This is to certify that the

dissertation entitled

The Evaluation of a Simulated Hunt
as a Method for Teaching Hunter Safety and
Responsibility

presented by

Ronald James Saunders

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Education

Major professor

Date 10/3/86

THE EVALUATION OF A SIMULATED HUNT AS A METHOD FOR TEACHING HUNTER SAFETY AND RESPONSIBILITY

BY

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

College of Education
Department of Educational Administration

1986

ABSTRACT

THE EVALUATION OF A SIMULATED
HUNT AS A METHOD FOR TEACHING
HUNTER SAFETY AND RESPONSIBILITY

By

Ronald J. Saunders

The main purpose of this study was to investigate the relationship between certain variables and skills connected with a simulated hunt at a hunter safety workshop. Forty students from the Ypsilanti, Michigan area were divided into two groups. An experimental group was given a hands-on experience in the field which included handling of guns, learning about zone-of-fire, and walking safely over rough terrain. A control group received lectures and films concerning hunter safety.

A survey was formed using the highest risk areas in hunting as reported by the Michigan State Department of Natural Resources. These areas were put into behavior objectives and the state coordinators of all of the hunter safety programs in the United States determined which objectives were the most important and most difficult to achieve. The most important of these objectives were chosen as exercises in a simulated hunt. These included climbing fences, logs, walking through woods and rough terrain, reporting poachers, and shooting at pop-up and stationary targets. Students were evaluated on the simulated hunt by certified hunter safety instructors.

A post survey was given to all students to determine the success of their hunting season.

The principle conclusions from the study were the following:

1. There were no differences in the scores of the simulated hunt or in the final examination given to the two groups.
2. There were no differences in the number of hunting licenses purchased, the number of times hunted, amount of practice, and the number of game killed.
3. The observation of unsafe hunting practices were witnessed by 79 percent more of the participants in the experimental group. It was assumed that the participants who had the hands-on experience were more safety conscious and better able to recognize the unsafe practices of other hunters.

ACKNOWLEDGEMENTS

The research effort would not have been possible without the assistants and cooperation of several very important individuals. First and foremost is my family; my wife Betty and sons Bill and Mark whose love, understanding, and support were constant sources of encouragement and motivation.

Drs. Samuel Moore, Roy Neimeyuer, and Louis Twadziack, as members of the guidance committee, provided valuable insights into the design and analysis aspects of this tudy. Their critical review and comments were both beneficial and educational. I would like to especially thank Dr. Howard Hickey who, as committee chair, provided not only professional expertise and demonstrated a great amount of patience.

I would also like to thank Dr. Ben Payton from the Department of Environmental Studies at Michigan State University, Edward Langenau, and James Dabb from the State Department of Natural Resources for their very important input into the study. Finally I wish to recognize the Washtenaw Sportsmans Club, its officers and its instructors who supported the study by donating their time as volunteers and acted as evaluators for the simulated hunt.

A special debt of graditude goes to two of my collegues at Eastern Michigan University; Drs. Myrna Yeakle and Bruce Warren, Director of the Center for Research Support, for their expertise and suggestions made while reading the final copy.

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CHAPTER I

INTRODUCTION

There is considerable pressure on educational institutions to initiate or expand efforts in the area of outdoor experiential education (Howie 1974). Where can this activity be best conducted? Some advocate that it must be in the outdoor setting because here first-hand information can be found as described by Blomber (1967). Others are just as convinced that the real lasting type of learning can be just as or more effectively taught in the classroom (Ransey 1969).

Much of this pressure is brought about by non-hunters, whose numbers are increasing yearly, due to urbanization. Today fewer than 2 percent of the population live on farm lands or in a rural setting. Singer (1979) is a strong advocate of non-hunting and states that rightness or wrongness of killing animals rests on classical utilitarian considerations. In his studies he points out that it is all right to kill animals if it is painless and without causing suffering to other members of the animal community; that no wrong is done if the animals killed will be replaced by another animal living an equally pleasant life. Beyond this statement Singer emphatically believes that it is wrong to take a human life, therefore, it is

wrong to take an animal's life -- animals and humans have similar interests and those interests should be counted equally. Regan (1977) encourages total elimination of commercial and sport hunting and trapping of animals. Windealt (1977) admits there is no chance at this time to obtain a total ban on hunting as more than 15 percent of the voting population are hunters and no politician is about to risk that kind of voting power.

Twardzik (1986) notes that even Leapold's well accepted ethics based on natural resources stewardship is being challenged today because he approaches his value system from an anthroprocentive perspective. As such, he does not fully consider the rights of animals in his advocacy of hunting for sport and management of habitat. Thus, the onus now falls on the shoulders of the sportsmen who use firearms. They must show the natural response policy makers and the public that great care in education is being bestowed upon young hunters so that they will show the utmost care and courtesy to others as they demonstrate their obligation to be a responsible person and a responsible hunter.

Hunter safety education began in New York in 1950. The program content generally centered around the knowledge of firearm safety, game laws, and map and compass skills (Anderson 1985). Until the late 1970's, firearm safety was considered to be the most important subject to be taught. Since then, new trends have begun to appear and additional required material and teaching hours have taken place

in each state's hunter safety program. Hunter Responsibility was added in 1978 (Jackson 1979) so that students would understand landowner/hunter relationships, poaching and managing the environment. Most recently Moe (1985) advocates that instructors use "The Dilemma Method." This is a teaching method used by teachers where students are in small groups and incorporate problem-solving techniques to specific problems presented by the instructors.

In 1984, Jim Norine, the National Rifle Association's (NRA) Director of Hunter Services emphasized, "Without a doubt, youngsters will be better prepared for a real hunting experience by having an effective hands-on experience in many facets of hunter safety education" (Shelsby 1984). To support this statement the NRA started the Hunter Safety Championship Program in 1984. The students who scored highest at the state level in the cognitive and psychomotor skills of shooting, map-reading, environmental understanding and a simulated hunt were sent to the national competition to determine the best hunter safety student in the United States. Carter and O'Toole (1977) as well as Lankenau (1985) and Jackson (1979) agreed with Norine's statement. Kelly (1970) and Howie (1974) however, found in their research no significant difference in the behavior and performance of students taught science in the classroom compared to those with an added outdoor experience.

The author of this research questioned Mr. Norine about his statement and was informed that he knew of no empirical evidence - it was just a "gut feeling" that a hands-on experience would greatly

enhance a young hunter's skills in a real hunting situation. Dr. Jackson and Mr. Lankenau also agreed they knew of no research to verify that experiential learning actually made a better hunter.

Purpose of the Study

The researcher's main purpose in this study was to investigate the relationship between certain variables and skills connected with a simulated hunt. The specific problems which are explored in the study can be stated in the following manner:

1. Which are the problem areas most important to a young hunter when entering a field on the first hunt? Who will be the experts to determine which skills are the most important?
   a) Are certain skills more important and should have more emphasis than others?
   b) How difficult will it be to teach these skills?
2. Which skills should be included in a simulated hunt?
   a) Are there specific topical areas into which these skills should be divided?
   b) What should the length of the simulated hunt area be?

Hypotheses to be Tested

The hypotheses for this study were devised after a review of the literature. Several studies were found which related directly and indirectly to the questions raised in the previous section. Based on

the documents provided in the review of literature chapter, it was hypothesized that differences would be found between students who had a hands-on experiential learning in hunter safety skills and those who had classroom learning only.

1. There are no significant differences in the scores of the simulated hunt between Group I and Group II students.

2. There are no significant differences in the scores of the required standard test (Appendix K) between students who had an outdoor hands-on experience (Group II) and those who had only classroom instruction (Group I). Group I was a group of 20 students who received the standard lectures required by the State Department of Natural Resources and Group II received an additional hands-on field experience involving handling of firearms, the proper way to walk through a woods, observing zone-of-fire, and learning hunter responsibilities.

3. There are no significant difference in the number of students who purchased a hunting license in Group I and Group II.

4. There are no significant differences in the number of shots taken at live game by Group I and Group II students.

5. There are no significant differences in the number of game killed by Group I and Group II students.

6. There are no significant differences in the enjoyment received in the 1984-85 hunting season by Group I and Group II students.
7. There are no significant differences in the number of students in Group I and Group II who wished to hunt again.
8. There are no significant differences in the number of students in Group I and Group II who acted at least once in an unsafe manner.
9. There are no significant differences in the number of students in Group I and Group II who observed someone else acting in an unsafe manner at least once.

Delimitations of the Study

1. The investigation was conducted using only students residing in Washtenaw County, Michigan.

Limitations of the Study

1. The validity of the post-season study and the questionnaires given to state coordinators of hunter safety are affected by the degree of sincerity and frankness of response to the instruments administered.
2. The evaluators were members of the same sportsman's club.
3. Not all of the state hunter safety coordinators were present at the national meeting for the North American Association for Coordinators of Hunter Education.

Definition of Terms

Bagged game - animals and birds that have been killed and placed in a bag or pouch and sported from the hunting area.

Chamber - a part of a rifle or shotgun barrel where a bullet is placed ready to be fired.

Cocked Gun - a gun that is ready to be fired. The lever (cock) is placed in the open position in readiness for the trigger to be pulled.

Control Group - students who experience only classroom teaching in hunter safety.

Dilemma Method - an artificial device to get students to articulate and reflect on the reasoning required in making ethical decisions.

Duck Decoy - a wooden or plastic replica of a duck used by hunters to lure other ducks in the area.

Experiential Learning - additional experiences which compliments classroom learning by fostering the skill and motivation to act in socially constructive and personally satisfying ways. (Hamilton 1980).

Experimental Group - students who received classroom instruction and hands-on experiential learning.

Hunter Responsibility - moral responsible attitudes and behavior of hunters while hunting legal prey.

Hunter Safety Education - A program basically concerned with the cognitive aspects of teaching youngsters safe hunting habits, game management and ethics (Hunter Safety Handbook 1980).

National Rifle Association - A self-supporting group of sportsmen engaged in a broad shooting program, the real aim of which is to serve all shooters and to teach Americans to shoot safely and accurately.

North American Association of Hunter Safety Coordinators - A group of designated hunter safety coordinators (one from each state) and any other hunter safety instructors who have an interest in stimulating safe and enjoyable hunting (Hunter Safety Instructor 1985).

North American Hunter Education Championship - A national meet sponsored by the National Rifle Association and open to the top students in hunter safety representing the state in which they live. Featured in the meet are four simulated hunting events, a hunter

responsibility test, and outdoor events that include riflery, shotgun, and bow and arrow shooting (Skills Tested at Championship 1985).

Poacher - a person who hunts game illegally.

Pop-up Targets - pieces of boards with pictures of animals or birds pasted on them and when a string is pulled, they appear to pop-up out of the ground.

Ricochet - the motion of a projectile which rebounds one or more times from a flat surface over which it is passing (American College Dictionary 1955).

Safety Catch - a device on guns whereby then depressed should prevent the firearm from firing.

Shotgun Shell Blanks - shot shells that contain a primer and powder but no lead - BB's.

Simulated Hunt - An area chosen in the outdoors where students can exemplify their hunting skills. This area resembles as closely as possible woods, grasslands, and water areas that are normal to the countryside. Students will not shoot high-powered guns or ammunition but instead will use unloaded B.B. guns. The guns will be cocked but have no B.B.'s in the chamber. Instead of live animals or birds, life sized pictures or duck decoys will be used.

Swinging-on-Game - as birds fly or animals run, the muzzle of the gun must be moved (swung) to a spot slightly in front of the prey before the gun is fired.

Zone-of-Fire - an area of approximately 45 degrees directly in front of a hunter. A person should never shoot at game beyond this area when hunting with others.

Overview

In this first chapter the problem was defined, and the purpose of the study was described. In addition, the hypotheses to be investigated were stated and concepts that impinge on the study were noted.

Findings and other literature which relate to the major hypotheses will be presented in Chapter II. The design of the pilot and major study will be described in Chapter III, including a description of the population and the nature of the sample to be used. Demographic data which relate to the geographical location as well as the measuring device will be described. Methods of administration of the instruments will be followed by a statement of the statistical methodology employed.

Chapter IV will be devoted to an analysis of the data gathered in this study. Data will be charted, tabulated and analyzed and the hypotheses tested in the same order as they were presented in Chapter I. The final chapter, Chapter V, will consist of summaries, conclusions, implication and recommendations drawn from the total study.

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CHAPTER II

A REVIEW OF THE LITERATURE

The literature of hunter education can be divided basically into two categories: 1) surveys and research which examine specific areas usually via methodology, surveys and observation, with quantifiable results, and 2) documents either based on other research or on non-empirical observation. Articles reflect the various aspects of hunters, their behavior, success, responsibility, values and education, and history. The purpose of most hunter literature focuses on the need for hunters to increase public awareness by the education of the hunter through cognitive and experiential learning. These learning experiences attempt to establish a code of behavior, upgrading the hunter towards a responsible and ethical sportsman in the public eye.

This chapter will be divided into three parts: 1) other simulated courses in hunter safety education; 2) related fields addressing experiential learning and cognitive development; and 3) hunter safety education.

I. SIMULATED COURSES IN HUNTER SAFETY EDUCATION

In 1981, the International Association of Fish and Wildlife Agencies published a report recommending that "hands-on and live

firing experience" should be required of all basic hunter education courses. It described a field course as "vital to a hunter education training program, since it is designed to test or evaluate the student's actual performance with firearms..." It is through such a field course that a student can demonstrate his/her knowledge during simulated hunting circumstances based upon one-on-one training experiences.

Carter and O'Toole (1977) described the training program in Florida, adopted in 1971, which included class periods, a final exam and field training. The field training encompassed the live firing of rifle and shotgun, shooting archery and a "simulated hunt." The simulated hunt examined the students ability for: 1) proper handling of guns while crossing fences or rough terrain; 2) first aid and survival situations; and 3) game identification through a pre-set compass course. This is the earliest documented article describing the simulated hunt as part of any hunter safety education course.

In the Hunter Safety Instructor, a periodical geared toward educators and instructors, Lankenau (1985) described a shooting education program involving a simulated hunt: "The trail allowed novice hunters to go on a simulated hunt under the guidance of an experienced instructor. A pair of Boy Scouts acted as hunters, involved in mock situations including asking permission from landowners, taking firearms out of vehicles, crossing fences and streams, making decisions to shoot or not to shoot at life-size game targets placed along the trail." Lankenau concludes that such a

course gives students an opportunity to "hunt" under close supervision. In 1984, the National Rifle Association (NRA) began a new hunter safety education program called the Hunter Education Championship, which attempts to allow students to practice what they learn in the classroom. A simulated course was set up in Maryland, described in Shelsby (1984). She quoted Jim Norine, Director of Hunter Services Division, NRA, who concluded "Without a doubt, these individuals will be better prepared for a real hunting experience." Although Norine's statement represented a general understanding of the contribution a simulated hunting course makes to the improvement of skills and experience for the student, the lack of any empirical proof leaves the reader with no more than sentimental conclusions.

The concept of a simulated course to help train young hunters is not new. What is lacking in the literature is any method by which the simulated hunt is used as a test of knowledge and information in one group, and knowledge, information and a "hands-on" experience in the second group. Most educators would agree that such a course refines the student's experience and makes "real" the knowledge learned in the classroom through the observation of his/her behavior, actions and skills. By observing and grading such responses of controlled groups, one is able to determine not only the effectiveness of a "hands-on" experience but the potential refinement of the course itself for incorporation into future hunter safety education programs.

II. RELATED FIELDS: EXPERIMENTS IN EXPERIENTIAL LEARNING AND COGNITIVE DEVELOPMENT.

There is a fundamental question regarding processes of education in the study of hunter skills. The question of cognitive compared to experiential learning is raised and the effect of the exclusion of one, or the combination of the two, has on a student's education. Studies have been undertaken attempting to prove that experience increases the level of cognitive awareness in the student at the expense of lecture-based training.

In a study by Griffith (1978), international road signs are taught to drivers about to be deployed to Germany. Three goups, each having different methods of instruction ranging from a lecture to an oral presentation with slide projector, showed no significant differences in performance. Kelley (1970) discussed classroom performance between two groups of student-teachers (one group enrolled in a 3-semester on-site preparation sequence and a second group enrolled in a one semester on-campus and two-semester on-site sequence) and the results showed no significant difference. Warren (1973) showed where two groups of 12th-grade mathematic students were taught with a lecture method and with commercially available games. The group taught with the lecture method showed greater achievement after six weeks measured by a grade-point average. The author cautioned against over generalizing from this result.

It is generally understood that experiential learning was most realistically seen as complementary to classroom learning rather than

as a competitor or replacement in the sense that it was a more effective means of achieving certain educational objectives (Hamilton, 1980). Hamilton also added that experiential learning narrowed the gap between ends and means, between acquisition and application that characterize conventional classroom learning. Dewey (1938) believed that all learning was rooted in experience. "Experience may be hearing a lecture, reading a book, painting a picture,...but there can be no learning without experience. There can, however, be activity without learning; hence the need for attention to the conditions under which experience is educational." His further rejection of the "either-or's" of experiential vs. traditional learning holds true to this day. Piaget (1970) distinguished between physical experience and logico-mathematical experience, and acknowledges that experience cannot stand by itself in the development of intelligence.

The combination of cognitive learning supplemented by experiential education can create a more effective learning environment (Dustin, 1981; Matthews, 1980). Although Colemen (1977) believed that experiential learning took advantage of instrinsic motivation more than information assimilation, he acknowledged the two properties, generalization and efficiency (of time), which were drawbacks of experiential and cognitive learning combined to equal an academic environment over time, although their emphasis was on the child-initiated pre-school programs (Gilbert, 1986).

III. HUNTER SAFETY EDUCATION

Most research into hunter education is done by describing hunters, their characteristics and behaviors. Improving behavior seems to be a key to hunter safety education, with a movement from safety and skills towards responsibility and ethics.

Social science research has had a strong impact on hunter education. Jackson (1979) has been active in determining the best way to improve ethical behavior in hunters. In training students to observe violations by Wisconsin hunters of waterfowl, five phases have been observed through which hunters pass: 1) shooter-stage; 2) limiting-out stage; 3) trophy stage; 4) method stage; 5) 'mellowing-out' stage. He believed that improving hunter responsibilities happens through education rather than through regulation, identification as opposed to indoctrination. His findings have shown that social approval/disapproval tend to alter hunter behavior more than fines or court sentences. Opposed to this view was Smith (1984), who suggested that hunter education be placed in law enforcement and not in Wildlife Information and Education programs. Even Langenau (1980), in his study of the characteristics and behaviors of Michigan 12-18-year-old hunters, suggested a program designed to improve ethical standards of individuals who hunt, which would include additional hunter education as part of a court sentence. He admitted, however, that additional laws would require more enforcement.

Other research has centered around hunter success. James (1964)

showed that the hunter lacks adequate understanding of wildlife movement patterns and feeding habits. Groves' study (1978) tried to explain the differences among the sighting and/or bagging of game to help agencies design programs for hunter education. His conclusions showed: 1) the more successful hunter spent more time afield exploring hunting areas using low-risk methods, participates in outdoor activities as youths and was reared in rural areas; 2) those less successful looked for tangible outcomes from their experience. Langenau's (1980) results, in surveying 12-18 year-olds who bought resident hunting licenses in 1976, showed that rural hunters have lower scores on a hunting ethics scale, were more likely to violate the law, and tend to begin hunting earlier. He believed that hunters will continue to influence the development of future wildlife programs and discussed ways to increase hunter numbers. Schole (1973) argued that wildlife management agencies should eliminate hunters with low levels of responsibility and ethics, rather than attempt to increase hunter numbers for revenue purposes. Applegate (1977) analyzed the New Jersey hunter population by applying biological concepts such as recruitment, juvenile mortality and age structure. These population parameters are then related to education, occupation, human population density and other social factors. In his 1982 study of first-year hunters in New Jersey, he differentiated between "young" hunter (compare Langenau, 1977) and "new" hunter. His 1977 telephone survey showed that women, blacks and urbanites are underrepresented, and that new hunters are less

successful in bagging game. Most first-year hunters are dependent on one type of land -- that of private land owned by family/friends.

The history of hunter education in North America, although brief (since 1949), has seen hunting made safer and more enjoyable (Anderson, 1985). Skills have usually passed from father to son, although Caskey (1985) mentioned that skilled hunters and trappers, who have traditionally played the master-student role, have disappeared only to be replaced by education classes. Anderson further discussed the role of the NRA in Hunter Education and how these programs have shifted: from maximum participation to enhancing quality of the hunting experience, and from hunter safety to hunter education. Rich (1977) indicated the importance of hunting as a management tool for hunters, and felt that firearms safety instruction should include hunter ethics, basic wildlife, conservation and management, wilderness survival, specie identification and other basic skills. Caskey (1985) goes further and included the history and development of firearms, archery, muzzleloading, orienteering and first aid.

A Jackson survey (1978) showed that unethical behavior occurred among hunter safety graduates more than non-graduates. This led to review and revision of the entire Wisconsin Hunter Education program (Heberlein, et al, 1984). Ethical behavior of the hunter is an important issue in hunter education. R. White ("Education and Ethics," 1985) stressed ethical behavior and defined it as: 1) being able to make a sure clean shot; 2) being able to track and locate

game; and 3) using hunter orange as a safety factor. Moe and Means (1985) used the Dilemma Method as an articial device to get students to articulate and reflect on the reasoning required in making ethical decisions. Landowner relationships seemed also to be an issue which many understand to be an important part of a core curriculum of any future education program (Jackson and Anderson, 1982). A Homer Moe survey ("Wisconsin Plans Advanced Education," 1985) revealed that trespassing and landowner disrespect were the chief problems of today's hunters. Rugaber (1984) believes that young hunters need a good role model to follow, and stresses the positive recreational value hunting can give to the hunter. The transmission of a set of values to be internalized through classroom techniques and discussion is also important in teaching responsibility (Silverberg, 1984). But success was evaluated by hunter performance in the educational process and behavior in the field (Benson, 1985; Stankey and Ream, 1973; Potter and Hendee, 1973).

Langenau and Peyton (1982) considered theories and techniques necessary to enact a policy of creating and modifying public demand. They discussed at length a basic theory upon which strategies could developed to meet objectives for policy enactment, and analyze the belief systems, value systems (which include three stages: clarification, evaluation and prioritization) and behaviors of the public. Their conclusion stressed the importance of Wildlife Information and Education to help the public clarify, evaluate and prioritize value issues. Knowledge and information can change

behavior only when underlying values or belief systems are modified.

There is a movement by the outdoor Publication Empire, a company devoted to the printing of hunter safety education literature, to establish a national manual in Hunter Safety Education, although at the present time most states have their own publications. Niemeyer (1970) supplements other materials from the NRA and included four divisions: 1) Rifles/Air Guns; 2) Shotguns; 3) Pistolry; and 4) Hunter Safety. Station (1982) included, in addition, chapters on Hunting Tradition and Ethics, Hunter and Conservation and Hunter Responsibility, reflecting the growing need to emphasize responsibility in hunter education.

SUMMARY

Current modes of education play an important part in hunter safety education programs. The search for better ways to impart not only skills but also responsibility and safety has been an important issue for those involved in keeping hunting a viable sport for the future. Much of what has been written regarding hunter education reglects opinions through observation rather than by scientific methodoloogy and quantifiable results. Although a few authors have tended toward theoretical research (Langenau and Peyton, 1982) and scientific observation (Jackson et al, 1979; Groves, 1977; Kennedy, 1974), most material has been geared to ways either of improving specific educational skills, values, etc. (Silverberg, 1984; Rugaber, 1983/84; Moe-Means, 1985; Caskey, 1985; Rich, 1977; Chrislip, 1980; Howie, 1974; Benson, 1985), or gathering and dissemination of

information (Dabb, 1984; Holecek, 1983; most issues of Hunter Safety Instructor).

The need for further scientific and methodological sound research into behavior and skills (to improve education programs and to modify public opinion) will be mandatory if hunter safety education programs are to fit the changing requirements of a future generation of hunters.

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CHAPTER III

METHODOLOGY

This study was conducted to analyze the results of an outdoor experience in hunter safety versus a conventional classroom lecture and was divided into five phases in order to obtain the necessary information to make conclusions regarding the objectives and hypotheses. The phases were the following: Phase I - a survey given to the members of the North American Hunter Safety Coordinators Association. Phase II - a pilot test of a simulated hunt. Phase III - evaluation of the behavioral performance and knowledge of an outdoor experience relative to the control group versus the experimental group. Phase IV - evaluation of the written test results between the control and experimental groups. Phase V - A post survey given to all subjects to determine the hunting success between the control and experimental groups.

Phase I - to determine specific hunter safety content areas as perceived to be important by the members of the North American Hunter Safety Coordinators Association.

Every state in the nation now has a hunter safety education program (Hunter Safety Program File, 1984) and one person from each State Department of Natural Resources (DNR) is delegated to administer the program (Figure 1). Such people would be suitable

TABLE I

UNITED STATES DIVIDED INTO REGIONAL ZONES

REGION 1	CALIFORNIA, HAWAII, WASHINGTON, IDAHO, ALASKA*, OREGON
REGION 2	TEXAS*, ARIZONA, OKLAHOMA, NEW MEXICO*
REGION 3	MICHIGAN*, MINNESOTA, OHIO*, MISSOURI, ILLINOIS*, INDIANA, IOWA
REGION 4	ALABAMA, ARKANSAS, FLORIDA*, GEROGIA*, KENTUCKY*, LOUISIANA, MISSISSIPPI*, NORTH CAROLINA*, SOUTH CAROLINA*, TENNESSEE*
REGION 5	NORTH DAKOTA*, COLORADO*, NEBRASKA*, MONTANA, SOUTH DAKOTA, KANSAS, UTAH, WYOMING*, NEVADA
REGION 6	NEW JERSEY*, NEW HAMPSHIRE*, CONNECTICUT*, VIRGINIA*, RHODE ISLAND, WEST VIRGINIA, PENNSYLVANIA*, MARYLAND*, VERMONT, MASSACHUSETTS*, DELAWARE*, MAINE, NEW YORK*
REGION 7	EASTERN CANADIAN PROVINCES (TWO RESPONSES)
REGION 8	WESTERN CANADIAN PROVINCES (THREE RESPONSES)

* QUESTIONNAIRE RETURNED FROM STATE COORDINATORS

experts from which information regarding content could be accumulated.

To determine which activities should be tested in a simulated hunting experience, a questionnaire (Appendix A) was developed using behavioral objectives devised from a list of prior hunting accidents which was provided by the Michigan Department of Natural Resources (Appendix B). The coordinators were then asked to rank each behavioral objective in importance as well as difficulty of achievement using a 1 to 5 numbering system where number 1 was low and number 5 high. The coordinators were instructed not to consult their peers while marking the objectives in order to keep any bias to a minimum. Additional space was provided for comments if an explanation was considered necessary. Behavioral objectives that ranked the highest in importance and difficulty of achievement were to be used as exercises in an simulated hunt (TABLES II and III).

Phase II - to use the information collected from the hunter safety coordinators to design a pilot simulated hunting experience that contained the behavior objectives of several of the highest content areas.

The data collected from the hunter safety coordinators fell into four specific areas (Figure 1): 1) outdoor skills, 2) hunting techniques, 3) firearm safety, and 4) hunter responsibilities (Figure 2). Where possible, the behavior objective examples that were rated in the top 50 percent by the hunter safety coordinators as being very important and difficult to achieve were used for the simulated hunt. Not all of the objectives rated highly, however, were included due to

time and feasibility. For example: tracking wounded prey and cleaning game in the field were not used because live or freshly killed game were not available for the study. Shot placement was another objective not used as loaded guns were not permitted in the simulated hunt. The exercises chosen for outdoor skills were: climbing terrain and finding a good hunting spot. Zone-of-fire, loading and unloading firearms, firearm handling in the field and crossing obstacles were the exercises to be used in the area of firearm safety. The hunting techniques chosen for the simulated hunt were specie identification and removal of firearms from a vehicle. The exercises chosen to illustrate hunter responsibility were: receiving permission to hunt from the land owner, reporting poachers and determining the back-ground awareness in deciding whether or not to shoot.

A simulated hunting area at the Washtenaw Sportsman's Club in Ypsilanti Township, Michigan was designed from the previously mentioned four areas containing several of the behavior objectives and was used in a pilot study. The students chosen for the pilot study were enrolled in a hunter safety workshop and were asked to test their newly learned hunting skills as they passed through the designated areas of the simulated hunt (Appendix C). The workshop contained hunter safety education information required by the Michigan Department of Natural Resources. The content of the information was based on the behavioral objectives used in the questionnaire given to the hunter safety coordinators.

TABLE II

RANK ORDER AND MEAN OF IMPORTANCE OF OBJECTIVES
AS STATED BY HUNTER SAFETY COORDINATORS

	OBJECTIVE	REGION 1&2	3	4	5	6	7&8	OVER ALL MEAN
1.	FIREARM HANDLING	4.33	4.63	5.00	4.78	4.40	4.50	4.79
2.	FIREARM FAMILIARITY	4.33	4.38	4.40	4.33	4.60	5.00	4.79
3.	ZONE OF FIRE	4.00	4.88	4.20	4.33	4.60	4.50	4.61
4.	HORSEPLAY	4.33	4.63	4.60	3.78	4.60	4.75	4.51
5.	LOADING AND UN-LOADING GUN	4.33	4.25	4.40	3.89	4.20	5.00	4.39
6.	CROSSING OBSTACLES	4.33	3.88	4.40	4.00	4.40	4.75	4.33
7.	REMOVE FIREARMS FROM VEHICLE	4.33	4.00	4.60	3.22	4.40	5.00	4.21
8.	SPECIE IDENTIFICATION	4.66	3.88	3.80	3.78	4.40	4.50	4.18
9.	SHOT PLACEMENT (ARROW)	3.33	3.63	3.20	4.22	4.40	4.25	4.06
10.	TRACKING WOUNDED PREY	3.33	3.63	4.00	3.76	4.40	4.00	3.94
11.	SWING FIRING	3.66	3.63	3.80	3.44	3.40	4.25	3.76
12.	SHOT PLACEMENT (FIREARMS)	3.66	3.38	3.00	3.56	4.20	3.50	3.64
13.	ENTERING A BOAT	3.33	3.50	3.60	3.22	3.40	4.50	3.64
14.	CLEANING FIREARMS	2.33	3.63	3.40	2.78	4.20	3.50	3.39
15.	CLEANING GAME IN FIELD	2.66	3.13	2.80	2.89	3.20	3.75	3.15
16.	FINDING A GOOD HUNTING SPOT	2.33	3.25	2.60	3.11	3.00	3.00	3.06
17.	SURVIVAL TECHNIQUES	2.66	3.00	2.40	2.56	3.20	3.75	2.97
18.	COMPASS AND MAP READING	2.00	3.00	2.00	2.44	2.80	3.75	2.76

RANGE IN IMPORTANCE 1-5 (1=NOT IMPORTANT to 5=VERY IMPORTANT)

TABLE III

RANK ORDER AND MEAN OF DIFFICULTY IN ACHIEVING OBJECTIVES AS STATED BY HUNTER SAFETY COORDINATORS

OBJECTIVE	REGION 1&2	3	4	5	6	7&8	OVER ALL MEAN
1. TRACKING WOUNDED PREY	3.00	3.38	3.80	3.56	4.60	2.75	3.66
2. SHOT PLACEMENT (ARROW)	3.66	2.75	3.60	3.22	3.40	3.00	3.30
3. CLEANING GAME IN FIELD	2.33	3.00	2.80	2.67	4.00	3.00	3.06
4. SHOT PLACEMENT (FIREARMS)	3.33	3.00	2.80	2.56	3.40	3.00	3.03
5. FINDING A GOOD HUNTING SPOT	2.33	3.13	2.40	2.89	3.40	3.00	3.05
6. SPECIE IDENTIFICATION	1.66	2.50	2.80	2.56	2.60	2.50	2.88
7. COMPASS & MAP READING	2.33	3.00	3.40	2.67	2.00	3.00	2.85
8. SWING FIREARM	3.00	2.50	2.80	3.11	1.80	2.00	2.67
9. ENTERING A BOAT	1.66	3.38	3.20	2.33	3.00	3.00	2.66
10. FIREARM HANDLING	3.00	2.75	3.60	2.00	2.00	2.00	2.58
11. REMOVE FIREARMS FROM VEHICLE	2.66	3.38	3.20	2.11	2.60	2.25	2.55
12. SURVIVAL TECHNIQUES	2.33	2.13	3.00	2.44	2.80	2.25	2.55
13. LOADING AND UNLOADING GUNS	3.00	2.50	3.20	2.22	2.00	2.00	2.51
14. CROSS OBSTACLES	2.66	2.25	3.20	2.22	2.40	2.00	2.48
15. FIREARM FAMILIARITY	3.00	2.38	2.40	2.22	3.00	1.25	2.42
16. ZONE OF FIRE	2.00	2.25	2.60	2.67	2.20	1.75	2.39
17. HORSEPLAY	2.66	1.88	2.40	2.78	2.20	1.50	2.33
18. CLEANING FIREARMS	1.66	3.38	2.80	2.00	2.60	2.00	2.33

RANGE IN DIFFICULTY 1-5 (1=NOT DIFFICULT to 5=VERY DIFFICULT TO ACHIEVE)

FIGURE 1: TYPOLOGY OF OBJECTIVES FROM HUNTER SAFETY COORDINATORS

IMPORTANCE

DIFFICULTY IN ACHIEVING	LOW	HIGH
LOW	OUTDOOR SKILLS	FIREARM SAFETY
HIGH	HUNTING TECHNIQUES	HUNTER RESPONSIBILITY

OUTDOOR SKILLS

- ENTERING BOAT
- COMPASS & MAP READING
- SURVIVAL TECHNIQUES
- CLEANING GAME IN FIELD
- * FINDING A GOOD HUNTING SPOT
- * CLIMBING TERRAIN

HUNTING TECHNIQUES

- * SPECIE IDENTIFICATION
- SHOT PLACEMENT (ARROW)
- SHOT PLACEMENT (FIREARMS)
- TRACKING WOUNDED PREY
- SWINGING FIREARMS
- * REMOVING FIREARMS FROM VEHICLES

FIREARM SAFETY

- * ZONE OF FIRE
- FIREARM FAMILIARITY
- HORSEPLAY
- * LOAD & UNLOAD FIREARMS
- * CROSSING OBSTACLES
- * FIREARMS HANDLING

HUNTER RESPONSIBILITY

- * TRESPASSING
- * OWNER'S PERMISSION TO HUNT
- * REPORTING POACHERS
- * AWAREMESS OF BACKGROUNDS

* OBJECTIVES CHOSEN FOR FIELD EXPERIENCE

Evaluators for the hunt were experienced certified instructors who had been chosen by the Washtenaw County coordinator for hunter safety programs. The evaluation technique to be used for each of the 16 stations where the hunter safety exercises were to be conducted were based on a 3 point system: good (3 points), fair (2 points), and poor (1 point). Forty students were divided into groups of four and each group was assigned an evaluator. The evaluators walked the course and graded the four students simultaneously.

The simulated hunting area was composed of the following sixteen stations (Appendix C):

1) Asking permission of the farmer (Hunter Responsibility) - a shed was used to simulate a farmhouse where students were to knock and ask the landowner for written permission to use his land for hunting.

2) Taking firearms out of the car (Hunting Techniques) - each student was to prepare for the hunt by removing the firearm from the trunk of the car, loading the firearm while pointing it in a safe direction and depressing the safety catch.

3) Crossing a log (Firearms Safety) - a log 15 feet long and 3 feet in diameter was used. Each student showed his safety skills by unloading the firearm and passing it to a partner before climbing over the log.

4) Seeing a bird fly from the ground to a tree (Hunting Techniques) - a lifelike picture of a pheasant was pasted

onto a solid backing and tied with string onto pulleys that would allow the picture to be transported from the ground into a nearby tree. Students were to decide whether or not to shoot as a barn was in the background a short distrance away.

5) Climbing a fence (Firearm Safety) - in a similar manner to crossing the log (station 3), students were to climb over a fence.

6) Several ducks on a pond (Hunting Techniques) - a light blue sheet of canvas was used to simulate a pond and several duck decoys were placed on the canvas. Students were to recognize the possibility of a shot ricocheting from the pond.

7) Climbing a steep hill (Firearm Safety) - before climbing the hill, students should unload firearms.

8) Walking a narrow ledge between high bushes and sighting a deer (Outdoor Skills) - students were to walk single file holding their guns in a safe direction and determine whether or not to shoot at the deer when entering the open area at the end of the brush line.

9) Crossing a ditch (Firearm Safety) - in a manner similar to climbing the steep hill (station 7) students should unload their firearms.

10) Observing a trespassing sign (Outdoor Skills) - students were to determine whether or not to follow the pathway past a no-trespassing sign.

11) A concealed hunter (Hunter Responsibility) - a person in a thick brush area was to shake the bushes. Students were to decide whether or not to shoot into the brush area.

12) Seeing a poacher (Hunter Responsibility) - a man was firing blank shotgun shells into the air. Several decoy ducks were lying on the ground to simulate an illegal number of ducks being shot. His car was nearby so that students could easily see the license plate number.

13) Rabbit in the grass (Hunting Techniques) - a life-sized picture of a rabbit was pasted onto wood and was hinged so that when a string was pulled it "popped up". Students were to decide whether or not to shoot at the rabbit.

14) Camouflaged coats hanging in the trees (Hunting Techniques) - students were to determine the number of coats handing in the trees. The coats were examples of those used by hunters; one green, one orange, one green and brown camouflage, and one black. The coats were to simulate hunters sitting in the woods.

15) A deer on a pathway (Hunting Techniques) - as students came close to the trees where the coats were hanging, a life-sized deer pasted on hardboard became visible to them. Students were to decide whether or not to shoot at the deer.

16) Returning to starting area (Firearm Safety) - As students walked back to the simulated farm house, they were judged

on how safely the firearm was being carried and if the ammunition had been extracted from the firearm.

After each group of students finished the simulated hunt, they were asked if any changes should be made in the course. The evaluators were also asked to make suggestions concerning changes in course layout, method of evaluation, and visibility of targets. Several changes were suggested by the students and the evaluators and these changes were implemented before the second study simulated hunt (control versus experimental groups) was to be tested the following month.

The changes made were the following:

1. Green string that was used on station 4 (flying pheasant) was changed to nylon fishing line because the string was too easily seen and the students knew something was about to happen.
2. For the same reason as number one, white string on the rabbit "pop-up" target was changed to nylon fishing line.
3. Because the ducks were not flying at station 6, students did not indicate they would shoot, not because of the fear of ricochet but because a good hunter only shoots at birds flying. Therefore, a life-sized picture of a raccoon pasted on a bardboard backing was placed in front of the pond. Students were to recognize that if the raccoon was missed a ricochet off the pond was possible.

4. The evaluators felt that it took too long to walk the entire hunting area with one group. A change was made so that each evaluator would be responsible for only 3 to 5 stations (first evaluator - stations 1 through 5, second evaluator - 6 through 9, and third evaluator 10 - 13, and fourth evaluator 14 - 16.) This method would also reduce any bias that might develop from using one evaluator for the entire course.
5. The evaluators felt that by attempting to grade four students simultaneously was too difficult to critique each student's behavior effectively. As a result the group size was reduced from 4 to 2.

Phase III - to evaluate the impact of the performance of the outdoor simulated hunt relative to the control group versus the experimental group.

Forty students from the Ypsilanti Township, Michigan area who were registered in a hunter safety class were used as subjects in this experiment. The class list was divided by age into six divisions (11 through 16 year-olds) and then students were randomly placed into two groups: control group and experimental group. When possible, students were paired with students of the same age for the simulated hunt. Table IV shows that the average age for Group I, the control group, was 12.45 years and Group II 12.70 years. Statistically there is no significant difference in age between the two groups at the 5 percent level of confidence.

TABLE IV

AGE, SEX AND GROUPING OF PARTICIPANTS

Age	N	Male	Female	Group I (Control)	Group II (Experimental)
11	13	13	0	6	7
12	9	9	0	5	4
13	8	8	0	4	4
14	4	3	1	3	1
15	5	5	0	2	3
16	1	1	0	0	1
Total	40	39	1	20	20

$\bar{x}$ Group I 12.45

$\bar{x}$ Group II 12.70

α^1 = .596

α^1 = Difference-of-Means tests were calculated between experimental and control groups for each variable.

To make certain there was no bias in prior hunting knowledge between the two groups, a pre-test of fifteen questions needing 20 answers was designed by the instructors of the class and evaluators of the simulated hunt (Appendix E) and given to determine the students' knowledge of guns and safe handling of firearms (Table V).

TABLE V

Average Percentage Scores on Pre-Test

	N	X
Group I	20	92.25%
Group II	20	84.75%

Difference of means was .015 which indicated a significant difference at the 5 percent level.

There was some concern that the groups were significantly different at the 5 percent level, therefore, a further test was made to determine the number of errors each participant made (Table VI). It was discovered that seven participants in the experimental group had five or more mistakes whereas only two students had this amount in the control group.

TABLE VI

ERRORS MADE ON PRE-TEST

	0	1	2	3	4	5	6	7	TOTAL	x
Group I	6	5	5	2	0	2	0	0	20	1.55
Group II	1	6	3	2	1	4	2	1	20	3.05

α = .015 Significant at the 5 percent level.

α = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

When a t-test was done on the scores with 0 to 4 errors, the mean score of the experimental group was slightly higher than those in the control group: 89.58 to 87.83 and this was not significantly different at the 5 percent level. Therefore, except for just a few individuals whose prior knowledge concerning hunting was weak, there was no real significant difference between the two groups.

To further ensure no bias was present between the groups, a demographic questionnaire was given to determine: a)the number of times a student had been on a hunting trip prior to the instruction

workshop and b) with whom the student participated in the hunt (Table VII).

TABLE VII

NUMBER OF PARTICIPANTS WITH PRIOR HUNTING EXPERIENCE WITH RELATIVES BY EXPERIMENTAL AND CONTROL GROUPS

	N	DAD	BRO	AUNT	UNC	GF	COU	GM	MOM
Total	40	32	6	0	8	10	3	2	2
Group I	20	18	3	0	1	5	1	2	2
Group II	20	14	3	0	7	5	2	0	0
α^1		.120	1.00	0.00	.019*	1.00	.560	.154	.154

*Significant at 5 percent level

BRO = Brother
UNC = Uncle
GF = Grandfather
COU = Cousin
GM = Grandmother

α^1 = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Father was the relative who the participants mostly accompanied on a hunting trip with no significant difference being shown between Group I and Group II. There was a significant difference between the participants of the two groups who hunted with an uncle but in many cases the father was also present, therefore, it was determined that the two groups were compatible for the study.

A test to determine the shooting experience that the participants had had prior to the hunting workshop was also made. Table VIII

shows that most of the students had some experience in shooting particularly with a BB gun and that there was no significant difference at the 5 percent level of confidence statistically between the two groups in the use of any firearms.

TABLE VIII

SHOOTING EXPERIENCE WITH RIFLES, SHOTGUNS, PISTOLS AND BB GUNS PRIOR TO HUNTER SAFETY COURSE

	N	Rifle N	Shotgun N	Pistol N%	Begun N%
Group I	20	17	16	8	20
Group II	20	16	14	13	19
α^1		.687	.478	.119	.324

α^1 = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Finally in each of the two groups, nineteen of the twenty participants indicated that they wished to get a hunting license upon completion of the hunter safety class (Table IX).

TABLE IX

PARTICIPANTS WHO WILL BUY HUNTING LICENSE

	N	Yes N	No N
Group I	20	19	1
Group II	20	19	1
		1.00	1.00

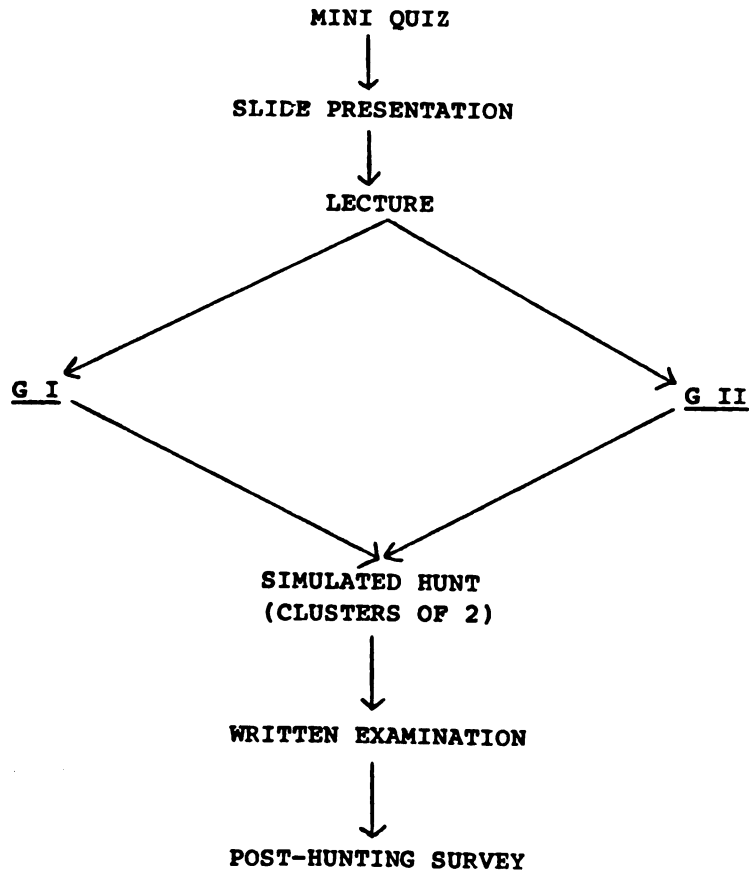
With the conclusion of the pre-test, demographic questionnaire and previous hunting and shooting experiences, it was determined that a bias did not exist between the two groups and that a study could be done with reasonably accurate results.

The hunter safety education class began with Group I (control) and II (experimental) receiving the standard lectures and slide presentations required by the DNR (Figure 2). This part of the education dealt with survival, hunter responsibility, firearms safety and first aid. The two groups were then divided so that Group I watched a film on game identification while Group II received a hands-on experience involving the handling of many different firearms, the proper way to walk single file through woods, walking three abreast in an open field where students could get a feel for a zone-of-fire, crossing a large boulder, seeing a life-size picture of a deer near an oil drum which depicted a background awareness and watching an example of a ricocheting shot from a B.B. gun after it hit a flat surface. None of the experiences witnessed by Group II were identically the same as those used in the simulated hunt.

Students were then divided into 20 groups of two (ten control and ten experimental) and walked through the designated simulated hunting area. The students were staged in an enclosed building until the evaluator for station one called for the next group. This was done so the succeeding groups did not have the opportunity to see what was being done on the course by prior groups. When possible, students were paired with a person of the same age within their

FIGURE 2

FLOW CHART FOR HUNTER SAFETY INSTRUCTION



groups. Only three of the twenty groups had students who were not the same age. This was done so that younger hunters would not mimic the behavior of the older ones.

Each student was given a number to wear on his/her back and the groups were randomly selected to take part in the hunt. The evaluator, at no time, knew if he was grading a couple from the control group or the experimental group. Upon finishing the course, the evaluation sheets (Appendix F) were returned to the coordinator and scored out of a possible 48 points.

Phase IV - evaluation of the written test results between the control and experimental groups.

This study was to determine if a difference existed in the scores of the required written test provided by the State Department of Natural Resources. The t-test analysis was to determine the difference of means between the two groups. Only in one test was the analysis of variance used and that was to determine the difference of means in the several age groups in the control and experimental groups.

Phase V - to determine the success of the young hunters at the termination of the hunting season.

As a finale to this study, a questionnaire was distributed by mail to each of the students at the end of the hunting season (March 31) to determine the success for their year of hunting. The

questionnaire sought information concerning the number of times each hunted, with whom was the hunting done, which game was shot at and killed, and how successful each thought the hunting experience was to him personally. Safety was also an important concern and students were asked to relate any unsafe practices they had either observed someone else doing or unintentionally caught themselves doing. The t-test was the analysis used to test the mean difference between the two groups.

Statement of Testable Hypotheses

Hypothesis I

Null Hypothesis I: There is no significant difference in the scores of the simulated hunt between Group I and Group II students.

Symbolically: Ho : $u_1 = u_2$

Hypothesis II

Null Hypothesis II: There is no significant difference in the scores of the standard test (appendix K) between students who had an outdoor hands-on experience and those who had only classroom instruction.

Symbolically: Ho : $u_1 = u_2$

u_1 = students who received only classroom instruction

u_2 = students who received classroom instruction plus an addition outdoor hands-on experience

Hypothesis III

Null Hypothesis III: There is no significant difference in the number of students who purchased a hunting license in Group I and Group II.

Symbolically: Ho : $u_1 = u_2$

Hypothesis IV

Null Hypothesis IV: There is no significant difference in the number of shots taken at live game by Group I and Group II students.

Symbolically: Ho : $u_1 = u_2$

Hypothesis V

Null Hypothesis V: There is no significant difference in the number of game killed by Group I and Group II students.

Symbolically: Ho : $u_1 = u_2$

Hypothesis VI

Null Hypothesis VI: There is no significant difference in the enjoyment received in the 1984-85 hunting season by Group I and Group II students.

Symbolically: Ho : $u_1 = u_2$

Hypothesis VII

Null Hypothesis VII: There is no significant difference in the number of students in Group I and Group II who wished to hunt again next year.

Symbolically: Ho : $u_1 = u_2$

Hypothesis VIII

Null Hypothesis VIII: There is no significant difference in the number of students in Group I and Group II who acted at least once in an unsafe manner.

Symbolically: Ho : $u_1 = u_2$

Hypothesis IX

Null Hypothesis IX: There is no significant difference in the number of students in Group I and Group II who observed someone else acting in an unsafe manner at least once.

Symbolically: Ho : $u_1 = u_2$

Summary

The author's purpose in this chapter has been to describe the procedures and instrumentation used to fulfill the objectives of this study. The rationale for the selection of the behavioral objectives to be used in the simulated hunt was given and the procedures for determining the sample were desribed. The study was divided into four phases. Phase I was a survey given to the members of the North American Hunter Safety Coordinators Association to determine which of the behavioral objectives were most important to hunter safety education and which should be included in the simulated hunt. Phase II was a pilot study where forty students enrolled in a hunter safety course tested the various stations chosen for a stimulated hunt. Their comments were very useful in determining the changes needed to be made in the simulated hunt field course prior to the experimental study.

Phase III was the main study with forty children equally and randomly placed into two groups (control and experimental). The experimental group received additional hands-on training in hunter safety education after both groups had been given the state required lecture and slide presentations. The two groups then walked a simulated hunting course where trained hunter safety instructors evaluated the student's hunting skills. Phase IV was an evaluation of the written required test offered by the state Department of Natural Resources. In both the simulated hunt exercise and the written test, scores were entered into a computer to determine if the

additional hands-on experience had a positive effect on a child's hunting skills. Phase V was a written post survey given to all subjects in the study to determine the hunting success between the control and experimental groups.

FOOTNOTES: CHAPTER III

"Hunter Safety Program Profile," Hunter Safety Instructor, (12.2, [April/May], 1984), pp. 6-7.

CHAPTER IV

ANALYSIS OF THE DATA

In this chapter, the author attempts to answer the following questions: Were the groups comparable at the beginning of the study with regard to knowledge of hunter safety?; How did the two groups perform on the simulated hunt and was there any significant difference in their evaluated scores?; How did the two groups perform on the State Department of Natural Resources standard test for new hunters?; Was there any difference in the two groups in hunting experience as measured by a survey after the first hunting season was over?

The format followed throughout this section in presenting the findings was as follows:

1. Statement of the null hypotheses followed by an introductory paragraph for each of the analysis.
2. Presentation of the mean scores in tables.
3. Testing of the hypotheses with the t-test, the computation formula being:

$$t = \frac{(x_1 - x_2) - (u_1 - u_2)}{S\, x_1 - x_2}$$

4. A 5 percent level of confidence was chosen.

To answer the question, "Were the two groups (Group I, the control group and Group II, the experimental group) comparable at the beginning of the study with regard to knowledge of hunter safety?", a pre-test to determine initial hunter information differences was

given to the participants. The results of the scores showed a significant difference at the 5 percent level of confidence between Group I and Group II in favor of the control group (Table X).

TABLE X

AVERAGE PERCENTAGE SCORES ON PRE-TEST, SIMULATED HUNT AND FINAL EXAMINATION

	N	Simulated Hunt	Pre-Test	Final Exam
Group I (control	20	68.30	92.25	87.10
Group II (experimental)	20	68.60	84.75	80.75
α^1		.901	.015*	.197

*Significant at 5 percent level.

α^1 Difference-of-Means tests were calculated between experimental and control groups.

A conclusion could be made that the experimental group had less knowledge of hunting than the control group. Caution was exercised in this conclusion as can be seen in Table VI of Chapter III which indicated that there is no significant difference in mean scores between the two groups when the larger scores were dropped and only those who had 0 to 4 mistakes were computed. It is therefore concluded that the groups were comparable and the difference was due to chance and should not be assumed that the results would not show a significant difference should another group be tested.

Test of the Hypotheses

Simulated Hunt Performance

Null Hypothesis I: There is no significant difference found in the scores of the simulated hunt between Group I and Group II students.

The two groups were compared with regard to performance on the simulated hunting experience and found to have no significant difference. Table X shows that there was less than one percentage point difference in the two groups. Scores from the simulated hunt were then divided into the four specific areas of hunter responsibility, hunter techniques, firearm safety, and outdoor skills to determine if a significant difference was present (Table XI).

TABLE XI

AVERAGE SCORES IN AREAS OF HUNTER RESPONSIBILITY, HUNTING TECHNIQUES, FIREARM SAFETY, AND OUTDOOR SKILLS IN THE SIMULATED HUNT

	N	Hunting Responsibility	Hunting Techniques	Firearm Safety	Outdoor Skills
Group I (control)	20	6.0	13.0	9.5	3.5
Group II (experimental)	20	5.5	12.9	10.2	3.9
α [1]		.319	.884	.185	.412

Scores Based on Good = 3 points, Fair = 2 points, Poor = 1 point

Maximum Points: Hunter Responsibility = 9 points
Hunting Techniques = 18 points
Firearm Safety = 15 points
Outdoor Skills = 6 points

α 1 Difference-of-Means tests were calculated between experimental and control groups.

In each of the four areas there was less than one percentage point difference, no significance was observed, and therefore it can be concluded that the following hypothesis was not rejected:

> There is no significant difference found in the scores of the simulated hunt between Group I and Group II.

The Final Examination

> Null Hypothesis II: There is no significant difference found in the standard test between Group I and Group II.

The final examination, a standard test developed by the State Department of Natural Resources, was given to all participants and although there was almost 7 percentage points difference in the scores in favor of the control group, it was not significant at the 5 percent level of confidence. Therefore, it was concluded that the following hypothesis was not rejected:

> There is no difference in the scores of the final examination between the two groups.

Post Hunting Experience

Purchasing of license, times hunted , and with whom.

> Null Hypothesis III: There is no significant difference in the number of students who purchased a hunting license in Group I and Group II.

A post survey was sent to all of the students at the end of the hunting season, five months after the hunter safety class. Thirty of

the forty questionnaires sent were returned immediately. An attempt was made to contact each delinquent respondent by telephone. Ypsilanti school administrators indicated that two of the participants had left the state with a divorced parent and their location was uncertain and two others had moved and now had unlisted phone numbers. Therefore, 17 of the 20 questionnaires were returned from participants in Group I and 19 of 20 from participants in Group II.

Twelve of the seventeen in Group I purchased a license to hunt and 13 of the nineteen in Group II purchased a hunting license (Table XII).

TABLE XII

NUMBER OF PARTICIPANTS WHO PURCHASED A HUNTING LICENSE, NUMBER OF TIMES HUNTED AND WITH WHOM

	N	Purchased License	Went Hunting	Average # of Times	Accompanied Father
Group I (control)	17	12	10	4.3	10
Group II (experimental)	19	13	13	6.9	13
α^1		.738	.287	.232	.137

α^1 Difference- of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Although many of the students purchased a license, about two thirds of the participants actually hunted. Ten of the twelve in Group I went hunting and all of the 13 participants in Group II hunted. In

all cases except two, the young hunters accompanied their fathers. The results showed that no significant differences existed between the two groups when comparing the number of hunting licenses purchased, how many actually went hunting, and whether or not they hunted with their fathers. Because more than 50 percent of the children in the United States are now living with a single parent or in a reconstituted family, it was unusual to observe all but two of the students had hunted with their fathers. The two exceptions were boys; one hunted with a grandfather and the other with an uncle.

The number of times during the season students hunted was also calculated and although the average number of hunting trips per student in Group I was 4.3 compared to 6.9 for Group II, a t-test showed no significant difference between the two groups therefore, it can be concluded the following hypotheses was not rejected:

> There is no significant difference in the number of licenses purchased by the students in Group I and Group II.

Shots Taken and Game Killed

> Null Hypothesis IV: There is no significant difference in the number of shots taken at live game by Group I and Group II students.
>
> Null Hypothesis V: There is no significant difference in the numbr of game killed by Group I and Group II students.

Of the eleven students in Group I who went hunting, only five saw game close enough to shoot at and the amount of game shot was seven (Table XIII).

TABLE XIII

NUMBER OF PARTICIPANTS WHO WENT HUNTING, SHOT AT GAME AND THE AMOUNT OF SUCCESS

	Shot at Game	Amount of Game Killed	N Who Went Hunting
Group I (control)	5	5	11
Group II (experimental)	11	7	13
α^1	.968	.953	

α^1 - Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Group II students did slightly better as eleven of the thirteen shot at live game but were successful only seven times. Neither statistic was statistically different at the 5 percent level of confidence.

The number of times Group I students hunted animals was nine and six were killed (Table XIV).

TABLE XIV

NUMBER OF PARTICIPANTS WHO HUNTED AND KILLED ANIMALS AND BIRDS

	Animals Hunted	Animals Killed	Hunted Birds	Birds Killed	N Who Went Hunting
Group I (control)	9	6	4	1	11
Group II (experimental)	11	4	8	4	13
α^1	1.00	1.00	1.00	.356	

α^1 = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Eleven group II students hunted animals and made four kills. Birds were hunted four times by Group I students and eight times by Group II students. The number of birds killed was one by the control group and four by the experimental group. There was no difference in the two groups for shots taken, game hunted, and game killed.

The amount of practice done by the participants did not appear to be a factor in being a better hunter. Table XV shows that all but one student who hunted had some practice with a rifle, shotgun, pistol, or BB gun.

TABLE XV

NUMBER OF PARTICIPANTS WHO HUNTED AND PRACTICED SHOOTING WITH RIFLES, SHOTGUNS, PISTOLS AND BB GUNS

	Number of Participants	Times Rifle Fired	Times Shotgun Fired	Times Pistol Fired	Times BB Gun Shot	N Who Went Hunting
Group I (control)	8	4	8	2	4	11
Group II (experimental)	11	6	9	6	7	13
α_1		.719	.506	.464	.355	

α_1 = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

There was no significant difference in the amount of times students in each group had practiced. Therefore, the following null hypotheses were not rejected:

1) There is no significant difference in the number of shots taken at live game by Group I and Group II students.

2) There is no significant difference in the number of game killed by Group I and Group II students.

Enjoyment of Hunting Experience and Observation of Unsafe Practices

Null Hypothesis VI: There is no significant difference in the enjoyment received by Group I and Group II students.

Null Hypothesis VII: There is no significant difference in the number of students in Groups I and II who wished to hunt the following year.

Null Hypothesis VIII: There is no significant difference in the number of students in Group I and Group II who acted at least once in an unsafe manner.

Null Hypothesis IX: There is no significant difference in the number of students in Group I and II who observed someone else acting in an unsafe manner.

All of the participants (except one student in Group I) felt they had a good experience hunting and would definitely hunt again if given the opportunity the following year (Table XVI).

TABLE XVI

PARTICIPANTS WHO HUNTED AND FOUND HUNTING ENJOYABLE, WOULD HUNT AGAIN, AND THOSE WHO FELT THE HUNTER SAFETY COURSE WAS HELPFUL

	Number who Enjoyed Hunting	Number who Would Hunt Again	Found Course Helpful	N Who Went Hunting
Group I (control)	10	10	6	11
Group II (experimental)	13	13	11	13
α^1	1.00	1.00	.347	

α^1 = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Six of the 11 students in the control who hunted felt that the hunter safety course was helpful, while eleven of the experimental hunters had positive thoughts concerning the course. The following null hypotheses were not rejected:

1) There is no significant difference in the enjoyment received by Group I and Group II students.

2) There is no significant difference in the number of students in Groups I and II who wished to hunt the following year.

Several of the participants had seen an unsafe practice of hunter safety while hunting and two had unconsciously caused an anxious moment for their hunting friends. (Table XVII). One student had accidentally pointed a loaded gun at his father and was reprimanded severely. No one in the control group witnessed an unsafe practice but 5 in the experimental group did.

Although the number of incidents are small, the difference of means is significant at the 5 percent level and indicates that the students in the experimental group may have become more aware of unsafe practices when hunting. Therefore, the following null hypotheses were not retained:

1) There is no significant difference in the number of students in Group I and Group II who acted at least once in an unsafe manner.

2) There is no significant difference in the number of students in Groups I and II who observed someone else acting in an unsafe manner.

TABLE XVII

PARTICIPANTS WHO EITHER DID OR
WITNESSED UNSAFE PRACTICES WHILE HUNTING

	Did Something Unsafe	Saw Something Unsafe	N Who Went Hunting
Group I (control)	1	0	11
Group II (experimental)	3	5	13
α^1	.800	.026	

α^1 = Difference-of-Means tests were calculated between experimental and control groups for each variable with Yes scored as 1 and No scored as 2.

Summary

The author's purpose in this chapter has been to find answers to the following questions:

1) Were the groups comparable at the beginning of the study with regard to knowledge of hunter safety?

2) How did the two groups perform on the simulated hunt and was there any significant difference in their evaluated scores?

3) How did the two groups perform on the State Department of Natural Resources standard test for new hunters?

4) Was there any difference in the two groups in hunting experiences as measured by a survey after the first hunting season was over?

Of the forty students who were involved in the early part of the study and took the pre-test and simulated hunt, three of the students

group, could not be located. School administrators indicated that the missing students had left the area.

The final function of this study was devoted to an explanation of the treatment and analysis of the data including a statement of the testable hypotheses of the study. Chapter V is devoted to a concise summary of the findings as well as the conclusions and implications of the study.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

In this final chapter, a summary of the purposes, limitations, literature and design of the study is presented first. The conclusions generated from the analysis followed by suggestions for further study conclude the chapter.

Summary

The researcher's central purpose in this study was to investigate the relationships between certain variables and skills connected with a simulated hunt. More specifically, forty students were divided into two groups; a control group which received hunter safety lectures and the experimental group which received the lectures and a hands-on field experience. An additional purpose was to determine the hunting success each person within the two groups had achieved. This was done by mailing a survey to each student at the end of the hunting season (Appendix G).

Limitations of the Study

1. The validity of the post-season study given to the participants and the questionnaire given to the state coordinators of hunter safety may affect the study if complete sincerity and frankness of response to the instruments administered was not observed.

2. The evaluators were members of the same sportsman's club. One member of the group had much more experience in gun handling and hunter safety education and may have influenced the others in making the evaluation scores in the simulated hunt.
3. Not all of the state hunter safety coordinators were present at the national meeting of the North American Association for Coordinators of Hunter Safety Education, thus some states were not included in the study.
4. The sample size was small and most of the participants who went through the simulated hunt had previous hunting experience.

Review of the Literature

The literature of hunter safety education was divided into two categories: 1) surveys and research which examined specific areas via methodology, surveys and observation with quantifiable results; and 2) documents which were based on other research or on non-empiracal observation. The second chapter was divided into three parts: 1) other simulated courses in hunter safety education; 2) related fields addressing experiential learning and cognitive development; and 3) hunter safety education. The major findings of these three parts were as follows:

1. Simulated Courses In Hunter Safety Education. -- Many organizations including the International Asssociation of Fish and Wildlife Agencies and the National Rifle

Association recommended that hands-on and live firing experiences should be required in hunter safety education courses. These organizations also prescribe a field course as vital to every hunter safety program. The work of Carter, O'Toole, Lankenau, Moe, Norton, Langenau and Norine all claim that a field course which involved a simulated hunt is paramount and necessary to all hunter safety programs. James Norine, Director of the Hunter Services Division of the National Rifle Association, was quoted as saying, "Without a doubt, young people will be better prepared for a real hunting experience if they have had a field experience."

2. Related fields addressing experiental learning and cognitive development. -- The research conducted by Griffith, Kelley, and Warren do not agree with the hunter safety experts as they found that in their studies of truck driving, student-teaching, and computer science that those who had hands-on experience showed no greater achievement than those who received only classroom instruction. Piaget distinguished between physical experience and logico-mathematical experience and acknowledged that experience cannot stand by itself in the development of intelligence.

Hunter Safety Education

Jackson, Moe, Norton, Langenau, and Peyton go one step beyond the instruction and hands-on experience. They advocate that social

science research has had a strong impact on hunter safety education in determining the best way to improve ethical behavior in hunters. They feel that hunter safety programs should also include ways to improve ethical standards. One method suggested by Jackson is the "Dilemma Method" to be used as an artificial device to get students to articulate and reflect on the reasoning required in making ethical decisions.

Caskey, Chrislip, and Benson suggest that the need for further scientific and methodological sound research into behavior and physical skills will be mandatory of hunter safety education programs are to fit the changing requirements of the future generation of hunters.

Design of the Study

In order to test the hypotheses of this study, it was necessary to develop several instruments relating to tests and evaluations to be analyzed and a post season questionnaire to determine the success that the young hunters had experienced. Thus the study was divided into five phases in order to obtain the necessary information to draw conclusions regarding the objectives and hypotheses. The phases were the following: Phase I was a survey given to the members of the North American Hunter Safety Coordinators Association (NAHSCA) to determine which activities should be tested in a simulated hunt. These activities were written in behavioral objective terms and were ranked by the state coordinators as being highest in importance and difficulty of achievement and the higher ones, when possible, were used as exercises in the simulated hunt.

Phase II was a pilot simulated hunting experience using exercises from the survey given to the members of the NAHSCA and were divided in four specific areas: 1) Hunter Responsibility; 2) Hunter Techniques; 3) Firearm Safety; and 4) Outdoor Skills. Evaluators graded each student as they passed each of the stations representing one of the four areas mentioned above.

Several changes were recommended by the evaluators and the students and were implemented prior to the main study. Phase III was an evaluation of the performance of the participants in the outdoor simulated hunt relative to the control versus the experimental. The simulated hunt was conducted in a similar manner as the pilot study with modifications suggested by the evaluators and participants of the pilot study.

Phase IV was an analytical review of the evaluation sheets from the simulated hunt relative to the control versus the experimental group. Finally, Phase V was a post survey given to the participants following the hunting season to determine how successful their hunting experiences had been.

Findings of the Study

Chapter IV was divided into four major sections:

1) A pre-test to determine if a compatible group of students were being tested.

The data determined that there was a slight significant difference between Group I and Group II students, but caution was exercised to conclude that Group I students were superior in knowledge of hunting and firearm safety than Group II students. An

additional test where students with 0 to 4 mistakes (18 of 20 students in Group I and 13 of 20 students in Group II) was analyzed and the mean difference of participants in Group II was higher than those in Group I and no significant difference was observed. Therefore it was concluded that the two groups were compatible for this study.

2) Data from the simulated hunt was analyzed to determine if there was a difference between the two groups.

Group I and Group II students were evaluated by trained hunter safety instructors on a simulated hunting course. The course included pop-up targets of a rabbit, a picture of a bird drawn on a wire between two trees, fences to cross, large pictures of deer in the woods, a large log to climb over, ditches to cross and hills to climb. Each station of the simulated portions of the course represented the objectives that were deemed important and hard to achieve by the state coordinators of hunter safety. No significant difference between the two groups at the 5 percent level of confidence was observed.

3) Analyze the scores of the standard test provided by the State Department of Natural Resources to determine any significant difference between the two groups.

The State Department of Natural Resources provides a required test for students in hunter safety classes. This test contains questions concerning hunter responsibility, firearm safety, first-aid and hunting techniques. Data were analyzed and no significant difference in scores between the two groups was observed.

4) A post survey was given to all participants to determine the success of their hunting season.

A survey was mailed the end of the hunting season to each of the hunter safety participants. Of the 20 original participants in Group I, 17 returned the questionnaire, whereas, 19 of 20 in Group II responded. The questionnaire had questions which sought answers to:

1) Was a hunting license purchased?

2) Who hunted and with whom.

3) Number of shots at game and the number of game killed.

4) Amount of practice with rifles, shotguns, pistols and BB guns.

5) Number of students who found hunting an enjoyable experience.

6) Number of students who witnessed and/or committed an unsafe practice while hunting.

Conclusions

Based upon the findings of this study, the need for a hands-on experience is not essential to being a better hunter. No significant differences were found between the control (Group I) and experimental (Group II) groups and it was concluded that:

1) There was no difference in the scores of the simulated hunt.

2) There was no significant difference in the scores of the final test.

3) There was some difference in favor of Group I in the pre-test, however, when dropping the scores of 5 mistakes or more, there was no significant difference between the groups.

4) There were no significant differences in many of the areas of the post hunt survey. These included: number of times hunting and with whom, amount of practice, enjoyment of the hunt, shots at game and the number of kills.

5) There was a significant difference in the number of unsafe practices reported. The experimental groups witnessed nine while one was recorded for the control group.

Implications

Although the study was modest in scope and had primary application in Washtenaw County, Michigan from which the sample was drawn, and because the county is very representative of the Great Lakes Region, it may have significant implications for many state coordinators of hunter safety education programs. In this study, several specific questions were raised concerning the simulated hunt being part of any hunter education program. It has been pointed out that, contrary to the beliefs of several experts in hunter safety, there is not a great need for a simulated hunt to be a requirement in a hunter safety education program. Many state coordinators are not pleased with 10 to 11 required hours of instruction and now are seeking legislation to make 20 hours of instruction mandatory. This would include many hours of field experience and a simulated hunt. Nowhere has research been conducted to support this claim. The researcher's goal in this study was to determine the potential need for a simulated hunt in order to make youngsters more responsible for their behavior in the outdoors.

It is possible that the students in the control and experimental groups learned about the skills of hunting while walking through the simulated hunt exercise causing little difference in the post hunt survey. Future studies should be conducted to explore this question by having a control group which does not receive this experience, yet is given the same post hunt survey.

It is also possible that the simulated hunt was not powerful enough: that more emphasis should have been placed on specie identification and the cleaning of game in the field. Maybe it was not the simulated hunt that should have been tested but instead the authenticity of the field experience

For whatever the reason, the data of the simulated hunt showed no significant difference between the experimental and control groups. The purpose of this section can best be served by indicating some of the problems which have been identified with some specific comments and recommendations for consideration in the development of new hunter safety education programs.

1. The activities of the simulated hunt -- Careful choices were made in the selection of the exercises for both the simulated hunt and the field experiences (Tables II and III). Hunter safety coordinators from every state were surveyed and the exercises chosen represented those activities the coordinators thought were the most important and difficult to achieve. The survey was given at a

national conference which also was attended by county coordinators and assistants to the state coordinators. These people were given the survey and the results of the data showed no significant differences in the choices of the state coordinators. Therefore, the author perceived that the simulated hunt was a viable test for hunter safety knowledge.

2. Success of the hunt -- No differences were found in the areas of who hunted, with whom, how many shots were taken and how many kills were reported. It was discouraging to find so few of the participants who had registered for the hunter safety course had actually hunted (63 percent). It was expected that all of the students would have hunted as so much enthusiasm for the sport of hunting was shown at the workshop.

3. Observing someone acting in an unsafe manner -- The observation of unsafe practices was witnessed by 79 percent more of the participants in the experimental group. There was no significant difference in violations caused by the students in each group but it can be assumed that the participants in the experimental group who had the hands-on experience were more safety conscious and better able to quickly recognize the unsafe practices of others. Probably the most important exercises in this area were the zone-of-fire and the handling of fire arms. The zone-of-fire was

an exercise that was used to teach hunters to walk in a straight line far enough from each other that shots set off accidentally would not hit nearby peers. Hunters who observe the proper zone-of-fire also do not shoot into the area designated for other shooters.

Safe gun handling is paramount for all hunters and a hands-on experience seemed to be the best method as this was the area where most unsafe practices were reported in the post hunt survey.

Recommendations for Further Study

This study demonstrated that there are some differences in the skills between young hunters who have a hand-on experience compared to students who have only classroom lectures. These differences usually were not at a significant level and therefore, the author recommends the following for future study:

1. A study of participants from another part of the state. Compare the results with this study.
2. A study using a larger sample. In the post survey, so few of the participants had actually hunted that it was difficult to make accurate conclusions.
3. A study to include more of the important objectives not being met in this study. For example: cleaning game in the field and tracking wounded prey.
4. A study to determine if bow and arrow hunting would contain the same results in hunter safety as this study.
5. Test the value of the simulated hunt as a means of teaching methodology.
6. Study a group who had no prior hunting experience.

7. Use a third group in the study in the post survey. This group would have seen the movie, had the field experience but did not participate in the simulated hunt. A study like this may help to determine if it was the experience of the simulated hunt that helped the students become better hunters.

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APPENDIX A

A SURVEY TO DETERMINE THE NEEDS FOR A STRONG HUNTER SAFETY EDUCATION PROGRAM

*NOTE: This survey was given to the state coordinators of hunter safety to determine the important objectives in hunter safety education and the difficulty relative to achieving the objectives. From these objectives deemed most important, the simulated hunt exercises were derived.

APPENDIX A

A SURVEY TO DETERMINE THE NEEDS FOR A STRONG HUNTER SAFETY EDUCATION PROGRAM

Two very important questions are asked in this survey: (1) What behavioral objectives should be stressed in the program, and (2) to what extent has it been difficult to realize these objectives when the hunters have taken to the outdoors?

PLEASE CIRCLE THE NUMBER THAT YOU FEEL IS APPROPRIATE. ANSWER BOTH IMPORTANCE AND DIFFICULTY. There is also a space provided below each topic should you wish to elaborate on your answer.

Important - 1 = Not Important
5 = Extremely Important

Difficult to Achieve - 1 = Not Difficult
5 = Extremely Difficult

		IMPORTANT	DIFFICULT TO ACHIEVE
1.	Be able to identify legal and protected species.	1 2 3 4 5	1 2 3 4 5
2.	Practice proper handling of firearms to avoid accidental discharge.	1 2 3 4 5	1 2 3 4 5
3.	Obey the "zone of fire" principles while hunting.	1 2 3 4 5	1 2 3 4 5
4.	Take time to become familiar with a firearm before using it.	1 2 3 4 5	1 2 3 4 5
5.	Avoid horseplay during the use of firearms.	1 2 3 4 5	1 2 3 4 5
6.	Utilize the proper procedure for swinging a shotgun in a safe manner when hunting game.	1 2 3 4 5	1 2 3 4 5

		IMPORTANT	DIFFICULT TO ACHIEVE
7.	Properly place rifle shots to kill large game.	1 2 3 4 5	1 2 3 4 5
8.	Properly place arrow shots to kill large game.	1 2 3 4 5	1 2 3 4 5
9.	Properly load and unload a firearm.	1 2 3 4 5	1 2 3 4 5
10.	Properly remove or place firearms in a vehicle.	1 2 3 4 5	1 2 3 4 5
11.	Properly cross an obstacle fence, or stream with a firearm.	1 2 3 4 5	1 2 3 4 5
12.	Properly, effectively, and safely clean a firearm.	1 2 3 4 5	1 2 3 4 5
13.	Following or tracking and retrieving wounded game.	1 2 3 4 5	1 2 3 4 5
14.	Properly entering and leaving a boat with a firearm.	1 2 3 4 5	1 2 3 4 5
15.	Use acceptable practices in care (cleaning) of game in the field.	1 2 3 4 5	1 2 3 4 5
16.	A workable knowledge of using a compass and map reading.	1 2 3 4 5	1 2 3 4 5
17.	Locating and getting access to a good hunting spot.	1 2 3 4 5	1 2 3 4 5
18.	Demonstrate good survival techniques.	1 2 3 4 5	1 2 3 4 5

Are there any other topic areas that you feel should be included?

	IMPORTANT	DIFFICULT TO ACHIEVE
1.	1 2 3 4 5	1 2 3 4 5
2.	1 2 3 4 5	1 2 3 4 5
3.	1 2 3 4 5	1 2 3 4 5
4.	1 2 3 4 5	1 2 3 4 5
5.	1 2 3 4 5	1 2 3 4 5

Thank you for the time you have taken to fill out the survey. It is felt that this is an important and integral part of a study in determining the amount of time beyond the lecture procedure that is necessary to conduct a successful Hunter Safety Program.

APPENDIX B

LIST OF HUNTING ACCIDENTS IN MICHIGAN

APPENDIX B

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
LAW ENFORCEMENT DIVISION
HUNTING ACCIDENT DEATHS AND INJURIES - 1985 REPORT

		SMALL GAME SEASON		BIG GAME SEASON		TOTAL	
YEAR	LICENSES	DEATHS	INJURIES	DEATHS	INJURIES	DEATHS	INJURIES
1940	718,334	21	49	14	28	35	77
1950	1,020,172	7	135	18	55	25	190
1960	1,145,360	7	236	4	56	11	296
1970	1,348,765	7	153	11	59	18	212
1971*	1,071,887	4	128	11	52	15	180
1972	997,368	8	143	5	36	13	179
1973	1,055,399	6	215	12	48	18	263
1974	1,111,502	7	223	6	52	13	275
1975	1,243,063	5	182	9	40	14	222
1976	1,238,436	3	121	2	35	5	156
1977**	1,241,120	5	102	6	23	11	125
1978	1,587,996	3	51	2	45	5	96
1979	1,425,599	2	66	8	19	10	85
1980	1,472,502	3	78	6	29	9	107
1981	1,349,947	2	68	8	30	10	98
1982	1,385,264	3	47	9	30	12	77
1983	1,362,815	1	58	6	43	7	101
1984	1,358,599	5	47	7	29	12	76
1985***	1,300,000	2	46	6	31	8	77

*Hunter Safety Training became mandatory for first time hunters ages 12-16.

**Mandatory Hunter Orange Law, effective October 1, 1977, amended in 1984 to cover all lands open to public hunting.

***Incomplete sales figures.

The total hunting accidents for 1985 numbered 85, including 8 fatalities. This is the fewest number of hunting accidents in Michigan since 1938, when there were 54 including 23 fatalities.

The leading contributing factors in 1985 were careless handling of firearms or where the victim was out of sight of the shooter, or where the victim was covered by the shooter swinging on game.

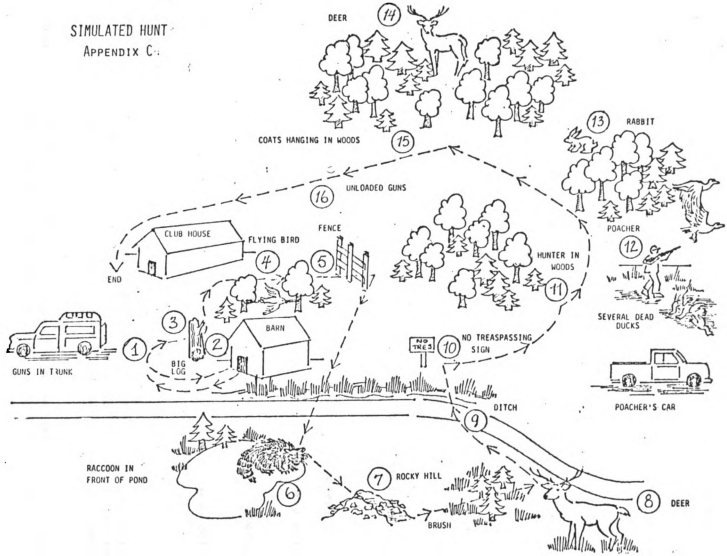
Fifty percent of the accidents fell into the catagories "victim moved into line of fire", "victim covered by shooter swinging on game", "victim out of sight of shooter", "victim mistaken for game". Most of these types of accidents involved members of the same hunting party not keeping track of where their companions were. While the wearing of Hunter Orange has dramaticlaly reduced this type of accident hunters MUST double check beyond their target and KNOW where their companions are at all times.*

Careless handling of firearms is uncalled for. Violations of basic safety rules in handling firearms should not be tolerated by others in the hunting party.

*Three incidents in 1985 resulted in six injuries; three deer hunters shooting at deer with shotguns loaded with buckshot resulting in each shooter injuring two other hunters with one shot.

APPENDIX C

MAP OF SIMULATED HUNTING AREA, EVALUATION GUIDELINES AND GRADING SHEET FOR THE SIMULATED HUNT


SIMULATED HUNT
APPENDIX C
DEER
14
COATS HANGING IN WOODS
15
RABBIT
13
UNLOADED GUNS
16
CLUB HOUSE
FLYING BIRD
FENCE
END
4
5
HUNTER IN WOODS
11
POACHER
12
SEVERAL DEAD DUCKS
3
BARN
2
1
GUNS IN TRUNK
BIG LOG
NO TRESPASSING
10
NO TRES PASS
DITCH
9
POACHER'S CAR
RACCOON IN FRONT OF POND
6
7
ROCKY HILL
BRUSH
8
DEER

APPENDIX C

EVALUATION GUIDELINES FOR THE SIMULATED HUNT

At each station students will be graded according to their emitted behavior in the following manner: 3 points for an excellent rating; 2 points for a good rating; and 1 point for a poor rating.

Station #1 Farm House:

Excellent - Students visiting the landowner while guns are still in the trunk of the car and in a pleasant manner ask for written permission to hunt on the land.

- Should have permission slip already made out.

Good - Visit farmer while guns in the trunk; not too friendly with the landowner and no permission slip for the landowner to sign.

Poor - Visit the landowner while taking the guns with them.

Station #2 Taking the Guns Out of the Car:

Excellent - Take guns from the trunk and remove carrying cases.

- Move away and with back to car, load the guns and put the safety catches on.

Good - Take guns from trunk, remove carrying cases and check guns while close to the car.

Poor - Take guns from the trunk, remove the carrying cases but do not check the guns to see if they are loaded.

Station #3 Going Over A Log

Excellent - First person unloads gun and hands it to his partner then cross over the log. When on the other side reaches back to take both funs while his partner crosses over the log.

Good - Unloads the guna dn places it against the log, crosses over the log, then reaches back to pick up the gun.

Poor - Does not unload the gun and either puts the gun against the log or carries it with him.

Station #4 Flying Bird:

Excellent - May remove safety but cannot shoot bird. The barn is in the background. This should be an immediate reaction.

Good - Hesitate too long before making up mind to shoot.

Poor - Shoot at bird.

Station #5 Crossing Fence:

Excellent - First person unloads gun and hands it to partner, gets over fence and is handed both guns.

Good - Unloads gun and puts it under fence, gets over fence and picks it up from other side.

Poor - Crosses fence with loaded gun.

NOTE: Crossing Road - Indicate to students that this is only a trail, therefore, guns can remain loaded.

Station #6 Raccoon Near Lake

Excellent - Sees immediately that there is a lake behind raccoon and does not shoot.

Good - Takes a lot of time thinking about the shot and then does not shoot.

Fair - Shoots at bird.

Station #7 Climbing Hill

Excellent - Stops at bottom of hill and unloads and climbs hill with gun held in a safe direction.

Good - Gun unloaded but turns back toward partner when getting to top of hill (gun not in safe direction).

Poor - Doe not unload gun.

Station #8 Walking Narrow Trail

NOTE: Students do this one at a time. Partner faces evaluator so that position of deer cannot be seen.

Excellent - Shoots deer immediately or can explain that there were people on high power range that were in the way.

Good - Takes too much time but does eventually shoot deer.

Poor - Does not shoot deer (unless he/she states there was someone in the way on high power range).

Station #9 Crossing Ditch:

NOTE: Tell students road is a main highway. (Therefore, guns must be unloaded before crossing it.)

Excellent - Guns unloaded before crossing highway and ditch and loaded again, on the far side.

Good - Crossing highway with guns loaded and safety on but unloading when going through ditch.

Poor - Never unloading guns.

Station #10 No Trespassing Sign:

Excellent - Turning away from sign immediately.

Good - Turns to left but stops when he/she realize that the sign says "no trespassing".

Poor - Turns to left and keeps on walking.

Station #11 Hunter-in-woods:

Excellent - Sees immediately that a shot cannot be made.

Good - Hesitate too long as to whether or not to take shot.

Poor - Shoots at noise.

Station #12 The Poacher:

Excellent - Gets description and license number of car or truck.

Good - Gets only license number of car or truck.

Poor - Walks away not wanting to get involved.

Station #13 Rabbit in Grass:

Excellent - Shoots immediately.

Good - Shoots but take a long time doing it.

Poor - Doesn't shoot.

NOTE: Stop after rabbit and tell students there are hunters up ahead. Ask how many coats they see.

Station #14 Coats:

Excellent - 3 coats.

Good - 2 coats.

Poor - 1 coat.

Station #15 Running Deer

NOTE: Students should see deer which is 40 feet down a trail while they are taking a close look at coats.

Excellent - Taking a shot immediately, providing the partner is out of the way.

Good - Taking a shot but partner too close.

Poor - Not taking a clear shot or shooting over partner's shoulder.

Station #16 End of Hunt:

Excellent - Opens guns in field as he/she approachs buildings.

Good - Open safety but does not unload.

Poor - Carry loaded guns to car.

NOTE: Make sure all guns are unloaded when being put back into car!

APPENDIX C

GRADING SHEET FOR SIMULATED HUNT

STATION	OBJECTIVE	NUMBER GRADE		
		Good	Fair	Poor
1	Farm House (permission)			
2	Guns In Car Trunk			
3	Crossing Log			
4	Bird Flying From Ground			
5	Crossing A Fence			
6	Raccoon Near Lake			
7	Sandy Hill (climbing)			
8	Narrow Path (shootable deer)			
9	Crossing Ditch			
10	No Trespassing Sign			
11	Hunter In Woods			
12	Poacher With Ducks			
13	Rabbit In Field			
14	Number Of Coats In Woods			
15	Deer In Woods			
16	Unloading Guns			
	TOTAL			

APPENDIX D

PARTICIPANT DEMOGRAPHICS

APPENDIX D

PARTICIPANT DEMOGRAPHICS

1. What is your age? _____

2. Are you a boy _____ or a girl _____?

3. Who hunts in your family? _____

   _____

   _____

   _____

4. Have you been with someone when they were hunting?
   Yes _____ No _____

5. Which of the following guns have you shot?

   Rifle _____

   Shotgun _____

   BB Gun _____

   Pistol _____

6. Is there anyone in your family that disagrees with hunting?

   Yes _____ No _____

7. Do you plan to buy a hunting license?

   Yes _____ No _____

APPENDIX E

PRE-TEST QUESTIONS

APPENDIX E

PRE-TEST QUESTIONS

True or False. Put a "T" in the space in front of the question if the statement is true and a "F" if it is false.

1. _____ Some shotguns have spiral grooves in the barrel.

2. _____ A firearm can be given to someone else with the action closed if the safety is on.

3. _____ Before starting to climb a fence, unload your gun and leave the action open.

4. _____ When three people are hunting, only the middle hunter can turn around and fire behind him.

5. _____ When walking on a ridge, it is best to walk one behind the other.

6. _____ You only need verbal permission from a farmer to hunt on his land.

7. _____ A 30 caliber rifle can be used to deer hunt throughout Michigan.

8. _____ It is unsafe to hurry ahead of the rest of your group to get the first shot.

9. _____ Do not walk for more than 15 minutes in any direction when you are lost.

10. _____ A 22 caliber rifle can shoot up to one mile.

11. _____ A person should rub a frost bitten area vigoursly.

12. _____ You will float better if you put the duck decoys under your coat after you have fallen from a boat into deep water.

13. _____ Birds placed in poor habitat will disappear soon after they are released.

14. _____ When you know deer are in the area, it is all right to shoot into the woods when you see something that is brown.

15. _____ A person gets hypothermia only in hot weather.

16. _____ Name 5 important items that you should have in a survival kit.

_____
_____
_____
_____
_____

Total answers = 20.

APPENDIX F

LETTER TO WORKSHOP PARTICIPANTS

APPENDIX F

LETTER TO WORKSHOP PARTICIPANTS

August 24, 1985

Dear Sportsman:

Last August you took part in an important study conducted at the Washtenaw Sportmans Club that involved an outdoor hunting exercise. We would now like to ask you some questions concerning how successful your hunting season was.

Your answers will be kept confidential and will in no way keep you from getting a hunting license this year. Please return this questionnaire as soon as possible.

Sincerely,

Ronald J. Saunders
Hunter Safety Coordinator
Washtenaw County

APPENDIX G

SUCCESS DURING HUNTING SEASON

APPENDIX G

QUESTIONNAIRE SENT TO STUDENTS AT END OF HUNTING SEASON

YOUR NAME _____

1. Did you buy a hunting license for the 1984-85 hunting season?

   Yes _____ No _____ If your answer is no, why not?

   _____

   _____

   If you answered no to question 1 **STOP HERE** and **RETURN THE QUESTIONNAIRE.** If you answered yes, continue answering the questions.

2. Did you go hunting last hunting season? Yes _____ No _____

   If Yes, how many times? _____

3. Who were the people you hunted with? (Example: father, uncle, friend, etc.)

   _____ _____ _____

4. What kind of animals or birds did you shoot at?

   _____ _____ _____

5. Approximately how many shots did you shoot at game? _____

6. Did you get any game? Yes _____ No _____

   If yes, what kind and how many of each. (Example: 4 rabbits, pheasants, etc.)

   _____

7. Did you practice shooting at a range or open field?

   Yes _____ No _____

   If yes, approximately how many times did you shoot:

   rifle _____

   shotgun _____

   BB gun _____

   pistol _____

8. Overall, how would you rate the enjoyment that you received from hunting during the 1984-85 season?

very good	good	neither good nor poor	very poor
_____	____	_____	_____

9. Do you plan to hunt again this year? Yes _____ No _____

_____

_____

10. Was there anything specific in the hunter safety course that you found helpful in preparing you for your hunting season?

Yes _____ No _____

If yes, please explain. (Use the back of this page if necessary.)

_____

_____

11. During the 1984-85 hunting season, did you catch yourself doing anything that was unsafe?

Yes _____ No _____

If yes, please explain: _____

_____

12. Did you ever observe any other hunter doing anything that was unsafe?

Yes _____ No _____

If yes, please explain: _____

_____

Thank you for your cooperation in taking part in the simulated hunt last year and answering these important questions.

Let me remind you that these answers will be kept confidential and will be read by no one else.

Your earliest return of this survey will be greatly appreciated.

APPENDIX H

MICHIGAN STATE HUNTER SAFETY EDUCATION FINAL EXAMINATION

APPENDIX H

HUNTER SAFETY EDUCATION FINAL EXAMINATION

NAME _____ SCORE _____

INSTRUCTIONS: This test consists of 100 questions, about half are multiple choice and half are true-false. Your instructor will tell you how many questions must be answered correctly to pass.

TRUE - FALSE
INSTRUCTIONS: Read each statement carefully. Circle (T) if the statement is True and (F) if the statement is False.

T F 1. One type of muzzleloading gun is called a "flintlock".
T F 2. Muzzleloading guns are used to hunt game animals.
T F 3. Black powder should *not* be poured from a horn or flask directly into the barrel of a muzzleloader.
T F 4. The word "pistol" is commonly used to describe short barreled guns that are fired from the hand.
T F 5. Revolvers have clip magazines for the extra cartridges.
T F 6. Modern rifles are made up of three major assembly groups.
T F 7. A hunter can always rely on the safety on the firearm.
T F 8. Ammunition used in modern guns is of two types—rimfire and centerfire.
T F 9. A 12 gauge shotgun barrel is "gauged" in this way: 12 lead balls the size of the bore will weigh one (1) pound.
T F 10. At close range (5 to 10 yds.), shotguns can be more dangerous than rifles.
T F 11. Muzzleloading firearms can be safely fired with smokeless powder.
T F 12. A safe hunter will shoot at a sound in the brush.
T F 13. A safe hunter will "treat every gun as if it were loaded".
T F 14. Loaded guns may be safely taken inside a cabin or dwelling, or placed in a car or truck.
T F 15. Serious accidents can occur while trying to string a bow.
T F 16. The sight on a shotgun is *not* the same as the sights on a rifle.
T F 17. During bow seasons most states allow hunters to use bow and arrow for hunting certain species of game.
T F 18. Modern hunting arrows are made of steel, brass and plastic.
T F 19. To string a bow safely, you should use a bowstringer.
T F 20. Whenever a bow hunter stops hunting for any reason, he should remove the arrow from the bow and put it in the quiver.
T F 21. Game laws are necessary to control the season limit so that each hunter has a fair share.
T F 22. A hunting license allows you to hunt on private property without asking permission.
T F 23. Many states require that big game hunters wear blaze orange or another special bright color.
T F 24. A lost hunter can tell his direction without a compass by using his wristwatch and the sun.
T F 25. A hunter, camper, fisherman or hiker should carry a survival kit while in the field.
T F 26. Snow caves should not be used for shelter.
T F 27. If you have water, you can survive two or more weeks in the wilderness without food.
T F 28. Drinking water can be obtained by building a water still with a piece of plastic.
T F 29. Ground to Air Rescue Signals can be helpful if you are lost.
T F 30. Wind does *not* increase the danger of exposure to cold temperatures.
T F 31. Game taken in the field should be cleaned immediately to assure that it will be good table meat.
T F 32. Game taken in the field, cleaned and properly skinned, should be covered with a cloth game bag.
T F 33. It's safe to carry a loaded gun in a vehicle or boat, provided that the safety is *on*.
T F 34. "Road hunting" improves landowner-sportsmen relations because the hunter doesn't have to bother the landowner to ask permission.
T F 35. The licensed hunter is an important tool in modern game management and wildlife conservation.
T F 36. Wildlife laws are established to protect game flocks, herds and all non-game species.
T F 37. Predatory animals do *not* prey on other animals.
T F 38. When hunters harvest only the surplus game, animal populations can be balanced to the available food and habitat.
T F 39. It is all right to point a gun at another person if the gun is unloaded.
T F 40. Game laws should be obeyed because they are intended to protect game animals and to assure a good future for the sport of hunting.
T F 41. Man, a warm blooded mammal, is a member of the animal kingdom.

continued inside

T F 42. Nature's checks and balances are far more cruel to wildlife than hunting as a means of controlling animal populations.
T F 43. Failure of hunters to ask permission to hunt on private property is one of the main complaints landowners have against hunters.
T F 44. When you discover an arrow is cracked, you should break it.
T F 45. A Damascus barrel is made of twisted wire wound around a mandril and welded into a tube.
T F 46. A bullet fired from a .30-06 is *not* dangerous over one (1) mile.
T F 47. When wildlife and domestic animals strip the grass, the topsoil is eroded away.
T F 48. A Damascus barreled shotgun is safe to fire with smokeless powder shot shells.
T F 49. A shot fired from a .22 rifle is dangerous to one mile or more.
T F 50. Throughout the nation each year, land and habitat are expanding for wildlife.
T F 51. The objective of marksmanship training is to enable the hunter to make a clean, humane kill with a single shot.
T F 52. When hunting alone, it is a safe practice to hunt with your finger on the trigger.
T F 53. When possible, guns should be cleaned after each hunting trip.
T F 54. Good sportsmen always leave a clean camp on both private and public property.
T F 55. Before leaving camp, your campfire should be put out with water and covered with dirt.
T F 56. A shot fired from a 12 gauge shotgun is dangerous at a distance of over a mile.
T F 57. A 12 gauge shotgun has a larger bore diameter than a 20 gauge shotgun.
T F 58. A gun should be unloaded before crossing a fence or a stream.

MULTIPLE CHOICE

INSTRUCTIONS: Read each statement carefully. Place the letter of the phrase which best completes the statement in the blank at the left of each statement.

____ 59. You can tell if a muzzleloader is loaded because
a. you cannot see through the barrel.
b. you can hear the ball or shot rattle in the barrel.
c. you can insert a ramrod to measure the inside of the barrel.

____ 60. Modern rifles are made up of which of these assembly groups?
a. action, stock and barrel.
b. front sight, rear sight and firing pin.
c. trigger, bolt and sling.

____ 61. Rifling (spiral grooves) is found in
a. rifles.
b. rifles and handguns.
c. shotguns.

____ 62. The safety on any gun is
a. a mechanical device that sometimes fails to work.
b. a sure way of keeping a gun from firing.
c. of no value at all.

____ 63. Ammunition used in a shotgun is called
a. bullet.
b. cartridge.
c. shotshell.

____ 64. Ammunition used in a rifle or pistol is called
a. bullet.
b. cartridge.
c. shotshell.

____ 65. The four components of a cartridge are:
a. primer pocket, wad, flashhole and slug.
b. primer, powder, case and bullet.
c. rim, shoulder, neck and mouth.

____ 66. The five components of a shot shell are:
a. rim, shoulder, neck, mouth and primer pocket.
b. shot, wad, powder, primer and case.
c. wad, bullet, shoulder, flashhole and powder.

____ 67. As a safe hunter you should carry your gun with the
a. muzzle pointed straight ahead.
b. muzzle pointed in a safe direction.
c. safety *off* so you can shoot quickly

____ 68. Waterfowl or migratory birds may be hunted with
a. any shotgun capable of holding any number of shells.
b. shotguns 12-gauge and smaller and capable of holding no more than five shells in the barrel and magazine.
c. shotguns not larger than 10-gauge and capable of holding no more than three shells in the barrel and magazine.

____ 69. When cleaning and storing a gun, the gun should be
a. lightly oiled.
b. packed with grease.
c. plugged with a rag to keep the dust out.

____ 70. Sighting in a rifle means to
a. change the sights.
b. see where the rifle is pointed.
c. fire several shots and adjust the rifle sights until the shots hit the bullseye or center of the target.

____ 71. Arrowheads used for big game hunting are called
a. blunt points.
b. broadhead points.
c. target points.

____ 72. The majority of firearms accidents happen in the
a. car.
b. field.
c. home.

____ 73. A "No Trespassing" or a "No Hunting" sign means
a. the landowner doesn't want you on private property and as a sportsman you should respect that decision.
b. you can hunt if a friend was given permission.
c. you can hunt, but if caught by the landowner you must leave.

____ 74. The color that has proven most visible in nature is
a. blaze orange.
b. red.
c. yellow.

fold here

____ 75. It is *best* for deer hunters to avoid wearing white because
a. it may alarm the deer.
b. it may be mistaken for the white rump of a deer.
c. white is hard to see against snow.

____ 76. The first thing a lost hunter should do is
a. admit to himself that he IS lost.
b. follow a ditch or stream.
c. make a ground signal.

____ 77. The most important reason a lost hunter would build a survival fire is to
a. scare away wild animals.
b. dry clothes, keep warm, cook food and signal for help.
c. provide a warm place to spend the night.

____ 78. The four most important requirements of survival are
a. matches, compass, map and knife.
b. matches, tent, lantern and blanket
c. mental self-control, water, food and shelter.

____ 79. The three main causes of meat spoilage are
a. hair, feathers and lead.
b. heat, dirt and moisture.
c. fog, air and steel.

____ 80. Big game that has been taken in the field should be tagged
a. immediately as your legal game.
b. immediately after field dressing the game.
c. when you get the animal back to camp.

____ 81. Domestic animals such as cattle and sheep, when grazed on the open range
a. compete directly with wildlife such as elk and deer for the same food.
b. do not compete with wildlife for the same food.
c. feed in different areas than the wildlife.

____ 82. The following animals are predators
a. lions, wolves and foxes.
b. mourning doves, ducks, geese and pheasants.
c. rabbits, gophers, squirrels and muskrats.

____ 83. If a lost hunter panics, he is most likely to die of
a. frostbite and exhaustion.
b. lack of water and starvation.
c. shock and hypothermia.

____ 84. When shooting a rifle or pistol, which of the following would make the best backstop?
a. a live tree.
b. a rock wall.
c. an earth bank.

____ 85. The safest rifle for a beginner is a single shot, bolt action because
a. it is easy to see if the action is open and unloaded.
b. it doesn't shoot as far.
c. the safety is bigger and less apt to give trouble.

____ 86. The rifling of a rifle is
a. another name for the bolt.
b. the grooves in the bore of the barrel which make the bullet spin.
c. the part of the barrel which the cartridge fits.

____ 87. If you should find yourself in a group of hunters where a member of the party was careless, you should
a. ignore him and not say anything to hurt his feelings.
b. remind him of his careless handling of his gun and the danger to his hunting partners.
c. take his gun away and send him home.

____ 88. When another person hands you a gun, you should
a. ask if it is loaded.
b. check to see if the safety is on.
c. request that he open the action and check it before you accept it.

____ 89. After stringing a bow, the next step is
a. check arrow nocks.
b. make certain the string is secure in the bow nocks.
c. twang the string a few times.

____ 90. Upon retrieving an arrow after shooting it, you should
a. check it for damage.
b. replace it in the quiver.
c. sharpen the broadhead.

____ 91. To properly sight in a gun, you should move the
a. front sight.
b. front and back sight.
c. rear sight in the same direction you want the bullet holes to move.

____ 92. Bullets should *not* be fired into water because
a. it is dangerous to fish.
b. it will bounce or ricochet off at an uncontrolled angle.
c. it is *not* sportsman like.

____ 93. If you think you see game running through the brush you should
a. positively identify the game before taking any further action.
b. shoot immediately.
c. take the safety off and aim the gun in that direction.

____ 94. Firearms safety rules apply to
a. all guns.
b. BB guns.
c. only guns that fire cartridges.

____ 95. For long shots when hunting ducks, geese or shooting trap, you should use a shotgun with a
a. full choke.
b. modified choke.
c. cylinder choke.

____ 96. If you are walking behind other hunters along a trail, you should carry your gun
a. loaded so that you're ready to shoot.
b. pointed straight ahead.
c. pointed to the side or back over the shoulder.

____ 97. Three hunters are hunting side by side in a field and a legal game bird flushes and flies to the right. Who shoots at it?
a. all hunters.
b. the hunter on the right.
c. the hunter in the middle.

____ 98. It is safe to cross a fence with a gun if the
a. barrel is pointed in a safe direction.
b. gun is unloaded first.
c. safety is on.

____ 99. Guns stored at home should be
a. hidden away in closets or cupboards.
b. loaded in case they are needed.
c. unloaded and locked in a cabinet or gun rack separate from any ammunition.

____ 100. The principle difference between a shotgun and a rifle is that the shotgun
a. does not have a spirally grooved barrel.
b. is not so dangerous because the shot doesn't travel very far.
c. usually has two barrels instead of one.

If you finish early, recheck your answers.