AN INVESTIGATION AND COMPARISON OF VEHICLE ACCIDENTS AND MOVING VIOLATIONS AS REPORTED BY SELECTED STUDENTS IN SUMMER AND TRADITIONAL NORTH CAROLINA DRIVER EDUCATION PROGRAMS

By

Horlin Carter

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ABSTRACT

AN INVESTIGATION AND COMPARISON OF VEHICLE ACCIDENTS
AND MOVING VIOLATIONS AS REPORTED BY SELECTED STUDENTS
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The central purpose of this study was to determine if there was a difference in vehicle accident involvement and moving violation convictions of students taught to drive in summer (over a short length of time) driver education programs versus students taught in traditional (over a longer period of time) driver education programs.

The study used a self-reporting driver education evaluation survey as the instrument to determine if summer or traditional driver education programs indicated differences on high school drivers' accident involvement and convictions for moving violations.

The sample population of this study consisted of 465 students from 10 high schools; 175 students who had completed driver education in the summer of 1981, and 290 students who had completed driver education in the traditional or regular school year of 1980-81.

The students and the ten schools in this study were randomly selected in North Carolina.

During the fall of 1982, the students were asked to respond to the Driver Education Evaluation Survey. The data collected from the survey consisted of the students' responses to 70 items which were divided into

four major categories: (1) suggestions for improving driver education courses, (2) driving experience, (3) collision experience, and (4) type of crash.

The data collected from the responses to the survey were tabulated and analyzed using a t-test for primary questions and a chi square test for the secondary variables.

Major findings of this study showed:

1. There was not a significant difference between vehicle accident involvement of students who completed a traditional or summer driver education program.
2. There was not a significant difference between moving violation convictions of students who completed a traditional or summer driver education program.
3. The more miles the students drove 12 months prior to the study the fewer traffic accident involvements and moving violation convictions they experienced.
4. The students that had been licensed to drive for longer periods of time, had fewer traffic accident involvements.
5. Males had more moving violation convictions than females.

DEDICATION

This study is dedicated to:

Mrs. L. Ophelia Carter, my mother

Tracy Renee, my daughter

Horlin, Jr., my son

Also dedicated to my sisters, brothers, and their families:

Dorothy, Orlin, Viola, Shirley, William,

Wanda, Reginald, Thurmond, and Adele

and Renee, my niece

Horlin Carter

East Lansing, Michigan 1983

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TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

THE PROBLEM

Introduction

The motor vehicle accident problem in the United States over the past ten years (1970-1980) has reached epidemic proportions. In 1970, United States motor vehicle drivers traveled approximately 1.1 billion miles, experienced approximately 54,633 deaths, and had a death rate per 100,000,000 vehicle miles of approximately 4.88 (See Figure 1). In 1980, U.S. motor vehicle drivers traveled approximately 1,511 billion miles, experienced 52,600 deaths, and had a death rate per 100,000,000 vehicle miles of 3.48[1]. The decline in motor vehicle fatalities in the seventies was suspected to be due to highway and vehicle engineering, education, and fewer vehicle miles traveled. Highway safety problems are very serious. The following facts from 1980 are presented to emphasize this point:[2]

1. 52,600 highway fatalities
2. 2,000,000 persons suffered disabling injuries
3. $13.4 billion property damage crashes
4. $39.3 billion lost in highway crashes

The U.S. Department of Transportation Driver Education Evaluation Program (DEEP) Study states the following about the highway safety problem:[3]

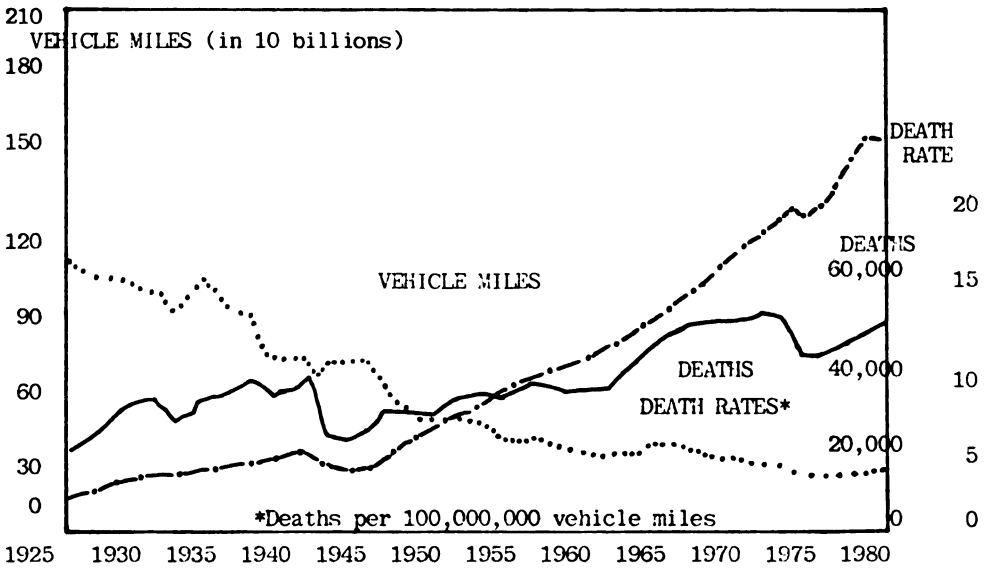

FIGURE 1

THE TRAFFIC SITUATION
TRAVEL, DEATHS AND DEATH RATES

Source: National Safety Council. Accident Facts, 1981 Edition. Chicago: National Safety Council, 1981, p. 40.

a. Highway crashes are the leading cause of death for Americans under the age of 40.

b. Highway crashes are the leading cause of accidental death for all ages.

c. Highway crashes account for 94% of all transportation-related deaths in America.

d. Highway crashes kill more Americans in one year than were killed in the Vietnam War in ten years.

Of the 52,600 deaths from motor vehicles in 1980, the age group 15-24 had the highest number (18,800), with a death rate per 100,000 population of 45.0. The only group that approximated this by number is the 16,100 deaths suffered by the 25-44 age group, but their death rate per 100,000 population was only approximately 25.0. The 75 and over age group had the second highest death rate (approximately 30.0), but only experienced 2,700 deaths from motor vehicles (see Figure 2).

The frequency of accidents and personal injury to the age group 15-24 was also very high (see Figure 3). The ratio of personal injury accidents to total accidents peaked at age 23 (see Figure 3).

Motor vehicle accidents and deaths cost this country approximately $39.3 billion in 1980. With the increasing cost of certain public agency activities (such as police, fire, courts, etc.), the motor vehicle accident cost will be even more astronomical to our nation.

"After more than 50 years of high school driver education (HSDE) during which time it appears to have gone through phases of uncontrolled development, made futile attempts to maintain quality control, undergone extreme criticism, and finally shown significant signs of objective curriculum development and evaluation--its actual effectiveness as a crash

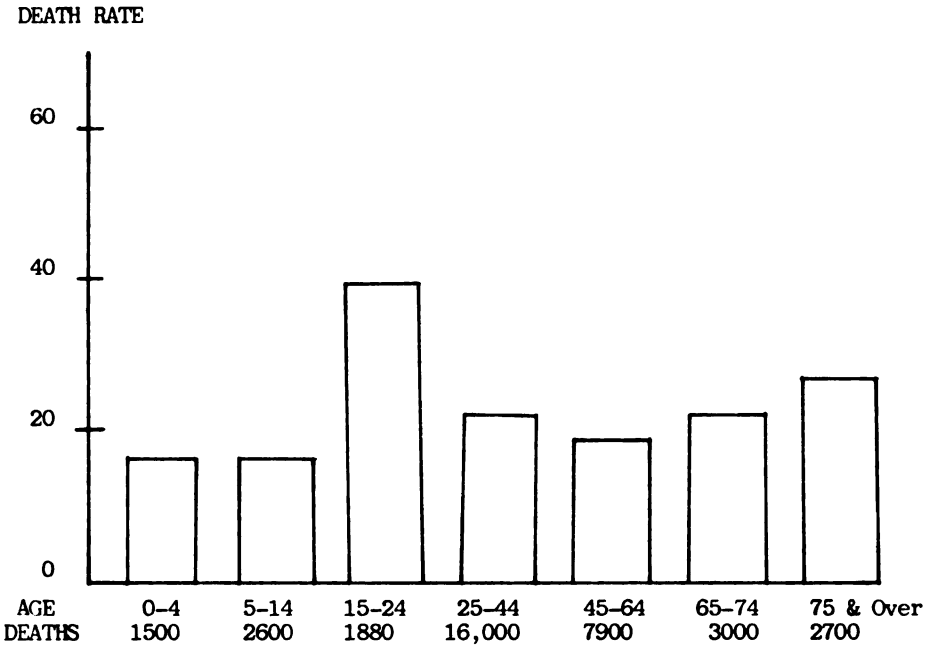

FIGURE 2

AGE OF VICTIM FOR
ALL MOTOR VEHICLE ACCIDENTS-1979

Source: National Safety Council. Accident Facts, 1981 Edition. Chicago: National Safety Council, 1981, p. 42.

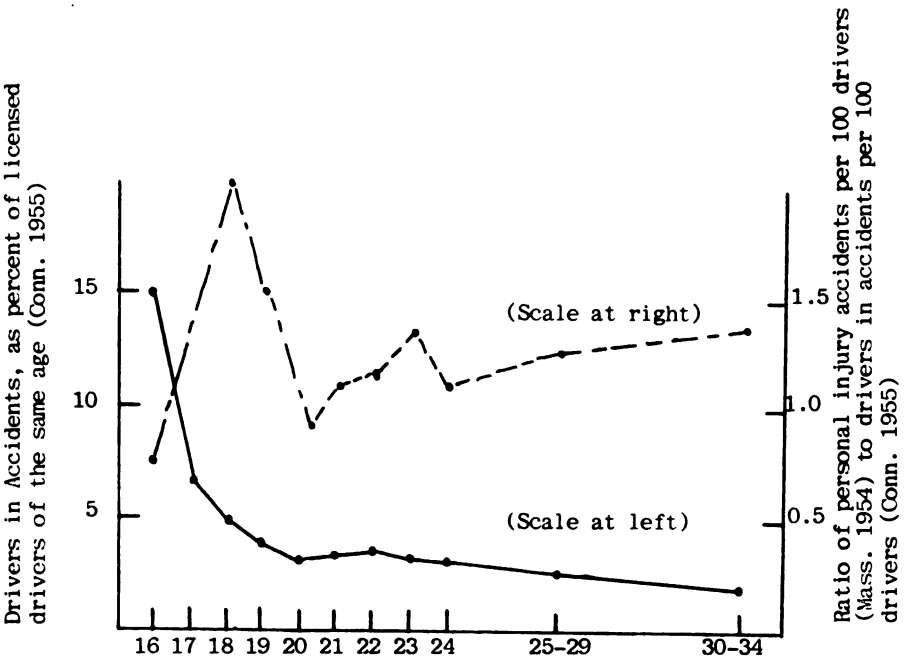

FIGURE 3

Frequency of Accidents and Personal Injury Ages 16-34

Source: Donald C. Pelz. "Driver Motivation and Attitudes", Driver Behavior, Cause and Effect. Insurance Institute for Highway Safety, Washington, D.C., 1968, p. 103.

reduction countermeasure is still undetermined. Early studies conducted in the 1950's and 1960's concluded that high school driver education reduced crashes and violations by 50 percent among those persons exposed to it. These studies did not control for a variety of contaminating preselection factors, which were found by later investigation to account for most of the reported effect. Thus, their conclusions were incorrect."[4]

"Some critics have claimed that high school driver education has no effect in reducing crashes, and has little potential for such an effect. Such claims cannot be supported."[5]

It is imperative that aspects of program cost, including the salaries of staff, the types of instructional program employed, the size of the enrollment of the program, the time of the day and of the year that instruction is provided, location of the school to population centers, and the average expenditure per pupil in the district, as well as other fiscal variables be studied. Decision makers in the local schools and at the state level must determine whether there are alternatives in driver education which offer savings without negatively affecting the quality of the program or the smoothness of school operations.[8]

Statement of the Problem

The problem for this study was: do short, condensed, and less costly summer driver education programs produce comparable or better drivers than long, expanded, and more costly traditional driver education programs as measured by accident involvement, moving violation convictions, and other criteria?

Definitions

The following definitions were used in this study:

Collision: When your car hits something or was hit by something causing any damage or injury.[7]

BTW: The behind-the-wheel phase of the driver education program (on and off-street).

Schools: The North Carolina Secondary Public Schools about which data were received.

Eligibile Student: Any youth between the ages of 14 years-6 months to 18 who resides in the State of North Carolina, regardless of whether or not the individual is currently enrolled in any other course in any school that the district operates.

Driver and Traffic Safety Education: The formal learning program and experiences provided by the school for the purpose of helping students become good traffic citizens and to use motor vehicles safely and efficiently.[8]

Standard Course: The traffic safety program which includes both classroom and laboratory instruction and meets all minimum standards set forth in the 1964 Safety Conference.[9]

Classroom Instruction: Group instruction which covers such content areas as traffic citizenship, laws and regulations, characteristics of drivers, role of government, automobile use and traffic problems.[10]

Traditional or Regular School: The period during which instruction is offered during the normal school hours of the typical 36-week school year.

Driving Simulation: A teaching method employing both films and electro-mechanical devices designed to represent the driver's compartment of the automobile through which students develop proper judgment and behavior responses as well as manipulative skills.[11]

Multiple-Car Driving Range: An off-street area on which a number of cars are used simultaneously to provide laboratory instruction under the supervision of one or more teachers.[12]

School Safety Supervisor: A person, often on the staff of a school district, who is responsible for school traffic safety programs, planning and operation, including curricular activities and personnel performance.[13]

Accident: An unforeseen and sudden occurrence which results in property damage, personal injury, or death with causal factors arising from an identifiable series of events or conditions.[14]

Split Schedule: A classroom-laboratory schedule in which the student completes all requirements of time and instruction in the classroom, and then at some later time (days, weeks, or months) begin the laboratory instruction.

Summer School: This includes instruction offered during the weeks of summer in which school is not normally in session.

Concurrent Schedule: A driver education course in which classroom and laboratory phases of the program are integrated into a single course. Students flow from one phase to another on a day-to-day basis in order for instruction to have maximum effectiveness.[15]

Conviction: The finding by a court that a person is guilty of violating a law as charged.[16]

Citation: A summons to appear before a court of law at a specified time to determine the guilt or innocence of the person charged with violating a traffic law.[17]

Approved Driver Education Course: Any driver education course certified by the State Department of Public Instruction or State Board as meeting at least minimum requirements of the North Carolina Driver Education Act.[18]

Practice Driving: That part of laboratory instruction which provides learning experiences for the student as an operator when behind-the-wheel of a dual-control car in traffic on public roadways under the direct supervision of a qualified teacher instructing from the front seat of the car.[19]

DOT: U.S. Department of Transportation.

NHTSA: National Highway Traffic Safety Administration.

HSDE: High School driver education.

Accident Involvement: Any accident involving a motor vehicle in transport (in motion, in readiness for motion, or on a roadway, but not parked in a designated parking area) that results in death, injury, or property damage.[20]

Limitations of the Study

1. Data collection was limited to student responses to the "Driver Education Evaluation Survey."

2. The accident and violation experience was for 500 students who completed driver education in 1980-81 school year and 1981 summer program. Accidents and violations were the criteria used in the study.

3. The study focused only on public driver education programs, not commerical or private driving schools.

4. The type of degree or preparation of teachers was not under investigation. All the teachers in programs that were studied had met minimum requirements for driver education instructor approval.

5. The quality of the driver education programs in the study was not under investigation. All of the programs had met the minimum requirements for driver education program approval.

6. Data was limited to North Carolina.

Basic Assumptions Related to the Study

1. The data reported by the randomly-selected students on the self-reporting questionnaire were accurate.

2. The instruction sheet for the administration of the self-reporting questionnaire was read the same way to all of the groups examined in that particular school.

3. All the programs in the study offered the state-required 30 hours of classroom and six (6) hours of behind-the-wheel instruction.

4. All the programs in the study used the same state driver education curriculum.

Purpose of the Study

The purpose of the study was to determine if there was a difference in accident involvement and moving violation convictions of students taught to drive in summer (over a short length of time) driver education programs versus students in traditional (over a longer period of time) driver education programs.

Justification for the Study

School districts throughout North Carolina are faced with the problem of tight budgets, and the expenditures for the continuation of course offerings are rising every year. State aid for schools is determined by enrollment, and for most North Carolina Schools the enrollment is declining as inflation increases. Schools are attempting to continue to offer programs at a minimal expense. Driver education programs are being offered increasingly in the summer as a result. Summer driver education programs save the school districts money in several ways: (1) Teachers work under a summer contract where no fringe benefits are paid, (2) teachers are not paid for days off, (3) teachers work by the hour so this allows more students to complete the program since the teachers usually work long hours, and (4) students usually have to pay a course fee to take driver education in the summer. This helps to offset costs to run the summer programs.

Traditional driver education programs cost the school districts more money: (1) Teachers work under contracts that provide fringe benefits; (2) teachers are paid for sick days during regular school year; (3) teachers work under a term contract rather than on an hourly basis; and (4) students do not pay a course fee to take driver education.

There is little conclusive data available at this time that would allow for adequate comparisons of drivers from summer driver education programs with drivers from traditional driver education programs.

If the less expensive summer driver education program graduates are comparable to traditional program graduates in terms of the study criteria, then summer programs could be justified in the State of North Carolina.

The Hypotheses

H_{o1}: There will be no difference in the accident involvement between students taught to drive in a summer driver education program and students taught to drive in a traditional driver education program.

H_{1a}: There will be a difference in the accident involvement between students taught to drive in a summer driver education program and students taught in a traditional driver education program.

H_{o2}: There will be no difference in the number of convictions for moving violations of students taught in a summer or a traditional driver education program.

H_{2a}: There will be a difference in the number of convictions for moving violations of students taught in a summer or a traditional driver education program.

First Hypothesis:

$$H_o: \frac{U1}{TMSG} = \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education accident group mean
U_2 = Traditional driver education accident group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Alternate Hypothesis:

$$H_{1a}: \frac{U1}{TMSG} \neq \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education accident group mean
U_2 = Traditional driver education accident group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Second Hypothesis:

$$H_{o2}: \frac{U1}{TMSG} = \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education violation group mean
U_2 = Traditional driver education violation group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Alternative Hypothesis:

$$H_{2a}: \frac{U1}{TMSG} \neq \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education violation group mean
U_2 = Traditional driver education violation group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Summary

In 1980, United States motor vehicle drivers traveled approximately 1,511 billion miles, experienced 52,600 deaths, and had a death rate per 100,000 vehicle miles of 3.48.[21] Of the 52,600 deaths from motor vehicles in 1980, the age group 15-24 had the highest number (18,800), with a death rate per 100,000 population of 45.0.

It is imperative that aspects of program cost be studied in order to maximize the program. Decision makers on the local school level must make difficult decisions about alternatives in driver education which appear to offer savings to the school operations. They must determine if the savings will negatively affect the quality of the driver education program.

Organization of the Study

Chapter One contained the Problem, Introduction, Statement of the Problem, Definitions, Limitations of the Study, Basic Assumptions Related to the Study, Purpose of the Study, Justification for the Study, and The Hypotheses.

Chapter Two contains a Review of Literature and Research for the Study. The review of literature and research identifies research which has been conducted investigating the effectiveness of driver education, studies which utilized socioeconomic data, and driver records studies.

Chapter Three contains the Design and Methodology for the Study. It also contains information concerning the Population, the Sampling Design, the Data, the Analysis of Data, and Summary.

Chapter Four contains the Analysis of the Data for the Study.

Chapter Five summarizes the research, draws conclusions from the findings, and includes recommendations for further study.

FOOTNOTES

1. National Safety Council. Accident Facts, 1981 Edition. Chicago: National Safety Council, 1981, pp. 40-41.

2. Ibid., pp. 3-5.

3. U.S. Department of Transportation, National Highway Traffic Safety Administration. The Driver Education Evaluation Program (DEEP) Study (A Report to the Congress), July, 1975.

4. Ibid., pp. 1.

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6. Budig, Ronald L. "A Study of the Costs of Driver Education Programs in the Public Schools of Illinois." Illinois State University, 1976. Dissertation Abstracts International, 1977, 37, no. 7, 4006-A.

7. Quensel, Warren P. and Dr. Joseph E. Talkington. Traffic and Safety Education Section, Home Economics and Industrial Technology Department, Illinois State Unversity. Driver Education Curriculum Materials for Illinois Demonstration Center and Satellite Schools. Springfield: Illinois Office of Education, 1976.

8. National Commission on Safety Education. High School Driver Education, Policies and Recommendations. Washington, DC: National Education Association, 1964.

9. Ibid.

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11. Ibid.

12. Ibid.

13. American Driver and Traffic Safety Education Association. Sixth National Conference on Safety Education Proceedings, Volume IV. Washington, DC: ADTSEA, 1980.

14. Ibid.

15. Aaron, James E. and Marland K. Strasser. Driver and Traffic Safety Education. New York: The MacMillan Company, 1974.

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17. Ibid.

18. North Carolina. North Carolina General Statues (1976), Chapter 115C-215. Raleigh: North Carolina State Board of Education, January 22, 1976.

19. Illinois Office of Education. Driver Education for Illinois Youth, Section 1.01. Springfield, ILL.: Office of Education, 1972.

20. National Safety Council. Accident Facts, 1981 Edition. Chicago: National Safety Council, 1981.

21. Ibid., pp. 40-41.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

This review of literature will provide a background of related research in the areas of driver record studies, summer school effectiveness studies, driver education effectiveness studies, driver education cost studies, and general studies that used the survey/questionnaire data gathering technique.

Driver Record Studies

A study by Gutshall, Harper, and Burke[1], showed that generally, intelligence and socioeconomic status were influencing factors in the total number of violation points accumulated over a five year period. After closer examination, the driving records indicated that subjects from high socioeconomic groups received more speeding violations than those of lower socioeconomic groups. However, the low intelligence group had more points for violations, other than speeding, than the average and above average intelligence groups.

The low intelligence group differed significantly from the average group on the factors of combined accidents and violations. However, the low intelligence group did not differ significantly from the high intelligence groups on these same factors (accidents and violations).

Studies have verified that drivers 16-25 years of age have a higher proportion of accidents in relation to the total number of drivers in their age group than do older drivers.[2]

Dubin[3] stated that the high rate of accidents cannot be attributed to any deficiency in the sensory and physical functions. He believes the main causes of accidents in the 16-25 age group were experience, emotional and social immaturity, and temperamental qualities. Kaestner[8] studied the records of 904 licensed Oregon drivers involved in fatal accidents (1961-62), which then were compared with those of a randomly selected control group from the general driving population. The expected disproportionate number of males and young, inexperienced drivers of both sexes were noted. They also were much more likely to have had a traffic conviction within 12 months immediately prior to a fatal accident. Among the males involved in the fatal accidents, those in their 30's and 40's, and even older, had conviction patterns similar to those of the youngest drivers in the control group.

Kaestner suggested that fatal accident drivers, as a group, may possess less maturity than ordinarily expected for their respective chronological years.

In reporting on 32,387 driver records in injury producing accidents, characteristics of several driver groups were studied by Campbell[5]. With respect to accident type, older drivers and females showed relatively less involvement in single car accidents. But, in two car accidents, they showed a relatively high frequency for being involved.

Campbell also found that age and sex differences by time and day of the accident were factors. Males (particularly younger ones) were involved in more night and weekend accidents. This seemed apparent since they had more exposure during these times.

Levonian[6] studied 7,430 California drivers who had come to the Department of Motor Vehicles field offices to renew their driver's licenses. He wanted to determine whether prediction of recorded accidents and convictions could be made on the basis of driver characteristics other than previous accidents and convictions.

Levonian used measures on thirty-five predictor variables obtained on each subject. Data from half of the subjects were used to select a subset of these variables and to generate an equation intended to maximize the prediction of whether each of the remaining 3,715 subjects would be classified as a negligent operator over the three year period following license renewal. The results of this study indicated that negligent operators could be identified correctly at a statistically significant level on the basis of four variables; driving exposure (reported annual mileage), age, sex, and marital status.

Carlson and Klein[7], in a study of Michigan drivers showed that sons of fathers with no traffic convictions had .75 (1.41 vs 2.16) fewer violation points per individual than sons of fathers with convictions. Carlson and Klein also stated that students with grade point averages higher than 2.6 have fifteen percent fewer convictions (.29 vs .44) than students with grade point averages of 2.6 or lower.

Pelz and Schuman[8] revealed that over a one year period, in a study of 3,000 suburban drivers (age 16-25 and 35-44), that young men aged 18 and 19 had more violations than men either younger or older. With road experience controlled by age when driving was learned, the same peak at 18 or 19 years appeared (except that among men who learned at age 15, the recommended age for driver education), the crash and violation peaks were delayed one or two years.

Pelz and Schuman also found that for young men the accident rate more than doubled between 16 and 19 (from under 20 crashes per 100 drivers to over 45 per 100), and thereafter showed an irregular decline toward the middle age, with a hint of secondary peaks at 22 and 24. For violations and warnings, the age effect for young males was even more profound; a steady rise and trebling of the rate between 16 and 19, and thereafter a steady drop toward middle age with a possible secondary peak at age 24.

Signori and Bowman[9], in their study on personality and traffic accidents, felt that driving behavior is dependent upon two kinds of factors; those pertaining to the skill of the driver and those imposed by the task or driving situation. These authors thought that tension and low tension tolerance have much in common with susceptibility to automobile accidents.

In referring to violations and accidents of young males, a study was completed by Boyce and Dax[10] in Australia of intelligence and driving offences in young males. Of four hundred young males aged 17 to 21 years, with intelligence quotients of 100 I.Q. and above group, 74 had been convicted of traffic offences. Of the 263 in the dull and backward group with current licenses, 105 had been convicted of traffic offenses. The results of Boyce and Dax study were:

1. The intellectually dull and backward had more traffic convictions than the average to bright.

2. The number of first offences were almost the same for both groups. More people in the dull group had repeated offences. Dull students may have been less able to avoid being apprehended.

3. More dull persons commit serious offences because they lack the moral standards and community responsibility of those who are brighter.

Both groups in the Boyce and Dax study were unconcerned about non-serious offences (non-moving violations). The intelligent group had more understanding and would deliberately avoid committing (or being apprehended committing) serious offences of which they had more understanding of the nature or consequence. Again, the authors pointed out that the study did not appear to indicate that the dull are a greater liability on the road, but only that their handicap makes them more apt to be convicted of the non-moving offences.

A study by Buttiglieri and Guenette[11] reviewed the driving records of neuropsychiatric patients with active driver's licenses in Sepulveda (California) Veterans Administration Hospital. The 165 patient sample had accident and violation records which did not differ significantly from the California male driving population. Eighty percent of the sample had no accidents and more than two-thirds of the sample had no more than one driving violation during the three years preceding hospitalization. There was no clear cut difference in negligent-operator point count between the patient group and the California male driving population except at the high point end of the point-count distribution for a very small proportion of patients.

Summer School Effectiveness Studies

Summer school sessions are normally offered for the purposes of enrichment, acceleration, reduction of the academic load during the regular school year, or to make up for an earlier failure. The following studies dealt with the effectiveness of summer school classes offered in driver education and other areas of the study.

Copley[12] tested the difference in academic achievement between students in summer school and in the regular high school in the areas of English, American and world history, chemistry, economics, biology, algebra, and geometry. In his study, he found differences only in the area of economics. In economics, the achievement scores of the regular school year were superior to the summer school scores. Results were based on standardized achievement tests administered to both groups.

Leach[13] found that students in a summer biology program did well or better than students in traditional biology classes. Students were evaluated after 180 hours of instruction through the use of standardized biology tests. The sample of male volunteers was equated on the basis of age, I.Q., and previous science courses. The summer program was taken "in the field," which included camping outdoors and exploration.

Walker[14], through the use of two Summer School Concepts Scales, reported that students in secondary summer schools in Missouri held a higher concept of summer school than of the regular term. The report further stated that students attending summer school for the purpose of "make-up" held a higher concept of summer school than those attending for the purpose of "enrichment," and that an inverse relationship existed between students' regular term grade-point averages and the level of their concepts of summer school.

Tack[15] included 339 driver education classes in his study, with 3,236 students being interviewed and included. His findings concerning the comparison of summer and tradtional school year driver education programs were as follows:

1. Between students taught in the summer as opposed to semester, significant differences were found in the amount of knowledge learned. Although the gains in knowledge scores were statistically siginficant in both time periods, the semester-taught students had significantly greater gains.

2. Summer students were found to have significantly fewer moving violation convictions and suspensions/revocations than semester-taught students. However, when the influence of other variables known to be related to driving records were taken into consideration, the time at which a male student took driver education had no effect on future driving. The female, as compared to the male student taking driver education in the summer had fewer accidents, moving violations, and official actions.

3. Summer taught students rated their instructors significantly lower on items relating to: (a) the instructor satisfactorily answering their questions, (b) the instructor being a better than average teacher, (c) the instructor providing a good combination of lecture and discussion in the classroom, and (d) the instructor being concerned whether students learned the material. In general, summer students' responses to interview items indicated they enjoyed driver education less as compared to semester students' responses.

Driver Education Effectiveness Studies

Shively and Asher[16] felt that socioeconomic status was a deciding variable that differentiated between schools that offer driver education and ones that did not. The variables that differentiated between students clustered around academic knowledge, intelligence, socioeconomic status, and socioeconomic variables.

One of the earlier studies evaluating the effectiveness of driver education was done by Smith[17] in Detroit, Michigan. His was a two-stage evaluation model:

1. Inspection and observations of on-street routes, ranges, simulation laboratories, classroom instruction, and a review of program costs; and

2. A pilot study to determine whether the findings from violation records in the Secretary of State's Office would give some clues as to the effectiveness of range training as compared to on-street training in Detroit.

Smith reported inefficient use of facilities and cars, and recommended changes in scheduling, staffing, and class size. He recommended that on-street programs be replaced with "improved" range programs and additional driving simulator installations made possible by federal government matching funds.

The pilot study of the effectiveness of the Detroit driver education program included "a sample so small that differences shown have no statistical significance."[18] No conclusions about the relative effectiveness of on-range and on-street driving practice could be drawn from the pilot study.

Lyle[19] compared driver record information of driver education graduates with records of non-driver education graduates over a period of five years. Conclusions reached upon examination of data included:

1. Driver education students appear to have learned more about driving practices that would enable them to achieve better driving records than other drivers.

2. Students in driver education seem to have developed more experience in defensive driving than other students.

3. The driver education program provides a variety of learning experiences that help develop more conscientious drivers.

4. Through efforts to increase driver training programs and their effectiveness, it should be possible to produce young drivers who will display even better records of driver performance.

In a study by Kavanaugh, Kemper, and Klamm[20], 1,455 Illinois junior and senior high school students were surveyed and the following facts found:

19% had received high school driver education
10% had a commercial course
59% were taught by parents
4% were taught by other adults
3% were taught by a brother or a sister
5% were taught by other persons

The high school trained drivers had 27 accidents per 100 students as compared to 41 accidents per 100 students who had learned to drive by other methods.

Kavanaugh[21] reported that 8 of the 100 high school trained drivers collected traffic violation tickets while 25 of the 100 parent-trained students received tickets.

The California Driver Training Evaluation Study by Jones[22] investigated the effectiveness of driver training (laboratory phase) in relationship to cost and other factors. The study was established by state legislative action, Assembly Bill 1486 (1969-Veysey), for the purpose of comparing benefits and costs of driver training as given in California high schools by certified high school teachers with that given by commercial driving school instructors. Additionally, the bill specified a comparison of the standard six-hour training, or its legal simulator-assisted substitute (short training programs) with an enriched program providing four extra hours behind-the-wheel (long training programs).

Twelve thousand high school students were selected randomly and assigned to programs and trained by public high school or commercial school instructors in long or short training courses. This study was limited to the laboratory phase of the driver education program. All students had completed or were enrolled in the classroom phase.

This study used driving records (official) as well as school district socioeconomic data.

Major findings of the study were as follows:

A. Trained variables

1. Students trained in the long programs were superior.
2. Males were superior in all variables except those measuring attiudes.

B. Licensing variables

1. The long programs resulted in higher road test scores and shorter licensing delays.
2. There were no differences between the standard simulator and standard six-hour BTW program.
3. Females require much longer to be licensed and fewer are licensed.
4. Licensing rate for trainees were low (4% at 6 months and 73% at about 2 years).

C. Driving records

1. Citations
   a. Students trained in public programs had somewhat fewer citations.
   b. No consistent reliable differences were found between simulator and six-hour programs.
   c. Males' driving records indicated greater accident involvement and violation experience.
2. Accidents
   a. There was no difference between the accident rates of public and commercially trained students.
   b. There were no differences in accident rate between those trained in short and those trained in long programs.
   c. There was no difference between simulator and standard six-hour programs.
   d. Males' driving records indicated greater accident involvement and violation experience.

D. Very few students reported practice during or after training.

E. Little use was made of student observation time in car.

F. Cost

1. Cost varied greatly among the school districts and among commercial schools.
2. Public school programs cost were greater than commercial programs.

Jones[23] further stated: "Since driver training is justified and funded as an accident countermeasure, then accident experience of the experimental group is the most important criterion of training effectiveness."

Ten percent of the students in the California study had one or more accidents on record. Comparisons of the records for commercially vs. publicly trained groups showed there was no difference between them in accident experience during the first year of driving. Jones also stated that any effect of training would be expected to show up during the first year if at all.

Another study that examined the effectiveness of driver education was undertaken by the State of New York. Klepak[24] analyzed cost variations in a statewide sample of sixty-seven New York public school driver education programs in 1972-73. Although no data were presented to justify the statement, Klepak reported no demonstrable difference in the effectiveness between instructional methods or types of program schedules.

In a study on the effects of driver education on driver knowledge and attitudes by Loft[25] in Indianapolis and Marion County, Indiana, he found that in using the Siebrecht Attitude Scale there were slight differences in favor of the students that had taken driver education. The girls in the driver education schools showed a better attitude than the girls in the non-driver education schools.

On the knowledge test of rules of the road, etc., the trained high school students seemed to fare better.

This study analyzed 2,442 students. One thousand, six hundred seven had valid licenses and they were checked with records of the Indiana Department of Motor Vehicles for violations and citations. Loft concluded that driver education was influential in reducing accidents and traffic violations for teenage drivers.

Kavanaugh, Kemper, and Klamm[26] showed in their study of high school students in Illinois how important the automobile was in the lives of students. Shively and Asher[27], Gutshall, et al.[28], and Bologna[29] also reported how important automobiles were to the Educable Mentally Handicapped students. All of the authors stated how important a role the automobile has played in almost everyone's life in this country. Further, there was perhaps no group to which the automobile is more important than today's teenagers. "More than just a means of transportation, to these youngsters the automobile is a symbol of prestige, social status, and most of all maturity and freedom they are so eager to assume."[30]

The authors agreed that in many cases, particularly among teenage boys, the automobile has become one of their major focal points of existence. Much of their free time is spent driving automobiles, tinkering with automobiles, reading, talking, thinking, and dreaming about automobiles.

An extensive study of driving records was done in Illinois by Florio and Huffman[31]. This study evaluated the driving records of over 500,000 drivers between the ages of 16 and 20 over a five year period. The conclusions of this study illustrated significant differences in favor of

driver education in both traffic law violations and motor vehicle collisions. Males who had driver education had a record of 66 fewer accidents per 1,000 drivers than those in the non-driver education groups; females who had driver education showed a difference of 18 fewer accidents. Driver education males also showed 439 fewer convictions per 1,000 drivers; and the females, 58 fewer convictions. A comparison of the summaries showed that the males in the driver education group had 505 fewer convictions and/or accidents per 1,000 drivers. Females compared had a difference of 76.

Boyce and Dax[32] reported that males under age 25 years have a higher death rate and injury rate from road accidents than any other age group. A large proportion of these had been drinking and many of them had criminal records. This was a repeat of the Boyce and Dax 1973 study, which mainly was involved in determining the driving records of low I.Q. males. This second study tried to establish the relationship of driver education and driving offences in young males. The reduction of numbers of offenders and offences relating to the driver education schools were almost the same categories as those in which the less intelligent group exceeded the more intelligent in the first study.

Boyce and Dax, therefore, thought it possible that the greatest effects of driver education are on the less intelligent members of the school population. Those students that took driver education had statistically less repeat offences, total offences and non-moving offenses. The authors further concluded that driver education goals should not be seeking accident reduction by itself--but should be that of achieving a competent and knowledgeable traffic citizen who recognizes a high standard

of driving behavior, has the interest and desire to play a part in an efficient, integrated highway transportation system.

Moss[33] studied the driving records of people who had completed either a competency-based or 4-phase driver education program, controlling for the variables of overall driving record, sex, number of moving violations, and number of chargeable accidents. The study concluded that either program was acceptable in terms of its effectiveness relating to driving performance.

Dreyer and Janke[34] compared range and non-range driver training, utilizing student performance during training, performance on tests required for licensing, and the number of days between training and licensing for their measurements. In that study, driver training meant the laboratory phase only, while driver education meant the classroom phase. California Department of Motor Vehicle files supplied information on student accident and conviction records within the year following the beginning of driver training. Results showed that non-range students performed significantly better on the following training variables: (1) knowledge post-test; (2) simulator score; and (3) driver course grade. There was not a significant difference between range and non-range students on driver licensing test scores or in the amount of time spent in becoming licensed. Range students had fewer total accidents than non-range students in the year following the beginning of training. Time spent in the range during training was not related to frequency of accidents or convictions for range students.

Council, Roper, and Sadof[35] compared range and non-range driver education students in North Carolina. Methodology included sampling the

class rolls of the seven orginial range programs in North Carolina and of seventeen randomly chosen non-range schools for the same year. Names were then linked with subsequent driving history as recorded by the North Carolina Department of Motor Vehicles, and resulting data were comparatively examined by various accident and violation classes and time periods. The categorical analyses indicated no significant differences between the range group and the non-range group based on accident histories.

Through the use of accident and violation involvement, Shaoul[36] concluded that driver education was usually observed to be significantly related to a reduction in accidents and violations. However, an investigation into the nature of this relationship showed that it was one of association with a third variable, namely experience and exposure to risk, rather than a direct causal one. The cognitive factor was an important element in the driving task. However, he found little evidence to suggest that driver education had been instrumental in altering driving behavior.

Conger, Miller, and Rainey[37], studied the effects of driver education, the role of motivation, intelligence, social class, and exposure, and found some questionable results. In this study, the accident and violation records of three groups of adolescent male drivers during their first four years of driving were compared. One group elected to take driver education and completed the course; another group consisted of students wishing to take driver education but who were unable to do so; and the third group consisted of students who did not wish to take driver education and did not.

Conger, et al. found that subjects in self-elected groups scored significantly lower than those in the two other groups on violations and

points. No significant differences were obtained for responsible accidents, although the elected group and the group that did not take driver education scored lowest. The analysis also revealed significant differences between the three groups on exposure (miles driven per year), socio-economic status, and intelligence.

Among findings of the Conger study was the fact that the results of studies purporting to show differences in driver behavior between students who have and those who have not had driver education may be influenced by factors other than the driver training experience itself.

Driver Education Cost Studies

The expense involved in the operation of the driver education program has been of prime concern. The following studies dealt with the expenses involved in driver education, and how they vary from one program to another.

Budig[38] investigated the relationship between the average cost per pupil for driver education in Illinois with selected variables. Those variables included: 1) location of school in state; 2) average daily attendance; 3) assessed valuation per pupil; 4) use of simulation, multiple/car driving ranges, and/or dual-control cars as laboratory methods; and 5) the time of day, week, or school year during which the laboratory phase was taken.

A cost-effectiveness study of driver education was done in Texas by Vernon and Phillips[39]. The study was designed to consider the effectiveness of the "30 and 6" program and the simulator program in terms of the effects on operators of passenger cars. Four program combinations were studied:

1. Two-phase program A: Thirty hours of classroom instruction, six hours of in-car observations, six hours of behind the wheel instruction. Urban programs were identified and classified separately from rural programs.

2. Two-phase program B: Educational television was used as the thirty-six hours of classroom instruction, six hours of in-car observation, and six hours of behind-the-wheel instruction were used.

3. Three-phase program: Thirty hours of classroom instruction, twelve hours of simulation, six hours of in-car observation, and three hours of behind-the-wheel practice driving.

4. Four-phase program: Thirty hours of class room instruction, twelve hours of simulation, four to six hours of in-car observation, and three hours of on-street practice driving.

Approximately 7,000 students were selected randomly from the pool of students who had completed a particular type of instructional program in driver education in the school year 1966-67 or 1968-69. Matching cases (controls) were young drivers who had not completed a formal program of driver education. A data pool of 4,759 pairs of drivers was established.

Criteria used to determine effectiveness of the various programs were: (1) performance rates: a) accident rates; b) severity rates; and c) violation rates; (2) accident type; (3) environmental conditions; (4) chargeable violations; and (5) moving violations. Official driving records were the source of performance data. These data, with appropriate facts furnished by the Texas Educational Agency, allowed the investigators to rank the different driver education programs in terms of: (1) effectiveness of the program in producing a violation and collision-free driver; (2) the cost of providing the educational programs; and (3) the cost-effectiveness associated with each of the four types of driver education programs.

The findings of the study were:

1. Using conviction criterion, students of "30 and 6" program had no better driving records than students without driver education. Using collision criterion, students of a "30 and 6" program had significantly greater collision involvement than their matched pairs.

2. Using conviction criterion, students of simulator training were significantly better drivers than those without driver education. Using collision criterion, no statistically significant differences were found.

3. Using conviction, collision, and severity criteria, simulator training programs produced better drivers than did the "30 and 6" program.

4. Cost per student for simulation training was significantly less expensive than "30 and 6", and driver performance by students taught by the simulator method was significantly better than performance of "30 and 6" subjects. Cost per pupil for simulation taught by assistants was less than cost of those programs taught by certified teachers. Cost per students in the "30 and 6" programs was lower in urban than suburban areas.

Klepak[40] found that programs planned with the laboratory phase (on-street driving) conducted exclusively outside of the regular school day (after school), Saturdays, or during the summer months, had per pupil costs far lower than those programs which conducted all the driving experiences during the school day. He attributed the lower cost to the fact that teachers were willing to teach on an overload basis that paid them less per contact hour than they earned during the regular school day. This study along with the California study[41] reported that a sizeable amount of money could be saved by either offering the driver education out of the regular school day or by contracting to commerical driving schools.

Studies That Used The Survey/Questionnaire Data Gathering Technique

Hardt[42] examined the relationship between a personal, oral interview and a group-administered written questionnaire. The study was conducted

in order to examine the efficiency of the two methods when their content is identical. The information gained through the two procedures was compared in terms of agreement between methods, and between each method and an external criterion. The subjects were two groups of 40 Oregon high school seniors. The subjects were randomly assigned to one of the methods. The information received was categorized either as school performance or as biographical background content. This permitted making method comparisons in terms of two types of content. The results of the statistical analyses indicated that the personal, oral interview and the group-administered written questionnaire were highly comparable; they provide essentially the same information.

Preston and Harris[43] in their study used interviews with fifty subjects (while they were in the hospital as a result of a traffic accident) and then compared the results with police records. The results were a very reliable measure as far as accidents and violations were concerned. The discrepencies came where they rated themselves as drivers. Most rated themselves as expert or close to expert drivers. Some of the results of the study were as follows:

1. Most accidents occurred on Saturday, Sunday, and Monday.
2. There was no concentration of accidents on any particular day.
3. Hit-fixed objects were major factors along with overturned vehicles on the roadway (22 of 50 of this type).

An unusual factor in this study was the follow-up description of the accidents by the drivers. The following are comments made:

15 - careless, preoccupied, tired, speeding, etc.

5 - partially responsible for the accident

30 - blamed other drivers and conditions

Police reports showed thirty-four were responsible for the accidents. Other drivers were only responsible for nine accidents. No responsibility was fixed for seven accidents.

Barr, Davis, and Johnson[44] have stated that carefully planned questionnaires, with due consideration of the ability and willingness of potential respondents to supply data, are capable of yielding reasonably accurate results. Also, the questionnaire survey technique of data gathering is generally regarded as more dependable when used to obtain facts rather than opinions.

Quensel and Talkington[45] of the Traffic and Safety Education Section of the Home Economics and Industrial Technology Department at Illinois State University conducted a four-year driver education curriculum development project. This project was designed to assist the Illinois Office of Education with the implementation and evaluation of the state driver education curriculum guide. The main objective of driver education is to help produce safer drivers, and a safe driver is defined as one who can avoid traffic collisions. Therefore, the effectiveness of the new curriculum for reducing highway collisions had to be determined. To carry out this type of evaluation, the collection and analysis of student collision records was required. Student survey questionnaires were prepared for this purpose. A three-step verification process was developed to determine if student responses represented a true record of their driving and collision experiences. These steps included: 1) visual inspection of all questionnaires returned; 2) personal interviews with students; and 3) comparison of the number of collisions for representative sample with official records in the Illinois Secretary of State's Office. This pro-

ject studied as a verification process, a random sample with office records. One hundred thirty students or 29% of the 450 driver records indicated fewer accidents than were reported by students. Ninety students reported one accident, but Secretary of State records showed none. As a result of these analyses, it was determined that the self-reporting survey technique could be used as a tool for determining whether or not one driver education program was more effective than another.

Summary

The investigation of the research and literature has revealed no study in recent years which investigated the relationships of variables of the same order as this research study. No research appears to have been conducted to determine how the variables affect the collision experiences of driver education students in North Carolina.

Very soon after the enactment of the Highway Safety Act of 1966, studies evaluating the effectiveness of driver education were initiated. One of the earlier studies was the Detroit study[46]. This early study did not have many controls incorporated into it and because of the relatively small sample, no statistical significance could be ascertained.

Recent studies of major importance concerned with the effectiveness of driver education in reducing collisions have been done in Texas[47] and California[48]. A driver education program study concerned cost effectiveness was done in New York[49]. All three of these studies were mainly concerned with cost, although the California and Texas studies were broader in scope than the New York study.

Most of the early studies in driver education were conducted to determine if drivers without a formal course in driver education had fewer

or more accidents than those students completing a formal course. Many of these studies did not control for exposure and the sample selection was questionable. Most of the earlier studies showed fewer collisions for high school driver education trained students, but the results are questionable since most were not controlled studies.

Studies of driving records of exceptional students in driver education showed that they were capable of operating a motor vehicle safely after completing formal high school driver education programs.

Some studies have shown that young drivers have high rates of accidents, but they should not be attributed to any deficiency in the sensory and phyical functions. They should be attributed to inexperience, emotional and social immaturity, and tempermental qualities.

In chapter three, the design and methodology will be presented.

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CHAPTER 3

DESIGN AND METHODOLOGY

Population

The population of this study included students who had completed driver education in school year 1980-81 in North Carolina schools which: (1) offered traditional driver education programs during the academic school year, and (2) offered summer driver education programs.

Sampling Design

This was an ex post facto study. Data were collected from a random sample of 500 students from 10 randomly selected North Carolina Public Schools which offered driver education. The sample was generated from the population of North Carolina public school students who completed driver education during the school year 1980-81 and summer 1981. A total of 500 students made up the sample for this study; two hundred and fifty students who completed the traditional driver education program during the regular school year, and two hundred and fifty students who had completed driver education during the summer.

External validity in the study design was controlled by the use of the random sampling technique permitting inference of the sample findings to the population from which the sample was drawn.

A random sampling design was used as per the following:

Legend:

State of North Carolina	=	1	(100 Counties Total)
Counties Selected	=	10	(1 School per county)
Summer Driver Education	=	25	(Students per school)
Traditional Driver Education	=	25	(Students per school)
Strata	=	2	

1 x 10 x 2 x 25 = 500 students
(State of NC) (Counties) (Strata) (Students)

Where:

Summer Driver Education: (Stratum I)
1 x 10 x 25 = 250 Students
(State of NC) (Counties (Students)

Traditional Driver Education: (Stratum II)
1 x 10 x 25 = 250 Students
(State of NC) (Counties) (Students)
Total = 500 Students

The age of the selected students was 16-18 years. The length of time since completing driver education was 18-24 months. The traditional or regular school year driver education group had 30 hours of classroom and six hours of behind-the-wheel instruction spread over the entire semester. The summer driver education group had 30 hours of classroom and six hours of behind-the-wheel instruction condensed into the summer session of four to six weeks. Both groups had completed the standard course of driver education which requires 30 hours of classroom and six hours of behind-the-wheel instruction.

The dependent variables were the number of accidents and the number of convictions for moving violations per selected student. The independent variables were the length of time the selected students have been licensed to drive, the time of year in which the selected students completed driver education, the total miles driven following instruction per year, grade point average, and the sex of the selected students.

Survey Instrument

The instrument used to collect data on the students was The Driver Education Evaluation Survey (See Appendix A) which was developed and validated by Mr. Warren P. Quensel and the Traffic and Safety Education Staff at Illinois State University, Normal, Illinois in 1976[1]. The survey consisted of seventy items divided into four major categories: (1) suggestions for improving driver education courses, (2) driving experience, (3) collision experience, and (4) type of crash.

This instrument was expanded by adding the following questions to the demographic data section and the driving experience section of the survey form: (1) Sex? (2) Grade point average? (3) When did you take the behind-the-wheel phase of driver education? (4) When did you take the classroom phase of driver education? (5) How many convictions have you received for moving violations as a driver since completing driver education?

The Data Collection

The information that was used for the comparison of summer and traditional driver education programs was obtained from a self-reporting survey which is presented in Appendix A. The survey has 70 questions. The first 28 questions were answered by all students surveyed. These questions deal with the student's sex, age, grade point average, when driver education instruction was received, general information concerning driving experience, suggestions for improvement of driver education, and the number of convictions for moving violations received. Questions 29 through 70 were answered by students who had been involved in traffic accidents. A student who had been involved in one traffic accident was asked to answer questions 28 through 44; a student who had been involved in two traffic accidents was asked to answer questions 45 through 57; and a student who had been involved in three traffic accidents was asked to answer questions 58 through 70. These questions asked specific information about the traffic accidents in which they were involved. The questions asked concerning the student's second and third traffic accidents were the same as those dealing with the student's first traffic accident.

Initial contact with the schools involved in the randomly-selected counties in this study was made through a telephone call and letter to the principal of each randomly-selected high school during the month of August 1982. During the telephone conversation and letter, the length and content of the survey to be administered was discussed as well as the purpose of the study. After obtaining permission to allow the survey to be administered at his/her school, the survey was completed in classes, homerooms, and special rooms by the selected students. A person appointed by the principal administered the survey.

The procedure for administration of the survey followed the same format at each school. The students were told the purpose for conducting the study and the role they would assume in the research. The students were assured that their identity would remain anonymous during and following the study. Finally, the students were instructed to read carefully all directions preceeding the first question, as well as all other directions presented throughout the survey. After the brief instructions, the students were requested to complete the survey which took 15 minutes on the average.

The Descriptive Analysis of School Program Form (Appendix B) was completed by the driver education teachers or department chairman of the selected schools. This form provided a descriptive analysis of the individual driver education programs.

Analysis of the Data

Following administration of the questionnaires, the data were coded and subsequently tabulated on IBM data cards, then computed using the Statistical Package for the Social Sciences.[2] For the purpose of this study, the computer program chosen permitted additional analysis and interpretation of the data.

The categorical data were analyzed by computer through the use of the parametric statistical technique called chi square.

$$[\text{chi square} = \sum \frac{(\text{observed} - \text{expected})^2}{\text{expected}}]$$

Variables which were included for analysis in this study included sex, whether the student received driver education instruction during the summer or during the regular school year, whether or not the student had been involved in a traffic accident, the school the student attended, and

whether or not the student had been convicted for moving violations. A .05 level of significance was used to test significance of difference of means.

Because of the amount of data collected and the number of variables tested, one of the first statistical treatments consisted of a simple frequency tabulation of all the variables.

The interactive effect of traffic involvement and moving violaton convictions with summer driver education and traditional driver eduction was analyzed through the use of the multivariate analysis of variance statistic (2 way MANOVA). A .05 level of significance was used to determine the significance of the difference of means.

The two way MANOVA is as follows:

2 Way MANOVA

	Male	Female
Summer D.E.	$\overline{X}$ TI $\overline{X}$ C	$\overline{X}$ TI $\overline{X}$ C
Trad. D.E.	$\overline{X}$ TI $\overline{X}$ C	$\overline{X}$ TI $\overline{X}$ C

Legend:

TI = Traffic Involvement
C = Convictions
DE = Driver Education

The Hypotheses

H_{o1}: There will be no difference in the accident involvement between students taught to drive in a summer driver education program and students taught to drive in a traditional driver education program.

H_{1a}: There will be a difference in the accident involvement between students taught to drive in a summer driver education program and students taught in a traditional driver education program.

H_{o2}: There will be no difference in the number of convictions for moving violations of students taught in a summer or a traditional driver education program.

H_{2a}: There will be a difference in the number of convictions for moving violations of students taught in a summer or a traditional driver education program.

First Hypothesis:

$$Ho: \frac{U1}{TMSG} = \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education accident group mean
U_2 = Traditional driver education accident group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Alternate Hypothesis:

$$H_{1a}: \frac{U1}{TMSG} \neq \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education accident group mean
U_2 = Traditional driver education accident group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Second Hypothesis:

$$Ho_2: \frac{U1}{TMSG} = \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education violation group mean
U_2 = Traditional driver education violation group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Alternative Hypothesis:

$$H_{2a}: \frac{U1}{TMSG} \neq \frac{U2}{TMSG}$$

Legend: U_1 = Summer driver education violation group mean
U_2 = Traditional driver education violation group mean
T = Time licensed in months
M = Miles driven
S = Sex of students
G = Grade Point Average

Summary

This was an ex post facto study. Data were collected from a random sample of 500 students from ten randomly selected North Carolina Public Schools which offered driver education during the school year 1980-81 and the summer of 1981. Of the students surveyed, two hundred and fifty had completed the traditional driver education program during the school year, and two hundred and fifty had completed driver education during the summer.

The categorical data were analyzed by computer through the use of the parametric statistical technique called chi square. Variables which were included for analysis in this study include sex, whether the student received driver education instruction during the summer or during the regular school year, whether or not the student had been involved in a traffic accident, the school the student attended, and whether or not the student had been convicted for moving violations. A t-test was used to analyze primary questions because it is a parametric statistic which is a more powerful test than the chi square test or a nonparametric statistic. Some of the data were analyzed through the use of the multivariate analysis of variance statistic (2 way MANOVA).

In chapter four, the analysis of the data will be presented.

FOOTNOTES

1. Quensel, Warren P. and Dr. Joseph E. Talkington. Traffic and Safety Education Section, Home Economics and Industrial Technology Department, Illinois State University. Driver Education Curriculum Materials for Illinois Demonstration Center and Satellite Schools. Springfield: Illinois Office of Education, 1976.

2. Nie, Norman and C. Hadlai Hull et al. Statistical Package for the Social Sciences. Second Edition. New York: McGraw-Hill Book Company, 1975.

CHAPTER 4

ANALYSIS OF THE DATA

The central purpose of this study was to determine if there was a difference in accident involvement and moving violation convictions of students enrolled in summer (over a short period of time) driver education programs versus students in traditional (over a longer period of time) driver education programs.

The study used a self-reporting driver education evaluation survey as the instrument to determine if summer or traditional driver education programs indicated differences on high school drivers' accident involvement and convictions for moving violations.

The sample population of this study consisted of 465 students from 10 high schools; 175 students who had completed driver education in the summer of 1981, and 290 students who had completed driver education in the traditional or regular school year of 1980-81.

The students and the ten schools in this study were selected randomly in North Carolina. Each of the 100 North Carolina counties was assigned a number from 1 through 100. A table of random numbers was then used to select ten counties for the study. After the ten counties were chosen, schools were then selected by the use of a table of random numbers. The students in the schools were selected randomly by taking every third name out of a list of students that completed the summer or traditional program.

During the fall of 1982, the students were asked to respond to the Driver Education Evaluation Survey (see Appendix A). The data collected from the survey consisted of the students' responses to 70 items which were divided into four major categories: (1) suggestions for improving driver education courses, (2) driving experiences, (3) collision experiences, and (4) type of crash. In the driving experiences category, question #29 asked the students how many moving violation convictions they had received since completing driver education.

The methods of analysis used in this study were the t-test and chi square. A t-test statistic was used primarily because it is a parametric statistic which is a more powerful test than the chi square test or a nonparametric statistic. A t-test provides for an analysis of the difference of the means of the two sample groups tested, while the chi square test measures the difference in cell frequencies. A t-test statistic was also used because it lessens the chance of making a type II error (accepting a hypothesis that is false).

Data Analyses

The primary purpose of this study was to find if there was a difference in traffic accident involvement and moving violation convictions of students enrolled in summer (over a short length of time) driver education programs versus students taught in traditional (over a longer period of time) driver education programs. In answering these questions, analyses were also made on the following: (1) the relationship between traffic accident involvement and the period of time in which driver education instruction was received; (2) the relationship between traffic accident involvement and the sex of the student; (3) the relationship between traf-

fic accident involvement and grade point average; (4) the relationship between traffic accident involvement and time since licensed to drive; (5) the relationship between traffic accident involvement and miles driven the past twelve months; (6) the relationship between the student receiving a conviction for a moving violation and the period of time in which driver education instruction was received; (7) the relationship between the student receiving a moving violation conviction and the sex of the student; and (8) the relationship between the student receiving a moving violation conviction and miles driven the past twelve months.

In Tables 1 and 1a, summaries of the analyses of traffic accident involvement by the time period during which high school driver education instruction was received are presented. Of the 465 students surveyed, 406 had no traffic accident involvement while 59 had one or more. One hundred seventy-five or 37.6% of the students took driver education in the summer while 290 or 62.4% took the traditional driver education program. Of the 175 who took driver education in the summer, 152 or 86.9% had no traffic accident involvement while 23 or 13.1% had one or more. Of the 290 who took the traditional program, 254 or 87.6% had no traffic accident involvement while 36 or 12.4% had one or more.

Upon performing a t-test, a value of 2.58 was needed for significance. A value of 0.227 was obtained which was not statistically significant at the 0.05 level; thus, there was not a significant difference in accident involvement between students who completed a traditional driver education program and those completing a summer driver education program. That is, the number of accidents experienced by the students did not vary significantly by the time period in which driver education instruction was received.

Table 1

Traffic Accident Involvement by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Traffic Accident Involvement					
	None		1 or More		Total	
	N	%	N	%	N	%
Summer	152	37.4	23	39.0	175	37.6
Traditional	254	62.6	36	61.0	290	62.4
Total	406	100.0	59	100.0	465	100.0

Table 1a

Traffic Accident Involvement by time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Traffic Accident Involvement					
	None		1 or More		Total	
	N	%	N	%	N	%
Summer	152	86.9	23	13.1	175	100.0
Traditional	254	87.6	36	12.4	290	100.00

t value = 0.227*

*Not Significant at the 0.05 level

In Tables 2 and 2a, summaries of the analyses of moving violations by time period during which high school driver education was received are presented. Of the 465 students surveyed, 434 of students had no moving violation while 31 had one or more. One hundred seventy-five or 37.6% took driver education during the summer while 290 or 62.4% took the traditional driver education program. Of the 175 who took driver education in the summer, 14 or 8.0% had one or more moving violations. Of the 290 who were in the traditional driver education program, 17 or 6.0% had one or more moving violations.

Upon performing a t-test, a value of 2.58 was needed for significance. A value of 0.863 was obtained which was not statistically significant at the 0.05 level; thus, there was not a significant difference in moving violation convictions between students who completed a traditional driver education proram and those completing a summer driver education program.

Table 2

Moving Violations by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Moving Violations: None		1 or More		Total	
	N	%	N	%	N	%
Summer	161	37.1	14	45.2	175	37.6
Traditional	273	62.9	17	54.8	290	62.4
Total	434	100.0	31	100.0	465	100.0

Table 2a

Moving Violations by time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Moving Violations: None		1 or More		Total	
	N	%	N	%	N	%
Summer	161	92.0	14	8.0	175	100.0
Traditional	273	94.1	17	5.9	290	100.0

t value = 0.863*

*Not Significant at the .05 level

Analysis of Time Period HSDE Received

In Tables 3 - 7, the summaries of the analyses of the time period during which high school driver education was received are presented.

In Tables 3 and 3a, summaries of the analyses of sex by time period during which high school driver education was received are presented.

Four hundred sixty-five students participated in the study; 200 of the students were males while 265 were females. One hundred twenty-eight or 73.1% of those who took driver education in the summer were males while 47 or 26.9% were females. Seventy-two or 24.8% of those who were in the traditional driver education program were males while 218 or 75.2% were females.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 101.98 was obtained which was significant at the .05 level. That is, the time period in which driver education instruction was received did vary significantly by the sex of the students. There were siginificantly more females than males in the traditional driver education program while significantly more males than females were in the summer driver education program.

Table 3

Sex by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Sex					
	Male		Female		Total	
	N	%	N	%	N	%
Summer	128	73.1	47	26.9	175	37.6
Traditional	72	24.8	218	75.2	290	62.4
Total	200	100.0	275	100.0	465	100.0

Table 3a

Sex by Time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Sex					
	Male		Female		Total	
	N	%	N	%	N	%
Summer	128	64.0	47	17.7	175	100.0
Traditional	72	36.0	218	82.3	290	100.0

chi square = 101.98**

**Significant at the .05 level

In Tables 4 and 4a, summaries of the analyses of age by time period during which high school driver education was received are presented.

One hundred seventy-three of the students took driver education in the summer while 282 took the traditional driver education program. Of the 173 students in the summer driver education program, 3 or 1.7% were 15 years old, 89 or 51.4% were 16 years old, 74 or 42.8% were 17 years old, and 7 or 4.1% were 18 years old. Of the 282 students in the traditional driver education program, 104 or 36.9% were 16 years old, 165 or 58.5% were 17 years old, and 13 or 4.6% were 18 years old. Ten students failed to record their ages on the survey form.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 15,38 was obtained which was significant at the .05 level. That is, the time period in which driver education instruction was received did vary significantly by the age of the student. Specifically, significantly more 15 year old students were enrolled during the summer period while significantly more 16 year old and older students were enrolled in the traditional driver education program.

Table 4

Age by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Age 15		16		17		18		Total	
	N	%	N	%	N	%	N	%	N	%
Summer	3	100	89	46.1	74	31.0	7	35.0	173	38.0
Traditional	0	0	104	53.9	165	69.0	13	65.0	282	62.0
Total	3	100	193	100.0	239	100.0	20	100.0	455	100.0

Table 4a

Age by Time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Age 15		16		17		18		Total	
	N	%	N	%	N	%	N	%	N	%
Summer	3	1.7	89	51.4	74	42.8	7	4.1	173	100.0
Traditional	0	0.0	104	36.9	165	58.5	13	4.6	282	100.0

chi square = 15.38**

**Significant at the .05 level

In Table 5 and 5a, summaries of the analyses of miles driven 12 months prior to the study by time period during which high school driver education was received are presented.

Of the 175 students in the summer driver education program, 153 or 87.4% had driven 3000 or less miles while 22 or 12.6% had driven 3001 or more miles 12 months prior to the study. Of the 290 students in the traditional driver education program, 246 or 84.8% had driven 3000 or less miles while 44 or 15.2% had driven 3001 or more miles 12 months prior to the study. Question #25 asked the students to respond to how many miles they had driven 12 months prior to the study. The responses were from 0-500 miles to 8001-12,000 miles. There were not enough responses to the higher mileage numbers so the responses were collapsed. The students had not driven many miles in the past 12 months. The category 2001-3000 miles was the fourth response the students would have chosen, and the category 3001-4000 was the fifth response. This allowed for four categories of equal length.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 0.41 was obtained which was not significant at the .05 level. There was not a significant difference in the miles driven the 12 months prior to the study between students who were in the traditional driver education program and those in the summer driver education program.

Table 5

Miles Driven Past 12 Months by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Miles Driven Past 12 Months 3000 or Less		3001 or More		Total	
	N	%	N	%	N	%
Summer	153	38.3	22	33.3	175	37.6
Traditional	246	61.7	44	66.7	290	62.4
Total	399	100.0	66	100.0	465	100.0

Table 5a

Miles Driven Past 12 Months by Time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Miles Driven Past 12 Months 3000 or Less		3001 or More		Total	
	N	%	N	%	N	%
Summer	153	87.4	22	12.6	175	100.0
Traditional	246	84.8	44	15.2	290	100.0

chi square = 0.41*

*Not Significant at the .05 level

In Tables 6 and 6a, summaries of the analyses of grade point average by time period during which high school driver education was received are presented.

Of the 465 students surveyed, 175 or 37.6% took driver education in the summer while 290 or 62.4% took the traditional driver education program. Of the 175 students in the summer driver education program, 36 or 20.6% had a 1.00 GPA, 13 or 7.4% had a 2.00 GPA, 111 or 63.4% had a 3.00 GPA, and 15 or 8.6% had a 4.00 GPA. Of the 290 students in the traditional driver education program, 78 or 26.9% had a 1.00 GPA, 27 or 9.3% had a 2.00 GPA, 154 or 53.1% had a 3.00 GPA, and 31 or 10.7 had a 4.00 GPA.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 4.77 was obtained which was not significant at the .05 level. There was not a significant difference in the grade point averages of students who were in the traditional driver education program and students who were in the summer driver education program.

Table 6

Grade Point Average by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Grade Point Average 1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
Summer	36	31.6	13	32.6	111	41.9	15	32.6	175	37.6
Traditional	78	68.4	27	67.5	154	58.1	31	67.4	290	62.4
Total	114	100.0	40	100.0	265	100.0	46	100.0	465	100.00

Table 6a

Grade Point Average by Time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Grade Point Average 1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
Summer	36	20.6	13	7.4	111	63.4	15	8.6	175	100.0
Traditional	78	26.9	27	9.3	154	53.1	31	10.7	290	100.0

chi square 4.77*

*Not Significant at the .05 level

In Tables 7 and 7a, summaries of the analyses of time since licensed to drive by time period during which high school driver education was received are presented. Of the 465 students surveyed, 175 or 37.6% took driver education in the summer while 290 or 62.4% took the traditional driver education program. Of the 175 students in the summer driver education program, 33 or 18.9% had driven six months or less, 93 or 53.1% had driven six months to one year, 29 or 16.6% had driven one year to one and one-half years, and 20 or 11.4% had driven one and one-half years plus since licensed to drive. Of the 290 students in the traditional driver education program, 62 or 21.4% had driven six months or less, 108 or 37.2% had driven six months to one year, 83 or 28.6% had driven one year to one and one-half years, and 37 or 12.8% had driven one and one-half years plus since licensed to drive.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 13.46 was obtained which was significant at the .05 level. That is, the time since licensed to drive did vary significantly by the time period in which driver education instruction was received. The students in the traditional driver education program had their licenses longer than the students in the summer driver education program.

Table 7

Time Since Licensed to Drive by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Time Since Licensed to Drive: 6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
Summer	33	34.7	93	46.3	29	25.9	20	35.1	175	37.6
Traditional	62	65.3	108	53.7	83	74.1	37	64.9	290	62.4
Total	95	100.0	201	100.0	112	100.0	57	100.0	465	100.0

Table 7a

Time Since Licensed to Drive by Time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Time Since Licensed to Drive: 6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
Summer	33	18.9	93	53.1	29	16.6	20	11.4	175	100.0
Traditional	62	21.4	108	37.2	83	28.6	37	12.8	290	100.0

chi square = 13.46**

**Significant at the 0.05 level

Analysis of Traffic Accident Involvement

In Tables 8 - 13, the summaries of the analyses of traffic accident involvement are presented.

Item 31 on the Driver Education Evaluation Survey asked for a response to the number of traffic collisions the student was involved in since the completion of driver education. The choices were from zero collisions to a total of seven collisions.

In Tables 8 and 8a, summaries of the analyses of traffic accident involvement by sex are presented.

Of the 465 students surveyed, 406 had no traffic accident involvement while 59 had one or more traffic accident involvements. Two hundred of the students were males while 265 or were females. Of the 200 males, 173 or 86.5% had no traffic accident involvement while 27 or 13.5% had one or more traffic accident involvements. Of the 265 females, 233 or 87.9% had no traffic accident involvements while 32 or 12.1% had one or more traffic accident involvements.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 0.10 was obtained which was not significant at the .05 level. There was not a significant difference in traffic accident involvement between males and females.

Table 8

Traffic Accident Involvement by Sex

(Across Sex)

	Traffic Accident Involvement					
Sex	None		1 or More		Total	
	N	%	N	%	N	%
Male	173	42.6	27	45.8	200	43.0
Female	233	57.4	32	54.2	265	57.0
Total	406	100.0	59	100.0	465	100.00

Table 8a

Traffic Accident Involvement by Sex

(Within Sex)

	Traffic Accident Involvement					
Sex	None		1 or More		Total	
	N	%	N	%	N	%
Male	173	86.5	27	13.5	200	100.0
Female	233	87.9	32	12.1	265	100.00

chi square = 0.10*

*Not Significant at the .05 level

In Tables 9 and 9a, summaries of the analyses of traffic accident involvement by age are presented.

Of the 465 students surveyed, 10 students did not indicate an age. Of the 455 who had responded, 396 had no traffic accident involvement while 59 had one or more traffic accident involvements. Of the 3 students who were 15 years of age, 3 or 100.0% had no traffic accident involvement. Of the 193 students who were 16 years old, 176 or 91.2% had no traffic accident involvement, 17 or 8.8% had one or more traffic accident involvements. Of the 239 students who were 17 years old, 200 or 83.7% had no traffic accident involvement, and 39 or 16.3% had one or more traffic accident involvements. Of the 20 students who were 18 years old, 17 or 85.0% had not traffic accident involvement, and 3 or 15.0% had one or more traffic accident involvements.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 5.86 was obtained which was not significant at the .05 level. There was not a significant difference in traffic accident involvement of 15, 16, 17, and 18 year old students.

Table 9

Traffic Accident Involvement by Age

(Across Age)

Age	Traffic Accident Involvement: None N	None %	1 or More N	1 or More %	Total N	Total %
15	3	0.8	0	0.0	3	0.7
16	176	44.4	17	28.8	193	42.4
17	200	50.5	39	66.1	239	52.5
18	17	4.3	3	5.1	20	4.4
Total	396	100.0	59	100.0	455	100.0

Number of Missing Observations = 10

Table 9a

Traffic Accident Involvement by Age

(Within Age)

Age	Traffic Accident Involvement: None N	None %	1 or More N	1 or More %	Total N	Total %
15	3	100.0	0	0.0	3	100.0
16	176	91.2	17	8.8	193	100.0
17	200	83.7	39	16.3	239	100.0
18	17	85.0	3	15.0	20	100.0

Number of Missing Observations = 10

chi square = 5.86*

*Not Significant at the .05 level

In Tables 10 and 10a, summaries of the analyses of traffic accident involvement by miles driven 12 months prior to the study are presented.

Of the 465 students surveyed, 406 had no traffic accident involvement while 59 had one or more traffic accident involvements. Three hundred ninety-nine had driven 3000 or less miles the past 12 months while 66 had driven 3001 or more miles. Of the 399 students who had driven 3000 or less miles 12 months prior to the study, 360 or 90.2% had no traffic accident involvement, and 39 or 9.8% had one or more traffic accient involvements. Of the 66 students who had driven 3001 or more miles 12 months prior to the study, 46 or 69.7% had no traffic accident involvement, and 20 or 30.3% had one or more traffic accident involvements.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 19.73 was obtained which was significant at the .05 level. Students who had driven 3,000 miles or less in 12 months prior to the study were significantly less involved in traffic accidents. However, those students who had driven 3001 or more miles 12 months prior to the study were significantly more involved in one or more traffic accidents.

Table 10

Traffic Accident Involvement by Miles Driven Past 12 Months

(Across Miles Driven)

Miles Driven Past 12 Months	Traffic Accident Involvement					
	None		1 or More		Total	
	N	%	N	%	N	%
3000 or Less	360	88.7	39	66.1	399	85.8
3001 or More	46	11.3	20	33.9	66	14.2
Total	406	100.0	59	100.0	465	100.0

Table 10a

Traffic Accident Involvement by Miles Driven Past 12 Months

(Within Miles Driven)

Miles Driven Past 12 Months	Traffic Accident Involvement					
	None		1 or More		Total	
	N	%	N	%	N	%
3000 or Less	360	90.2	39	9.8	399	100.0
3001 or More	46	69.7	20	30.3	66	100.0

chi square = 19.73**

**Significant at the .05 level

In Tables 11 and 11a, summaries of the analyses of traffic accident involvement by moving violations are presented.

Of the 465 students surveyed, 406 had no traffic accident involvement while 59 had one or more traffic accident involvements. Of the 434 who had no moving violations, 385 or 88.7% had no traffic accident involvemennts while 49 or 11.3% had one or more traffic accident involvements. Of the 31 who had one or more moving violations, 21 or 67.7% had no traffic accident involvements while 10 or 32.3% had one or more traffic accident involvements.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 9.67 was obtained which was significant at the .05 level. Students who had experienced one more traffic accidents had significantly more moving violation convictions than those students who had not experienced traffic accidents.

Table 11

Traffic Accident Involvement by Moving Violations

(Across Moving Violations)

Moving Violations	Traffic Accident Involvement: None		1 or More		Total	
	N	%	N	%	N	%
None	385	94.8	49	83.1	434	93.3
1 or More	21	5.2	10	16.9	31	6.7
Total	406	100.0	59	100.0	465	100.0

Table 11a

Traffic Accident Involvement by Moving Violations

(Within Moving Violations)

Moving Violations	Traffic Accident Involvement: None		1 or More		Total	
	N	%	N	%	N	%
None	385	88.7	49	11.3	434	100.0
1 or More	21	67.7	10	32.3	31	100.0

chi square = 9.67**

**Significant at the 0.05 level

In Tables 12 and 12a, summaries of the analyses of grade point average by traffic accident involvement are presented. The students in this study had indicated their actual grade point averages on the Driver Education Evaluation Survey form, but for statistical purposes, these grade point averages were collapsed into categories. These categories were as follows: GPA (lowest through 0.99 = 1), (1.00 through 1.99 = 2), (2.00 through 2.99 = 3), and (3.00 through highest = 4).

Of the 465 students surveyed, 406 or 87.3% had no traffic accident involvement while 59 or 12.7% had one or more traffic accident involvements. Of the 59 students who had one or more traffic accident involvements 10 or 16.9% had a 1.00 GPA, 7 or 11.9% had a 2.00 GPA, 33 or 55.9% had a 3.00 GPA, and 9 or 15.3% had a 4.00 GPA. Of the 406 students with no traffic accident involvements, 104 or 25.6% had a 1.00 GPA, 33 or 8.1% had a 2.00 GPA, 232 or 57.1% had a 3.00 GPA, and 37 or 9.1% had a 4.00 GPA.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 4.39 was obtained which was not significant at the .05 level. The grade point averages of the students were not significantly related to traffic accident experience.

Table 12

Grade Point Average by Traffic Accident Involvement

(Across Traffic Accident)

Traffic Accident Involvement	Grade Point Average									
	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
None	104	91.2	33	82.5	232	87.5	37	80.4	406	87.3
1 or More	10	8.8	7	17.5	33	12.5	9	19.6	59	12.7
Total	114	100.0	40	100.0	265	100.0	46	100.0	465	100.0

Table 12a

Grade Point Average by Traffic Accident Involvement

(Within Traffic Accident)

Traffic Accident Involvement	Grade Point Average									
	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
None	104	25.6	33	8.1	232	57.1	37	9.1	406	100.0
1 or More	10	16.9	7	11.9	33	55.9	9	15.3	59	100.0

chi square = 4.39*

*Not Significant at .05 level

In Tables 13 and 13a, summaries of the analyses of time since licensed to drive by traffic accident involvement are presented.

Of the 465 students surveyed, 406 had no accident involvements while 59 had one or more traffic accident involvements. Of the 406 who had no traffic accident involvements, 268 or 66.0% had driven up to one year since licensed to drive while 138 or 34.0% had driven one year or more. Of the 59 who had one or more traffic accident involvements, 28 or 47.5% had driven up to one year since licensed to drive while 31 or 52.5% had driven one year or more.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 8.29 was obtained which was significant at the .05 level. Those students who had been licensed to drive for up to one year time period were involved in significantly fewer accidents than those licensed for more than one year.

Table 13

Time Since Licensed to Drive by Traffic Accident Involvement

(Across Traffic Accident)

Traffic Accident Involvement	Time Since Licensed to Drive									
	6 mos/less		6 mos-1 yr		1 yr-1 yrs		1 yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
None	88	92.6	180	89.6	92	82.1	46	80.7	406	87.3
1 or More	7	7.4	21	10.4	20	17.9	11	19.3	59	12.7
Total	95	100.0	201	100.0	112	100.0	57	100.0	465	100.0

Table 13a

Time Since Licensed to Drive by Traffic Accident Involvement

(Within Traffic Accident)

Traffic Accident Involvement	Time Since Licensed to Drive									
	6 mos/less		6 mos-1 yr		1 yr-1 yrs		1 yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
None	88	21.7	180	44.3	92	22.7	46	11.3	406	100.0
1 or More	7	11.9	21	35.6	20	33.9	11	18.6	59	100.0

chi square = 8.29**

**Significant at the 0.05 level

Analysis of Moving Violations

In Tables 14 - 18, summaries of the analyses of moving violations by students are presented.

Item 29 on the Driver Education Evaluation Survey asked for a response to the number of moving violation convictions the students had received since completion of driver education. The choices were from zero to seven moving violation convictions. If students had more than seven accidents, they were told to write the number on the survey form.

In Tables 14 and 14a, summaries of the analyses of moving violations by time period during which high school driver education was received are presented.

One hundred seventy-five of the students took driver education during the summer, while 290 took the traditional driver education program. Of the 175 who took driver education in the summer, 161 or 92.0% had no moving violations while 14 or 8.0% had one or more moving violations. Of the 290 students who were in the traditional driver education program, 273 or 91.4% had no moving violations while 17 or 5.9% had one or more moving violations.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 0.49 was obtained which was not significant at the .05 level. The number of students with moving violation convictions from the traditional driver education program was not significantly different than the number of students with moving violation convictions from the summer driver education program.

Table 14

Moving Violations by Time Period HSDE Received

(Across Time Period)

Time Period HSDE Received	Moving Violations: None		1 or More		Total	
	N	%	N	%	N	%
Summer	161	37.1	14	45.2	175	37.6
Traditional	273	62.9	17	54.8	290	62.4
Total	434	100.0	31	100.0	465	100.0

Table 14a

Moving Violations by Time Period HSDE Received

(Within Time Period)

Time Period HSDE Received	Moving Violations: None		1 or More		Total	
	N	%	N	%	N	%
Summer	161	92.0	14	8.0	175	100.0
Traditional	273	94.1	17	5.9	290	100.0

chi square = 0.49*

*Not significant at the .05 level

In Tables 15 and 15a, summaries of the analyses of grade point average by moving violations are presented.

Of the 465 students surveyed, 434 had no moving violations while 31 had one or more moving violations. Of the 434 students with no moving violations, 105 or 24.2% had a 1.00 GPA, 38 or 8.8% had a 2.00 GPA, 246 or 56.7% had a 3.00 GPA, and 45 or 10.4% had a 4.00 GPA. Of the 31 students with one or more moving violations, 9 or 29.0% had a 1.00 GPA, 2 or 6.5% had a 2.00 GPA, 19 or 61.3% had a 3.00 GPA, and 1 or 3.2% had a 4.00 GPA.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 2.05 was obtained which was not significant at the .05 level. The grade point averages of the students were not significantly related to moving violation convictions.

Table 15

Grade Point Average by Moving Violations

(Across Moving Violations)

Moving Violations	Grade Point Average									
	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
None	105	92.1	38	95.0	246	92.8	45	97.8	434	93.3
1 or More	9	7.9	2	5.0	19	7.2	1	2.2	31	6.7
Total	114	100.0	40	100.0	265	100.0	46	100.0	465	100.0

Table 15a

Grade Point Average by Moving Violations

(Within Moving Violations)

Moving Violations	Grade Point Average									
	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
None	105	24.2	38	8.8	246	56.7	45	10.4	434	100.0
1 or More	9	29.0	2	6.5	19	61.3	1	3.2	31	100.0

chi square = 2.05*

*Not Significant at the .05 level

In Tables 16 and 16a, summaries of the analyses of moving violations by sex are presented.

Of the 465 students surveyed, 434 had no moving violations while 31 had one or more moving violations. Of the 200 male students, 178 or 89.0% had no moving violations while 22 or 11.0% had one or more moving violations. Of the 265 female students, 256 or 96.6% had no moving violations while 9 or 3.4% had one or more moving violations.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 9.40 was obtained which was significant at the .05 level. There was a significant difference in the number of moving violation convictions between male and female students.

Table 16

Moving Violations by Sex

(Across Sex)

Sex	Moving Violations: None		1 or More		Total	
	N	%	N	%	N	%
Male	178	41.0	22	71.0	200	43.0
Female	256	59.0	9	29.0	265	57.0
Total	434	100.0	31	100.0	465	100.0

Table 16a

Moving Violations by Sex

(Within Sex)

Sex	Moving Violations: None		1 or More		Total	
	N	%	N	%	N	%
Male	178	89.0	22	11.0	200	100.0
Female	256	96.6	9	3.4	265	100.0

chi square = 9.40**

**Significant at the .05 level

In Tables 17 and 17a, summaries of the analyses of time since licensed to drive by moving violations are presented.

Of the 465 students surveyed, 434 had no moving violations while 31 had one or more violations. Of the 434 who had no moving violations, 282 or 64.9% had driven up to one year, while 152 or 35.1% had driven one or more years since licensed to drive. Of the 31 who had one or more moving violations, 14 or 45.2% had driven up to one year, while 17 or 54.8% had driven one or more years since licensed to drive.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 7.14 was obtained which was not significant at the .05 level. The students who had their license to drive one year and more did not experience significantly more violation convictions than those students who had their license to drive one year and less.

Table 17

Time Since Licensed to Drive by Moving Violations

(Across Moving Violations)

Moving Violations	Time Since Licensed to Drive									
	6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
None	93	97.9	189	94.0	102	91.1	50	87.7	434	93.3
1 or More	2	2.1	12	6.0	10	8.9	7	12.3	31	6.7
Total	95	100.0	201	100.0	112	100.0	57	100.0	465	100.0

Table 17a

Time Since Licensed to Drive by Moving Violations

(Within Moving Violations)

Moving Violations	Time Since Licensed to Drive									
	6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
None	93	21.4	189	43.5	102	23.5	50	11.5	434	100.0
1 or More	2	6.5	12	38.7	10	32.3	7	22.5	31	100.0

chi square = 7.14*

*Not Significant at the .05 level

In Tables 18 and 18a, summaries of the analyses of moving violations by the miles driven 12 months prior to the study are presented.

Of the 465 students surveyed, 399 or 85.8% had driven 3000 or less miles the past 12 months, while 66 or 14.2% had driven 3001 or more miles Of the 399 who had driven 3000 or less miles, 381 or 95.5% had no moving violations, while 18 or 4.5% had one or more moving violations. Of the 66 who had driven 3001 or more miles, 53 or 80.3% had no moving violations while 13 or 19.7% had one or more moving violations.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 18.62 was obtained which was significant at the .05 level. Students who had driven 3001 or more miles 12 months prior to the study received significantly more moving violation convictions than those students who had driven 3000 or less miles 12 months prior to the study.

Table 18

Moving Violations by Miles Driven Past 12 Months

(Across Miles Driven)

Miles Driven Past 12 Months	Moving Violations					
	None		1 or More		Total	
	N	%	N	%	N	%
3000 or Less	381	87.8	18	58.1	399	85.8
3001 or More	53	12.2	13	41.9	66	14.2
Total	434	100.0	31	100.00	465	100.0

Table 18a

Moving Violations by Miles Driven Past 12 Months

(Within Miles Driven)

Miles Driven Past 12 Months	Moving Violations					
	None		1 or More		Total	
	N	%	N	%	N	%
3000 or Less	381	95.5	18	4.5	399	100.0
3001 or More	53	80.3	13	19.7	66	100.0

chi square = 18.62**

**Significant at the 0.05 level

Analysis of Students in the Study

In Tables 19-24, summaries of the analyses of students in the study are presented.

In Tables 19 and 19a, summaries of the analyses of time since licensed to drive by miles driven 12 months prior to the study are presented. Of the 465 students surveyed, 399 had driven 3000 or less miles in the past 12 months, while 66 had driven 3001 or more miles. Of the 399 who had driven 3000 or less miles, 275 or 69.0% had driven up to one year since licensed to drive, while 124 or 31.0% had driven one or more years. Of the 66 who had driven 3001 or more miles the past 12 months, 21 or 31.8% had driven up to one year, while 45 or 68.2% had driven one year or more since licensed to drive.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 37.21 was obtained which was significant at the .05 level. Those students who had a shorter time period in which they had been licensed to drive had driven fewer miles 12 months prior to the study.

Table 19

Time Since Licensed to Drive by Miles Driven Past 12 Months

(Across Miles Driven)

Miles Driven Past 12 Months	Time Since Licensed to Drive: 6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
3000 or less	92	96.8	183	91.0	85	75.9	39	68.4	399	85.8
3001 or more	3	3.2	18	9.0	27	24.1	18	31.6	66	14.2
Total	95	100.0	201	100.0	112	100.0	57	100.0	465	100.0

Table 19a

Time Since Licensed to Drive by Miles Driven Past 12 Months

(Within Miles Driven)

Miles Driven Past 12 Months	Time Since Licensed to Drive: 6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
3000 or less	92	23.1	183	45.9	85	21.3	39	9.7	399	100.0
3001 or more	3	4.5	18	27.3	27	40.9	18	27.3	66	100.0

chi square = 37.21**

**Significant at the 0.05 level

In Tables 20 and 20a, summaries of the analyses of time since licensed to drive by sex are presented.

Of the 465 students surveyed, 200 were males, while 265 were females. Of the 200 males, 139 or 69.5% had driven up to one year, while 61 or 30.5% had driven one year or more since licensed to drive. Of the 265 females, 157 or 59.2% had driven up to one year while 108 or 40.8% had driven one year or more since licensed to drive.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 7.73 was obtained which was not significant at the .05 level. There was not a significant difference in the amount of time since licensed to drive between males and females.

Table 20

Time Since Licensed to Drive by Sex

(Across Sex)

	Time Since Licensed to Drive									
Sex	6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
Male	42	44.2	97	48.3	36	32.1	25	43.9	200	43.0
Female	53	55.8	104	51.7	76	67.9	32	56.1	265	57.0
Total	95	100.0	201	100.0	112	100.0	57	100.0	465	100.0

Table 20a

Time Since Licensed to Drive by Sex

(Within Sex)

	Time Since Licensed to Drive									
Sex	6 mos/less		6 mos-1 yr		1 yr-1 ½yrs		1 ½yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
Male	42	21.0	97	48.5	36	18.0	25	12.9	200	100.0
Female	53	20.0	104	39.2	76	28.7	32	12.1	265	100.0

chi square = 7.73*

*Not Significant at the .05 level

In Tables 21 and 21a, summaries of the analyses of time since licensed to drive by grade point average are presented.

Of the 465 students surveyed, 296 had driven up to one year since licensed to drive, while 169 had driven one year or more. Of the 114 students who had a 1.00 GPA, 73 or 64.1% had driven one year or less while 41 or 35.9% had driven more than one year. Of the 40 students who had a 2.00 GPA, 24 or 60.0% had driven one year or less while 16 or 40.0% had driven more than one year. Of the 265 students who had a 3.00 GPA, 172 or 64.9% had driven one year or less while 93 or 35.1% had driven more than one year. Of the 46 students who had a 4.00 GPA, 27 or 58.7% had driven one year or less while 19 or 41.3% had driven more than one year since licensed to drive.

A x^2 value of 16.92 or greater was needed for significance at the .05 level. A x^2 value of 10.42 was obtained which was not significant at the .05 level. There was not a significant difference in amount of time since the students had been licensed to drive and the students' grade point averages.

Table 21

Time Since Licensed to Drive by Grade Point Average

(Across Grade Point Average)

Grade Point Average	Time Since Licensed to Drive									
	6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
1.00	24	25.3	49	24.4	33	29.5	8	14.0	114	24.5
2.00	10	10.5	14	7.0	11	9.8	5	8.8	40	8.6
3.00	50	52.6	122	60.7	54	48.2	39	68.4	265	57.0
4.00	11	11.6	16	8.0	14	12.5	5	8.8	46	9.9
Total	95	100.0	201	100.0	112	100.0	57	100.0	465	100.0

Table 21a

Time Since Licensed to Drive by Grade Point Average

(Within Grade Point Average)

Grade Point Average	Time Since Licensed to Drive									
	6 mos/less		6 mos-1 yr		1 yr-1½ yrs		1½ yrs +		Total	
	N	%	N	%	N	%	N	%	N	%
1.00	24	21,1	49	43.0	33	28.9	8	7.0	114	100.0
2.00	10	25.0	14	35.0	11	27.5	5	12.5	40	100.0
3.00	50	18.9	122	46.0	54	20.4	38	14.7	265	100.0
4.00	11	23.9	16	34.8	14	30.4	5	10.9	46	100.00

chi square = 10.42*

*Not Significant at the .05 level

In Tables 22 and 22a, summaries of the analyses of grade point average by miles driven during 12 months prior to the study are presented.

Of the 465 students surveyed, 399 had driven 3000 or less miles the past 12 months, while 66 had driven 3001 or more miles. Of the 399 students who had driven 3000 or less miles, 105 or 26.3% had a 1.00 GPA, 31 or 7.8% had a 2.00 GPA, 225 or 56.4% had a 3.00 GPa, and 38 or 9.5% had a 4.00 GPA. Of the 66 students who had driven 3001 or more miles prior to the study, 9 or 13.6% had a 1.00 GPA, 9 or 13.6% had a 2.00 GPA, 40 or 60.6% had a 3.00 GPA, and 8 or 12.1 had a 4.00 GPA.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 6.54 was obtained which was not significant at the .05 level. There was not a significant difference in the miles driven 12 months prior to the study and the students' grade point averages.

Table 22

Grade Point Average by Miles Driven Past 12 Months

(Across Miles Driven)

Miles Driven Past 12 Months	Grade Point Average									
	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
3000 or less	105	92.1	31	77.5	225	84.9	38	82.6	399	85.8
3001 or more	9	7.9	9	22.5	40	15.1	8	17.4	66	14.2
Total	114	100.0	40	100.0	265	100.0	46	100.0	465	100.0

Table 22a

Grade Point Average by Miles Driven Past 12 Months

(Within Miles Driven)

Miles Driven Past 12 Months	Grade Point Average									
	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
3000 or less	105	26.3	31	7.8	225	56.4	38	9.5	399	100.0
3001 or more	9	13.6	9	13.6	40	60.6	8	12.1	66	100.00

chi square = 6.54*

*Not Significant at the .05 level

In Tables 23 and 23a, summaries of the analyses of miles driven during 12 months prior to the study by sex are presented.

Of the 465 students surveyed, 399 had driven 3000 or less miles in the past 12 months, while 66 had driven 3001 or more miles. Of the 200 male students, 169 or 84.5% had driven 3000 or less miles while 31 or 15.5% had driven 3001 or more miles. Of the 265 female students, 230 or 86.8% had driven 3000 or less miles while 35 or 13.2% had driven 3001 or more miles 12 months prior to the study.

A x^2 value of 3.84 or greater was needed for significance at the .05 level. A x^2 value of 0.32 was obtained which was not significant at the .05 level. There was not a significant difference in the miles driven 12 months prior to the study between males and females.

Table 23

Miles Driven Past 12 Months by Sex

(Across Sex)

Sex	Miles Driven Past 12 Months: 3000 or less		3001 or More		Total	
	N	%	N	%	N	%
Male	169	42.4	31	47.0	200	43.0
Female	230	57.6	35	53.0	265	57.0
Total	399	100.0	66	100.0	465	100.0

Table 23a

Miles Driven Past 12 Months by Sex

(Within Sex)

Sex	Miles Driven Past 12 Months: 3000 or less		3001 or More		Total	
	N	%	N	%	N	%
Male	169	84.5	31	15.5	200	100.0
Female	230	86.8	35	13.2	265	100.0

chi square = 0.32*

*Not Significant at the .05 level

In Tables 24 and 24a, summaries of the analyses of grade point average by sex are presented.

Of the 465 students surveyed, 200 were males while 265 were females. Of the 200 male students, 48 or 24.0% had a 1.00 GPA, 17 or 8.5% had a 2.00 GPA, 121 or 60.5% had a 3.00 GPA, and 14 or 7.0% had a 4.00 GPA. Of the 265 female students, 66 or 24.9% had a 1.00 GPA, 23 or 8.7% had a 2.00 GPA, 144 or 54.3% had a 3.00 GPA, and 32 or 12.1% had a 4.00 GPA.

A x^2 value of 7.82 or greater was needed for significance at the .05 level. A x^2 value of 3.77 was obtained which was not significant at the .05 level. There was not a significant difference in the grade point averages between males and females.

Table 24

Grade Point Average by Sex

(Across Sex)

	Grade Point Average									
Sex	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
Male	48	42.1	17	42.5	121	45.7	14	30.4	200	43.0
Female	66	57.9	23	57.5	144	54.3	32	69.6	265	57.0
Total	114	100.0	40	100.0	265	100.0	46	100.0	465	100.0

Table 24a

Grade Point Average by Sex

(Within Sex)

	Grade Point Average									
Sex	1.00		2.00		3.00		4.00		Total	
	N	%	N	%	N	%	N	%	N	%
Male	48	24.0	17	8.5	121	60.5	14	7.0	200	100.0
Female	66	24.9	23	8.7	144	54.3	32	12.1	265	100.0

chi square = 3.77*

*Not Significant at the .05 level

Summary

Summaries of the findings of this study are presented in Figure 4. The two major research hypotheses were tested by the use of t-tests. Traffic accident involvement by the time in which driver education instruction was received was not significant at the .05 level. Moving violation convictions by the time in which driver education instruction was received also was not significant at the .05 level. In both instances, the traffic accident involvements and the number of moving violation convictions did not vary significantly by whether driver education instruction was received during the regular school year or during the summer.

The following are additional analyses that did prove to be significant at the .05 level: (1) the time in which driver education instruction was received when correlated to sex; (2) the time in which driver education instruction was received when correlated to age; (3) the number of moving violation convictions when correlated to sex; (4) the number of moving violation convictions when correlated to miles driven the past 12 months; (5) the traffic accident involvements when correlated to miles driven the past 12 months; (6) the traffic accident involvements when correlated to the number of moving violation convictions; (7) the time since licensed to drive when correlated to the traffic accident involvements; and (8) the time since licensed to drive when correlated to the miles driven the past 12 months.

All of the other analyses in the study were not statistically significant at the .05 level.

FIGURE 4

ANALYSIS OF RESULTS SUMMARY

Research Hypothesis	Stat. Test	Calculated Value of Significance	Critical Value of Test Stat.	Decision
Sex by Time HSDE Received	x^2	3.84	101.98**	Reject Ho
Age by Time HSDE Received	x^2	7.82	15.38**	Reject Ho
Miles Driven Past 12 Months by Time HSDE Received	x^2	3.84	0.41*	Fail to Reject Ho
Moving Violations by Sex	t	2.58	3.06**	Reject Ho
Moving Violations by Miles Driven Past 12 Months	x^2	3.84	18.62**	Reject Ho
Traffic Accident Involvement by Sex	t	2.58	0.453*	Fail to Reject Ho
Moving Violations by HSDE Received	t	2.58	0.863*	Fail to Reject Ho
Traffic Accident Involment by Time HSDE Received	t	2.58	0.227*	Fail to Reject Ho
Traffic Accident Involment by Age	x^2	7.82	5.86*	Fail to Reject Ho

*Not Significant at the .05 level
**Significant at the .05 level

Figure 4 (continued)

Research Hypothesis	Stat. Test	Calculated Value of Significance	Critical Value of Test Stat.	Decision
Traffic Accident Involment by Miles Driven Past 12 Months	x^2	3.83	19.73**	Reject Ho
Traffic Accident Involvement by Moving Violations	x^2	3.84	9.67**	Reject Ho
GPA by Traffic Accident Involvement	x^2	7.82	4.39*	Fail to Reject Ho
GPA by Moving Violations	x^2	7.82	2.05*	Fail to Reject Ho
GPA by Time HSDE Received	x^2	7.82	4.77*	Fail to Reject Ho
Miles Driven Past 12 Months by Sex	x^2	3.84	0.32*	Fail to Reject Ho
GPA by Miles Driven Past 12 Months	x^2	7.82	6.54*	Fail to Reject Ho
GPA by Sex	x^2	7.82	3.77*	Fail to Reject Ho
Time Since Licensed to Drive by GPA	x^2	16.92	10.42*	Fail to Reject Ho

*Not Significant at the .05 level
**Significant at the .05 level

Figure 4 (continued)

Research Hyppthesis	Stat. Test	Calculated Value of Significance	Critical Value of Test Stat.	Decision
Time Since Licensed to Drive by Sex	x^2	7.82	7.73*	Fail to Reject Ho
Time Since Licensed to Drive by Time HSDE Received	x^2	7.82	13.46**	Reject Ho
Time Since Licensed to Drive by Traffic Accident Involvement	x^2	7.82	8.29**	Reject Ho
Time Since Licensed to Drive by Moving Violations	x^2	7.82	7.14*	Fail to Reject Ho
Time Since Licensed to Drive by Miles Driven Past 12 Months	x^2	7.82	7.21**	Reject Ho

*Not Significant at the 0.05 level
**Significant at the .05 level

In Chapter 5, the summary, conclusions, discussion, and recommendations will be presented.

CHAPTER 5

SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Summary

The central purpose of this study was to determine if there was a difference in accident involvement and moving violation convictions of students enrolled in summer (over a short length of time) driver education programs versus students taught in traditional (over a longer period of time) driver education programs.

The study used a self-reporting driver education evaluation survey (Appendix A) as the instrument to determine accident involvement and moving violation conviction.

A review of the literature indicated that no research had been conducted to determine if the time period in which high school driver education was received to a student's first accident was a factor in the collision experience of driver education students in North Carolina. The review of literature also showed that most of the early studies in driver education were conducted to determine if drivers without a formal course in driver education had fewer or more accidents than those students completing a formal course. Many of these studies did not control for exposure, and their sample selection was questionable. Most of the studies showed fewer collisions for high school driver education trained students, but the results were questionable since most were not scientifically controlled studies.

The survey instrument for this study was completed by a randomly selected sample population of 465 high school students from ten randomly selected high schools in North Carolina. The students selected had completed the driver education programs in the summer of 1981 and the 1980-81 academic school year. Of the 465 students surveyed, 175 had completed driver education in the summer while 290 had completed driver education in the academic school year.

During the fall of 1982 the students were asked to respond to the Driver Education Evaluation Survey. The students surveyed had completed the regular school year driver education program in June 1981, and the students in the summer driver education program had completed the program in August 1981. The period of time under investigation was from June 1981 (when the regular program ended) and August 1981 (when the summer program ended) to October 1982 (when all of the selected students from both programs responded to the Driver Education Evaulation Survey). The data collected from the survey consisted of the students' responses to 70 items divided into four major categories: (1) suggestions for improving driver education courses, (2) driving experience, (3) collision experience, and (4) type of crash. In the driving experience category, question #29 asked the students how many moving violation convictions they had received since completing driver education.

The data collected from responses to the survey were tabulated and analyzed using a t-test for the primary questions and chi square for the secondary variables.

One purpose of this study was to find if there was a difference in traffic accident involvement of students completing summer (over a short

length of time) driver education programs versus students taught in a traditional (over a longer period of time) driver education programs. Upon performing a t-test, a value of 2.58 was needed for significance. A value of 0.227 was obtained which was not statistically significant at the 0.05 level; thus, there was not a significant difference in accident involvement between students who completed a traditional or summer driver education program. That is, the number of accidents experienced by the students did not vary significantly by the time period in which driver education instruction was received.

The second purpose of this study was to find if there was a difference in moving violation convictions of students taught to drive in summer (over a short length of time) driver education programs versus students taught in traditional (over a longer period of time) driver education programs.

Upon performing a t-test, a value of 2.58 was needed for significance. A value of 0.863 was obtained which was not statistically signficant at the 0.05 level; thus, there was not a significant difference in moving violation convictions between students who completed a traditional or a summer driver educaton program. That is, the number of moving violation convictions experienced by the students did not vary significanty by the time period in which driver education instruction was received.

There were other analyses performed in order to get a more complete picture of the collected data from the randomly selected sample population of North Carolina driver education students. The following are the results of the analyses that were performed at the .05 level:

1. There was a significant relationship between traffic accident involvement and miles driven the 12 months prior to the study. The more miles the students had driven, the fewer traffic accidents.

2. There was no significant relationship between traffic accident involvement and the sex of the student.

3. There was no significant relationship between traffic accident involvement and grade point average.

4. There was a significant relationship between traffic accident involvement and time since licensed to drive. The longer the students had been licensed to drive, the fewer traffic accidents.

5. There was a significant relationship between moving violation convictions and the sex of the student. Males experienced more convictions.

6. There was no significant relationship between time since licensed to drive and moving violation convictions.

7. There was a significant relationship between moving violation convictions and miles driven the past 12 months. The more the students drove, the fewer moving violation convictions.

8. There was no significant relationship between moving violation convictions and grade point average.

The more miles students had driven 12 months prior to the study, the fewer moving violation convictions and traffic accidents they experienced. This also related to time since licensed to drive. The longer the student had been licensed to drive, the fewer moving violation convictions. Males experienced more moving violation convictions, but experienced fewer traffic accidents. The older a student was in the study, the fewer traffic accidents he/she experienced. Grade point average did not influence whether or not the student received a moving violation conviction or experienced a traffic accident. The grade point average did relate to how long a student had been licensed to drive; the higher the grade point average, the longer a student had been licensed to drive.

Conclusions

This study was designed primarily to determine if there was a difference in accident involvement and moving violation convictions of students completing a traditional driver education program versus students taught in a summer driver education program.

There appeared to be no relationship between accident involvement and whether or not the student took driver education in the summer or during the regular school year in North Carolina. There also appeared to be no relationship between moving violation convictions of the two groups who had received driver education instruction at different times of the year.

Discussion

A study of this type and magnitude should have uncovered variables that distinguish between graduates of traditional and summer driver education programs. The results of this study did not do such. There were not any differences between the two groups as far as traffic accidents and moving violations were concerned, but differences did appear in some of the variables. As for moving violations and traffic accidents it might be that the length of time since the students were licensed to drive had much to do with why there were no differences between the two groups. There was a relatively small amount of time between when a student received a license and when a student had an accident or received a moving violation conviction.

There may be significant differences between the two groups, but the criteria used in this study were not able to discern them. Using traffic accidents and moving violation convictions as the criteria could actually be the reason for not finding differences. There have been shortcomings

in the past with the use of driving records as valid criteria for measuring driver performance. One example of a shortcoming might be increased traffic enforcement in effect at the time of the issuance of the moving violation citation. Another shortcoming would be the inadequate accident report form (some do not contain enough information to answer much needed questions about a particular traffic accident); there is a lack of uniformity in accident report forms (all do not ask the same questions); and lastly, drivers experience few accidents during their driving careers (traffic accidents are rare event). The theories of learning that the writer has been exposed to over the last 15 years tend to suggest that learning material over a short period of time is inferior to learning over a longer extended period of time. It also stands to reason that a student exposed to a dynamic teacher for an extended period of time will have a better working knowledge of material presented. Also, the positive attitude from a dynamic teacher should have greater carryover value for the student. The student will have a more positive attitude toward himself/herself and the material presented.

Driver education teachers frequently complain about not having enough time in the recommended 30 hours of classroom instruction to teach the required driver education material. It does not seem possible that they could teach driver education concepts and do a good job in a shortened summer school program. In the short amount of time a student is exposed to driver education concepts during the summer, there is not enough time to develop positive attitudes and long lasting skills. It stands to reason that they would tend to show poorer driving records and have a greater number of moving violation convictions.

The purpose of driver education is not only the prevention of traffic accidents and violation convictions; it also teaches respect for one's fellow man by learning about sharing the highway transportation system, and it also teaches proper attitudes toward man made and natural laws.

There is a need for driver education in the schools. Students learn good citizenship and that being a law abiding person transfers to the use of the highways and other transportation systems. Students learn to be good consumers, especially when purchasing vehicles and accessories. Students learn about insurance and financial responsibility laws as they relate to vehicle ownership. Students learn the psychological, physiological, and sociological aspects of driving and using vehicles in the highway transportation system. Lastly, students learn the interrelationships between man, the vehicle, and the environment in which these operations take place. Vehicles play a very important role in the economy of our country, and the wise use of resources related to their use is of utmost importance. Driver education attempts to convey this important message to its students.

Recommendations For Further Study

The following are recommendations for further study based on the data from this study:

1. A replication of this study using greater number of students who have had five years or more driving experience.

2. A study to be done that would develop other criteria (beside driver records and violation convictions) to measure the worthiness of driver education programs.

3. A replication of this study in a large school district where randomly assigned students from the same school could be used.

4. A replication of this study in a larger school district with students who had at least three years of driving experience. Randomly selected schools would use either an old or new driver education curriculum guide for instruction in the classroom phase.

Recommendations

The following are recommendations based on the findings of this study:

1. Because of the increased cost of operating a regular school year driver education program, the school district could offer an expanded summer driver education program and complete more students for approximately the same cost. The school district would receive more funds from the state for operating the program.

2. Students enrolled in either the traditional driver education program or the summer driver education program should get driving experience with parents and friends (using urban and rural driving environments) while under the control of the high school driver education program. Hopefully, this would allow for more discussion of potential problems to which they have been exposed.

3. Driver education teachers of traditional programs and summer programs should stress the economics of maintaining a driving record that is free of moving violation convictions and traffic accidents; we could all pay higher costs for insurance premiums and vehicle repair bills if additional points are added to our driving records. Emphasis should also be placed on the male driver education students since they received more moving violation convictions.

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APPENDICES

APPENDIX A

DRIVER EDUCATION SURVEY

DRIVER EDUCATION EVALUATION SURVEY

BY

HORLIN CARTER
MICHIGAN STATE UNIVERSITY

1982

DRIVER EDUCATION EVALUATION SURVEY

Need and Importance of Survey

The purpose of this survey is to obtain information which can help improve the driver education program in North Carolina. This information will be used to compare the products of summer driver education programs with products of regular driver education programs.

The main objective of driver education is to help drivers avoid traffic collisions. We need to find out how well students from your school are achieving this objective. To do this, we need to know the number, the kinds, and the reasons for the traffic collisions you and your classmates have had so far.

It is very difficult and costly to obtain accurate or complete information about traffic collisions from state records. Also, the information available at this time is not very helpful for improving the driver education courses. Actually, you are the only one who can provide information about your driving experiences and problems. So, your cooperation is most important if we are to make progress in driver education.

The information you provide will be analyzed by number only and compiled on a group basis. In this way, your responses will be completely confidential since they will not be connected to you as an individual.

The completed questionnaire will be picked up by a staff member or mailed to N.C. A&T State University. The results will be summarized and reported by driver groups and types of school programs. Then, recommendations for program improvement can be made.

Some of the information related to driving experience requested may be difficult to recall. However, it is important to find out if the times, places, and miles driven have anything to do with the types of collisions drivers have. Therefore, please make the best estimates you can.

Thanks for your help!

Horlin Carter, Assistant Professor
Dept. of Safety & Driver Education
North Carolina A&T State University
Greensboro, North Carolina 27411

Date _____

School_____ Name_____
Code First Last

Age_____ Grade Point Average_____

___1. Sex
1. Male
2. Female

___2. When did you take the behind-the-wheel phase of driver education?
1. During the summer
2. During the regular school year

___3. When did you take the classroom phase of driver education?
1. During the summer 2. During the regular school year

Suggestions for Improving Driver Education Course--Please put a check (✓) in front of each item below that you had the most problems with after becoming a licensed driver.

____4. Judging space needed
____5. Seeing hazards in time
____6. Driving at night
____7. Driving on slick pavements
____8. Passing other cars
____9. Judging safe speed
____10. Identify need for car repair
____11. Parking
____12. Other (explain) or None_____

Driving Experience--Select the one choice which best describes your experiences. Then write the number of your choice in the blank before the question number. If you are not sure, please make your best estimate.

___13. How many months after you completed driver education did you receive your license?
1. Up to 2 months 3. 4 to 6 months 5. 8 to 10 months 7. over 12 months
2. 2 to 4 months 4. 6 to 8 months 6. 10 to 12 months

___14. How long has it been since you were licensed to drive?
1. 6 months or less 4. 1 1/2 to 2 years 7. 3 to 3 1/2 years
2. 6 months to 1 year 5. 2 to 2 1/2 years 8. 3 1/2 to 4 years
3. 1 to 1 1/2 years 6. 2 1/2 to 3 years

___15. Where does most of your driving take place?
1. within 10 miles of home 3. within 50 miles of home
2. within 25 miles of home 4. within 100 miles of home
5. over 100 miles from home

___16. On what kind of highways or streets do you do most of your driving?
1. city streets 3. expressways or freeways
2. rural two-lane highways 4. county blacktop or gravel roads

___17. With whom do you do most of your driving?
1. alone 3. friends 5. other, such as employer or workers
2. parents 4. relatives

___18. How old were you when you received your drivers license?
1. 16 3. 17
2. 16 1/2 4. 17 1/2

___19. In whose car do you usually drive?
1. your own 3. relatives 5. employer
2. parents 4. friends 6. other

___20. How much of your driving is done on weekends? (Friday evening, Saturday, and Sundays)
1. less than 15% 3. 30-45% 5. 60-75% 7. 90% or more
2. 15-30% 4. 45-60% 6. 75-90%

___21. On weekends, when do you do most of your driving?
1. mornings 3. night time 5. afternoons and night time
2. afternoons 4. mornings & afternoons

___22. During the week (Monday to 6 p.m. Friday), when do you do most of your driving?
1. mornings 3. night time 5. afternoons & night time
2. afternoons 4. mornings & afternoons

___23. About how much time do you spend driving during an average week? (Monday-Sunday)?
1. 0-2 hours 3. 6-8 hours 5. 12-14 hours 7. 18-20 hours
2. 3-5 hours 4. 9-11 hours 6. 15-17 hours 8. over 20 hours

___24. About how many miles, on the average, do you drive each month?
1. 0-50 miles 3. 101-150 miles 5. 201-250 miles 7. 301-500 miles
2. 51-100 miles 4. 151-200 miles 6. 251-300 miles 8. over 500 miles

___25. About how many miles have you driven the last twelve months?
1. 0-500 miles 3. 1001-2000 miles 5. 3001-4000 miles 7. 5001-8000 miles
2. 501-1000 miles 4. 2001-3000 miles 6. 4001-4000 miles 8. 8001-12,000 miles

___26. How many convictions have you received for moving violations as a driver since completing driver education?
1. none 3. two 5. four 7. six
2. one 4. three 6. five 8. seven

___27. How many times have you taken driver education?
1. one 3. three 5. five
2. two 4. four

Collision Experience--Write the number that best describes your experience in the blank before the question number. Leave blank those questions that do not apply to you. If your car hit something or was hit by something causing some damage or injury, then count it as a traffic collision or crash. If your response to question 28 is none, then you do not need to continue. If you have been involved in a collision or collisions, please answer the remaining questions.

___28. How many traffic collisions have you had as a driver?
1. none 3. two 5. four 7. six
2. one 4. three 6. five 8. seven

___29. If you had a collision, how many months had you been driving before the first collision happened?
1. 0-4 months 3. 7-10 months 5. 13-16 months 7. 19-24 months
2. 4-7 months 4. 10-13 months 6. 16-19 months 8. 2 years or more

___30. If you had a second collision, how many months had you been driving between the first and second collision?
1. 0-4 months 3. 7-10 months 5. 13-16 months 7. 19-24 months
2. 4-7 months 4. 10-13 months 6. 16-19 months 8. 2 years or more

___31. If you had a third collision, how many months had you been driving between the second and third collision?
1. 0-4 months 3. 7-10 months 5. 13-16 months 7. 19-24 months
2. 4-7 months 4. 10-13 months 6. 16-19 months 8. 2 years or more

Type of Crash--Please write the number of the one best choice by the question number in the proper column. Use question numbers 32-44 only for the first crash, use question numbers 45-57 only for the second crash, and the other numbers for the third crash. All questions apply to both urban and rural roads. Leave blank those questions that do not apply to you. Feel free to write a comment if needed.

First Crash	Second Crash	Third Crash	
___32.	___45.	___58.	Where did the crash happen? 1. at intersection 5. interchange 2. in between intersections 6. underpass 3. driveway 7. RR crossing 4. parking lot 8. none of these (explain)
___33.	___46.	___59.	What type of roadway 1. straight-level 4. straight-hilltop 7. curve-downhill 2. straight-uphill 5. curve-level 8. curve-hilltop 3. straight-downhill 6. curve-uphill
___34.	___47.	___60.	Condition of road surface? 1. dry 3. snow-packed 5. oily 7. loose material on roadway 2. wet 4. icy 6. gravel
___35.	___48.	___61.	When did crash happen? 1. 7 am-10 am 3. 1 pm-4 pm 5. 7 pm-10 pm 7. 1 am-4 am 2. 10 am-1 pm 4. 4 pm-7pm 6. 10 pm-1 am 8. 4 am-7 am
___36.	___49.	___62.	What other object was involved? 1. another moving car 4. pedestrian or bicycle 2. truck or bus 5. motorcycle 3. parked vehicle 6. RR train 7. fixed object (post, tree, etc.) 8. none of these (explain)
___37.	___50.	___63.	How did the crash take place? 1. rear end 4. right angle from left side 2. slight angle from right side 5. right angle from right side 3. slight angle from left side 6. sideswipe 7. head on 8. none of these (explain)
___38.	___51.	___64.	What maneuver were you making? 1. going straight 4. lane changing 7. merging 2. turning 5. passing 8. parking 3. entering traffic 6. backing
___39.	___52.	___65.	What maneuver was the other driver making? (Leave blank if no other driver) 1. going straight 4. lane changing 7. merging 2. turning 5. passing 8. parking 3. entering traffic 6. backing

First Crash	Second Crash	Third Crash	
___40.	___53.	___66.	How did you try to avoid the crash? 1. hard braking 3. quck steering 5. increased speed 2. pump brakes 4. steer & brake 6. none of these (explain)
___41.	___54.	___67.	What mistake did the other driver make, if any? 1. none 5. did not see signals or signs 2. speed too fast for conditions 6. did not give proper signal 3. failed to yield 7. misjudged distance or spaced needed 4. following too close 8. did not see other car or predestrian
___42.	___55.	___68.	What mistake did you make, if any? 1. none 5. did not see signals or signs 2. speed too fast for conditions 6. did not give proper signal 3. failed to yield 7. misjudged distance or space needed 4. following too close 8. did not see other car or predestrian
___43.	___56.	___69.	How serious was crash? 1. property damage only 2. injuries to one or more 3. death to one or more
___44.	___57.	___70.	How much damage to your car? 1. up to $250 3. $500-750 5. $1000-$2000 2. $250-$500 4. $750-$1000 6. over $2000

APPENDIX B

DESCRIPTIVE ANALYSIS OF SCHOOL PROGRAM

DESCRIPTIVE ANALYSIS OF SCHOOL PROGRAM

SCHOOL_____ CODE_____ YEAR_____

Classroom

Period_____minutes; Days per week_____: Weeks_____;

Total Clock hours_____

Laboratory

Simulator: period_____minutes; Days per week_____;

weeks_____; Total Simulator Clock Hours_____;

Range: period_____minutes; Days per week_____;

weeks_____; Total Range Clock Hours_____;

On-Street: period_____minutes; Days per week_____;

weeks_____; Total Clock Hours As Observer_____;

Total Clock Hours As Driver_____

TOTAL CLOCK HOURS OF PRACTICE:

Simulator hours _____ ÷ 4 plus range hours _____ ÷ 2 plus on-street hours _____ equals _____ total hours

Class and Lab Correlation

Lab starts: _____concurrent with class; _____days after class starts;

_____after class is completed;

Teacher Assignment

No. of teachers: full Time_____; 75% DE_____;

50-70% DE_____; 20-40% DE_____;

No. of teachers:

class only_____; BTW only_____;

simulator only_____; range only_____;

class and BTW_____; class and simulator_____;

class and range_____; simulator and BTW_____;

range and BTW_____; class, simulator and BTW_____;

class, range and BTW_____;

class, simulator, range and BTW_____;

APPENDIX C

GUIDES FOR ADMINISTRATION OF SURVEY

GUIDES FOR ADMINISTRATION OF
DRIVER EDUCATION EVALUATION SURVEY

( ) - Statements in parentheses are instructions to follow for the person administering the survey questionnaire.

" " - Statements within quotation marks are those to be read aloud to students.

INTRODUCTION

(Make general announcement--have some extra pencils)--"Today, you are being asked to fill out a questionnaire on your driving experiences so far. The purpose and need for this information is explained on the first page . . . You may use pencil or pen . . . Do not begin writing until the instructions are given."

(Pass out survey forms and have students read the need and purpose with you.)--"Please read to yourself while I read aloud the purpose and importance of the survey."

INSTRUCTIONS

"On the first line, write the date."

"On the next line, you are to print our school code number if you completed driver education in this high school. If you did not complete driver education in this high school, then print the name of the public or private school on this line. If you did not complete a course in driver education, then write NONE on this line."

"Please print your name."

"In the next two blanks, write in your age and grade point average."

"Questions 1-3 are to be answered by placing the one best answer to each question on the blank line provided."

"Now, turn to page two and read the instructions carefully. Please listen to some special instructions before you begin writing."

"Note that you may check one or more of the items numbered 4-12. All other questions from number 13 on call for just the ONE best choice. Feel free to write an explanation of your choice if necessary. Those of you who may not have a driver's license yet need answer only those questions that apply to you. Leave the rest blank."

"Now, look at questions 23, 24, and 25. It may be hard to estimate the number of miles you have driven the last year. However, knowing about how many hours you drive each week should help you figure out how many miles you drive during an average month. Then, you should be able to make a better estimate of how many miles per year. Of course, you will need to add in any long vacation trips if you did most of the driving."

"For question 23, do not count any collisions you might have had before completing the driver education course."

"Remember the definition of a collision is as follows: If your car hits something or was hit by something causing any damage or injury, then count it as a collision or crash."

"Now, turn to the last two pages. Please note that there is a separate column for each collision or crash."

"When you have completed the questionnaire, turn it over and wait until I ask for them to be collected."

"Are there any questions? You may begin."

(Collect and return to person in charge.)

Thank you for your assistance:

Horlin Carter, Assistant Professor
Dept. of Safety & Driver Education
North Carolina A & T State University

APPENDIX D

SAMPLE OF LETTERS SENT TO THE SCHOOLS

MICHIGAN STATE UNIVERSITY EAST LANSING • MICHIGAN 48824

CONTINUING EDUCATION SERVICE • HIGHWAY TRAFFIC SAFETY CENTER • KELLOGG CENTER

July 26, 1982

Mr. Armand Mando, Principal
Ashebrook High School
2222 New Hope Road
Gastonia, NC 28052

Dear Mr. Mando:

I spoke to you on the phone in May 1982 concerning the administration of a driver education survey to your students who had completed driver education in the 1980-81 academic school year and summer 1981. I have enclosed a copy of the questionnaire and instructions for administering the survey. I need permission to give the survey to fifty (50) of your students. Twenty-five (25) from the 1980-81 academic school year program and twenty-five (25) from the 1981 summer driver education program. I have randomly selected ten schools in North Carolina for my study, and Ashebrooke High School is one of them.

I am completing a doctoral program at Michigan State University in Traffic and Safety Education. The topic of my dissertation is a comparison and investigation of accidents and moving violations of selected students in North Carolina who completed driver education in the academic school year programs versus students who completed driver education in the summer programs. The academic school year 1980-81 and summer 1981 is the year under study. For the study, I wish to have 50 randomly selected students from the total program: twenty-five from the 1980-81 academic school year program and twenty-five from the 1981 summer program. It should only take the students 26-30 minutes to complete the surveys.

If possible, I would like to either administer the surveys or have someone at the school administer them between August 30, 1982 and September 24, 1982. A positive answer will be greatly appreciated. I will make further arrangements upon hearing from your office.

I will be returning to Greesnboro, NC July 29, 1982, but I will not be at my office until August 16, 1982. Please forward your reply to my attention at the following address:

Department of Safety and Driver Education
Price Hall, Room 113
North Carolina A&T State University
Greensboro, NC 27411

Sincerely yours,

Horlin Carter

HC/ljt
Enclosure

APPENDIX E

LIST OF SCHOOLS IN THE STUDY

SCHOOLS IN THE STUDY

1. Scotland County High School
   Mr. Anzel Harrel, Driver Education Coordinator
   Box 272
   Laurinburg, North Carolina 28352

2. Garinger East High School
   Mr. B.B. Delaine, Driver Education Coordinator
   P.O. Box 30035
   Charlotte, North Carolina 28230

3. Southwestern Randolph Senior High School
   Mr. Robert L. Brewer, Driver Education Coordinator
   Route 3
   Asheboro, North Carolina 27203

4. Ashbrook High School
   Mr. Armand Mando, Principal
   2222 Newhope Road
   Gastonia, North Carolina 28052

5. Ayden-Grifton High School
   Mr. Claude Kennedy, Driver Education Department Chairman
   Route 3, Box 172
   Ayden, North Carolina 28513

6. Page High School
   Mrs. Elizabth Bell, Central Administration
   Greensboro Public Schools
   712 N. Eugene Street
   Greensboro, North Carolina 27402

7. North Forsyth High School
   Mr. Julian Gibson, Principal
   Route 7
   575 Shattalon Drive
   Winston-Salem, North Carolina 27106

8. Southeast High School
   Mr. Kenneth Turnage, Driver Education Director
   Route 1, Box 206
   Halifax, North Carolina 27839

9. Lee Senior High School
   Dr. George Seagraves, Principal
   P.O. Box 1010
   Sanford, North Carolina 27330

10. Freedom High School
Mr. Ron Black, Driver Education Coordinator
Route 12, Box 27
Morganton, North Carolina 28655