation is confined to the reflections upon statistical procedures, the uncontrolled extraneous variables, and the inferences to larger populations.

At the same time, the field experiment has certain advantages relating to the practical relationships between subjects and issues which may not be duplicated in laboratory conditions.

The selection of a specific population is a product of the limitations from field experiments. Yet the experiment itself bears a direct and real relationship with the conditions existing among the potential client situations. The relatively normal conditions and properties of the subjects are the function of the social milieu in which they occur. Removal of these conditions for the benefit of greater experimental precision would be an act which would lead to engagement of unreal conditions which in turn would bias the experiment. It is a defensible arguement that where the problem is, there the experiment and the research should be.

Size of sample may be classed as a limitation for this investigation. It is, however, to be argued that the specific problem calls for small groups of individuals in the educational treatment as a method of maximizing inter-personal relationships. From a practical standpoint, it was necessary to use those subjects who were able to make themselves available during the experiment.

In some respects, it may be classed as a limitation that five variables were grouped together for observation. To be sure, one or two variables permit greater assessment of attributes. For this study, the array of five dependent

variables consisted of interacting dimensions which could be influenced by the same educational treatment. This is a further confirmation of the belief that the design for research should be fitted to the specific problem.

Recommendations

The recognition of limitations imposed upon the present investigation gives rise to suggestions for further research. The need for research directed toward testing imaginative educational treatment ideas for the development of issue-solving rationale is reiterated in these suggestions.

The point has been made previously that the development of an education program to treat issue-solving might entail repeated involvement of the same clients. This declaration leads to the recommendation that research efforts should be developed to observe client behavior following client involvement in successive educational treatments. For example, a long duration investigation might be entertained in which clients could enroll in a succession of issue-solving adult education programs. An initial measurement of attributes, followed by a post test after each educational event would have the dual purpose of investigating the "repeat" effect and the time effect.

Research needs to be directed toward clarification of the minimum and maximum limits of both time and

educational "load" necessary to achieve results of satisfactory strength. The issue-confronting adult is time bound with daily events and can devote precious little time to classlike engagements. He is highly selective in his choices of what it is he wishes to learn about, his retention period is correlated with the selectivity he exhibits. He is often confronted with new issues in such a way that there is no time for a full scale training or learning experience in issue solving.

Large scale research projects are recommended in which several groups or samples may be observed simultaneously in testing the concepts of educational awareness experience and the components of position. This would increase the number of subjects and provide larger samples from which to draw inferences. It is conceivable that one planned educational treatment could be utilized with different experimental and control samples. This would hold constant the treatment and vary the sample.

A recommendation for additional research in this subject matter derives from the already completed and continuing research in correlating age of clients with maximum learning capacity. It may be possible to identify at what age the issue-solving training is most effective, or what age groups are most involved in the solving of community and resource issues. Or, it may be determined that some dimension of maturity other than age may be associated with activities of an issue-deciding

nature. Research of this kind would provide economies in the planning of educational programs.

The acknowledged limitations of this study may be assumed to suggest that there is a legitimate need for further research in the attempt to isolate and identify both the programming evaluations and the impacts of adult education programs in community and resource development. References have been made to the general need for the type of educational experience in these fields which will present learning opportunities for clients in the critical areas of ideological rational and emotional feelings. In the rapidly changing society, it can be argued that much energy is eroded by groups and by individuals because the rationale used to resolve issues is a function of long-standing conflicts of ideologies, of political beliefs, of skepticism of trained experts, of incomplete or imperfect knowledge, and of imprecise perceptions of how action should proceed. What needs to be further researched is the methodology by which clients may prepare themselves for logical and rational consideration of the issues to be solved in the complex interacting issues of the modern affluent society and culture.

Appendices

Appendix A

Preliminary Instrument

Questionnaire on Hunting

Following are three sets of statements relating to hunting. Please read each set carefully, then go back and place X in the blank at the left of the statements you agree with, and leave blank those you do not agree with. After you have done this for one set, then go to the next set and do the same.

Set A

a.___ Free men are entitled to wild game in their country.
b.___ Hunting is a natural right of free men.
c.___ Hunting is a form of recreation for those who like it.
d.___ Hunting is a privilege, not a right.
e.___ Hunting, as a privilege, must be under the close and rigid supervision of officials of the state.

Set B

a.___ Individuals in our society can claim ownership of game animals.
b.___ Groups of individuals can claim ownership of wild game animals.
c.___ The people collectively own wild game in our society.
d.___ The state, not the people, has ownership of wild game.
e.___ The state retains ownership of game even after it is killed.

Set C *

a.___ State government must be active in game management and hunting regulations.
b.___ State activity in management and regulation is about right now.
c.___ State activity in management and regulations needs to change when conditions change.
d.___ State activity in management and regulation should increase now.
e.___ State activity in management and regulation should be increased greatly because conditions are graetly changed now.

*This item was rejected completely because of the failure to scale with preliminary respondents.

Please read each of the following statements then check either agree or disagree depending on how you believe it should be.

Agree	Disagree	
___	___	Hunting is a dangerous form of recreation.
___	___	Hunting on private land without permission really isn't like trespassing even though the law treats it as trespassing.
___	___	State game management experts are not very realistic about managing the wild game situation.
___	___	People who don't hunt shouldn't have as much influence on hunting regulations as real hunters.
___	___	Land owners seem to have a grudge against hunters.

For the following sets of statements, place X in the blanks to the left of those which you agree with and leave blank those you can't agree with. Please read each set carefully before you mark any of the statements.

Set D

It seems to be a passtime for some to talk about hunter-landowner relations and whether or not there are real problems between the two. How do you feel about this?

a.___ I don't feel there are any particular problems.
b.___ There are probably some problems we have to be concerned about.
c.___ Such problems as we may now have can be controlled by our present laws.
d.___ Present problems are such that laws should be a little stronger.
e.___ Present problems are such that laws should be much stronger.
f.___ Present problems are such as to threaten the future of hunting.

Set E

When I hear the stories going around about damages by some hunters, my usual feeling is that;

a.___ Its only a few careless hunters, we can't prevent it,
b.___ Its only a few careless hunters, and the damages are small anyway,
c.___ Because of damage by careless hunters, we'll have to do more educational work.
d.___ Such carelessness will bring about the closing of more land, and there is entirely too much carelessness,
e.___ All this carelessness by some hunters will completely spoil the sport of hunting.

Set F

When anyone tells me that hunters don't respect the private property rights of owners, my usual response is to;

a.___ Just pass it off as of little importance.
b.___ I think I become a little disturbed about it.
c.___ I guess to tell the truth it makes me a little mad.
d.___ It makes me quite mad.
e.___ It makes me feel very mad indeed.

Please mark in the columns at the left of the following statements to show if you agree or disagree with what is said, using X to indicate agree or disagree.

agree	disagree	
___	____	a. Land owners don't treat hunters very well.
___	____	b. The problems of hunting aren't as bad as some people think.
___	____	c. Hunters don't have enough voice in the management of game.
___	____	d. Law enforcement favors hunters more than owners.
___	____	e. Hunters don't understand the private rights of the owners.
___	____	f. Actually, hunters and owners get along well.

Please place X in the blanks before the statements in this next set if you agree with them and leave blank those which you don't agree with.

Set G

So far as becoming personally involved in any kind of action to improve the hunting situation, and providing whatever you think is the necessary relationship with land owners, what ideas do you have?

a.___ I think we always have to work at these things.
b.___ I think there are times when we need to work harder than usual.
c.___ I think this is one of the times we need to work a little harder.
d.___ I think this is one of the times to work much harder than usual.
e.___ I am convinced that this is a time of urgent need for an intensive program of hard work.

Following are three groups of statements. At the left of each statement is a blank space. Read each statement carefully and then place a number from one to six in the space depending on how much you agree or disagree with the statement. The numbers have the following meaning;

1-if you agree very strongly
2-if you agree strongly
3-if you agree just a little
4-if you disagree a little
5-if you disagree strongly
6-if you disagree very strongly

Just pick the number that best tells your feeling about the statement and place that number in the blank.

a. * Things will work out all right if we just have patience.
b. ___ Things are not so bad, lets not get all excited now.
c. ___ We have a Conservation Department, let them handle the situation.
d. ___ We, meaning me too, must take action immediately.
e. ___ I don't want to become involved yet.
f. * Long range programs by our clubs is what we should have on this.
g. * There's plenty of time to get things worked out.
h. * We'd better decide what we're going to do and get at it now.
i. * I think this calls for some good committee work first of all.
j. ___ I'm ready to do what I can, and I think we better get started.
k. ___ There are other things for the club to work on first.
l. ___ I wish we could get going before next hunting season, so we won't have the same problems again.
m. ___ It hasn't been proven to me that anything needs doing, at least no more than the clubs usually do.
n. * I think we just better leave things alone for the time being.
o. ___ We just can't wait for further developments, we must act now.
p. ___ We can always wait for someone to come up with something better.

---

a. ___ Problems could be controlled by increasing license fees.
b. * An expanded educational program will curtail problems for us.
c. * More State hunting land is the solution.
d. ___ The solution to hunting problems lies in stricter laws.
e. ___ Getting hunters and owners together to take action is the best way to try to solve the problem of careless hunting practices.
f. ___ Changing the hunting season dates would curtail problems.

* The asterisk indicates items rejected

g. * Land owners should ban together to set up common rules for hunters.
h. ___ The best way is to have hunters, owners, and the Conservation people work out the solutions together.
i. * The legislators should be the ones to solve any problems on this.
j. ___ Stronger punishment of offenders will stop careless hunting.
k. ___ Hunter organizations have to take the responsibility to inform and educate all the hunters.
l. * Joint action committees with hunters and owners working together will get at the source of local problems.
m. ___ The first job is for a complete examination of the present situation.
n. ___ Law enforcement people should be more active in stopping the careless hunter.

---

a. ___ The Horton Trespass Act is the chief law involving hunting.
b. ___ Most land owners don't find time to prosecute careless hunters.
c. ___ Law enforcement officials are working hard on careless hunting.
d. ___ The State retains ownership of game even after it is killed.
e. ___ Most landowners are agreeable to letting hunters use their land.
f. * Most hunters respect the property and rights of owners.
g. ___ Posting private land has effectively reduced trespassing by hunters.
h. * Local governments have the power to close lands to hunting.
i. ___ Only the state can close hunting areas.
j. ___ The Horton Act can only be enforced by the conservation department.
k. ___ The two requirements for closing hunting areas are an increase in careless hunting and population growth in the area.
l. * Landowners are legally responsible if a hunter is hurt on land which they control.
m. ___ Stories get around about reckless hunters threatening landowners with personal harm, but these things really don't happen.
n. * The season long hunter is a different character than the hunter who hunts only on opening day of the season.
o. * The number of hunters in Michigan rises each year.

p.___ It is legal to go on private land without permission to get game that you have wounded while hunting where you had permission.
q.___ There is a nusiance involvement for landowners when so many hunters just stop to ask about hunting on privately owned land.
r._*_ Legally you do not have to ask permission to hunt on private land that has not been posted.
s.___ Current hunting laws would be more effective if more prosecutions were carried out.

---

* The asterisk indicates items which were rejected from further use in succeeding versions of the questionnaire.

Appendix B

The differences between low 1/3 and high 1/3 means for each of three groups responding to the preliminary instrument. The 49 statements represent the Likert type items used for the measurement of Disposition to Act, Perception of Appropriate Action, and Perception of Facts.

Varaible III Disposition to Act

Item number	Respondent groups: Faculty-student N=24	Owners N=8	Hunters N=7
a. *	.38	2.00	3.50
b.	.50	3.50	2.00
c.	.00	1.00	.50
d.	1.50	1.50	1.50
e.	1.88	2.50	.50
f. *	.63	.50	-1.00
g. *	.63	.50	2.00
h. *	1.25	-1.00	1.00
i. *	1.25	- .50	.50
j.	1.38	2.00	1.50
k.	.38	-1.50	1.00
l.	.25	.00	1.50
m.	1.13	1.00	.50
n. *	1.38	.00	1.00
o.	1.88	1.50	1.00
p.	1.50	2.00	1.00

Variable IV Perception of Appropriate Action

a.	.13	1.00	2.00
b. *	.38	1.50	- .50
c. *	.38	1.50	-1.00
d.	.50	1.00	.00
e.	1.13	1.50	1.50
f.	1.00	1.00	1.00
g. *	2.13	-2.00	.00
h.	1.63	.00	1.00
i. *	1.00	.00	1.50
j.	1.63	2.00	1.00
k.	.13	- .50	1.50
l. *	1.00	.50	2.50
m.	.88	.50	- .50
n.	.38	.50	1.00

*The asterisk indicates those items which were rejected from inclusion in succeeding versions of the instrument. The magnitude of difference between low and high third plus the content relationship were criterion for retention.

Variable V Perception of Facts

Item	Respondent groups: Faculty-student N=24	Owners N=8	Hunters N=7
a.	.13	1.00	1.50
b.	.75	2.00	1.00
c.	-.75	1.00	-1.50
d.	.00	-.50	1.00
e.	1.00	2.50	- .50
f. *	-.75	.50	-.50
g.	.25	3.00	.00
h. *	.50	-.50	-1.00
i.	1.25	-1.50	-1.00
j.	.38	.50	2.50
k.	.13	2.50	1.00
l. *	-.63	-1.50	-2.50
m.	-.38	.50	3.00
n. *	1.00	-1.00	2.00
o. *	-1.13	1.50	-2.00
p.	1.00	2.00	1.50
q.	1.63	2.00	3.50
r. *	1.13	.50	.50
s.	-.88	2.50	2.50

* The asterisk indicates rejected items.

Appendix C

Hunter Group, Owner Group, and Faculty-Student Group response scores to 49 Likert Items on Trial Instrument

Group	Number	Mean	Standard Deviation
Fac. Stud.	24	193.500	16.08
Owner	8	202.250	16.918
Hunter	7	206.857	17.995

Ranking by group subjects on raw score and T-score

Raw Score			T-score		
Fac.Stud	Owner	Hunter	Fac.Stud.	Owner	Hunter
		240			68
	225			63	
	224			62	
217			64		
		215			54
214			62		
213		213	62	62	
211			47		
210			60		
		209			51
206			57		
		205			48
		204			48
203			55		
202			55		
202			55		
201			54		
	200			48	
198			52		
	197			46	
193			52		
191	191		48	43	
190	190	190	47	42	40
190			47		
189			47		
189			47		
188			45		
186			45		
		185			37
184			44		
179			40		
	178			35	
169			34		
169			34		
150			22		

Appendix D

Questionnaire to Expert Quasi-panel

To: Faculties in Conservation and Staff Personnel in the Michigan Department of Conservation.

From: Eugene F. Dice, Graduate Student, University of Mich.

Dear Sir:

In the course of designing research questionnaires, it becomes necessary to establish a high level of validation for the subject matter and arrangement of the questions. It will be highly appreciated if you will examine the enclosed items and give me your judgement as to their validity.

The final questionnaire will be used in an experiment with about 70 sportsmen's club leaders.

When you have had time to examine the items and comment upon them, you may return them in the attached self addressed envelope. It will be most helpful if you can do me this favor at an early moment.

I sincerely thank you for this assistance.

The six sets of statements are each assumed to represent a continuum from weak toward stronger content (or from low to higher accuracy) in a ranking manner. Each b. statement is assumed to be stronger than its a. companion, each c. statement higher than its b. companion, etc. What I need is your good judgement as to whether the assumed rank order does exist in each set.

After each set there is a X followed by a blank. If you feel after reading each set that the assumed rank order exists in the set, then please place an OK in the blank after the X.

If you feel that the assumed rank does not exist in a given set, please use the blank spaces before the statements to make a correct order of statements. For example, if you feel that the existing order (a.b.c.d.e.) is not correct, you may want to substitute d.b.a.c.e. or some other order.

Set A. In our modern way of living, I believe that the hunting of small game should be regarded as:

a.___ a natural right to be freely enjoyed by mankind.
b.___ a natural right and a form of recreation.
c.___ a lawful privilige and a form of recreation, not a right.
d.___ a lawful privilege and a form of recreation which has to be supervised and controlled by a wise and

firm agency of the state government.

X___

Set B. So far as ownership of wild small game in our kind of society, I believe that:
a.___ it should belong to the individual taxpayers,
b.___ it should belong to the people collectively,
c.___ it should belong to the state, since the State is a legal entity,
d.___ it should belong to no one, but the State must exercise an ownership relationship to regulate game and hunting.

X___

Set C. I believe that all the reports about hunter-landowner problems only means that:
a.___ its only a few careless hunters and damages are slight,
b.___ its only a few careless hunters, and we can't do much about it,
c.___ a littlemore carelessness will result in some real problems,
d.___ landowners and the public will outlaw hunting if we have many more problems.

X___

Set D. People react differently to reports of fence cutting, crop destruction, wounded livestock, owners who refuse to allow hunting on their land, etc. As for me,
a.___ I guess it disturbs me some,
b.___ I guess, to tell the truth, it makes me a little mad,
c.___ it makes me feel quite mad,
d.___ it makes me feel very mad indeed.

X___

Set E. Someone always starts a discussion about problems between hunters and owners. It is my feeling that:
a.___ there are probably some problems to be concerned about,
b.___ present laws are capable of handling the problems we have,
c.___ present problems call for somewhat stronger law,
d.___ present problems call for much stronger laws than we have.

X___

Set F. People have different ideas about the possible need to work on improving the so called problems between the hunters and landowners. I believe I feel like:

a.___ we always need to work on these kinds of things,
b.___ we sometimes need to work harder than at other times,
c.___ we need to work a little harder now,
d.___ we need to work quite a bit harder now,
e.___ we need to work very much harder now than before.

X___

Appendix E

Correlations between group score means for five variables observed

Control Group	Pretest					Posttest				
Variable	I	II	III	IV	V	I	II	III	IV	V
I	1.00					1.00				
II	-.08	1.00				.06	1.00			
III	-.24	.39	1.00			-.08	.42	1.00		
IV	.26	.05	.71*	1.00		.37	.14	.29	1.00	
V	.50*	-.09	.21	.20	1.00	.57*	-.17	.12	.19	1.00

Experimental Group

Variable										
I	1.00					1.00				
II	-.18	1.00				.12	1.00			
III	.23	.09	1.00			-.05	.04	1.00		
IV	.33	.16	.38	1.00		-.08	.20	.32	1.00	
V	.55*	-.21	.16	.17	1.00	.14	.04	.47*	.32	1.00

*The asterisk indicates significant correlations.

Appendix F
Final Instrument

Examination Paper for
Hunter-landowners Training
School Fall 1964

Student name_____ No._____

Instruction number 1

Following are several sets of statements(Set A through Set H). Please work out your answers for one set at a time. For example, read all the statements in Set A, then place X in the answer blanks for any or all the statements in that set which you agree with. Don't put any marks in front of the statements which you do not agree with. When you have done this with Set A, then go to the next set and work it out in the same way.

Set A In our modern way of living, I believe that hunting of wild game should be regarded as;

a.___ a natural right to be freely enjoyed by mankind,
b.___ a natural right and a form of recreation,
c.___ a lawful privilege, a form of recreation, but not a natural right,
d.___ a lawful privilege and form of recreation which has to be under the wise and firm supervision of state government.

Set B So far as the ideas about who owns wild game animals in our kind of society, it is my belief that;

a.___ it should belong to individual taxpayers,
b.___ it should belong to the people collectively,
c.___ it should belong to the state,as a legal entity which represents all the people,
d.___ it shouldn't really belong to anyone, but an agency of the state must exercise an ownership relationship to regulate and control it.

Set C

a.___ the sport of hunting is getting too dangerous in our state.
b.___ hunting on private land without permission really is not like trespassing even though the law regards it as such.
c.___ state game management experts don't seem to be very realistic in their management programs lately.
d.___ people who don't hunt should not have as much voice in making hunting laws as real hunters do.
e.___ landowners seem to have more control over wild game than the rest of the people.
f.___ the state should provide more hunting land.

Set D Whenever I hear or read stories about hunters causing damages or being careless, I feel that;

a.___ its only a few careless hunters and damages are slight anyway,
b.___ its only a few careless hunters, we can't do much about it,
c.___ we're going to have real problems if carelessness keeps up,
d.___ landowners and the public will outlaw hunting if carelessness gets much worse.

Set E People react differently to reports of fence cutting, crop damage, wounded livestock, owners who won't allow hunting, etc. As for me;

a.___ I guess it disturbs me some,
b.___ I guess to tell the truth it makes me a little mad,
c.___ It makes me feel quite mad,
d.___ It makes me feel very mad indeed.

Set F Someone is always starting a discussion about problems between hunters and landowners. It is my feeling that;

a.___ there are probably some problems to be concerned about,
b.___ present laws are capable of handling the problems we have,
c.___ problems at present call for somewhat stronger laws,
d.___ present laws call for much stronger laws than we now have.

Set G

a.___ land owners don't treat hunters very well,
b.___ the problems in hunting are not as serious as they sound,
c.___ hunters don't have enough voice in game management,
d.___ law enforcement favors landowners more than hunters,
e.___ hunters don't fully understand the owners private rights,
f.___ actually, hunters and owners get along pretty well.

Set H People have different ideas about the possible need to work on improving the so-called problems between hunters and owners. It is my feeling that;

a.___ we always have to work on these kinds of things,
b.___ we sometimes need to work harder than at other times,
c.___ we need to work a little harder now,
d.___ we need to work quite a bit harder now,
e.___ we need to work very much harder now than before.

Instruction number 2

Following are three groups of statements dealing with different aspects of hunting. For each statement, decide how strongly you either agree or disagree with what is said. Then, instead of placing X in the blank spaces, use the number which indicates how strongly you agree or disagree. Read each of the statements carefully, then use the following scale to tell how strongly you feel. For example, if you agree a little with what is said, put a 3 in the blank, or if you disagree very strongly, then put a 6 in the blank.

answer scale

1- if you agree very strongly
2- if you agree strongly
3- if you agree a little

4- if you disagree a little
5- if you disagree strongly
6- if you disagree very strongly

---

a. * Lets not get excited, things will work our all right.
b. * We should leave these problems to someone like the conservation department.
c. ___ We must all take some action right away.
d. * I don't want to become involved at this point.
e. * There are other more important things to work on first.
f. ___ I'm ready to do what I can, we better get started.
g. ___ I wish we could get started so that we can solve some problems.
h. * It hasn't been proven that we need to do much now.
i. ___ We just can't afford to wait for further developments.
j. * We can always wait, someone will come up with something useful.

---

a. * Hunting problems could be controlled by increasing license fees.
b. * Our problems can be solved by getting more state hunting land.
c. * The solution to hunting problems lies in stricter laws.
d. ___ Joint activity by hunter and owner groups will lead to solution
e. * Changing the dates of hunting season is the answer.
f. * Stronger punishment of careless hunters will stop the problems.
g. ___ Hunter organizations need to take the responsibility of informing and educating all hunters as a way to stop carelessness.
h. ___ The most progress will come from hunters, owners, and the Department of Conservation working together on the problems.

i.___ The first job is a complete examination of the situation.
j.*__ More law enforcement action will put a stop to carelessness.

---

a.___ No other act is as important to hunting on private land as the Horton Trespass Act.
b.___ Most landowners don't find time to prosecute offending hunters.
c.*__ Peace officers are working hard to reduce offending practices by hunters.
d.___ The State retains an ownership right to game after it is killed.
e.___ Most landowners are agreeable to letting hunters use their land.
f.*__ Posting private land has effectively reduced hunter problems.
g.___ Except for city property, only the State Legislature can close large areas of land to prevent hunting.
h.*__ Only conservation officers can enforce the Horton Act.
i.___ There are two requirements for closing areas to hunting, too much careless hunting, and too many people in the area.
j.*__ You hear stories about some hunters who threaten owners when they want to hunt, but these things really don't happen.
k.*__ Legally, you don't have to get permission to go on private land to get game you have wounded elsewhere.
l.___ It becomes quite a nusiance to the private owner when lots of hunters stop to ask permission to hunt on his property.
m.___ Current hunting laws would be more effective if more prosecutions were carried to completion by owners.

Use this space to add any other notes you may have.

* Asterisk indicates items considered to be false or unfavorable in content.

The following questions are not part of the scoring, but the answers are needed so that we may make certain kinds of groupings and divide the papers.

Place X or a check mark in the blank beside the best answers.

Which of the following comes closest to your actual age?

a.___ 28 to 36
b.___ 37 to 45
c.___ 46 to 54
d.___ more than 54

How much schooling have you completed?

a.___ less than high school grad.
b.___ high school graduate.
c.___ college but not a grad.
d.___college graduate.

Which of the following do you hunt?

a.___ small upland game
b.___ waterfowl
c.___ deer and bear
d.___ larger game animals

How long have you lived in your present city or county (or within 50 miles of there)?

a.___ less than 5 years
b.___ 6 to 11 years
c.___ 12 to 17 years
d.___ more than 17 years

How many clubs or organizations do you belong to (or have you recently belonged to)?

a.___ one or two
b.___ three or four
c.___ five or six
d.___ more than six.

How long have you been a

Hunter	or Land Owner	
a.___	Less than 5 Years	a.___
b.___	6 to 11 years	b.___
c.___	12 to 17 years	c.___
d.___	more than 17 yrs.	d.___

Use this space to add any other notes you may have.

Appendix C

Plans and Ground Rules Presented to Subjects

The objective of this training school is to try to develop a better training method and at the same time to attempt to find ways to improve hunter-owner relations.

The classes will consist of speakers on technical aspects of the hunting situation, together with small-group discussions in which students will add their own ideas and experiences. The idea is to get as manythoughts and ideas as possible out on the tables for review and then come up with some ideas for action. Everyone's help is needed, everyone has at least one good idea.

In order to find out how well this kind of training works, we will divide the total list into two groups. Group one will be called the Training Group, and Group two will be called the Check Group. You will be notified by mail as to which group you will be in. Group one will become trainees for the three class meetings. Group two will not attend the training meetings, but these men will attend a special meeting at the end of the training period. Both groups will then take a final exam.

By comparing the scores of the Training group with the scores of the Check group, we will be able to tell how much progress has come from the training meetings. So, this means that both groups are very important to the program.

Ground Rules--Both Groups

A few simple ground rules are necessary if we are to get good results. Even though they are simple, breaking any one of them will mean that the good intentions of everyone are wasted.

A- The subject matter of the examinations and the training classes must not be discussed outside the meetings themselves. Club officers are agreed that this subject matter will not be discussed at the club events during the period the training is going on.

B- The members of tje check group should not try to find the answers to any of the examination questions from any sources outside the group.

C- While you should not discuss the subject matter outside the meetings, you are free to discuss the fact that a training program is being conducted, and what the purpose is.

D- Our news media friends are agreed that they should not print any of the subject matter during the period of training.

E- Each person should do his own work on the examinations and be sure he does not interfere with those next to him. Also, there just can't be any information leaking out from the Training Group to the Check Group.

I hope you will appreciate that these ground rules are not just petty things to be taken lightly. The whole experiment depends upon sticking by these rules, or else we will end up like so many other programs, a lot of talk but no action.

Appendix H

Summary of the first training meeting discussion--presented at the opening of the second training meeting.

Hunting has changed with the changes of the country and the society. Man first needed to live off the "fat of the land". He needed to harvest the meat of wild game for food, the furs and pelts for clothing and shelter. But, over time, man did not exercise good game management. He sought to get all he could whenever he could, in order to keep ahead of his competitors.

We have since changed to the kind of society which does not depend so much on what it finds in the open wilds. Hunting has become a recreational activity for the most part. The state has had to take over the management of wildlife because the flocks and herds were being depleted. The result was the establishment of hunting seasons as a means of protecting a supply for the future.

We have all heard it said that we, or they, or I, have a right to wild game. The idea of rights to wild game as well as ownership of wild game came from the past when it was necessary to use wild game as a means of staying alive, when there were vast areas of unsettled land. You can imagine what it would be like today, or twenty years from now, if everyone had a right, and used it, to take wild game where ever and when ever they wanted to.

From this discussion we can see the need for looking upon hunting with a modernized attitude. There isn't enough game for everyone whenever they want it. There isn't enough unsettled land to give everyone all the room they want to hunt on. Some hunting must be done on the property of others who have private investments to guard. Individuals have not exhibited the ability to use good sense and judgement when hunting on someone else's land. Illegal taking of game is still evident. An agency of the state must oversee these hunting and game management activities, to set the seasons, the bag limits, and the courts must entertain the prosecution of violators.

Wildlife exists freely in nature. It is not owned by anyone, but a unit of society, in our case the state government, must play watchdog so that not too much illegal activity occurs. But such an agency as the state conservation department cannot do the job alone. Seemingly you cannot hire enough police to stop all crimes. The control of crime must stem from the minds of men, not the jail cell or the electric chair. This leaves

a tremendous job to be done by organized hunters in getting busy and staying busy in the knowledge of hunter-owner relations and problems, and to spread the information attempting to curtail offenses.

Sportsmen's clubs can't get the job done alone, and the owner organizations can't do it alone. Neither can the conservation department. But add all these together and much can be accomplished. If these groups do not act together in the investigation and correction of hunting problems, then it is possible that the privilege of hunting will have to be done away with.

One of the things we want to discuss is the best way to go about these tasks. As we work this evening, I'd like you to keep the following points in mind;

1st.-what are the real facts in the hunting problems,
2nd.-what solutions are possible,
3rd.-what are the best ways to work out solutions,
4th.-what action should be taken first?

Our expert helper tonight is Charlie Shick. Charlie has been working on game management education and hunter-owner problems in Michigan for about 25 years. He is a specialist in Game Management working for the Cooperative Extension Service at Michigan State University. After Charlie has placed some ideas and concerns on the table, we will have an opportunity to work in small discussion groups and thing about his message.

Appendix I

Instructions to experimental subjects for a take home problem to be answered before third meeting.

Assume that you are a landowner with crops and livestock in the fields when hunting season opens. Last year you had allowed hunters to hunt on your land. But one group of hunters left a field gate open and your dairy herd was able to overfeed in the green crops. As a result of this, you had to pay a veterinarian $62.00 to treat the cattle.

It is now the opening day of the new hunting season. Hunters have been stopping all day long to ask your permission to hunt on your land.

Your take home problem is to prepare the answer which you would be likely to give to the 16th hunter who asks you for permission to hunt on your land. Bring this answer to the next training school meeting for further discussion.

Appendix J

Summary review of coverage in first two meetings
Presented at the start of the third meeting.

As a review of the first two meetings, the following points have thus far been discussed by speakers and ourselves.

Last week we speculated upon a process for handling problems and decided on the following:

a- examine the situation to separate rumor from fact,
b- identify the real problem, what it is that needs changing,
c- explore the best ways to take action,
d- then take that action which seems best fitted,
e- continue to examine the situation for more improvement.

We had decided that there were three primary parties involved in hunter-landowner troubles and that all three should act together in solving problems. The three include the hunter organizations, the owner organizations, and the department of conservation. All face much more work on these problems than at any time in the past.

It has been suggested that we have changed our hunting activities as we passed from the pioneer stage of development to the modern scientific stage in the culture. This change is given as a basic reason why we must today look upon the rights and privileges of hunting differently.

From Charlie Shick we learned last week that:

1- more and more people in the State means more and more hunters in the State, with less and less land to hunt upon in the future. It is probable that the number of hunters will tend to level off as other activities compete for outdoor time.
2- everyone seems to lay the blame for hunting problems at the feet of the careless, reckless, inconsiderate hunter.
3- the careless hunter is hard to reach with the messages about respecting private rights and property.
4- strong laws don't seem to stop carelessness. The Horton Trespass Act is basically a very good law, but it is difficult to prosecute at present.
5- generally, the owner will allow hunting on his land if:
    a- he can identify you as a responsible person,
    b- he has not already permitted someone else,
    c- the hunting group is small,
    d- he has not recently suffered damage by other hunters,
    e- his crops are harvested or free from damage.

6- some of the worst causes of trouble are:
   a- road hunting,
   b- shooting too close to buildings or livestock,
   c- uncontrolled dogs in livestock areas,
   d- failure to ask permission,
   e- too many hunters in the hunting party.

Appendix K

Instructions for responding to the general question of what kind of change is felt as a result of participating in the hunter-owner relations training school.

For each of the following questions, please indicate what kind of changes you feel as a result of taking part in this training school. Your choices are:

a___ no change
b___ a little change
c___ a lot of change

Please place the letter indicating your feeling at the left of the statement.

1___ In the way you look at the idea of rights to game and the ownership of wild game.
2___ The results of careless hunting, damages and their effect upon owners, and law enforcement.
3___ About the possible need for doing something about improving hunter-owner relations
4___ About the best ways of doing whatever needs to be done to improve hunter-owner relations
5___ So far as knowing more about the real facts in the hunter-owner relations situation.

Appendix L

Analysis of Covariance using the Normalized scores for each variable on pretest and posttest results

Analysis of Covariance for Variable I

Source of Variance	d.f.	adjust. sumsq.	mean square	F.ratio
Between groups	1	427.31	427.31	14.32
Within groups	37	1103.77	29.83	
Total	38	1531.08		

Analysis of Covariance for Variable II

Source of Variance	d.f.	adjust. sumsq.	mean square	F.ratio
Between groups	1	328.14	328.14	8.78
Within groups	37	1382.99	37.38	
Total	38	1711.12		

Analysis of Covariance for Variable III

Source of Variance	d.f.	adjust. sumsq.	mean square	F.ratio
Between groups	1	276.92	276.92	5.05
Within groups	37	2030.65	54.88	
Total	38	2307.57		

Analysis of Covariance for Variable IV

Source of Variance	d.f.	adjust. sumsq.	mean square	F.ratio
Between groups	1	548.33	548.33	7.72
Within groups	37	2629.18	71.06	
Total	38	3177.50		

Analysis of Covariance for Variable V

Source of Variance	d.f.	adjust. sumsq.	mean square	F.ratio
Between groups	1	1127.75	1127.75	17.81
Within groups	37	2342.26	63.30	
Total	38	3470.01		

Scores of respondents for each variable on pretest and posttest by the control and the experimental group subjects.

Control Group

i = score on initial(pretest), f = score on final(posttest)

Subject Number	Variables I		II		III		IV		V		totals	
	i	f	i	f	i	f	i	f	i	f	i	f
1	8	8	11	11	55	52	48	47	56	57	178	175
2	7	7	12	13	47	47	42	40	50	52	158	159
3	8	8	10	10	50	50	45	48	62	62	175	178
5	8	8	10	11	52	49	47	48	62	63	179	179
8	8	8	12	13	48	49	45	44	53	56	166	170
10	8	8	10	10	46	36	48	50	37	44	149	148
11	8	8	12	11	47	44	52	47	53	50	172	160
12	4	4	12	12	57	57	47	49	43	43	163	165
13	8	8	10	10	58	59	47	43	62	53	185	173
16	5	7	9	10	51	51	34	39	46	56	145	163
17	7	8	7	6	39	42	46	45	52	56	151	157
18	7	6	9	8	53	49	47	46	45	55	161	164
19	8	5	10	8	34	36	38	28	48	47	138	124
20	8	8	10	9	50	51	49	49	51	59	168	176
21	8	7	7	6	40	35	48	45	58	59	161	152
23	8	6	10	9	57	58	49	45	57	51	181	169

Experimental Group

1	6	8	11	10	54	56	48	51	43	76	163	201
2	8	8	9	11	46	51	44	51	54	62	161	183
4	4	7	8	10	46	49	40	50	42	57	140	173
7	8	8	9	10	51	52	45	44	52	63	165	177
11	7	7	8	10	58	56	49	47	64	63	186	183

continued next page-

14	6	8	12	14	55	52	50	45	49	60	172	179
15	6	8	12	12	42	60	44	57	53	58	157	195
16	7	8	10	10	40	52	55	51	51	72	163	201
18	8	8	11	13	49	53	50	54	51	73	169	201
19	7	8	10	12	44	43	43	47	48	55	152	165
20	8	8	8	10	47	55	43	43	48	58	154	174
21	7	8	10	10	50	53	44	43	50	57	161	171
23	7	8	9	10	49	53	39	41	54	62	158	174
24	8	8	11	11	45	50	43	45	54	66	161	180
25	8	8	11	14	49	54	40	49	56	62	164	187
26	8	8	10	12	50	50	43	41	60	66	171	177
27	8	8	11	14	40	40	47	50	58	60	164	172
28	8	8	10	10	56	60	48	50	64	75	186	203
29	7	8	10	10	55	57	45	48	62	72	179	195
30	8	8	7	10	39	48	42	51	60	61	156	178
32	7	8	6	6	43	43	38	42	55	58	149	157
33	8	8	9	11	51	59	39	49	45	60	152	187
34	4	8	12	12	39	60	30	57	49	58	134	195
36	8	8	9	8	49	52	45	48	65	69	176	185

Appendix N

Preliminary test responses to six scalogram items for Varaibles I and II by 3 groups of subjects with x= approval or endorsement, and o= non-endorsement

Group	Responses to items					
Hunters	ooxoo	ooooo	ooxoo	xoxooo	ooxoo	ooooo
	oooxx	ooxoo	ooxoo	ooooox	ooxxx	oxxoo
N = 7	oooox	ooxoo	ooxoo	ooooxx	ooxxx	ooxoo
	ooxxo	ooxoo	ooxoo	oxooox	oooxx	oooxo
	oooox	ooxoo	ooxoo	oxooox	ooxoo	oxooo
	xxxoo	ooxoo	ooxox	oxxooo	xoxoo	ooxoo
	ooxxx	ooxoo	xxxoo	oxooxo	oxxxo	oxxxx
reproducib.	.89	.83	.77	.79	.86	.80
	oooox	oooxo	ooxxx	oxxxxx	ooxxx	ooxxo
Owners	ooxox	xoooo	ooxoo	oooooxo	oooox	oooxo
N = 8	oooox	xoooo	xoooo	oxxoox	ooxxx	oooox
	ooxxx	oooxx	xoxoo	ooxoxx	ooxxx	oooox
	ooxxo	ooxoo	xoxoo	oooooxx	ooxxx	oooxo
	oooxx	ooxoo	ooxoo	oooooo	ooxxx	ooooo
	ooxxx	ooxoo	xxxoo	oxxooo	xxxoo	oxooo
	ooxxx	oooxo	xoxoo	oxxooo	xxxxx	oxooo
reproducib.	.95	.83	.75	.84	.95	.88
	xxxxx	xxxoo	xxxoo	oxoooo	ooxoo	oxooo
Faculty	ooxxo	xxxxo	oxxoo	oxoooox	ooxoo	xxooo
	oxxoo	ooxoo	xoxoo	oxoooo	ooxxo	ooxoo
and	ooxox	ooxoo	xoxoo	oxoooo	ooxox	ooxoo
	ooxxx	oooxo	xoxoo	oxoooo	oooox	oooxo
	ooxoo	ooxoo	ooxoo	oxoooo	ooxoo	oxooo
Students	ooxxx	ooxxo	xoxoo	oxxooo	ooxoo	oooxo
	xxxox	ooxoo	ooxoo	ooxoox	ooxxx	oooxo
	oooox	ooxoo	ooxoo	oxooox	ooxoo	oooox
N = 22	ooxxx	ooxxo	xoxoo	oooooxx	ooxxo	oooxo
	ooxxx	xoxoo	xoxxo	oxxooo	ooxxo	oxooo
	oooxx	oooxo	xxooo	oxoooo	ooxoo	oxooo
	ooxxx	oooxx	xxxxx	oxoooo	ooxxx	oxooo
	xoxxo	ooxoo	xoxoo	oxooox	ooxxo	ooxoo
	xxxxx	ooxoo	xxooo	oxoooo	ooxoo	oxooo
	ooxxx	ooxxo	xxxoo	oxxooo	ooxxx	oxooo
	xoxoo	ooxoo	xoxoo	ooooox	ooxxo	oxooo
	ooxxx	ooxoo	xoxoo	oxoooo	ooxoo	ooxoo
	xoxoo	ooxoo	oxxoo	oxxooo	oxxoo	oxooo
	oooxo	ooxoo	ooxoo	oxoooo	ooxoo	oxooo
	ooxoo	ooxoo	ooxoo	oxoooo	ooxoo	oxooo
	oooxo	ooxoo	oooox	ooooxo	oooxo	ooxoo
reproducib.	.87	.79	.73	.82	.83	.80
Total Rep.	.88	.81	.74	.82	.86	.82

Bibliography

1 Bradford,Leland P. "The Teaching-Learning Transaction". in Bennis,Benne,and Chin. The Planning of Change. New York: Holt, Rinehart, and Winston,Inc., 1961, 781pp.

2 Brunner, Edmund DeS. An Overview of Adult Educational Research. Chicago: The Adult Education Association, 1959, 275pp.

3 Cartwright, Dorwin." Achieving Change in People". in Bennis, Benne, and Chin. The Planning of Change. New York: Holt, Rinehart, and Winston, Inc., 1961 781pp.

4 Cochran, Wm. G. and Cox, Gertrude M. Experimental Designs. 2nd. ed. New York: John Wiley & Sons, Inc., 1960, 611pp.

5 Counts, George S. "The Impact of Technological Change", in Bennis, Benne, and Chin. The Planning of Change. New York: Holt, Rinehart, and Winston,Inc., 1961, 781pp.

6 Cronbach, L.J. Essentials of Psychological Testing. New York: Harper & Brothers Publishers, 1960, 650pp.

7 Dixon, W.J., and Massey, F.J.Jr. Introduction to Statistical Analysis. New York: McGraw-Hill Book Company, Inc., 1957, 488pp.

8 Doby,John T; Suchman, Edward; Francis, Ray; McKinney, John C.; and Dean,John. Introduction to Social Research. The Stackpole Company, Harrisburg,Pa.: 1954, 275pp.

9 Edwards, Allen L. Experimental Design in Psychological Research. New York: Holt, Rinehart, and Winston, 1962, 398pp.

10 Edwards, Allen L. Techniques of Attitude Scale Construction. New York: Appelton-Century-Crofts , Inc., 1957, 256pp.

11 Festinger, Leon, and Katz, Daniel. Research Methods in the Behavioral Sciences. 3rd print., New York: The Dryden Press, 1953, 660pp.

12 Gibb, Jack. "Learning in the Adult Group". Review of Educational Research, vol.29,no.3(June 1954), ppg. 256-261.

13 Good, Carter V. Introduction to Educational Research. New York: Appelton-Century-Crofts Inc., 1959,424pp.

14 Goode,Wm.J. and Hatt,Paul K. Methods in Social Research. New York: McGraw-Hill Book Company Inc.,1952, 386pp.

15 Green, Bert F. "Attitude Measurement" in Lindzey, Gardner. Handbook of Social Psychology. Reading, Mass.: Addison-Wesley Publishing Company Inc., 1954, 588pp.

16 Hill, Richard J. A Comparative Study of Lecture and Discussion Methods. Chicago: The Adult Education Association, 1960, 153pp.

17 Hillson,Joseph; Wylie, Alexander; and Wolfensberger, P. "The Field Trip as a Supplement to Teaching: An Experimental Study". Journal of Educational Research, vol.53,no.1,(September 1959),ppg 19-22.

18 Jennes,A. "Social Influence in the Change of Opinion: the Role of Discussion in Changing Opinion Regarding a Matter of Fact". Journal of Abnormal Social Psychology, vol. 27, 1932, ppg. 29-34, 279-296.

19 Johnson,Palmer O. Statistical Methods in Research. New York: Prentice Hall Inc., 2nd print.,1950, 377pp.

20 Lewin,Kurt and Grabbe, Paul. "Principles of Re-Education", ppg. 503-509 in Bennis, Benne, and Chin. The Planning of Change. New York: Holt, Rinehart, and Winston Inc., 1961, 781pp.

21 McAshan,H.H. "An Experimental Study of Traffic Safety Films". Journal of Experimental Education, vol.31, no.1, (September 1962) ppg.43-53.

22 Mitnic,L.L. Influencing Ethnocentrism in Small Discussion Groups through a Film Communication, unpublished PhD. dissertation, University of Maryland, 1956.

23 Moser, C.A. Survey Methods in Social Investigation. London: Heinemann, 1961, 3rd. printing, 352pp.

24 Novak,Joseph D. "An Experimental Comparison of a Conventional and a Project Centered Method of Teaching a College General Botany Course". Journal of Experimental Education,vol. XXVI,(September 1957 - June 1958), ppg.217 - 230.

25 Riesman, David. "The Researcher and His Audience". in Bennis, Benne, and Chin. The Planning of Change. New York: Holt, Rinehart, and Winston Inc., 1961, 781pp.

26 Rogers,Everett M. Diffusion of Innovations. New York: The Free Press of Glenco, 1962, 376pp.

27 Rumford, Herbert P."An Experiment in Teaching Elementary School Methods via Closed Circuit Television." Journal of Educational Research. vol. 56, no.3, November 1962, ppg. 139 - 143.

28 Scott, Wm.A. and Wertheimer, Michael. Introduction to Psychological Research. New York: John Wiley & Sons, Inc., 1962, 445pp.

29 Selltiz,Claire; Jahoda,Marie; Deutsch, Morton and Cook,Stuart W. Research Methods in Social Relations, revised. New York: Holt, Rinehart, and Winston Inc.. 1963. 622pp.

30 Sower, Christopher; Holland,J; and Freeman, Walter. Community Involvement. Glenco,Ill.: The Free Press, 1957, 323pp.

31 Torgerson, Warren S. Theory and Methods of Scaling. New York: John Wiley & Sons Inc., 1958, 460pp.

32 Travers, Robt.M W. An Introduction to Educational Research. New York: The McMillan Company, 1958, 466pp.

33 Verner, Coolie. Adult Education Theory and Method, Chicago: The Adult Education Association, 1962, 34pp.

34 Walker,Helen M. and Lev, Joseph. Statistical Inferences, New York: Henry Holt and Company, 1953, 510pp.

35 Welch, John M. and Verner, Coolie. "A Study of Two Methods for the Diffusion of Knowledge." Adult Education, vol. XII, no.41, Summer 1962, ppg 231-37.