AN EVALUATION OF THE EFFECTIVENESS OF THE ILLINOIS DEMONSTRATION-SATELLITE PERFORMANCE CURRICULUM AS MEASURED BY STUDENT SELF-REPORTING ACCIDENT INVOLVEMENT

By

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ABSTRACT

AN EVALUATION OF THE EFFECTIVENESS OF THE ILLINOIS DEMONSTRATION-SATELLITE PERFORMANCE CURRICULUM AS MEASURED BY STUDENT SELF-REPORT ACCIDENT INVOLVEMENT

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The central purpose of this study was to examine the relationship between a specific driver performance curriculum and motor vehicle accident involvement among students completing driver education.

A secondary purpose of this study was to examine the feasibility of using a self-reporting accident survey as a measure of driver performance.

The Illinois Demonstration-Satellite Performance Curriculum (DSPC) was developed as part of a four year curriculum development and evaluation project funded by the Illinois Department of Transportation and sponsored by the Illinois Office of Education.

The goal of the project was two-fold, to provide assistance to public schools in Illinois in the implementation of the new state curriculum guide (Driver Education for Illinois Youth, 1972) and to provide the Illinois Office of Education with methods and data for evaluating the effectiveness of driver education programs in producing competent and responsible users of the highway transportation system.

Due to a time lag between development, implementation and revision of the curriculum, the project came to an end before any

statistical analysis could be done on those demonstration-satellite schools which utilized all thirteen modules. Of special significance to this study was the fact that of the fifty-seven schools involved in the project during the four year time span (1972-1976), only twelve schools during the 1975-76 school year were provided with the finalized modules identified as key modules to the project.

The sample population of this study consisted of 4024 seniors drawn from twenty-four high schools in Illinois who graduated in the Spring of 1978 and who had successfully completed driver education during the 1975-76 school year within the school from which they graduated.

The twenty-four schools involved in the study consisted of twelve schools (experimental group) which had participated in the utilization of the DSPC during the 1975-76 school year and twelve schools (control group) which had not participated in the utilization of the DSPC during the 1975-76 school year.

During the Spring of 1978 pre-graduation exercises, the students were asked to respond to the Driver Education Evaluation Survey. The data collected on the survey consisted of the subjects' responses to the best choice in three or more of the following five categories: (1) Suggestions for Improving Driver Education Courses, (2) Driving Experience, (3) Collision Experience, (4) Severity of Collision Experience and (5) Type of Crash.

Statistical analysis of the data consisted of parametric t-tests on all questions dealing with accident involvement and non-parametric Chi-square Tests on all questions dealing with severity of accident

involvement.

Analysis of the data led to two major conclusions: (1) that the Illinois Demonstration-Satellite Performance Curriculum did significantly influence (in a reduction direction) an individual's probability of being involved in an accident and (2) that the Illinois Demonstration-Satellite Performance Curriculum had little influence on the severity of accident involvement for students exposed to it.

Additional findings relative to influence of sex, type of program, type of city, and performance on module tests were also discussed.

DEDICATION

This study is dedicated to:

Mary I. Van Fleet and Charles L. Van Fleet, Jr.
without whose love, guidance and support this study
would not have been possible,

and

Marie, Breelyn and Shawn
wife, daughter and son,
who, along with his parents, made it all worthwhile.

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INTRODUCTION

Death, injury and property damage, resulting from motor vehicle collisions, is considered to be one of the major health and social problems of the last five decades. The motor vehicle accident rate has reached such epidemic proportions, as to be ranked as the number one cause of death between the ages of one and twenty-four years and fifth in all ages identified by the National Safety Council. (49:40-72)

During 1977 alone, 49,500 individuals lost their lives in motor vehicle collisions with another 1,900,000 individuals sustaining injuries. An estimated direct cost of over 30.5 billion dollars to those directly and indirectly involved resulted from these mishaps. In the last twenty years over 850,000 lives have been lost, with a majority of these motor vehicle collisions (86%) being attributed to improper driving. (49:30-59) (49: 40-72) Of special significance is the fact that the youth of our nation have been involved in a disproportionate percent of these mishaps (38.2) and fatalities (38.2), yet they represent only 21.9% of the driving population. (49:54)

Because of the problems associated with motor vehicle utilization, a variety of countermeasures have been employed in three specific areas in an attempt to reduce the overall impact of collisions in this nation: the driving environment, the vehicle being driven and the driver and his passengers.

A major difficulty arising from these countermeasure programs is:

> The probability of involvement in a crash at any one time is already relatively low and quite difficult to reduce. Significant reductions will probably require large-scale national approaches that have some significant impact on the Nation's drivers, in terms of either how they drive (e.g., using seatbelts, minding speed limits) or how much they drive (e.g., in the recent fuel shortage). (70:4)

The Emergency Highway Energy Conservation Act, passed in January of 1974, represented one such national effort to affect the way people drive. This act prohibited speed limits above fifty-five miles per hour on the nation's highways and was credited by the National Safety Council as playing a major role in the reduction of fatal motor vehicle collisions during 1974-76. (59:11-17)

The overall effectiveness of that particular countermeasure in the years to come has not yet been established.

Paul H. Blaisdell, in the article "The Relevance of Safety Education in Schools of Tomorrow," warned that when examining the history of traffic accidents in this country, there have been several periods during which this nation experienced a crash reduction only to be followed by a relentless increase.

> If society were to expect long term effects ". . . . we have to so improve our capability in highway safety that we can hold the accident experience and its results on the downgrade despite the inevitable increase in drivers, vehicles and traffic." (1:6)

It was with that long term effect, ". . . . hold the accident experience and its results on the downgrade...", that the birth of driver education in the high school as a countermeasure came about. It was felt that if society were to produce safe drivers in the future,

it would need to provide some type of formalized educational program at an age when the youth of the nation were being introduced to the driving task. (46:1-60)

Driver Education, in the high school setting, came about because of a recognized social problem. Since it was not part of the original curriculum, it became a mandated program in most states.

In recent years it has come under significant attack from a variety of areas concerning its effectiveness and, in some quarters, concerning its role in the educational environment. (13:259-274)

Of special concern to most traffic safety educators was the position taken by the National Highway Traffic Safety Administration ". . . . that the quality high school driver education (HSDE) program is capable of a 10-15 percent effect in terms of reducing the probability of crash involvement among persons exposed to it." (70:3)

There are not many who would argue the merit of a high school driver education program producing a decrease in accident involvement among those exposed to it. However, based on present day measures of effectiveness (namely driver license records) and current practices regarding instructor preparation, program structures, licensing procedures, accident involvement records and course curriculum development, there is concern as to the present ability to evaluate driver education, much less to set a level of performance. (13) (56) (70)

STATEMENT OF THE PROBLEM

Since the inception of the first separate driver education course of study in the early 1920's, and the inclusion of behind-the-wheel instruction by Neyhart in 1933, the goal of driver education has been to provide novice drivers with skills and knowledge that would lead toward safe, efficient and economical operation of a motor vehicle within the highway transportation system (HTS). (46:32-36)

Although the goal of safe, efficient, economical operation of a motor vehicle within the HTS has been considered a worthy one, progress toward the attainment of that goal has been hampered by many elements, a few of which were: the growth of the motorized vehicle (from 950,000 vehicles registered in 1912 to 149 million registered in 1977) versus knowledge of the driving task (first complete task analysis for driver education conducted by HumRRO in later part of the 1960's), lack of adequate research, lack of qualified instructors and availability of instructor preparation institutions and lack of adequate curriculum development. (8) (18) (31) (32) (36) (56) (58) (60)

Concern over these problems, along with the increasing cost of driver education within the educational system, has been mounting for a number of years and has culminated in recent years in an all-out attack on the value of driver education in the educational system coupled with a challenge from the National Highway Traffic Safety Administration (NHTSA).

The attacks revolve around two central questions: (a) Can driver education, for persons exposed to it, reduce accident involvement? and (2) At what level of performance does driver education become cost

effective?

In dealing with the first question, opponents of driver education have cited study after study showing driver education in the high school setting to be non-effective, costly, and in a recent study published on the front page of the Chicago Tribune (12/7/77), the researchers Robertson and Zador went one step further by suggesting that driver education was directly responsible for at least 2,000 fatal teenage crashes a year. (9)

Proponents, on the other hand, have justified the existence of driver education through citing studies that disclaim and/or refute the opponents' studies and through insurance company claims that policy holders' children, who have taken driver education, make fewer claims then those whose children have not taken driver education. (13) (40) (52)

The value of the research used to support and or refute driver education's effectiveness as an accident countermeasure has been challenged from a number of camps.

Little, in 1966, refuted the ability of the educational system to keep up with the needs and growth of driver education and verified his beliefs through a review of the literature which generally indicated a considerable difference in the quality of driver education in various schools. (35)

David Klein, in describing the state of the art of research on the young driver in 1968, indicated that the research was "primitive.... poor data quality, methodological parochialism and low professionalism." (13:261)

Challengers, other than Little and Klein, have dealt with a number of methodological errors committed by various researchers and cited that much of the research to date has centered around type of instruction, number of phases, length of programs, cost of programs, etc. . . . rather than on what type of curriculum would be best suited toward reducing the probability of crash involvement.

Finally, the Driver Education Evaluation Program (DEEP) Study presented to the U. S. Congress in 1975 reviewed the research literature and stated:

> . . . . the history of HSDE suggests that much of the present lack of documented effectiveness results from premature attempts to promote High School Driver Education (HSDE), based on its face validity, and to expand it to all eligible students without equal emphasis on evaluating and subsequently improving such programs. (70:39)

It would appear that much still needs to be done along the lines of program development and research before the value of driver education in an educational setting can be determined accurately.

The second question (At what level of performance does driver education become cost effective?) has prematurely been answered. The NHTSA has indicated that for driver education to become cost effective it must produce a ". . . . 10-15 percent effect in terms of reducing the probability of crash involvement among persons exposed. . . ." to it. (70:3)

The 10-15 percent effect represented a premature assessment because to effectively set a level of performance for any curriculum, answers to questions such as the following must be obtained:

1. What prerequisite capabilities must the target population, for whom the curriculum is intended, have?

2. At what level of preparedness must the instructors of the curriculum be?

3. What equipment will be necessary for implementation of the program?

4. What minimum levels of performance must the learners achieve to progress successfully through each segment of the curriculum?

5. Within what time frame must the curriculum function?

6. What tools will be best suited for measuring the effectiveness of the curriculum and how will it be evaluated? (1) (13) (38) (57)

The problems that have confronted driver education have been increased due to the criterion that has been used in the past to evaluate its effectiveness. Much of the research has relied heavily upon the use of state driver license records. The major problem associated with that approach has been that ". . . . driving records, as collections of crash and violation entries, are not complete, often involve inaccuracies, and are subject to the whims of reporting officers, prosecuting attorneys and traffic court judges." (70:42) (76)

Research to date has not provided answers to what kind of curriculum will produce a reduction in the probability of being involved in an accident. Nor has it provided the best means to measure prospective curriculums. (13) (70) (76) This lack of adequate research relative to identifying a viable curriculum and concern over present day measuring tools (i.e., driver license records) used to determine program effectiveness represent the central problem on which this study will focus. Without answers as to what type of curriculum will contribute to accident

and severity reduction and without a viable means to measure potential curriculums, the value of driver education will remain elusive and the setting of a given level of performance, folly.

PURPOSE OF THE STUDY

The central purpose of this study was to examine the relationships between a specific driver performance curriculum and motor vehicle accident involvement among novice drivers.

Specifically, the study attempted to determine if the Illinois Demonstration-Satellite Performance Curriculum contributed to a reduction in accident involvement and in severity of accident involvement among those novice drivers exposed to the curriculum.

The study used a self-reporting accident involvement survey as the criterion variable when attempting to determine what influence the Illinois Demonstration-Satellite Performance Curriculum had on novice drivers' accident involvement.

IMPORTANCE OF THE STUDY

If one were to accept the challenge that driver education should reduce the probable accident involvement of those individuals exposed to it, one would first have to identify the knowledge, skills, attitudes, and competencies an individual must possess to avoid and/or reduce the severity of accident involvement and then structure that information into a viable curriculum.

Much of the research to date has not concerned itself with curriculum evaluation but rather with program evaluation. (8) (15) (23) (53) (70)

As has been stressed by Driessen and others, the intent of research in driver education, should have been to identify, measure and improve the accident avoidance training content of its curriculum. Only after this has been done would the field of traffic safety be in a position to determine whether or not driver education should exist in the school setting. (8) (56) (70)

Through the conduct of this study it was possible to determine what part the Illinois Demonstration-Satellite Performance Curriculum played in the goal of reducing the potential accident involvement of those exposed to it. This study also provided an opportunity to evaluate the effectiveness of self-reporting accident involvement surveys as a measure of program evaluation.

Without the conduct of studies such as this, the field of traffic safety would probably never be in a position to develop and/or identify a viable curriculum that was capable of reducing the accident involvement of those exposed to it. And without a viable curriculum, any efforts to set a level of performance based on cost-effectiveness would be highly questionable.

GENERAL QUESTIONS TO BE ANSWERED

This study attempted to answer the following questions:

1. Did seniors who successfully completed driver education courses using the Demonstration-Satellite Performance Curriculum (DSPC) have fewer traffic collisions than seniors who successfully completed driver education courses using a traditional curriculum?

2. Did seniors who successfully completed driver education

courses using the DSPC have less severe traffic collisions than those who successfully completed driver education courses using a traditional curriculum?

3. Did senior girls who successfully completed driver education courses using the DSPC have fewer traffic collisions than senior girls who successfully completed driver education courses using a traditional curriculum?

4. Did senior girls who successfully completed driver education courses using the DSPC have less severe traffic collisions than senior girls who successfully completed driver education courses using a traditional curriculum?

5. Did senior boys who successfully completed driver education courses using the DSPC have fewer traffic collisions than senior boys who successfully completed driver education courses using a traditional curriculum?

6. Did senior boys who successfully completed driver education courses using the DSPC have less severe traffic collisions than senior boys who successfully completed driver education courses using a traditional curriculum?

7. Was there a difference in the number of traffic collisions experienced between all senior girls and boys who successfully completed driver education?

8. Was there a difference in the severity of traffic collisions experienced between all senior boys and girls who successfully completed driver education?

9. Did type of driver education program (2 phase, 3 phase

range, 3 phase-simulation and 4 phase) influence the number of traffic collisions experienced by all seniors who successfully completed driver education?

10. Did the type of driver education program (2 phase, 3 phase-range, 3 phase-simulation and 4 phase) influence the severity of traffic collisions experienced by all seniors who successfully completed driver education?

11. Did the type of community (urban, suburban, rural) influence the number of traffic collisions experienced by all seniors who successfully completed driver education?

12. Did the type of community (urban, suburban, rural) influence the severity of traffic collisions experienced by all seniors who successfully completed driver education?

13. Did performance on the DSPC tests reflect a difference in accident involvement?

14. Did performance on DSPC tests reflect a difference in severity of accident involvement.

15. Did seniors exposed to the DSPC have a different type of accident involvement picture than seniors not exposed to the curriculum based on location of accident, type of roadway, condition of road surface, time of day, objects involved, type of collisions, avoidance procedures, and driver errors made?

METHODS OF PROCEDURE

The Illinois Demonstration-Satellite Performance Curriculum (DSPC) was developed as part of a four year curriculum development project funded by the Illinois Department of Transportation and sponsored by the Illinois Office of Education.

The goal of the project was twofold, to provide assistance to public schools in Illinois in the implementation of the new state curriculum guide (Driver Education for Illinois Youth, 1972), and to provide the Illinois Office of Education with methods and data for evaluating the effectiveness of driver education programs in producing competent and responsible users of the Highway Transportation System. (27)

The demonstration-satellite schools that were selected to participate in the project were selected on the basis of their interest, staff qualifications and program organization.

The role of the demonstration-satellite schools was to implement the instructional materials into their individual programs, identify strengths and weaknesses of the materials, make recommendations for revision and assist in the collection of data for curriculum evaluation.

Due to a time lag between development, implementation and revision of the curriculum, the project came to an end before any statistical analysis could be done on those demonstration-satellite schools which utilized all thirteen modules. Of special significance to this study was the fact that, of the fifty-seven schools involved in the project during the four year time span (1972-1976), only twelve schools during the 1975-76 school year were provided with the thirteen finalized modules identified as key modules to the project.

The sample population of this study consisted of 4024 seniors drawn from twenty-four high schools in Illinois who graduated in the spring of 1978 and who had successfully completed driver education during the 1975-76 school year within the school from which they graduated.

The twenty-four schools involved in the study consisted of twelve schools (experimental group) which had participated in the utilization of the Demonstration-Satellite Performance Curriculum (DSPC) during the 1975-76 school year and twelve schools (control group) which had not participated in the utilization of the DSPC during the 1975-76 school year.

The control group was matched to the experimental group based on the following criteria: (1) type of program, (2) educational makeup, (3) Insurance rating tables, (4) Enforcement Index and (5) city size and location. In addition, the control group schools had to have their course curriculum tied directly to the textbook used in that school, with no additional resources used to set program objectives and/or course content.

During the Spring of 1978 pre-graduation exercises, the students were asked to respond to the Driver Education Evaluation Survey. The data collected on the survey consisted of the students' responses to the best choice in three or more of the following five categories: (1) Suggestions for Improving Driver Education Courses, (2) Driving Experience, (3) Collision Experience, (4) Severity of Collision Experience and (5) Type of Crash. Students not involved in collisions would not respond to items in category 4 or 5.

The data collected from responses to the survey and tabulated on IBM data cards was analyzed using parametric and non-parametric statistical procedures. Specifically, parametric t-tests were performed on all items dealing with accident involvement and non-parametric Chi-squares were done on all items dealing with severity of accident involvement.

The analysis to be reported on was performed with the use of the Statistical Package for the Social Sciences.

BASIC ASSUMPTIONS

The investigation of the above questions was based on the following assumptions:

1. The validity and reliability of student self-reporting accident involvement procedures were sufficient for the purposes of this study.

2. Expressed opinions were help opinions.

3. An individual's responses to questionnaire items were based on true and real feelings.

4. Safe, efficient, economical driving behavior could be taught.

DEFINITION OF TERMS

For the purposes of this study, the following terms were defined:

1. Accident, mishap, collision: (terms used interchangeably) an unplanned interruption of a planned activity, resulting in personal injury, property damage or both, while driving a motor vehicle. (43)

2. Approved driver education course: any driver education course approved by the Superintendent of Public Instruction as meeting at least the minimum requirement of the "Driver Education Act", as now or hereafter amended. (52)

3. Illinois Demonstration-Satellite Performance Curriculum: a performance based high school driver education curriculum consisting of twenty-one modules, thirteen of which were developed by Illinois State University and field tested within fifty-seven school in Illinois during the 1973-1976 school years.

4. Mandated programs: all programs not originally part of a school curriculum which, because of a recognized social need, are legislated by law to be incorporated into the school curriculum.

5. Novice driver: a person who has less than five years of experience as a motor vehicle operator within the highway transportation system.

6. Severity of accident: the degree to which personal injury and property damage are affected by any given motor vehicle accident.

7. Traditional driver education curriculum: a curriculum which follows state guidelines in relation to subject content and is closely tied to the text used in the given school.

LIMITATIONS OF STUDY

The limitations of this study were as follows:

1. The schools used in this study were not randomly selected.

2. The respondents would not be able to recall accurately the events surrounding each collision.

3. The study was conducted after implementation of the curriculum

into selected schools.

DELIMITATIONS OF STUDY

The delimitations of this study were as follows:

1. The study was conducted only on seniors who had been involved in driver education at the selected schools during the 1975-76 school year.

2. The study was conducted in the State of Illinois outside of Cook County.

3. The instructors involved in the DSPC were provided with special training related to the use of the curriculum material.

ORGANIZATION OF THE STUDY

The general plan of this study is to present in Chapter 2 the review of the literature from the following areas: curriculum evaluation in driver education, the measurement of driving behavior using motor vehicle records, and the measurement of driving behavior using self-reporting questionnaires. In Chapter 3 the design and methodology of the study will be presented. Chapter 4 will present the analysis of data for the study, and Chapter 5 will contain a summary of the findings, conclusions, recommendations and a discussion.

Chapter 2

REVIEW OF THE LITERATURE

Driver education has undergone an unprecedented growth in its first fifty years, but along with this growth a number of serious questions have developed as to its role in the educational system and its effectiveness as an accident countermeasure. (13) (35) (46) (49) (70)

The Driver Education Evaluation Program (DEEP) Study (70) traced the history of driver education, since its inception in the school systems as an accident countermeasure, through four phases.

Phase I covered the period of its inception (1930's) to post World War II (1949). This period was indicative of disorganization coupled by uncontrolled growth, without efforts toward program development as it related to curriculum development, program quality and evaluation. (64) (70)

Phase II (1943 through mid-sixties) was marked by several initial attempts to improve the quality of high school programs through implementation of teacher preparation programs and course standardization. However, little evidence of objective curriculum development and evaluation was reported to be in progress during that time period. The two most significant events occurring during phase II were the insurance companys' adoption of a policy of reduced premiums for youths who successfully completed a driver education course, and a number of large (uncontrolled) studies conducted to evaluate driver

education. (16) (44) (50) (65) (70)

In Phase III (early sixties through later part of the sixties), identified as the critical period, high school driver education came under severe attack with regard to its effectiveness as an accident countermeasure. The attack was a result of a re-examination of previous research and new research conducted by independents, which contradicted earlier claims that driver education was directly responsible for reduction of accident involvement for those exposed to it. It is important to note that despite the critical issues being raised, a number of efforts continued with regard to program expansion, curriculum change and innovative learning activities with little concern toward quality control and/or program evaluation. (63) (70)

The final phase, Phase IV (late sixties to present), was identified as the beginning of a new era for driver education. This period would note the implementation of a research and development program by the National Highway Traffic Safety Administration. Although a number of new studies of a more sophisticated nature would attempt to evaluate driver education, more important studies would examine the driving task (42), develop performance based curriculum at the state and national level (Illinois Demonstration-Satellite Performance Curriculum and Safe Performance Curriculum respectively) and identify the need for extensive research of one curriculum (Safe Performance Curriculum) to assertain its effectiveness as an accident countermeasure.

This study concerns itself with the evaluation of another performance based curriculum in driver education (Illinois Demonstration-Satellite Performance Curriculum) as a potential accident countermeasure.

The review of the literature therefore will address the areas of: Driver Education Program Evaluation; Driver License Records, as a criterion for program evaluation; and Self-reporting Accident Surveys (referred to hereafter as self-reporting surveys), as a criterion for program evaluation. (13) (27) (40) (57) (70)

DRIVER EDUCATION PROGRAM EVALUATION

Research conducted in driver education began as early as 1945 and has progressed through a series of stages. Although most of the research concerned itself with evaluation and comparisons of various driver education programs all of the literature indicated that the various studies were plagued with varying degrees of inadequacies, leaving the definitive answer to the question "Is driver education an effective accident countermeasure?" elusive and at times seemingly out of reach. (13) (63)

The following section dealing with evalution of driver education programs will be subdivided into three categories: (1) Early studies, (2) New era and (3) Related studies.

Early Studies

Most of the early studies (mid-forties through early sixties) conducted to evaluate driver education failed to control for variables known to bias the results of a study and none applied statistical tests of significance when analyzing their results. (13) (44) (46)

The American Automobile Association (AAA) sponsored one of the first effectiveness studies in 1945. In this study two groups of

Cleveland, Ohio high school students' driving records were compared. The experimental group (those students who received formal driver education in the schools) had half as many accidents as the control group (those students who did not receive formal driver education in the schools). (45) A distinction should be made for the reader's benefit. Driessen stressed that there is no clear distinction between the trained driver and the untrained driver and suggests that the distinction made is based on the irrelevant dimension along which subjects are divided for study. He stated that the real dimension of concern is in the amount and quality of the accident avoidance training received regardless of whether it's in a formal or informal setting. (13)

Maryland, during 1949-52, compared the driving records of 298 trained students against 258 untrained students. They reported that although little difference existed between the males with regard to accident involvement, the trained males received nearly half as many violations and the trained females had half as many accidents and violations as the untrained females. (44) Similar results were reported in studies conducted in New Hampshire, Oregon and West Virginia with the exception that in those studies the trained male as well as the trained female had superior accident involvement records compared to the untrained male and female drivers. (45)

It should be pointed out that in the above studies no attempt was made to control for variables such as exposure and socioeconomic status and no statistical tests of significance were performed on the treatment groups.

In studies conducted in Michigan and New York (45) conflicting data was obtained with regard to comparisons between trained and untrained females. The data indicated that untrained females actually had better driving records than trained females. The inconsistencies of the Maryland, Michigan and New York studies (44) were attributed to inadequate sample size as a basis for making reliable conclusions.

The final three studies to be discussed in this section were considered an improvement over previous research studies because they included larger samples and evaluated driving performance over a period of years.

The first of these, the Minnesota study represented a five year study comparing driving records of 1,000 subjects in each of three driving groups: (1) those students that did not receive formal training in driver education, (2) those students who only received classroom instruction in driver education and (3) those students who received classroom and behind the wheel instruction in driver education. The overall findings indicated that the fully trained group had the least accidents and violations, the classroom only group had the second best record and the untrained group had the worst accident and violation record. (44)

Virginia's study followed the accident and violation record of 1386 students (655 untrained and 721 trained) during a four year period. In the first year's driving experience the trained group demonstrated superior performance on the driving records but during the following three years, produced mixed results. In the final year (1953) the total untrained group demonstrated involvement in fewer accidents

(based on official state records) than the total trained group. The investigator concluded that trained drivers have an initial advantage over untrained but that over time this advantage may be erased due to driving experience. (45)

In the final study to be reviewed for this period, the New York Motor Vehicle Department (1964) released a study conducted over an 18 month time period in which 960 high school driver education trained students were compared against 960 untrained high school students. The study attempted to control for such variables as academic status, sex and school attended. The findings of the study indicated that the trained group had 22% fewer accidents than the untrained group. (70)

In summary, from the mid-forties to the early sixties a number of studies were conducted in an attempt to demonstrate the value of driver education as an accident countermeasure. None of the studies reported subjected the differences found between the trained and untrained groups to tests of statistical significance and few made any attempt to control for variables that are known to bias the results of a study (i.e., difference between sexes, exposure, evaluation criteria etc..). (20) (44) (45) (70) (76)

New Era

As a result of the research inadequacies of the early studies conducted on driver behavior, and the implementation of the Research and Development Program of the National Highway Traffic Safety Administration, the field entered a new era. This era included the re-evaluation of previous research studies and developmental efforts to

identify and develop a curriculum that was performance based.

Much of the research conducted during this time period was conducted by independent researchers and was controversial in nature.

For example, Rainey, in a study on personality characteristics of individuals choosing to take or not take driver education, reported that in a comparison of 6,906 students there was a considerable difference in the personality make-up of those self-selecting to take driver education as opposed to those students self-selecting not to take driver education. He concluded that these differences in personality factors alone could contribute to differences in the reported accident involvement between the two groups. (58) Similar results were reported by Ferdum, Peck and Coppin in 1967. (70)

Rodell in a different type of study compared the accident involvement records of public trained driver education students against private trained driver education students. Of the 521 students under investigation (public vs. private ratio 4:1) Rodell concluded that students receiving private lessons had fewer accidents than those receiving public lessons. Rodell attempted to match the groups by age and sex but did not obtain equal group size and made no effort to control for exposure. (60)

In the Young Driver Follow Up Study (Highway Safety Research Report #38, 1971) conducted by Harrington, driving records were used as the criterion variable to evaluate trained high school driver education students against untrained high school students. Based on his findings, Harrington reported that driver training seemed to reduce fatal, injury, partially at fault and single vehicle crashes for female

drivers but was less conclusive for male drivers.

Finally in a review of a number of studies conducted in California and Mississippi, McGuire and Kersh (39) concluded that there was little or no difference that could be found between driver education trained and non-driver education trained groups with regard to accident and violation frequencies. They went on to indicate that as a result of failure in a number of studies to control for variables such as exposure, sex, age, socioeconomic status etc.... that much of the research concerning the value of driver education was not positive.

Related Studies

The two studies covered in this section represented attempts to evaluate driver education programs using intermediate measures (Knowledge, Skill, Attitudes Test). Most of the previous studies cited concerned themselves with driver education vs. non-driver education. In the late sixties the National Highway Traffic Safety Administration (NHTSA) stepped in and funded five independent projects in an attempt to identify and develop a comprehensive method for evaluating driver education. The two studies to follow represent an effort to follow-up on the recommendations eminating out of the five studies. (70)

In 1972-1974, the Kansas City Project (69) represented the culminating effort of the five earlier studies. The purpose of the Kansas City Project was to implement the Safe Performance Curriculum (SPC) into three Kansas City, Missouri school systems. The study was designed so that three randomly assigned groups of students would be exposed to one of the three treatment conditions. The treatment conditions were: those students that would be exposed to SPC, those

students that would be exposed to a Pre-Driving Licensing Course (a short course that simply prepared students to take the driver license test) and those students that would receive no formal preparation of any kind (the control group).

Although the project was intended to include the ultimate evaluation of accident involvement (via driver license record checks) the project experienced a number of difficulties in the implementation phase which resulted in the project coming to an end before its long term goals could be evaluated. The project did, however, provide insights into the value of some of its intermediate criteria (Knowledge, Basic Skills and Perceptual Tests). (69)

In a different type of driver education evaluation study conducted in Michigan, intermediate criteria were again used as the primary source of program effectiveness. Schmitt (62) progressing through a series of steps, established 60 paper and pencil performance objectives for the classroom phase of driver education that were to be administered to 140,000 students in Michigan driver education programs to evaluate how these programs were meeting the established objectives for the classroom phase of the program. The author concluded, based on the analysis of the findings, that programs were not meeting an acceptable number of the classroom objectives identified as important by the researcher.

In a rebuttal to Schmitt's study, an article entitled "A Critique of the Michigan Driver Education Evaluation Study" by Dr. Donald Smith (Journal of Traffic Safety, 26, 2, 1979) the author pointed to a number of inconsistencies between what the researcher did and the

conclusions arrived at. Smith pointed out that Schmitt: (1) failed to control for differences which might exist between students enrolled in summer classes as opposed to those in the regular school program; (2) made no provisions to have a research staff administer the tests thereby allowing possible abuses to occur; (3) made no effort to control for the differences in the various programs; and (4) made no effort to study or to determine the reading level of the responders. In addition to the arguments presented by Smith it should be noted that the concept of performance objectives that are solely pencil and paper tests is highly questionable and the practice of establishing performance objectives to be met in some "non-existent curriculum" and then using them to compare existing curriculas violates basic principes of curriculum development. (38)

Summary

A number of researchers, recognizing the methodological errors in early research in driver education sought to reevaluate driver education as an accident countermeasure. Although much of their findings repudiated the earlier findings the researchers themselves committed methodological errors. Driessen when addressing the state of the art of driver education, summed up the research by indicating that most of the studies were of poor quality, rampant with methodological errors, and indicated that efforts are needed to identify those accident avoidance skills needed to reduce the accident involvement of individuals exposed to driver education. (13)

ACCIDENT INVOLVEMENT: DRIVER LICENSE RECORD STUDIES

Much of the research that has attempted to evaluate the effectiveness of driver education as an accident countermeasure relied heavily upon the use of driver license records as the criterion variable in determining program success and/or failure. This section will review a number of representative studies in an attempt to shed light on the concerns over the use of such records to measure program success or failure. (39) (44) (45) (58) (69) (70) (76)

Burg, in a study of the stability of driving records over time compared 7841 (4897 males and 2944 females) individual driving records over a period of six years. Based on his analysis of the data, Burg concluded that convictions and accident records stabilized over times. The author went on to point out, however, that in an earlier study in which insurance records were used in conjunction with official driver license records, the insurance records provided a higher percentage of accidents than the official records. (2) Burg also indicated that for shorter periods of time, accident records were less reliable. Similarly, Campbell reported on the instability of accident records over short periods of time, based on a study conducted in which the population under investigation had dramatically different driving records over two consecutive two-year driving periods. (3)

Forbes, when re-analyzing data from a study of over 29,500 drivers, concluded that conclusions drawn from comparing accident records over two succeeding three-year periods was markedly different from previous interpretations of accident records analyzed by the total time period. (19)

In addressing the problem of stability of accident records, Eslander states:

> "The standard of accident reporting varies very much between different countries even today. The more motorized a country is, the more developed, in general, is the accident reporting system. However, even in countries with as many cars per inhabitant as the U.S.A. and Sweden, the accident reporting systems are inadequate for their purposes." (17:126)

Zylman, in a position paper dealing with driver records as a valid measure of driver behavior stated that:

> "Data gathered by any police agency can only be used to describe conditions in that jurisdiction. It cannot be assumed that data gathered from two or more agencies are either valid or representative unless it has first been determined that each agency is using the same rules of measurement, the same interpretations and the same terminology and that they are enforcing similar laws and ordinances with similar diligence." (75:348)

Beyond inconsistencies in reporting procedures, Tarrants and others pointed out that several studies have demonstrated that accident and violation rates were influenced by exposure, age, sex, socio-economic status, education and intelligence. (31) (39) (53)

McGuire conducted a study using 500 subjects, who had their driver license for a period of two years, to ascertain if there was any bias in official accident records. He concluded that bias did not exist with regard to age or race but that a definite bias existed on sex (women having had fewer accidents on official records than reported on a questionnaire) and occupation (semi-professionals and professionals having fewer reported on a questionnaire). McGuire stated that based on the comparisions of self-reported accident involvement surveys and official state driving records, not only did state records under-represent actual frequencies, but probably contained definite bias with

regard to sex and occupation. (39)

McGuire's conclusion of official driver records under-representing the actual frequencies and accident involvement was further supported by Smith (66), Katz (31) and Sain (61).

Katz placed particular blame on the inadequacies of official driving records because of the so-called "reporting level".

> "Accidents statistics will suffer a distinct bias due to their historical purpose of placing the legal blame for the accident on the driver where possible." (31:16)

In summary, although there is some support for the use of official accident records over long periods of time (6 years +) as a criterion for evaluation, most of the literature refuted the value of official accident records on the basis of: (1) differences in reporting practices, policies and procedures; (2) built-in bias with regard to sex, socioeconomic status, exposure and occupation; (3) built-in bias with regard to purposes of official records (assessing blame and (4) percentages of accidents that go unreported.

It is of interest to note that the National Highway Traffic Safety Administration acknowledges the above limitations and then goes on to recommend that official driving records be the criterion variable used to evaluate the ultimate success of the Safe Performance Curriculum. (74)

ACCIDENT INVOLVEMENT: SELF-REPORT STUDIES

In the previous section, studies using driver license records as a viable criterion for program evaluation were presented and the consensus was that when used for purposes of research, official driving

records may yield spurious results. (31) (39) (53) (74) (75)

This section will examine research as it related to use of self-report accident surveys as a potential criterion for driver education program evaluation.

Epperson and Peck conducted a study to evaluate whether the anonymity/non-anonymity conditions had any influence in the nature of survey responses. Their study consisted for 693 California drivers drawn from an original pool of 15,290 used in a study conducted by Marsh. The subjects were divided into two primary groups (anonymous and non-anonymous) and asked to respond to a series of forced choice questions. Based on an analysis of the data the researchers concluded that subjects in the anonymous condition were more likely to give positive comments on forced choice questions than subjects in the non-anonymous conditions.

> "These findings seem to indicate that anonymity is not an important factor in collecting the type of information represented in that study." (16:256)

In a study conducted by McGuire (as discussed in the previous section) use of self-reporting accident data was compared to determine if any bias existed in official driver license records. Of importance to this section was the fact that respondents to the self-report accident survey indicated greater accident involvement than was indicated on official accident records. Out of 110 reportable accidents only 42 appeared on state records. McGuire cited a similar study conducted by Michalski (65), in Illinois in which out an estimated 320,672 accidents only 33% could be accounted for on the official accident records. (39)

Smith (66) conducted a study to evaluate the value of using official driving records and self-reports as a source of accident and conviction data for research purposes. In a sample of 129 males, between the ages of 20 and 23 driving in Perth, Australia (92% of eligible population) each subject was requested to complete a written questionnaire which included the following: (1) Questions dealing with level of education reached and kilometers driven in a week; (2) Extraversion Inventory; (3) Lie Scale of Form A of the Eysenck Personality Inventory; (4) Driving Aggression Inventory and (5) details of any traffic accidents in the past three years. Accident and conviction records were pulled from the Road Traffic Authority records for the preceeding three years. Of the 106 accidents the subjects had indicated they had been involved in, only 59 were listed in official records. The subjects failed to report 10 accidents (17%) which were on the official records. Smith concluded that based on a comparison of the official accident records with the inventories, no relationship between accident involvement and various driver characteristics could be made. However, if official driving records were used in conjunction with self-reporting accident data, a significant relationship could be established between accident involvement and driver characteristics. (66) Smith's study also verified McGuire's (39) statement that most drivers will report more accidents and convictions than will appear on official driver record files.

Researchers' willingness to accept an individual's response to questions on self-report surveys can be demonstrated in a study conducted by Counts. Counts investigated the driving experience of youths from

Ingham County high schools during a thirty-day period between receiving a driver education certificate and being able to apply for a Michigan driver's license. Of importance to this study was that Counts used a questionnaire which asked the students to respond to: (1) Information about parents, guardians, and families; (2) Information about the respondee; (3) Amount and type of driving experience received during the interview period, (4) Information concerning driving experience and type of experience received during driver education and (5) Information regarding the attitude of the respondent to the interim period. (7)

Results of the study, although of interest, were not as important to this study as the fact that much of the information collected, which could provide insights into development of viable driver education and driver improvement programs, would not have been obtainable any other way. (57)

Sain conducted a study to investigate selected factors which seemed to affect the quality of driver education programs in the high schools of the Upper Peninsula of Michigan. As in previous studies, a number of criteria were used in the program evaluation. Of particular interest to this paper was the use of student responses to driving exposure and accident involvement. Of the 1264 students interviewed, the researcher compared a portion of the respondents' answers regarding accident violation involvement with state records. The comparison revealed that 26.1% had been involved in one or more accidents than official records indicated. On the surveys checked all were found to be in accord with state police records. In fact, Sain reported that "students were prone to report even minor accidents on their questionnaire that would not have been reported to law enforcement officials".

(61:49) It was Sain's belief that the criterion of self-report accident surveys was more reliable and informative for evaluating driver education programs than were official driving records. (61)

Although Sain was not able to arrive at a sound evaluation of the driver education programs under investigation (because of bias related to place of residence) he did demonstrate that subjects can provide more accurate information than conventional reporting systems.

Witherill, in a study designed to measure the feasibility of using selected student data for the assessment and evaluation of driver education programs in the state of Minnesota, also demonstrated that student responses to self-report surveys provided more accurate and viable information, relating to accident involvement and program improvement, than would be found on any agency records. (74)

Two final studies which used self-reporting surveys dealt with the evaluation of a driver improvement program developed for the United States Coast Guard (USCG). Both studies were implemented in the early seventies. In the first study, mailed questionnaires were used to ascertain accident involvement of the potential respondents. The returned questionnaires were compared against official driving records and demonstrated substantial agreement. As in previous studies in this section, the questionnaire indicated more accident involvement than the official records. Based on the data analysis, the researchers concluded that there was a significant relationship between driver training and injury reduction in favor of those individuals exposed to the USCG training program. (73)

In the follow-up study efforts were made to determine whether or not the driver improvement programs at the USCG Training Center at Cape May, New Jersey, should be retained. As in the first study, respondents were asked to reply to a survey questionnaire, the "Coast Guard Driver Experience Form", which dealt with: (1) exposure; (2) traffic violations; (3) accident information; (4) critical driving experience and (5) suggestions for improving the driver training program. Of an original pool of 3,600 USCG enlisted men, 77% (2837) returned their questionnaires. Through the use of information collected and analyzed, the researchers concluded that no significant differences were found between trained and untrained (matched group) men with regard to driving exposure. There were fewer multiple accidents and single accidents experienced by the trained men but, the difference was not significant at the .05 level. There was also a reduction in severity of accident involvement in favor of the trained men, but again it was not significant at the .05 level. (73)

The studies discussed in this section have dealt with the use of self-report surveys as an indicator of accident involvement, violation and driving experience. All of the studies indicated that self-reports yielded more accident data than was available on official driving records. Several of the studies indicated that surveys in conjunction with official accident records could provide information relative to driver behavior. A number of studies also indicated that information relative to driving experience were best obtained via self-reporting surveys.

SUMMARY

Driver education experienced an unprecedented growth in the first fifty years of its existence. (8) (44) (64) (70) Its growth has exceeded its ability to make strides in program and curriculum development. (1) (13) (15) (27) (64) Although evaluation of driver education began as early as 1945, the quality of research left much to be desired. (13) (30) (31) (44) (64) (70) (75) The time has come when driver education must demonstrate its effectiveness as an accident countermeasure. (57) (64) (70) To date, the most common variable identified for purposes of evaluating driver education has been accident reduction and the criterion used to measure it has been official driving records. (44) (45) (46) (70) Official driving records have been clearly demonstrated in the research to be a poor criterion for use in program improvement and evaluation, because of built-in bias, lack of consistent reporting and differences in reporting procedures. (2) (7) (13) (16) (17) (19) (21) (23) (26) (27) (31) (35) (39) (40) (41) (45) (53) (58) (61) (66) (70) (75) Self-reporting surveys represent one viable way of obtaining accurate information regarding accident involvement, driving exposure and other pertinent information, that is necessary for program (curriculum) evaluation and program improvement. (6) (7) (16) (17) (27) (29) (41) (57) (58) (61) (66) (73) (74)

In chapter three the design and methodology of the study will be presented.

Chapter 3

DESIGN AND METHODOLOGY

The evaluation of the Illinois Demonstration-Satellite Performance Curriculum was undertaken to examine the relationship between a specific driver performance curriculum and motor vehicle accident involvement among novice drivers exposed to that curriculum. Before the value of driver education in the school setting can be properly evaluated, efforts toward the identification of a viable curriculum which will produce a reduction in the probability of accident involvement among those exposed to it must take place. (13) (70) Without conducting such studies, the field of traffic safety would never be in a position to identify a curriculum and/or its components capable of reducing the accident involvement of those exposed to it.

DEMONSTRATION-SATELLITE PERFORMANCE CURRICULUM

The Illinois Demonstration-Satellite Performance Curriculum (DSPC) was developed as part of a four year curriculum development project funded by the Illinois Department of Transportation and sponsored by the Illinois Office of Education. The project was part of the Illinois Highway Safety program (1972-76) supported by state funds which were reimbursed from the National Highway Traffic Safety Administration under 402 funding guidelines.

The curriculum project coordinator and principal writer of the instructional materials was Warren P. Quensel, Assistant Professor of

Traffic Safety Education at Illinois State University. Under Quensel's direction, the project grew from two demonstration schools and eight satellite schools during the 1972-73 school year to fifty-seven schools during the 1975-76 school year.

The goal of the project was twofold: to provide assistance to public schools in Illinois in the implementation of the new state curriculum guide (Driver Education for Illinois Youth, 1972) and to provide the Illinois Office of Education with methods and data for evaluating the effectiveness of driver education programs in producing competent and responsible users of the highway transportation system. (27)

This goal was to be met by the attainment of the following objectives:

> 1. Development, field testing and revision of instructional materials for use in units of the Driver Education for Illinois Youth curriculum guide.
> 2. Development and standardization of a group of materials for key units of the curriculum guide.
> 3. Assisting a significant number of public schools in implementing the units into their programs.
> 4. Development of intermediate and summative evaluation instruments.
> 5. Collection of data for analysis and longitudinal studies reflecting students' performance in both the classroom and laboratory phases of driver education. (27:4)

The demonstration-satellite schools that were selected to participate in the project were selected on the basis of willingness to participate, staff qualifications and program organization. The role of the demonstration-satellite schools was to implement the instructional materials into their individual programs, identify strengths and weaknesses of the material, make recommendations for revision and assist in the collection of data for curriculum evaluation.

The curriculum itself was drawn from twelve units outlined in the curriculum guide, Driver Education for Illinois Youth (DEFIY), developed by the Illinois Office of Education and distributed to all secondary schools in Illinois in 1972. Four units of the DEFIY guide (Unit 3 - Vehicle Performance and Control Capabilities, Unit 5 - Perception of Systems Events, Unit 6 - Judgment of System Events and Unit 7 - Decision -Making for a Plan of Action) were identified as key units and represented the most innovative part of the DSPC.

The DSPC consisted of twenty-one modules outlined, thirteen of which were to be developed by the project and eight to be developed by individual school districts as needed. (See Appendix A) The curriculum was developed so as to be adaptable to both the traditional group-paced and individualized instructional system. Each module included behavioral objectives based on a driver task analysis, student centered learning activities and criterion referenced tests. It was felt by the developers that this approach would provide a more valid driver education program that would be both relevant and measurable.

The most innovative aspect of the DSPC revolved around module 8 (Identification of HTS Elements and Clues), module 10 (Evaluation of HTS Situations and Hazards) and module 11 (Plan of Action for Driver Decisions). These three modules represented the information processing or IPDE (Identify, Predict, Decide, Execute) process approach to driver education. Also of significance in the curriculum were four basic concepts (adequate traction, adequate space, adequate visibility and adequate timing) that related to vehicle control. These concepts were introduced in the classroom phase of the driver education program,

then applied and reinforced during the laboratory experiences. The On-Road Situation Test, a final laboratory criterion test, was developed utilizing the above concepts as its main criteria for evaluation of student learning.

Because of the unique structure of the DSPC and the emphasis it placed on key modules, use of conventional textbooks became impractical other than as reference tools.

Due to a time lag between development, implementation and revision of the curriculum, the project came to an end before any statistical analysis could be done on those demonstration-satellite schools which utilized all thirteen mdoules. Of special significance to this study was the fact that of the fifty-seven schools involved in the project during the four year time span, only twelve school districts could be funded during the 1975-76 school year to field test the thirteen finalized modules identified as key modules to the project.

SURVEY INSTRUMENT

The present form of the Driver Education Evaluation Survey (See Appendix C) attempted to identify an individual's driving experiences and accident experiences. The survey consisted of sixty-five items divided into five major categories: (1) suggestions for improving driver education courses, (2) driving experience, (3) collision experience, (4) severity of collision experience, and (5) type of crash.

POPULATION

The sample population of this study consisted of 4024 seniors drawn from twenty-four high schools in Illinois who graduated in the Spring of 1978 and who had successfully completed driver education during the 1975-76 school year within the school from which they graduated.

The twenty-four schools involved in the study consisted of twelve schools (experimental group) which had participated in the utilization of the Demonstration-Satellite Performance Curriculum during the 1975-76 school year and twelve schools (control group) which had not participated in the utilization of the Demonstration-Satellite Performance Curriculum during the 1975-76 school year.

The control group was matched to the experimental group based on the following criteria: (1) the number of phases offered in the driver education program, the length of the program over the school year, the length of the teaching hour, number of full or part-time instructors, educational background of instructors (number of credits in safety education), the type of laboratory phases offered, and the number of students involved in the program, (2) the educational makeup (percent of college oriented, etc.) of the student body (information on that and item 1 were obtained from the descriptive data available from the Illinois Office of Education), (3) the insurance rating tables (tables used to assess policy premiums for a given locale based on age, sex, size of city, accident frequency, etc.) supplied by Allstate Insurance Company and Country Companies, (4) the Enforcement Index (a tool used to identify areas where additional enforcement of specific laws will in turn hold down associated accidents) for their community supplied by the Illinois

State Police, and (5) by city size and its approximate location to major roads and urban centers (information obtained from Rand McNally 1976-78 Road Atlas). In addition to the above, the control schools had to have their course curriculum tied directly to the textbook used in that school, with no additional resources used to set program objectives and/or course content.

The following demographic data could best describe the sample population.

1. Programs consisted of two four-phase programs, two three-phase (range) programs, eight three-phase (simulation) programs and twelve two-phase programs.

2. Students consisted of 1927 in the experimental group (965 males and 962 females) and 2097 in the control group (1051 males and 1046 females).

DATA

Five types of data were obtained from the Driver Education Evaluation Survey based on the students' response to each item. The data consisted of the students' response to the best choice in three or more of the following five categories: (1) Suggestions for Improving Driver Education Courses, (2) Driving Experience, (3) Collision Experience, (4) Severity of Collision Experience, and (5) Type of Crash. Students not involved in collisions would not respond to items in category 4 or 5.

The present form of the Driver Education Evaluation Survey instrument was modified from the form field tested by Illinois State

University and validated by the Illinois Department of Transportation. The current form was modified by the inclusion of section four, dealing with Severity of Collision Experience. Three items were selected to represent severity as follows: (1) Extent of injury, (2) Use of active restraint system, and (3) Extent of damage. (See Appendix C)

The survey was administered to all seniors participating in pre-graduation exercises during the Spring of 1978. A portion of the surveys were administered by local school guidance personnel to those graduating seniors not present at the initial administration.

During the administration of the survey, all students were given standardized instructions on filling out the survey and provided a definition for accident involvement. (See Appendix B)

In addition to the administration of the survey, school personnel agreed to call in 10% of the students who had responded to the survey and conduct personal interviews with each regarding difficulties in filling out the survey. Guidelines for conducting such interviews and a set of questions were prepared for school personnel to follow.

Following administration of the survey, the data were coded and subsequently tabulated on IBM data cards. For the purposes of this study the computer program chosen permitted additional analysis and interpretation of the data.

The students responded to the survey by writing the number of the one best choice that described their experience in the blank provided for that item.

A random sample of 200 students was drawn from the total population of 4024 students used in this study to check the validity of the current Driver Education Evaluation Survey. A Rank Order

Correlation Coefficient was conducted to compare the number of accidents reported on the students' survey forms with the number of accidents reported on the Secretary of State's (SOS) records.

A correlation of .55 was found to exist between the surveys and the records. This finding corresponds to the findings in the pilot study conducted by Illinois State University in 1976. In that study, 34% of the students reported more collisions than were on state records, yet only 3% of the students in that study reported fewer accidents than state records indicated. (57) Of the 200 students used in the validation of the current survey instrument, 47% of the students reported more collisions than were on the SOS records and 0% reported fewer collisions than SOS records indicated.

A low correlation between survey responses and state records was expected for two reasons: (1) the differences between reportable accidents by state statue (must involve a minimum of $250. in property damage or involve personal injury) and the accident definition provided to students (any motor vehicle accident in which property damage or personal injury occurred) for survey purposes, and (2) the fact that many accidents resulting in property damage only, go unreported even when required by law to be reported. (39) (61) (66)

In the Driver Education Evaluation Program Study conducted by the U.S. Department of Transportation, it was stated that...

> ...driving records, as collections of crash violation entries are not very complete, often involve inaccuracies, and are subject to the whims of reporting officers, prosecuting attorneys and traffic court judges. Thus, driving records probably have a high degree of "error variation" that makes then relatively insensitive measures of change. (70:42)
>
> Other significant problems involved in the use of driving records involve variation in enforcement, adjudication, or reporting procedures from one time or location to another. (70:43)

GENERAL QUESTIONS TO BE ANSWERED

This study attempted to answer the following questions:

1. Did seniors who successfully completed driver education courses using the Demonstration-Satellite Performance Curriculum (DSPC) have fewer traffic collisions than seniors who successfully completed driver education courses using a traditional curriculum?

2. Did seniors who successfully completed driver education courses using the DSPC have less severe traffic collisions than those who successfully completed driver education courses using a traditional curriculum?

3. Did senior girls who successfully completed driver education courses using the DSPC have fewer traffic collisions than senior girls who successfully completed driver education courses using a traditional curriculum?

4. Did senior girls who successfully completed driver education courses using the DSPC have less severe traffic collisions than senior girls who successfully completed driver education courses using a traditional curriculum?

5. Did senior boys who successfully completed driver education courses using the DSPC have fewer traffic collisions than senior boys who successfully completed driver education courses using a traditional curriculum.

6. Did senior boys who successfully completed driver education courses using the DSPC have less severe traffic collisions than senior boys who successfully completed driver education courses using a traditional curriculum?

7. Was there a difference in the number of traffic collisions experienced between the senior girls and boys who successfully completed driver education?

8. Was there a difference in the severity of traffic collisions experienced between the boys and girls who successfully completed driver education?

9. Did the type of driver education program (2-phase, 3-phase range, 3-phase simulation and 4-phase) influence the number of traffic collisions experienced by seniors who successfully completed driver education?

10. Did the type of driver education program (2-phase, 3-phase range, 3-phase simulation and 4-phase) influence the severity of traffic collisions experienced by seniors who successfully completed driver education?

11. Did the type of community (urban, suburban, rural) influence the number of traffic collisions experienced by seniors who successfully completed driver education?

12. Did the type of community (urban, suburban, rural) influence the severity of traffic collisions experienced by seniors who successfully completed driver education?

13. Did performance on the DSPC test reflect a difference in accident involvement?

14. Did performance on the DSPC test reflect a difference in severity of accident involvement?

15. Did seniors exposed to the DSPC have a different type of accident involvement picture than seniors not exposed to the curriculum based on location of accident, type of roadway, condition of road surface,

time of day, objects involved, type of collision, avoidance procedures and driver error made?

THE HYPOTHESES

The hypotheses tested in this study were:

H_1: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between seniors who successfully completed driver education courses using the DSPC and seniors who successfully completed driver education courses using a traditional curriculum.

H_2: There is a significant difference in the severity of accident involvement, as measured by a self-reporting accident survey, between seniors who successfully completed driver education courses using the DSPC and seniors who successfully completed driver education courses using a traditional curriculum.

H_3: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between senior girls who successfully completed driver education courses using the DSPC and senior girls who successfully completed driver education courses using a traditional curriculum.

H_4: There is a significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between senior girls who successfully completed driver education courses using the DSPC and senior girls who successfully completed driver education courses using a traditional curriculum.

H_5: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between senior boys who successfully completed driver education courses using the DSPC and senior boys who successfully completed driver education courses using a traditional curriculum.

H_6: There is a significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between senior boys who successfully completed driver education courses using the DSPC and senior boys who successfully completed driver education courses using a traditional curriculum.

H_7: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between all senior boys and all senior girls who successfully completed driver education.

H_8: There is a significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between all senior boys and all senior girls who successfully completed driver education.

H_9: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between all types of driver education programs (2-phase, 3-phase range, 3-phase simulation and 4-phase).

H_{10}: There is a significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between all types of driver education programs (2-phase, 3-phase range, 3-phase simulation and 4-phase).

H_{11}: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between all types of communities (urban, suburban and rural).

H_{12}: There is a significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between all types of communities (urban, suburban and rural).

H_{13}: There is a significant difference in accident involvement, as measured by a self-reporting accident survey, between seniors scoring 70% or better on the DSPC module tests and seniors scoring less than 70% on the DSPC module tests.

H_{14}: There is a significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between seniors scoring 70% or better on the DSPC module tests and seniors scoring less than 70% on the DSPC module tests.

H_{15}: There is a significant difference in the type of accident involvement based on location of accident, type of roadway, condition of road surface, time of day, objects involved, type of road conditions, avoidance procedures, and driver error made, as measured by a self-reporting accident survey, between seniors successfully completing driver education courses using the DSPC and seniors successfully completing driver education courses using a traditional curriculum.

NULL HYPOTHESES

Following is a restatement of the research hypotheses in the null form:

HO_1: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between seniors who

successfully completed driver education courses using the DSPC and seniors who successfully completed driver education courses using a traditional curriculum.

HO_2: There is no significant difference in the severity of accident involvement, as measured by a self-reporting accident survey, between seniors who successfully completed driver education courses using the DSPC and seniors who successfully completed driver education courses using a traditional curriculum.

HO_3: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between senior girls who successfully completed driver education courses using the DSPC and senior girls who successfully completed driver education courses using a traditional curriculum.

HO_4: There is no significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between senior girls who successfully completed driver education courses using the DSPC and senior girls who successfully completed driver education courses using a traditional curriculum.

HO_5: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between senior boys who successfully completed driver education courses using the DSPC and senior boys who successfully completed driver education courses using a traditional curriculum.

HO_6: There is no significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between senior boys who successfully completed driver education courses using

the DSPC and senior boys who successfully completed driver education courses using a traditional curriculum.

HO_7: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between all senior boys and all senior girls who successfully completed driver education.

HO_8: There is no significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between all senior boys and all senior girls who successfully completed driver education.

HO_9: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between all types of driver education programs (2-phase, 3-phase range, 3-phase simulation and 4-phase).

HO_{10}: There is no significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between all types of driver education programs (2-phase, 3-phase range, 3-phase simulation and 4-phase).

HO_{11}: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between all types of communities (urban, suburban and rural).

HO_{12}: There is no significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between all types of communities (urban, suburban and rural).

HO_{13}: There is no significant difference in accident involvement, as measured by a self-reporting accident survey, between seniors scoring 70% or better on the DSPC module tests and seniors scoring less than

70% on the DSPC module tests.

HO_{14}: There is no significant difference in severity of accident involvement, as measured by a self-reporting accident survey, between seniors scoring 70% or better on the DSPC module tests and seniors scoring less than 70% on the DSPC module tests.

$H)_{15}$: There is no significant difference in type of accident involvement based on location of accident, type of roadway, condition of road surface, time of day, objects involved, type of road conditions, avoidance procedures, and driver error made, as measured by a self-reporting accident survey, between seniors successfully completing driver education courses using the DSPC and seniors successfully completing driver education courses using a traditional curriculum.

ANALYSIS OF DATA

The data collected on the Driver Education Evaluation Survey represented continuous and categorical information. Categorical data provides the researcher information about the category in which the measurement falls. Scores can be obtained when the categories are limited to the degree of level of that given characteristic.

Due to limitations inherent with categorical data, the use of parametric statistical procedures becomes highly suspect. Parametric statistical procedures require the acceptance of the following assumptions: (1) that the information collected dealt with continuous variables, (2) that the sample population was homogeneous, and (3) that the sample population was normally distributed. Since categorical data is discrete in nature, it cannot represent a continuous variable

which would be a violation of (1) above.

Even though categorical data do not lend themselves to the use of parametric procedures, they do lend themselves to the use of non-parametric statistical procedures.

The use of parametric and non-parametric statistical procedures was selected for analysis of the data. Parametric procedures were selected for analysis of data dealing with accident involvement (continuous data). Non-parametric procedures were selected for analysis of data dealing with severity of accident involvement (categorical data). "A nonparametric statistical test is a test whose model does not specify conditions about the parameters of the population from which the sample was drawn." (33:257) Although the availability of non-parametric or distribution-free statistics has been known for a number of decades, it has only recently gained in popularity. Three important advantages to non-parametric testing are:

> 1. Simplicity of derivation. The derivation of classical tests requires a level of competence in mathematics far above that attained by the typical research worker, whereas most distribution-free statistics can be derived using simple combinational formula.
> 2. Scope of application. Because they are based on fewer and less elaborate assumptions than the classical tests, distribution-free statistical tests can be correctly applied to a much larger class of populations.
> 3. Susceptibility to violation of assumptions. Since the assumptions are fewer and less elaborate with nonparametric statistical tests, they are less susceptible to violations. These violations are easier to detect with nonparametric tests. The effects of the violation of assumptions is important with both types of statistics, but Bradley feels that the effects of violation of assumptions can be more readily and economically taken care of with distribution-free statistical tests. (12:264)

The analytical techniques specifically used to test the fifteen null hypotheses were Chi-square Distribution and t-tests.

Cross-tabulations represent joint frequency distributions of cases according to two or more classificatory variables. These joint frequency distributions, which represent one of the most commonly used analytic methods in the social sciences, can be statistically analyzed by certain tests of significance. For the purpose of this study the Chi-square statistics were used to determine whether or not the variables were statistically independent.

Chi-square, as a test of statistical significance, assists the user in determining whether a systematic relationship existed between two variables. This is accomplished by computing the cell frequencies which would be expected if no relationship were present between the variables given the existing row and column totals.

In order to assess if a systematic relationship did exist, it became necessary to ascertain the probability of acquiring a value of chi-square as large or larger than the one calculated from the sample, when in fact the variables are independent. (5) (12) (33)

Chi-Square analysis was performed on the following null-hypotheses: HO_2, HO_4, HO_6, HO_8, HO_{10}, HO_{12}, HO_{14}, and HO_{15}.

T-tests provide the researcher with the capability of computing whether or not the difference between two sample means is significant. As with cross-tabulations, t-tests represent one of the most commonly used analytic procedures in the social sciences. The power of that test as as analytic predictor increases as the number of subjects in the population increases and the importance of its susceptibility to violation of its underlying assumptions decreases as the sample population increases. (5) (12) (33)

T-test analysis was performed on the following null-hypotheses: HO_1, HO_3, HO_5, HO_7, HO_9, HO_{11}, and HO_{13}.

Due to the limits of the self-report method of data collection, the .05 level of significance was chosen as sufficiently stringent for accepting or rejecting the null-hypotheses.

The analysis was performed with the use of the Statistical Package for the Social Sciences (SPSS). The SPSS is an intergrated system of computer programs designed for the analysis of social science data. The system provides a unified and comprehensive package that enables the user to perform many different types of data analysis in a simple and convenient manner. (51)

SUMMARY

The sample population was drawn from twenty-four schools throughout Illinois (excluding Cook County). Responses regarding driving experience, accident involvement and severity of accident involvement were collected during the spring semester 1977-78 school year.

The data obtained were analyzed using parametric and non-parametric testing procedures. A t-test was employed to determine the significance of the difference between the mean accident involvement of seniors successfully completing driver education courses using the DSPC and seniors successfully completing driver education courses using a traditional curriculum.

Chi-square analysis was also employed to determine the significance of the difference between the mean severity of accident involvement of seniors successfully completing driver education courses using the DSPC

and seniors successfully completing driver education courses using a traditional curriculum.

In chapter 4, the analysis of the data will be presented.

Chapter 4

ANALYSIS OF RESULTS

The central purpose of this study was to examine the relationships between a specific driver performance curriculum and motor vehicle accident involvement among novice drivers.

Specifically, the study attempted to determine if the Illinois Demonstration-Satellite Performance Curriculum contributed to a reduction in accident involvement and in severity of accident involvement among those novice drivers exposed to the curriculum.

The study used a self-reporting accident involvement survey as the criterion variable when attempting to determine what influence the Illinois Demonstration-Satellite Performance Curriculum had on novice drivers' accident involvement.

The sample population of this study consisted of 4024 seniors drawn from twenty-four high schools in Illinois who graduated in the Spring of 1978 and who had successfully completed driver education during the 1975-76 school year within the school from which they graduated.

The twenty-four schools involved in the study consisted of twelve schools (experimental group) which had participated in the utilization of the Demonstration-Satellite Performance Curriculum (DSPC) during the 1975-76 school year and twelve schools (control group) which had not participated in the utilization of the DSPC during the 1975-76 school year.

The control group was matched to the experimental group based on the following criteria: (1) Type of program, (2) Educational makeup, (3) Insurance rating tables, (4) Enforcement Index and (5) City size and location. In addition, the control group schools had to have their course curriculum tied directly to the textbook used in that school, with no additional resources used to set program objectives and/or course content.

During the Spring of 1978 pre-graduation exercises, the students were asked to respond to the Driver Education Evaluation Survey. The data collected on the survey consisted of the students' responses to the best choice in three or more of the following five categories: (1) Suggestions for Improving Driver Education Courses, (2) Driving Experience, (3) Collision Experience, (4) Severity of Collision Experience and (5) Type of Crash. Students not involved in collisions would not respond to items in category 4 or 5.

The data collected from responses to the survey and tabulated on IBM data cards were analyzed using non-parametric statistical statistical procedures. Specifically, t-tests were done on all items dealing with accident involvement and Chi-squares were done on all items dealing with severity of accident involvement.

The analysis to be reported on was performed with the use of the Statistical Package for the Social Sciences.

The following results of the analysis of data are presented:

(1) The analysis of accident involvement as measured by responses to a self-reporting accident survey between those students successfully completing driver education programs utilizing the Demonstration-Satellite

Performance Curriculum (DSPC) and those students successfully completing driver education programs using a Traditional Curriculum (TC).

(2) The analysis of severity of accident involvement as measured by responses to a self-reporting accident survey between students successfully completing driver education courses utilizing the DSPC and those students successfully completing driver education courses utilizing the TC.

(3) The analysis of accident involvement as measured by responses to a self-reporting accident survey between those students successfully completing driver education courses utilizing the DSPC who scored 70% or better on the curriculum module tests and those students scoring less than 70%.

(4) The analysis of severity of accident involvement as measured by responses to a self-reporting accident survey between those students successfully completing driver education courses utilizing the DSPC who scored 70% or better on the curriculum module tests and those students scoring less than 70%.

(5) The analysis of type of accident as measured by responses to a self-reporting accident survey between students successfully completing driver education courses utilizing the DSPC and those students successfully completing driver education courses utilizing the TC.

Of an original population of 4865 students, 319 refused to participate (student rejected), 401 had taken driver education outside the school from which they were graduating (researcher rejected), 51 had not yet obtained a driver license at the time of survey administration (researcher rejected), and 70 had improperly filled out the survey

(researcher rejected). In terms of usable survey data, 522 students were deleted from the study by the researcher because they failed to meet the criteria to be eligible to participate (452) and/or had spoiled surveys (70). An additional 319 were deleted from the study by the students themselves by failing to respond to the survey. This equated to a 92% response to the survey based on the number of students eligible to participate (4476) based on stated criteria.

A summary of population data breakdown and usable responses is presented in Figure 1.

FIGURE 1

POPULATION DATA BREAKDOWN

Original Pool	Student Rejected	Experimenter Rejected	Sample Population	Null Hypothesis	Statistical Test	Missing Observations Expected
4865	319	522	4024	HO_1	t	0
4865	319	522	2013	HO_2	x^2	2397
4865	319	522	2013	HO_3	t	0
4865	319	522	2011	HO_4	x^2	1324
4865	319	522	2011	HO_5	t	0
4865	319	522	4024	HO_6	x^2	1073
4865	319	522	4024	HO_7	t	0
4865	319	522	4024	HO_8	x^2	2397
4865	319	522	4024	HO_9	t	0
4865	319	522	4024	HO_{10}	x^2	2397
4865	319	522	4024	HO_{11}	t	0
4865	319	522	4024	HO_{12}	x^2	2397
515	0	74	441	HO_{13}	t	0
515	0	74	441	HO_{14}	x^2	278
4865	319	522	4024	HO_{15}	x^2	2397

Reference to "Missing Observation Expected" found in Figure 1 deals with the minimum number of responses the computer was directed to delete from the data by the researcher because of non-accident

involvement on the part of the student. Any difference between "Missing Observations Expected" as shown in Figure 1 and "Missing Observations" as shown in the summary of analysis for a given Chi-square table can be accounted for by the fact that the students, when filling out the survey did not always respond to items beyond item 40. (See Appendix C)

ANALYSIS OF ACCIDENT INVOLVEMENT

Item 36 on the Driver Education Evaluation Survey asked for a response to the number of traffic collisions the subject was involved in since the completion of driver education. The choices were from zero collisions to a total of seven collisions.

A traffic collision was defined as an unplanned accident resulting in personal injury, property damage or both, while operating a motor vehicle, regardless of the illegal or unsafe acts of others.

Accident Involvement: Control group vs. Experimental group

The summary of analysis of accident involvement obtained by DSPC students and TC students based on responses to item 36 is presented in Table 1.

Table 1

Accident Involvement: Control Group vs. Experimental Group

GROUP 1 = Control = 1.
GROUP 2 = Experimental = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	2097	1.6443	1.045	.023	1.34	.000	3.94	4007.32	.000
GROUP 2	1927	1.5262	.904	.021					

A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 3.84 was obtained for accident involvement. On the basis of the obtained "t" value a statistically significant difference existed between the two groups with regard to accident involvement, in favor of the experimental group which had fewer accidents. Therefore, on the basis of information presented in Table 1, the null hypothesis (HO_1) of no significant difference in accident involvement between seniors successfully completing driver education courses using the DSPC and seniors successfully completing driver education courses using the TC must be rejected.

Accident Involvement: Control Female vs. Experimental Female

In Table 2 a summary of the analysis of accident involvement obtained by senior girls exposed to the DSPC and senior girls exposed to the TC is presented.

Table 2

Accident Involvement: Control Female vs. Experimental Female

(FEMALE vs. FEMALE)

GROUP 1 = Control = 1.
GROUP 2 = Experimental = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	1046	1.4799	.896	.028	1.64	.000	2.33	1955.78	.020
GROUP 2	965	1.3969	.699	.023					

A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 2.33 was obtained for accident involvement. On the basis of the obtained "t" value a significant difference existed between the two groups with regard to accident

involvement in favor of the DSPC senior girls who had fewer accidents. The null hypothesis (HO_3) of no significant difference in accident involvement between senior girls successfully completing driver education courses using the DSPC and senior girls successfully completing driver education courses using the TC was rejected based on findings in Table 2.

Accident Involvement: Control Boys vs. Experimental Boys

A summary of the analysis of accident involvement obtained by senior boys exposed to the DSPC and senior boys exposed to the TC, based on responses to item 36 is presented in Table 3.

Table 3

Accident Involvement: Control Male vs. Experimental Male

(MALES vs. MALES)

GROUP 1 = Control = 1.
GROUP 2 = Experimental = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	1051	1.8078	1.152	.036	1.19	.006	3.09	2011.00	.002
GROUP 2	962	1.6559	1.055	.034					

A "t" value of greater than $\pm$ 1.960 was needed for significance at .05 level. A "t" value of 3.09 was obtained for accident involvement. On the basis of the obtained "t" value a significant difference at the .05 level existed between the two groups with regard to accident involvement, in favor of the DSPC senior boys who had fewer accidents. On the basis of this information the null hypothesis (HO_5) of no significant difference in accident involvement between senior boys successfully completing driver education courses using the DSPC and senior boys

successfully completing driver education courses using the TC was rejected.

Accident Involvement: Males vs. Females

A summary of the analysis of accident involvement between senior boys successfully completing driver education and senior girls successfully completing driver education is presented in Table 4.

Table 4

Accident Involvement: Males vs. Females

GROUP 1 = Males = 1.
GROUP 2 = Females = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	2013	1.4481	.532	.012	1.07	.300	8.29	4017.94	.000
GROUP 2	2011	1.3113	.515	.011					

A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 8.29 was obtained for accident involvement in favor of the senior girls who had fewer accidents at the .05 level. Based on this information the null hypothesis (HO_7) of no significant difference in accident involvement between senior boys who successfully completed driver education and senior girls who successfully completed driver education was rejected.

Accident Involvement Between Program Types

Tables 5 through 10 represent a summary of the analysis of accident involvement between four types of driver education programs; (1) 2-Phase (Classroom and On-Street), (2)3-Phase (Classroom, Range,

and On-Street), (3) 3-Phase (Classroom, Simulation and On-Street) and (4) 4-Phase (Classroom, Range, Simulation and On-Street).

In Table 5 a summary of the analysis of accident involvement between 2-phase programs and 3-phase range programs is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 1.41 was obtained for accident involvement which was not significant at the .05 level.

Table 5

Accident Involvement: 2-Phase vs. 3-Phase Range

GROUP 1 = 2 Phase = 0
GROUP 2 = 3 Phase (Range) = 1.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	1458	1.6872	1.068	.028	1.27	.011	1.41	523.68	.159
GROUP 2	325	1.6031	.949	.053					

A summary of the analysis of accident involvement between 2-phase programs and 3-phase simulation programs based on responses to item 36 is presented in Table 6. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 5.46 was obtained in favor of simulation which was significant at the .05 level.

Table 6

Accident Involvement: 2-Phase vs. 3-Phase Simulation

GROUP 1 = 2 Phase = 0
GROUP 2 = 3 Phase (Simulation) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	1458	1.6872	1.068	.028	1.43	.000	5.46	2850.80	.000
GROUP 2	1704	1.4941	.894	.022					

In Table 7 a summary of the analysis of accident involvement between 2-phase programs and 4-phase programs is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 1.60 was obtained for accident involvement which was not significant at the .05 level.

Table 7

Accident Involvement: 2-Phase vs. 4-Phase

GROUP 1 = 2 Phase = 0
GROUP 2 = 4 Phase = 3.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	1458	1.6872	1.068	.028	1.15	.055	1.60	1022.42	.109
GROUP 2	537	1.6052	.993	.043					

A summary of the analysis of accident involvement between 3-phase range programs and 3-phase simulation programs based on responses to item 36 is presented in Table 8. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 1.91 was obtained which was not significant at the .05 level.

Table 8

Accident Involvement: 3-Phase Range vs. 3-Phase Simulation

GROUP 1 = 3 Phase (Range) = 1.
GROUP 2 = 3 Phase (Simulation) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	325	1.6031	.949	.053	1.13	.180	1.91	440.64	.056
GROUP 2	1704	1.4941	.894	.022					

In Table 9 a summary of the analysis of accident involvement

between 3-phase range programs and 4-phase programs is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of -.03 was obtained for accident involvement which was not significant at the .05 level.

Table 9

Accident Involvement: 3-Phase Range vs. 4-Phase

GROUP 1 = 3 Phase (Range) = 1.
GROUP 2 = 4 Phase = 3.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM36									
GROUP 1	325	1.6031	.949	.053	1.09	.371	-.03	707.68	.975
GROUP 2	537	1.6052	.993	.043					

A summary of the analysis of accident involvement between 3-phase simulation programs and 4-phase programs based on responses to item 36 is presented in Table 10. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of -2.31 was obtained in favor of simulation which was significant at the .05 level.

Table 10

Accident Involvement: 3-Phase Simulation vs. 4-Phase

GROUP 1 = 3 Phase (Simulation) = 2.
GROUP 2 = 4 Phase = 3.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM 36									
GROUP 1	.1704	1.4941	.894	.022	1.23	.005	-2.31	828.11	.021
GROUP 2	537	1.6052	.993	.043					

On the basis of information summarized in Tables 5, 7 and 8 there

was no significant difference between 2-phase - 3-phase range, 2-phase - 4-phase, or 3-phase range - 3-phase simulation programs. On the basis of information summarized in Tables 6 and 10, there was a significant difference between 2-phase - 3-phase simulation and 4-phase - 3-phase simulation both in favor of simulation. Therefore, based on information presented in Tables 6 and 10 the null hypothesis (HO_9) of no significant difference in accident involvement between types of driver education programs was rejected.

Accident Involvement between Community Types

Tables 11 through 13 represent a summary of the analysis of accident involvement between three types of communities: (1) Urban (50,000+ population), (2) Suburban (less than 50,000 population and within 25 miles of an Urban area) and (3) Rural (less than 25,000 population and more than 25 miles from an Urban area).

A summary of the analysis of accident involvement between urban communities and suburban communities based on responses to item 36 is presented in Table 11. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 2.87 was obtained in favor of suburban communities which was significant at the .05 level.

Table 11

Accident Involvement: Urban vs. Suburban

GROUP 1 = Urban = 0
GROUP 2 = Suburban = 1.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM 36									
GROUP 1	1236	1.5906	1.002	.028	1.34	.000	2.87	2433.01	.004
GROUP 2	1656	1.4885	.866	.021					

In Table 12 a summary of the analysis of accident involvement between urban communities and rural communities is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of -3.22 was obtained in favor of the urban communities which was significant at the .05 level.

Table 12

Accident Involvement: Urban vs. Rural

GROUP 1 = Urban = 0
GROUP 2 = Rural = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM 36									
GROUP 1	1236	1.5906	1.002	.028	1.19	.005	-3.22	2294.76	.001
GROUP 2	1132	1.7297	1.095	.033					

A summary of the analysis of accident involvement between suburban communities and rural communities based on responses to item 36 is presented in Table 13. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of -6.20 was obtained in favor of the suburban communities which was significant at the .05 level.

Table 13

Accident Involvement: Suburban vs. Rural

GROUP 1 = Suburban = 1.
GROUP 2 = Rural = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
ITEM 36									
GROUP 1	1656	1.4885	.866	.021	1.60	.000	-6.20	2049.76	.000
GROUP 2	1132	1.7297	1.095	.033					

Differences, statistically significant at the .05 level, were found between (1) Urban and suburban communities (in favor of suburban), (2) Urban and rural communities (in favor of urban) and (3) Suburban and rural communities (in favor of suburban). On the basis of information presented in Tables 11 through 13 the null hypothesis (HO_{11}) of no significant difference in accident involvement between types of communities was rejected.

Accident Involvement: Module Tests

Tables 14 through 20 represent a summary of the analysis of accident involvement between students within the experimental group who scored 70% or more on the seven module tests and students within the experimental group who scored 69% or less on the seven module tests. The 70% level of performance was selected because it usually represents the bottom end of the satisfactory grading range, C.

In Table 14, a summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on Module 1 (Controls Test) is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of -0.06 was obtained for accident involvement which was not significant at the .05 level.

Table 14

Accident Involvement: Test Scores Module 1

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)

GROUP 1 = Item 12 (70%+) = 1.
GROUP 2 = Item 12 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM 36									
GROUP 1	328	1.3598	0.493	0.027	1.04	0.806	-0.06	439	0.954
GROUP 2	113	1.3628	0.483	0.045					

A summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on Module 2 (HTS Test) based on responses to item 36 is presented in Table 15. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 0.04 was obtained for accident involvement which was not significant at the .05 level.

Table 15

Accident Involvement: Test Scores Module 2

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)

GROUP 1 = Item 13 (70%+) = 1.
GROUP 2 = Item 13 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM 36									
GROUP 1	374	1.3610	0.492	0.025	1.04	0.883	0.04	439	0.966
GROUP 2	67	1.3582	0.483	0.059					

In Table 16 a summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on Module 4 (Vehicle Capabilities Test) is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 0.52 was obtained which was not significant at the .05 level.

Table 16

Accident Involvement: Test Scores Module 4

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)

GROUP 1 = Item 14 (70%+) = 1.
GROUP 2 = Item 14 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM36									
GROUP 1	349	1.3668	0.494	0.026	1.08	0.662	0.52	439	0.604
GROUP 2	92	1.3370	0.475	0.050					

A summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on Module 8 (Identification Test) based on responses to item 36 is presented in Table 17. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 0.06 was obtained for accident involvement which was not significant at the .05 level.

Table 17

Accident Involvement: Test Scores Module 8

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)

GROUP 1 = Item 15 (70%+) = 1.
GROUP 2 = Item 15 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM36									
GROUP 1	321	1.3614	0.488	0.027	1.05	0.749	0.06	439	0.954
GROUP 2	120	1.3583	0.499	0.046					

In Table 18 a summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on Module 10 (Evaluation Test) is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 0.06 was obtained which was not significant at the .05 level.

Table 18

Accident Involvement: Test Score Module 10

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)
GROUP 1 = Item 16 (70%+) = 1.
GROUP 2 = Item 16 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM 36									
GROUP 1	385	1.3610	0.492	0.025	1.03	0.911	0.06	439	0.956
GROUP 2	56	1.3571	0.483	0.065					

A summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on Module 11 (Plan of Action Test) based on responses to item 36 is presented in Table 19. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 1.15 was obtained for accident involvement which was not significant at the .05 level.

Table 19

Accident Involvement: Test Scores Module 11

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)
GROUP 1 = Item 17 (70%+) = 1.
GROUP 2 = Item 17 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM36									
GROUP 1	321	1.3769	0.498	0.028	1.14	0.416	1.15	439	0.251
GROUP 2	120	1.3167	0.467	0.043					

In Table 20 a summary of the analysis of accident involvement between students scoring 70%+ and students scoring 69%- on the On-Road Situation Test is presented. A "t" value of greater than $\pm$ 1.960 was needed for significance at the .05 level. A "t" value of 2.42 which was significant at the .05 level was obtained in favor of students scoring 70%+.

Table 20

Accident Involvement: Test Scores Module 12

TEST SCORES EXPERIMENTAL GROUP (70%+ vs. 69%-)

GROUP 1 = Item 18 (70%+) = 1.
GROUP 2 = Item 18 (69%-) = 2.

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED T VALUE	VARIANCE ESTIMATE DEGREES OF FREEDOM	VARIANCE ESTIMATE 2-TAIL PROB.
ITEM36									
GROUP 1	395	1.3797	0.496	0.025	1.53	0.081	2.42	439	0.016
GROUP 2	46	1.1957	0.401	0.059					

No differences were found between students scoring 70%+ and students scoring 69%- on Modules 1, 2, 4, 8, 10 or 11. A significant difference was found on Module 12 in favor of the students scoring 70%+. On the basis of information presented in Table 20 the null hypothesis (HO_{13}) of no significant difference in accident involvement between students scoring 70% or better on the DSPC module tests and students scoring less than 70% on the DSPC module tests was rejected.

ANALYSIS OF SEVERITY OF ACCIDENT INVOLVEMENT

Three items on the Driver Education Evaluation Survey asked the respondent, who was involved in one or more accidents, to identify the severity of each accident. Item 40 dealt with injury and death. The choices ranged from no injury to major injury and death. Item 43 consisted of choices concerning the use or nonuse of active restraint systems. The final item, number 56, asked the respondents to estimate the amount of damage to property and/or cars. The choices ranged from under $500 to over $3500. In addition to check on severity for each of the three items independently, a check for any interaction of the items was also crosstabulated.

Tables 21 through 24 represent a summary of the analysis of severity of accident involvement between DSPC students and TC students based on responses to items 40, 43, 56 and a combination of the three items.

Severity of Accident: Control vs. Experimental

In Table 21 the analysis of severity of accident involvement as measured by responses to item 40 (personal injury) between DSPC students and TC students is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00063 was obtained which was not significant at the .05 level.

Table 21

Personal Injury: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM 40)

		ITEM40		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SCHOOL	1	885	37	922
		96.0	4.0	56.7
		56.7	56.1	
		54.4	2.3	
	2	676	29	705
		95.9	4.1	43.3
		43.3	43.9	
		41.5	1.8	
	COLUMN TOTAL	1561	66	1627
		95.9	4.1	100.0

CORRECTED CHI SQUARE = 0.00063 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9800

NUMBER OF MISSING OBSERVATIONS = 2397

In Table 22 a summary of the analysis of severity of accident involvement as measured by responses to item 42 (use of active restraints) between DSPC students and TC students is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 7.67822 was obtained which was significant at the .05 level in favor

of the experimental group.

Table 22

Active Restraints: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM 43)

		ITEM43		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SCHOOL	1	214	685	899
		23.8	76.2	56.4
		50.6	58.5	
		13.4	43.0	
	2	209	485	694
		30.1	69.9	43.6
		49.4	41.5	
		13.1	30.4	
	COLUMN TOTAL	423	1170	1593
		26.6	73.4	100.0

CORRECTED CHI SQUARE = 7.67822 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.0056

NUMBER OF MISSING OBSERVATIONS = 2431

In Table 23 a summary of the analysis of severity of accident involvement as measured by responses to item 56 (property damage) between DSPC students and TC students is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.20438 was obtained which was not significant at the .05 level.

Table 23

Property Damage: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM 56)

SCHOOL	ITEM56 1	ITEM56 2	ROW TOTAL
1	666	150	816
	81.6	18.4	55.5
	55.9	54.2	
	45.3	10.2	
2	526	127	653
	80.6	19.4	44.5
	44.1	45.8	
	35.8	8.6	
COLUMN TOTAL	1192	277	1469
	81.1	18.9	100.0

CORRECTED CHI SQUARE = 0.20438 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.6512

NUMBER OF MISSING OBSERVATIONS = 2555

In Table 24 the summary of the analysis of severity of accident involvement as measured by a combination of responses to items 40, 43 and 56 between DSPC students and TC students is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.06278 was obtained which was not significant at the .05 level.

Table 24

Severity: Control Group vs. Experimental Group

(CROSSTABULATION OF SEVERITY BY SCHOOL)

SEVERITY	SCHOOL 1	SCHOOL 2	ROW TOTAL
1	240	191	431
	55.7	44.3	32.5
	32.1	32.9	
	18.1	14.4	
2	507	389	896
	56.6	43.4	67.5
	67.9	67.1	
	38.2	29.3	
COLUMN TOTAL	747	580	1327
	56.3	43.7	100.0

CORRECTED CHI SQUARE = 0.06278 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8022

NUMBER OF MISSING OBSERVATIONS = 2697

On the basis of information presented in Tables 21 through 24 there was no significant difference between DSPC students and TC students with regard to amount of personal injury, property damage and/or a combination of personal injury, use of active restraints and property damage. There was a significant difference with regard to use of active restraints in favor of the experimental students. Based on this information the null hypothesis (HO_2) of no significant difference in severity of accident involvement between seniors who successfully completed driver education courses using the DSPC and seniors who successfully completed driver education courses using the TC was rejected.

Severity of Accident: Control Girls vs. Experimental Girls

Tables 25 through 28 present a summary of the analysis of severity of accident involvement between DSPC senior girls and TC senior girls based on responses to items 40, 43, 56 and a combination of the three items.

In Table 25 the summary of the analysis of severity of accident involvement as measured by responses to item 40 (personal injury) between DSPC senior girls and TC senior girls is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00622 was obtained which was not significant at the .05 level.

Table 25

Personal Injury: Control Female vs. Experimental Female

(CROSSTABULATION OF FEMALE BY ITEM 40)

		ITEM40		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
FEMALE				
1		370	12	382
		96.9	3.1	55.6
		55.6	57.1	
		53.9	1.7	
2		296	9	305
		97.0	3.0	44.4
		44.4	42.9	
		43.1	1.3	
COLUMN TOTAL		666	21	687
		96.9	3.1	100.0

CORRECTED CHI SQUARE = 0.00622 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9371

NUMBER OF MISSING OBSERVATIONS = 1324

A summary of the analysis of severity of accident involvement as measured by responses to item 43 (use of active restraints) between DSPC senior girls and TC senior girls is presented in Table 26. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 1.09493 was obtained which was not significant.

Table 26

Active Restraints: Control Female vs. Experimental Female

(CROSSTABULATION OF FEMALE BY ITEM 43)

		ITEM43		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
FEMALE				
1		88	285	373
		23.6	76.4	55.5
		51.8	56.8	
		13.1	42.4	
2		82	217	299
		27.4	72.6	44.5
		48.2	43.2	
		12.2	32.3	
COLUMN TOTAL		170	502	672
		25.3	74.7	100.0

CORRECTED CHI SQUARE = 1.09493 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.2954

NUMBER OF MISSING OBSERVATIONS = 1339

In Table 27 the summary of the analysis of severity of accident involvement as measured by responses to item 56 (property damage) between DSPC senior girls and TC senior girls is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.10990 was obtained which was not significant.

Table 27

Property Damage: Control Female vs. Experimental Female

(CROSSTABULATION OF FEMALE BY ITEM 56)

		ITEM56		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
FEMALE	1	281	52	333
		84.4	15.6	53.8
		53.4	55.9	
		45.4	8.4	
	2	245	41	286
		85.7	14.3	46.2
		46.6	44.1	
		39.6	6.6	
	COLUMN TOTAL	526	93	619
		85.0	15.0	100.0

CORRECTED CHI SQUARE = 0.10990 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.7403

NUMBER OF MISSING OBSERVATIONS = 1392

A summary of the analysis of severity of accident involvement as measured by a combination of responses to items 40, 43 and 56 between DSPC senior girls and TC senior girls is presented in Table 28. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.06278 was obtained which was not significant.

Table 28

Severity: Control Female vs. Experimental Female

(CROSSTABULATION OF SEVERITY BY FEMALE)

		FEMALE		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEVERITY	1	240	191	431
		55.7	44.3	32.5
		32.1	32.9	
		18.1	14.4	
	2	507	389	896
		56.6	43.4	67.5
		67.9	67.1	
		38.2	29.3	
	COLUMN TOTAL	747	580	1327
		56.3	43.7	100.0

CORRECTED CHI SQUARE = 0.06278 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8022

NUMBER OF MISSING OBSERVATIONS = 2697

On the basis of information presented in Tables 25 through 28 there was no significant difference between DSPC senior girls and TC senior girls with regard to personal injury, use of active restraints, property damage and/or a combination of the three. Based on this information the null hypothesis (HO_4) of no significant difference in severity of accident involvement between senior girls who successfully completed driver education courses using the DSPC and senior girls who successfully completed driver education courses using the TC was not rejected.

Severity of Accident: Control Boys vs. Experimental Boys

In Tables 29 through 32 a summary of the analysis of severity of accident involvement between DSPC senior boys and TC senior boys based on responses to items 40, 43, 56 and a combination of the three items is presented.

In Table 29 a summary of the analysis of severity of accident involvement as measured by responses to item 40 (personal injury)

between DSPC senior boys and TC senior boys is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.01177 was obtained which was not significant.

Table 29

Personal Injury: Control Male vs. Experimental Male

(CROSSTABULATION OF MALE BY ITEM 40)

		ITEM40		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
MALE	1	515	25	540
		95.4	4.6	57.4
		57.5	55.6	
		54.8	2.7	
	2	380	20	400
		95.0	5.0	42.6
		42.5	44.4	
		40.4	2.1	
	COLUMN TOTAL	895	45	940
		95.2	4.8	100.0

CORRECTED CHI SQUARE = 0.01177 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9136

NUMBER OF MISSING OBSERVATIONS = 1073

In Table 30 a summary of severity of accident involvement as measured by item 43 (use of active restraints) between DSPC senior boys and TC senior boys is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 7.20283 was obtained in favor of the experimental boys which was significant at the .05 level.

Table 30

Active Restraints: Control Male vs. Experimental Male

(CROSSTABULATION OF MALE BY ITEM 43)

		ITEM43		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
MALE	1	126	400	526
		24.0	76.0	57.1
		49.8	59.9	
		13.7	43.4	
	2	127	268	395
		32.2	67.8	42.9
		50.2	40.1	
		13.8	29.1	
	COLUMN TOTAL	253	668	921
		27.5	72.5	100.0

CORRECTED CHI SQUARE = 7.20283 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.0073

NUMBER OF MISSING OBSERVATIONS = 1092

A summary of the analysis of severity of accident involvement as measured by item 56 (property damage) between DSPC senior boys and TC senior boys is presented in Table 31. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 1.03662 was obtained which was not significant.

Table 31

Property Damage: Control Male vs. Experimental Male

(CROSSTABULATION OF MALE BY ITEM 56)

		ITEM56		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
MALE	1	385	98	483
		79.7	20.3	56.8
		57.8	53.3	
		45.3	11.5	
	2	281	86	367
		76.6	23.4	43.2
		42.2	46.7	
		33.1	10.1	
	COLUMN TOTAL	666	184	850
		78.4	21.6	100.0

CORRECTED CHI SQUARE = 1.03662 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.3086

NUMBER OF MISSING OBSERVATIONS = 1163

In Table 32 a summary of the analysis of severity of accident involvement as measured by a combination of responses to items 40, 43 and 56 between DSPC senior boys and TC senior boys is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.06278 was obtained which was not significant.

Table 32

Severity: Control Male vs. Experimental Male

(CROSSTABULATION OF SEVERITY BY MALE)

		MALE		
COUNT / ROW PCT / COL PCT / TOT PCT		1	2	ROW TOTAL
SEVERITY	1	240	191	431
		55.7	44.3	32.5
		32.1	32.9	
		18.1	14.4	
	2	507	389	896
		56.6	43.4	67.5
		67.9	67.1	
		38.2	29.3	
COLUMN TOTAL		747	580	1327
		56.3	43.7	100.0

CORRECTED CHI SQUARE = 0.06278 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8022

NUMBER OF MISSING OBSERVATIONS = 2697

Based on the summary information presented in Tables 29 through 32 there was no significant difference between DSPC senior boys and TC senior boys with regard to personal injury, property damage and/or a combination of personal injury, use of active restraints and property damage. There was a significant difference with regard to use of active restraints in favor of the experimental senior boys. On the basis of information summarized in Table 30 the null hypothesis (HO_6) of no significant difference in severity of accident involvement between senior boys who successfully completed driver education courses using the DSPC and senior boys who successfully completed driver education

courses using the TC was rejected.

Severity of Accident: Males vs. Females

In Tables 33 through 36 a summary of the analysis of severity of accident involvement between all senior boys and all senior girls based on responses to items 40, 43, 56 and a combination of the three items is presented.

A summary of the analysis of severity of accident involvement as measured by responses to item 40 (personal injury) between all senior boys and all senior girls is presented in Table 33. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 2.62543 was obtained which was not significant.

Table 33

Personal Injury: Males vs. Females

(CROSSTABULATION OF SEX BY ITEM 40)

		ITEM40			
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEX	1	895	45	940
		95.2	4.8	57.8
		57.3	68.2	
		55.0	2.8	
	2	666	21	687
		96.9	3.1	42.2
		42.7	31.8	
		40.9	1.3	
	COLUMN TOTAL	1561	66	1627
		95.9	4.1	100.0

CORRECTED CHI SQUARE = 2.62543 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.1052

NUMBER OF MISSING OBSERVATIONS = 2397

In Table 34 a summary of the analysis of severity of accident involvement as measured by responses to item 43 (use of active restraints) between all senior boys and all senior girls is presented. A x^2 value of

3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.83216 was obtained which was not significant.

Table 34

Active Restraints: Males vs. Females

(CROSSTABULATION OF SEX BY ITEM 43)

SEX		ITEM43 1	ITEM43 2	ROW TOTAL
	COUNT			
	ROW PCT			
	COL PCT			
	TOT PCT			
1		253	668	921
		27.5	72.5	57.8
		59.8	57.1	
		15.9	41.9	
2		170	502	672
		25.3	74.7	42.2
		40.2	42.9	
		10.7	31.5	
COLUMN TOTAL		423	1170	1593
		26.6	73.4	100.0

CORRECTED CHI SQUARE = 0.83216 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.3616

NUMBER OF MISSING OBSERVATIONS = 2431

In Table 35 a summary of the analysis of severity of accident involvement as measured by responses to item 56 (property damage) between all senior boys and all senior girls is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 9.83915 was obtained which was significant at the .05 level in favor of the senior girls.

Table 35

Property Damage: Males vs. Females

(CROSSTABULATION OF SEX BY ITEM 56)

SEX	ITEM56 1	ITEM56 2	ROW TOTAL
1	666	184	850
	78.4	21.6	57.9
	55.9	66.4	
	45.3	12.5	
2	526	93	619
	85.0	15.0	42.1
	44.1	33.6	
	35.8	6.3	
COLUMN TOTAL	1192	277	1469
	81.1	18.9	100.0

CORRECTED CHI SQUARE = 9.83915 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.0017

NUMBER OF MISSING OBSERVATIONS = 2555

A summary of the analysis of severity of accident involvement as measured by a combination of responses to items 40, 43 and 56 between all senior boys and all senior girls is presented in Table 36. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00111 was obtained which was not significant.

Table 36

Severity: Males vs. Females

(CROSSTABULATION OF SEVERITY BY SEX)

SEVERITY	SEX 1	SEX 2	ROW TOTAL
1	246	185	431
	57.1	42.9	32.5
	32.6	32.3	
	18.5	13.9	
2	509	387	896
	56.8	43.2	67.5
	67.4	67.7	
	38.4	29.2	
COLUMN TOTAL	755	572	1327
	56.9	43.1	100.0

CORRECTED CHI SQUARE = 0.00111 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9734

NUMBER OF MISSING OBSERVATIONS = 2697

On the basis of information summarized in Tables 33 through 36 there was no significant difference between senior boys and senior girls with regard to personal injury, use of active restraints and/or a combination of personal injury, use of active restraints and property damage. There was a significant difference with regard to property damage in favor of the senior girls. Based on information summarized in Table 35 the null hypothesis (HO_8) of no significant difference in severity of accident involvement between all senior boys and all senior girls who successfully completed driver education was rejected.

Severity of Accident: Program Type

In Tables 37 through 40 a summary of the analysis of severity of accident involvement between all types of driver education programs (2-phase, 3-phase range, 3-phase simulation and 4-phase) based on responses to items 40, 43, 56 and a combination of the three items is presented.

In Table 37 a summary of the analysis of severity of accident involvement as measured by responses to item 40 (personal injury) between all types of driver education programs is presented. A x^2 value of 7.815 or greater was needed for significance at the .05 level. A x^2 value of 1.74919 was obtained which was not significant.

Table 37

Personal Injury by Program Type

(CROSSTABULATION OF PROGTYPE BY ITEM 40)

PROGTYPE	ITEM 40 1	ITEM 40 2	ROW TOTAL
0 COUNT	621	25	646
ROW PCT	96.1	3.9	39.7
COL PCT	39.8	37.9	
TOT PCT	38.2	1.5	
1 COUNT	134	3	137
ROW PCT	97.8	2.2	8.4
COL PCT	8.6	4.5	
TOT PCT	8.2	0.2	
2 COUNT	605	29	634
ROW PCT	95.4	4.6	39.0
COL PCT	38.8	43.9	
TOT PCT	37.2	1.8	
3 COUNT	201	9	210
ROW PCT	95.7	4.3	12.9
COL PCT	12.9	13.6	
TOT PCT	12.4	0.6	
COLUMN TOTAL	1561	66	1627
	95.9	4.1	100.0

RAW CHI SQUARE = 1.74919 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = 0.6261

NUMBER OF MISSING OBSERVATIONS = 2397

In Table 38 a summary of the analysis of severity of accident involvement as measured by responses to item 43 (use of active restraints) between all types of driver education programs is presented. A x^2 value of 7.815 or greater was needed for significance at the .05 level. A x^2 value of 5.39912 was obtained which was not significant.

Table 38

Active Restraints by Program Type

(CROSSTABULATION OF PROGTYPE BY ITEM 43)

PROGTYPE	COUNT / ROW PCT / COL PCT / TOT PCT	ITEM 43: 1	ITEM 43: 2	ROW TOTAL
0		152	483	635
		23.9	76.1	39.9
		35.9	41.3	
		9.5	30.3	
1		31	100	131
		23.7	76.3	8.2
		7.3	8.5	
		1.9	6.3	
2		179	441	620
		28.9	71.1	38.9
		42.3	37.7	
		11.2	27.7	
3		61	146	207
		29.5	70.5	13.0
		14.4	12.5	
		3.8	9.2	
COLUMN TOTAL		423	1170	1593
		26.6	73.4	100.0

RAW CHI SQUARE = 5.39912 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = 0.1448

NUMBER OF MISSING OBSERVATIONS = 2431

A summary of the analysis of severity of accident involvement as measured by responses to item 56 (property damage) between all types of driver education programs is presented in Table 39. A x^2 value of 7.815 or greater was needed for significance at the .05 level. A x^2 value of 4.34871 was obtained which was not significant.

Table 39

Property Damage by Program Type

(CROSSTABULATION OF PROGTYPE BY ITEM 56)

PROGTYPE	COUNT / ROW PCT / COL PCT / TOT PCT	ITEM 56: 1	ITEM 56: 2	ROW TOTAL
0	COUNT	482	99	581
	ROW PCT	83.0	17.0	39.6
	COL PCT	40.4	35.7	
	TOT PCT	32.8	6.7	
1	COUNT	100	23	123
	ROW PCT	81.3	18.7	8.4
	COL PCT	8.4	8.3	
	TOT PCT	6.8	1.6	
2	COUNT	459	125	584
	ROW PCT	78.6	21.4	39.8
	COL PCT	38.5	45.1	
	TOT PCT	31.2	8.5	
3	COUNT	151	30	181
	ROW PCT	83.4	16.6	12.3
	COL PCT	12.7	10.8	
	TOT PCT	10.3	2.0	
COLUMN TOTAL		1192	277	1469
		81.1	18.9	100.0

RAW CHI SQUARE = 4.34871 WITH 3 DEGREES OF FREEDOM. SIGNIFICANCE = 0.2262

NUMBER OF MISSING OBSERVATIONS = 2555

In Table 40 a summary of the analysis of severity of accident involvement as measured by a combination of responses to items 40, 43 and 56 between all types of driver education programs is presented. A x^2 value of 7.815 or greater was needed for significance at the .05 level. A x^2 value of 5.50435 was obtained which was not significant.

Table 40

Severity by Program Type

(CROSSTABULATION OF SEVERITY BY PROGTYPE)

		PROGTYPE				
	COUNT / ROW PCT / COL PCT / TOT PCT	0	1	2	3	ROW TOTAL
SEVERITY	1	163	33	167	68	431
		37.8	7.7	38.7	15.8	32.5
		30.4	30.3	32.7	39.8	
		12.3	2.5	12.6	5.1	
	2	374	76	343	103	896
		41.7	8.5	38.3	11.5	67.5
		69.6	69.7	67.3	60.2	
		28.2	5.7	25.8	7.8	
	COLUMN TOTAL	537	109	510	171	1327
		40.5	8.2	38.4	12.9	100.0

RAW CHI SQUARE = 5.50435 WITH 3 DEGREES OF FREEDOM.
SIGNIFICANCE = 0.1384

NUMBER OF MISSING OBSERVATIONS = 2697

On the basis of information summarized in Tables 37 through 40 there was no significant difference between program types with regard to personal injury, use of active restraints, property damage and/or a combination of the three. Based on this information the null hypothesis (HO_{10}) of no significant difference in the severity of accident involvement between all types of driver education programs was not rejected.

Severity of Accident: Community Type

In Tables 41 through 44 a summary of the analysis of severity of accident involvement between all types of communities (urban, suburban and rural) based on responses to items 40, 43 56 and a combination of the three items is presented.

In Table 41 a summary of the analysis of severity of accident involvement as measured by responses to item 40 (personal injury) between all types of communities is presented. A x^2 value of 5.991 or greater was needed for significance at the .05 level. A x^2 value of 0.24010 was obtained which was not significant.

Table 41

Personal Injury by City Type

(CROSSTABULATION OF CITY BY ITEM40)

CITY	COUNT / ROW PCT / COL PCT / TOT PCT	ITEM40 1	ITEM40 2	ROW TOTAL
0		487	19	506
		96.2	3.8	31.1
		31.2	28.8	
		29.9	1.2	
1		569	24	593
		96.0	4.0	36.4
		36.5	36.4	
		35.0	1.5	
2		505	23	528
		95.6	4.4	32.5
		32.4	34.8	
		31.0	1.4	
COLUMN TOTAL		1561	66	1627
		95.9	4.1	100.0

RAW CHI SQUARE = 0.24010 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0.8869

NUMBER OF MISSING OBSERVATIONS = 2397

In Table 42 a summary of the analysis of severity of accident involvement as measured by responses to item 43 (use of active restraints) between all types of communities is presented. A x^2 value of 5.991 or greater was needed for significance at the .05 level. A x^2 value of 8.49806 was obtained which was significant at the .05 level in favor of urban and suburban communities.

Table 42

Active Restraints by City Type

(CROSSTABULATION OF CITY BY ITEM 43)

CITY	ITEM 43			
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
0		139	355	494
		28.1	71.9	31.0
		32.9	30.3	
		8.7	22.3	
1		170	410	580
		29.3	70.7	36.4
		40.2	35.0	
		10.7	25.7	
2		114	405	519
		22.0	78.0	32.6
		27.0	34.6	
		7.2	25.4	
COLUMN TOTAL		423	1170	1593
		26.6	73.4	100.0

RAW CHI SQUARE = 8.49806 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0143

NUMBER OF MISSING OBSERVATIONS = 2431

A summary of the analysis of accident involvement as measured by responses to item 56 (property damage) between all types of communities is presented in Table 43. A x^2 value of 5.991 or greater was needed for significance at the .05 level. A x^2 value of 1.1499 was obtained which was not significant.

Table 43

Personal Injury by City Type

(CROSSTABULATION OF CITY BY ITEM56)

CITY	ITEM 56 1	ITEM 56 2	ROW TOTAL
0 COUNT	358	90	448
ROW PCT	79.9	20.1	30.5
COL PCT	30.0	32.5	
TOT PCT	24.4	6.1	
1 COUNT	444	105	549
ROW PCT	80.9	19.1	37.4
COL PCT	37.2	37.9	
TOT PCT	30.2	7.1	
2 COUNT	390	82	472
ROW PCT	82.6	17.4	32.1
COL PCT	32.7	29.6	
TOT PCT	26.5	5.6	
COLUMN TOTAL	1192	277	1469
	81.1	18.9	100.0

RAW CHI SQUARE = 1.14999 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0.5627

NUMBER OF MISSING OBSERVATIONS = 2555

In Table 44 a summary of the analysis of severity of accident involvement as measured by a combination of responses to items 40, 43 and 56 between all types of communities is presented. A x^2 value of 5.991 or greater was needed for significance at the .05 level. A x^2 value of 3.95356 was obtained which was not significant.

Table 44

Severity by City Type

(CROSSTABULATION OF SEVERITY BY CITY)

SEVERITY	CITY 0	CITY 1	CITY 2	ROW TOTAL
1 COUNT	140	164	127	431
ROW PCT	32.5	38.1	29.5	32.5
COL PCT	34.6	34.0	28.9	
TOT PCT	10.6	12.4	9.6	
2 COUNT	265	318	313	896
ROW PCT	29.6	35.5	34.9	67.5
COL PCT	65.4	66.0	71.1	
TOT PCT	20.0	24.0	23.6	
COLUMN TOTAL	405	482	440	1327
	30.5	36.3	33.2	100.0

RAW CHI SQUARE = 3.95356 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = 0.1385

NUMBER OF MISSING OBSERVATIONS = 2697

On the basis of information summarized in Tables 41 through 44 there was no significant difference between community types with regard to personal injury, property damage and/or a combination of personal injury, use of active restraints and property damage. A significant difference between community types in favor of urban and suburban communities was obtained for use of active restraints. Based on the information summarized in Table 42 the null hypothesis (HO_{12}) of no significant difference in severity of accident involvement between all types of communities was rejected.

Severity of Accident: Module Test Performance

In Tables 45 through 72 a summary of the analysis of severity of accident involvement between students within the experimental group who scored 70% or better on the seven module tests and students within the experimental group who scored 69% or less on the seven module tests is presented.

Specifically, Tables 45 through 51 will summarize severity of accident involvement as measured by item 40 (personal injury) for modules 1, 2, 4, 8, 10-12; Tables 52 through 58 will summarize severity of accident involvement as measured by item 43 (use of active restraints) for modules 1, 2, 4, 8, 10-12; Tables 59 through 65 will summarize severity of accident involvement as measured by item 56 (property damage) for modules 1, 2, 4, 8, 10-12; and Tables 66 through 72 will summarize severity of accident involvement as measured by the combination of items 40, 43 and 56 for modules 1, 2, 4, 8, 10-12.

Personal Injury by Module

In Table 45 a summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on module 1 (Controls test) is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 of 0.02014 was obtained which was not significant.

Table 45

Personal Injury by Module 1

(CROSSTABULATION OF ITEM40 BY ITEM12)

ITEM40	COUNT / ROW PCT / COL PCT / TOT PCT	ITEM12 1	ITEM12 2	ROW TOTAL
1		115	39	154
		74.7	25.3	94.5
		95.0	92.9	
		70.6	23.9	
2		6	3	9
		66.7	33.3	5.5
		5.0	7.1	
		3.7	1.8	
COLUMN TOTAL		121	42	163
		74.2	25.8	100.0

CORRECTED CHI SQUARE = 0.02014 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8872

NUMBER OF MISSING OBSERVATIONS = 278

A summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on module 2 (HTS test) is presented in Table 46. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.02863 was obtained which was not significant.

Table 46

Personal Injury by Module 2

(CROSSTABULATION OF ITEM 40BY ITEM 13)

		ITEM 13		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 40	1	132	22	154
		85.7	14.3	94.5
		95.0	91.7	
		81.0	13.5	
	2	7	2	9
		77.8	22.2	5.5
		5.0	8.3	
		4.3	1.2	
	COLUMN TOTAL	139	24	163
		85.3	14.7	100.0

CORRECTED CHI SQUARE = 0.02863 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8656

NUMBER OF MISSING OBSERVATIONS = 278

In Table 47 a summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on module 4 (Vehicle Capabilities test) is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.05309 was obtained which was not significant.

Table 47

Personal Injury Module 4

(CROSSTABULATION OF ITEM40 BY ITEM14)

		ITEM14		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 40	1	123	31	154
		79.9	20.1	94.5
		93.9	96.9	
		75.5	19.0	
	2	8	1	9
		88.9	11.1	5.5
		6.1	3.1	
		4.9	0.6	
	COLUMN TOTAL	131	32	163
		80.4	19.6	100.0

CORRECTED CHI SQUARE = 0.05309 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8178

NUMBER OF MISSING OBSERVATIONS = 278

In Table 48 a summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on module 8 (Identification test) is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00297 was obtained which was not significant.

Table 48

Personal Injury by Module 8

(CROSSTABULATION OF ITEM 40 BY ITEM 15)

ITEM 40	COUNT / ROW PCT / COL PCT / TOT PCT	ITEM 15 1	ITEM 15 2	ROW TOTAL
1		112	42	154
		72.7	27.3	94.5
		94.1	95.5	
		68.7	25.8	
2		7	2	9
		77.8	22.2	5.5
		5.9	4.5	
		4.3	1.2	
COLUMN TOTAL		119	44	163
		73.0	27.0	100.0

CORRECTED CHI SQUARE = 0.00297 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9565

NUMBER OF MISSING OBSERVATIONS = 278

A summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on module 10 (Evaluation test) is presented in Table 49. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.17107 was obtained which was not significant.

Table 49

Personal Injury by Module 10

(CROSSTABULATION OF ITEM 40 BY ITEM 16)

		ITEM 16		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 40	1	136	18	154
		88.3	11.7	94.5
		95.1	90.0	
		83.4	11.0	
	2	7	2	9
		77.8	22.2	5.5
		4.9	10.0	
		4.3	1.2	
	COLUMN TOTAL	143	20	163
		87.7	12.3	100.0

CORRECTED CHI SQUARE = 0.17107 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.6792

NUMBER OF MISSING OBSERVATIONS = 278

In Table 50 a summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on module 11 (Plan of Action test) is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 3.55796 was obtained which was not significant.

Table 50

Personal Injury by Module 11

(CROSSTABULATION OF ITEM 40 BY ITEM 17)

		ITEM 17		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 40	1	120	34	154
		77.9	22.1	94.5
		96.8	87.2	
		73.6	20.9	
	2	4	5	9
		44.4	55.6	5.5
		3.2	12.8	
		2.5	3.1	
	COLUMN TOTAL	124	39	163
		76.1	23.9	100.0

CORRECTED CHI SQUARE = 3.55796 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.0593

NUMBER OF MISSING OBSERVATIONS = 278

A summary of the analysis of severity of accident involvement as measured by item 40 between students scoring 70%+ and students scoring 69%- on the On-Road Situation test is presented in Table 51. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00555 was obtained which was not significant.

Table 51

Personal Injury by Module 12

(CROSSTABULATION OF ITEM 40 BY ITEM 18)

ITEM 40	ITEM 18 1	ITEM 18 2	ROW TOTAL
1	144	10	154
ROW PCT	93.5	6.5	94.5
COL PCT	94.1	100.0	
TOT PCT	88.3	6.1	
2	9	0	9
ROW PCT	100.0	0.0	5.5
COL PCT	5.9	0.0	
TOT PCT	5.5	0.0	
COLUMN TOTAL	153	10	163
	93.9	6.1	100.0

CORRECTED CHI SQUARE = 0.00555 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9406

NUMBER OF MISSING OBSERVATIONS = 278

On the basis of information summarized in Tables 45 through 51 performance on the module tests had no significant effect on extent of personal injury as measured by item 40.

Use of Active Restraints by Modules

In Table 52 a summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the Controls test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.01922 was obtained which was not significant.

Table 52

Active Restraints by Module 1

(CROSSTABULATION OF ITEM43 BY ITEM12)

ITEM 43 \ ITEM 12	1	2	ROW TOTAL
1	38	13	51
	74.5	25.5	31.3
	31.4	31.0	
	23.3	8.0	
2	83	29	112
	74.1	25.9	68.7
	68.6	69.0	
	50.9	17.8	
COLUMN TOTAL	121	42	163
	74.2	25.8	100.0

CORRECTED CHI SQUARE = 0.01922 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8897

NUMBER OF MISSING OBSERVATIONS = 278

A summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the HTS test is presented in Table 53. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00002 was obtained which was not significant.

Table 53

Active Restraints by Module 2

(CROSSTABULATION OF ITEM 43 BY ITEM 13)

ITEM 43 \ ITEM 13	1	2	ROW TOTAL
1	44	7	51
	86.3	13.7	31.3
	31.7	29.2	
	27.0	4.3	
2	95	17	112
	84.8	15.2	68.7
	68.3	70.8	
	58.3	10.4	
COLUMN TOTAL	139	24	163
	85.3	14.7	100.0

CORRECTED CHI SQUARE = 0.00002 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9965

NUMBER OF MISSING OBSERVATIONS = 278

In Table 54 a summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the Vehicle Capabilities test is presented. x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.14934 was obtained which was not significant.

Table 54

Active Restraints by Module 4

(CROSSTABULATION OF ITEM 43 BY ITEM 14)

		ITEM 14		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM43	1	43	8	51
		84.3	15.7	31.3
		32.3	26.7	
		26.4	4.9	
	2	90	22	112
		80.4	19.6	68.7
		67.7	73.3	
		55.2	13.5	
	COLUMN TOTAL	133	30	163
		81.6	18.4	100.0

CORRECTED CHI SQUARE = 0.14934 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.6992

NUMBER OF MISSING OBSERVATIONS = 278

A summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the Identification test is presented in Table 55. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.27549 was obtained which was not significant.

Table 55

Active Restraints by Module 8

(CROSSTABULATION OF ITEM 43 BY ITEM 15)

		ITEM 15		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 43	1	36	15	51
		70.6	29.4	31.3
		29.8	35.7	
		22.1	9.2	
	2	85	27	112
		75.9	24.1	68.7
		70.2	64.3	
		52.1	16.6	
	COLUMN TOTAL	121	42	163
		74.2	25.8	100.0

CORRECTED CHI SQUARE = 0.27549 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.5997

NUMBER OF MISSING OBSERVATIONS = 278

A summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the Evaluation test is presented in Table 56. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.05482 was obtained which was not significant.

Table 56

Active Restraints by Module 10

(CROSSTABULATION OF ITEM 43 BY ITEM 16)

		ITEM 16		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 43	1	45	6	51
		88.2	11.8	31.3
		31.3	31.6	
		27.6	3.7	
	2	99	13	112
		88.4	11.6	68.7
		68.8	68.4	
		60.7	8.0	
	COLUMN TOTAL	144	19	163
		88.3	11.7	100.0

CORRECTED CHI SQUARE = 0.05482 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8149

NUMBER OF MISSING OBSERVATIONS = 278

In Table 57 a summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the Plan of Action test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 1.08769 was obtained which was not significant.

Table 57

Active Restraints by Module 11

(CROSSTABULATION OF ITEM43 BY ITEM17)

ITEM 43	ITEM 17 1	ITEM 17 2	ROW TOTAL
1	36	15	51
	70.6	29.4	31.3
	28.8	39.5	
	22.1	9.2	
2	89	23	112
	79.5	20.5	68.7
	71.2	60.5	
	54.6	14.1	
COLUMN TOTAL	125	38	163
	76.7	23.3	100.0

CORRECTED CHI SQUARE = 1.08769 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.2970

NUMBER OF MISSING OBSERVATIONS = 278

In Table 58 a summary of the analysis of severity of accident involvement as measured by item 43 between students scoring 70%+ and students scoring 69%- on the On-Road Situation test is presented. A x^2 value of 3.841 was needed for significance at the .05 level. A x^2 value of 0.19595 was obtained which was not significant.

Table 58

Active Restraints by Module 12

(CROSSTABULATION OF ITEM43 BY ITEM18)

		ITEM 18		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 43	1	49	2	51
		96.1	3.9	31.3
		32.0	20.0	
		30.1	1.2	
	2	104	8	112
		92.9	7.1	68.7
		68.0	80.0	
		63.8	4.9	
	COLUMN TOTAL	153	10	163
		93.9	6.1	100.0

CORRECTED CHI SQUARE = 0.19595 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.6580

NUMBER OF MISSING OBSERVATIONS = 278

Based on the information summarized in Tables 52 through 58 performance on module tests had no significant affect on use of active restraint systems as measured by item 43.

Property Damage by Modules

In Table 59 a summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the Controls test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.37842 was obtained which was not significant.

Table 59

Property Damage by Module 1

(CROSSTABULATION OF ITEM 56 BY ITEM 12)

		ITEM 12		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	88	29	117
		75.2	24.8	80.1
		78.6	85.3	
		60.3	19.9	
	2	24	5	29
		82.8	17.2	19.9
		21.4	14.7	
		16.4	3.4	
	COLUMN TOTAL	112	34	146
		76.7	23.3	100.0

CORRECTED CHI SQUARE = 0.37842 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.5385

NUMBER OF MISSING OBSERVATIONS = 295

In Table 60 a summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the HTS test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.08130 was obtained which was not significant.

Table 60

Property Damage by Module 2

(CROSSTABULATION OF ITEM 56 BY ITEM 13)

		ITEM 13		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	100	17	117
		85.5	14.5	80.1
		79.4	85.0	
		68.5	11.6	
	2	26	3	29
		89.7	10.3	19.9
		20.6	15.0	
		17.8	2.1	
	COLUMN TOTAL	126	20	146
		86.3	13.7	100.0

CORRECTED CHI SQUARE = 0.08130 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.7755

NUMBER OF MISSING OBSERVATIONS = 295

In Table 61 a summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the Vehicle Capabilities test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.99082 was obtained which was not significant.

Table 61

Property Damage by Module 4

(CROSSTABULATION OF ITEM 56 BY ITEM 14)

		ITEM 14		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	93	24	117
		79.5	20.5	80.1
		78.2	88.9	
		63.7	16.4	
	2	26	3	29
		89.7	10.3	19.9
		21.8	11.1	
		17.8	2.1	
	COLUMN TOTAL	119	27	146
		81.5	18.5	100.0

CORRECTED CHI SQUARE = 0.99082 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.3195

NUMBER OF MISSING OBSERVATIONS = 295

A summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the Identification test is presented in Table 62. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.02826 was obtained which was not significant.

Table 62

Property Damage by Module 8

(CROSSTABULATION OF ITEM56 BY ITEM15)

		ITEM 15		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	88	29	117
		75.2	24.8	80.1
		80.0	80.6	
		60.3	19.9	
	2	22	7	29
		75.9	24.1	19.9
		20.0	19.4	
		15.1	4.8	
	COLUMN TOTAL	110	36	146
		75.3	24.7	100.0

CORRECTED CHI SQUARE = 0.02826 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8665

NUMBER OF MISSING OBSERVATIONS = 295

In Table 63 a summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the Evaluation test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.03914 was obtained which was not significant.

Table 63

Property Damage by Module 10

(CROSSTABULATION OF ITEM56 BY ITEM16)

		ITEM 16		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	106	11	117
		90.6	9.4	80.1
		80.3	78.6	
		72.6	7.5	
	2	26	3	29
		89.7	10.3	19.9
		19.7	21.4	
		17.8	2.1	
	COLUMN TOTAL	132	14	146
		90.4	9.6	100.0

CORRECTED CHI SQUARE = 0.03914 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8432

NUMBER OF MISSING OBSERVATIONS = 295

In Table 64 a summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the Plan of Action test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 1.81702 was obtained which was not significant.

Table 64

Property Damage by Module 11

(CROSSTABULATION OF ITEM 56 BY ITEM 17)

		ITEM 17		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	93	24	117
		79.5	20.5	80.1
		83.0	70.6	
		63.7	16.4	
	2	19	10	29
		65.5	34.5	19.9
		17.0	29.4	
		13.0	6.8	
	COLUMN TOTAL	112	34	146
		76.7	23.3	100.0

CORRECTED CHI SQUARE = 1.81702 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.1777

NUMBER OF MISSING OBSERVATIONS = 295

A summary of the analysis of severity of accident involvement as measured by item 56 between students scoring 70%+ and students scoring 69%- on the On-Road Situation test is presented in Table 65. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.74738 was obtained which was not significant.

Table 65

Property Damage by Module 12

(CROSSTABULATION OF ITEM 56 BY ITEM 18)

		ITEM 18		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
ITEM 56	1	110	7	117
		94.0	6.0	80.1
		79.1	100.0	
		75.3	4.8	
	2	29	0	29
		100.0	0.0	19.9
		20.9	0.0	
		19.9	0.0	
	COLUMN TOTAL	139	7	146
		95.2	4.8	100.0

CORRECTED CHI SQUARE = 0.74738 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.3873

NUMBER OF MISSING OBSERVATIONS = 295

Based on the information summarized in Tables 59 through 65 performance on module tests had no significant effect on extent of property damage as measured by item 56.

Severity by Modules

A summary of the analysis of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the Controls test is presented in Table 66. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.03377 was obtained which was not significant.

Table 66

Severity by Module 1

(CROSSTABULATION OF SEVERITY BY ITEM12)

		ITEM 12		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEVERITY	1	32	14	46
		69.6	30.4	34.3
		33.3	36.8	
		23.9	10.4	
	2	64	24	88
		72.7	27.3	65.7
		66.7	63.2	
		47.8	17.9	
	COLUMN TOTAL	96	38	134
		71.6	28.4	100.0

CORRECTED CHI SQUARE = 0.03377 WITH 1
DEGREE OF FREEDOM. SIGNIFICANCE = 0.8542

NUMBER OF MISSING OBSERVATIONS = 307

In Table 67 a summary of the analysis of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the HTS test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00066 was obtained which was not significant.

Table 67

Severity by Module 2

(CROSSTABULATION OF SEVERITY BY ITEM13)

		ITEM 13		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEVERITY	1	38	8	46
		82.6	17.4	34.3
		33.9	36.4	
		28.4	6.0	
	2	74	14	88
		84.1	15.9	65.7
		66.1	63.6	
		55.2	10.4	
	COLUMN TOTAL	112	22	134
		83.6	16.4	100.0

CORRECTED CHI SQUARE = 0.00066 WITH 1
DEGREE OF FREEDOM. SIGNIFICANCE = 0.9795

NUMBER OF MISSING OBSERVATIONS = 307

In Table 68 a summary of the analysis of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the Vehicle Capabilities test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.04045 was obtained which was not significant.

Table 68

Severity by Module 4

(CROSSTABULATION OF SEVERITY BY ITEM[14])

		ITEM 14		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEVERITY	1	37	9	46
		80.4	19.6	34.3
		35.2	31.0	
		27.6	6.7	
	2	68	20	88
		77.3	22.7	65.7
		64.8	69.0	
		50.7	14.9	
	COLUMN TOTAL	105	29	134
		78.4	21.6	100.0

CORRECTED CHI SQUARE = 0.04045 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.8406

NUMBER OF MISSING OBSERVATIONS = 307

In Table 69 a summary of the analysis of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the Identification test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 1.39850 was obtained which was not significant.

Table 69

Severity by Module 8

(CROSSTABULATION OF SEVERITY BY ITEM15)

SEVERITY	ITEM 15 1	ITEM 15 2	ROW TOTAL
1	31	15	46
	67.4	32.6	34.3
	31.0	44.1	
	23.1	11.2	
2	69	19	88
	78.4	21.6	65.7
	69.0	55.9	
	51.5	14.2	
COLUMN TOTAL	100	34	134
	74.6	25.4	100.0

CORRECTED CHI SQUARE = 1.39850 WITH 1
DEGREE OF FREEDOM. SIGNIFICANCE = 0.2370

NUMBER OF MISSING OBSERVATIONS = 307

A summary of the analysis of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the Evaluation test is presented in Table 70. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 1.53340 was obtained which was not significant.

Table 70

Severity by Module 10

(CROSSTABULATION OF SEVERITY BY ITEM16)

SEVERITY	ITEM 16 1	ITEM 16 2	ROW TOTAL
1	37	9	46
	80.4	19.6	34.3
	31.9	50.0	
	27.6	6.7	
2	79	9	88
	89.8	10.2	65.7
	68.1	50.0	
	59.0	6.7	
COLUMN TOTAL	116	18	134
	86.6	13.4	100.0

CORRECTED CHI SQUARE = 1.53340 WITH 1
DEGREE OF FREEDOM. SIGNIFICANCE = 0.2156

NUMBER OF MISSING OBSERVATIONS = 307

In Table 71 a summary of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the Plan of Action test is presented. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.00374 was obtained which was not significant.

Table 71

Severity by Module 11

(CROSSTABULATION OF SEVERITY BY ITEM17)

		ITEM 17		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEVERITY	1	36	10	46
		78.3	21.7	34.3
		35.0	32.3	
		26.9	7.5	
	2	67	21	88
		76.1	23.9	65.7
		65.0	67.7	
		50.0	15.7	
	COLUMN TOTAL	103	31	134
		76.9	23.1	100.0

CORRECTED CHI SQUARE = 0.00374 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.9512

NUMBER OF MISSING OBSERVATIONS = 307

A summary of the analysis of severity of accident involvement as measured by a combination of items 40, 43 and 56 between students scoring 70%+ and students scoring 69%- on the On-Road Situation test is presented in Table 72. A x^2 value of 3.841 or greater was needed for significance at the .05 level. A x^2 value of 0.54590 was obtained which was not significant.

Table 72

Severity by Module 12

(CROSSTABULATION OF SEVERITY BY ITEM18)

		ITEM 18		
	COUNT / ROW PCT / COL PCT / TOT PCT	1	2	ROW TOTAL
SEVERITY	1	41	5	46
		89.1	10.9	34.3
		33.1	50.0	
		30.6	3.7	
	2	83	5	88
		94.3	5.7	65.7
		66.9	50.0	
		61.9	3.7	
	COLUMN TOTAL	124	10	134
		92.5	7.5	100.0

CORRECTED CHI SQUARE = 0.54590 WITH 1 DEGREE OF FREEDOM. SIGNIFICANCE = 0.4600

NUMBER OF MISSING OBSERVATIONS = 307

Based on the information summarized in Tables 66 through 72 performance on the module tests had no significant effect on the interaction of severity items 40, 43 and 56. On the basis of information summarized in Tables 45 through 72 the null hypothesis (HO_{14}) of no significant difference in severity of accident involvement between seniors scoring 70% or better on the DSPC module tests and seniors scoring less than 70% on the DSPC module tests was not rejected. No significant differences were found between personal injury, use of active restraints, property damage or a combination of these elements.

ANALYSIS OF TYPE OF ACCIDENT

Items 45 (location of accident), 46 (type of roadway), 47 (condition of road surface), 48 (time of day), 49 (objects involved), 50 (type of road conditions), 53 (avoidance procedures), and 55 (driver error) were selected to determine if the DSPC respondents experienced a different type of traffic collisions than TC respondents.

Tables 73 through 80 summarize the analysis of type of accident involvement by item between students successfully completing courses using the DSPC and students successfully completing courses using the TC.

Location of Accident

In Table 73 a summary of the analysis of type of accident involvement as measured by item 45 (location of accident) between DSPC students and TC students is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 9.62975 was obtained which was not significant.

Table 73

Location of Accident: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM 45)

SCHOOL	ITEM45	1	2	3	4	5	6	7	8	ROW TOTAL
1	COUNT	333	145	75	176	11	3	7	120	870
	ROW PCT	38.3	16.7	8.6	20.2	1.3	0.3	0.8	13.8	56.0
	COL PCT	59.7	58.2	52.8	54.5	52.4	42.9	63.6	49.4	
	TOT PCT	21.4	9.3	4.8	11.3	0.7	0.2	0.5	7.7	
2	COUNT	225	104	67	147	10	4	4	123	684
	ROW PCT	32.9	15.2	9.8	21.5	1.5	0.6	0.6	18.0	44.0
	COL PCT	40.3	41.8	47.2	45.5	47.6	57.1	36.4	50.6	
	TOT PCT	14.5	6.7	4.3	9.5	0.6	0.3	0.3	7.9	
COLUMN TOTAL		558	249	142	323	21	7	11	243	1554
		35.9	16.0	9.1	20.8	1.4	0.5	0.7	15.6	100.0

RAW CHI SQUARE = 9.62975 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.2105

NUMBER OF MISSING OBSERVATIONS = 2470

Type of Roadway

A summary of the analysis of type of accident involvement as measured by item 46 (type of roadway) between DSPC students and TC students is presented in Table 74. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 3.19320 was

obtained which was not significant.

Table 74

Type of Roadway: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM46)

SCHOOL	ITEM46	1	2	3	4	5	6	7	8	ROW TOTAL
1	COUNT	587	50	80	21	84	19	26	9	876
	ROW PCT	67.0	5.7	9.1	2.4	9.6	2.2	3.0	1.0	56.2
	COL PCT	55.6	59.5	58.4	58.3	56.0	50.0	56.5	75.0	
	TOT PCT	37.7	3.2	5.1	1.3	5.4	1.2	1.7	0.6	
2	COUNT	469	34	57	15	66	19	20	3	683
	ROW PCT	68.7	5.0	8.3	2.2	9.7	2.8	2.9	0.4	43.8
	COL PCT	44.4	40.5	41.6	41.7	44.0	50.0	43.5	25.0	
	TOT PCT	30.1	2.2	3.7	1.0	4.2	1.2	1.3	0.2	
COLUMN TOTAL		1056	84	137	36	150	38	46	12	1559
		67.7	5.4	8.8	2.3	9.6	2.4	3.0	0.8	100.0

RAW CHI SQUARE = 3.19320 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.8666

NUMBER OF MISSING OBSERVATIONS = 2465

Condition of Road Surface

In Table 75 a summary of the analysis of type of accident involvement as measured by item 47 (condition of road surface) between DSPC students and TC students is presented. A x^2 value of 11.070 or greater was needed for significance at the .05 level. A x^2 value of 2.77294 was obtained which was not significant.

Table 75

Condition of Road Surface: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM47)

SCHOOL	ITEM47 1	2	3	4	5	6	ROW TOTAL
1	491	160	63	101	2	68	885
	55.5	18.1	7.1	11.4	0.2	7.7	56.0
	55.6	56.5	61.8	52.6	66.7	58.7	
	31.1	10.1	4.0	6.4	0.1	3.4	
2	392	123	39	91	1	49	695
	56.4	17.7	5.6	13.1	0.1	7.1	44.0
	44.4	43.5	38.2	47.4	33.3	41.3	
	24.8	7.8	2.5	5.8	0.1	2.4	
COLUMN TOTAL	883	283	102	192	3	117	1580
	55.9	17.9	6.5	12.2	0.2	7.4	100.0

RAW CHI SQUARE = 2.77294 WITH 5 DEGREES OF FREEDOM. SIGNIFICANCE = 0.8368

NUMBER OF MISSING OBSERVATIONS = 2444

Time of Day

In Table 76 a summary of the analysis of type of accident involvement as measured by item 48 (time of day) between DSPC students and TC students is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 12.03876 was obtained which was not significant.

Table 76

Time of Day: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM 48)

SCHOOL	ITEM48 1	2	3	4	5	6	7	8	ROW TOTAL
1	119	139	255	135	134	80	21	1	884
	13.5	15.7	28.8	15.3	15.2	9.0	2.4	0.1	56.0
	58.9	58.9	60.0	51.5	53.4	49.1	60.0	25.0	
	7.5	8.8	16.2	8.6	8.5	5.1	1.3	0.1	
2	83	97	170	127	117	83	14	3	694
	12.0	14.0	24.5	18.3	16.9	12.0	2.0	0.4	44.0
	41.1	41.1	40.0	48.5	46.6	50.9	40.0	75.0	
	5.3	6.1	10.8	8.0	7.4	5.3	0.9	0.2	
COLUMN TOTAL	202	236	425	262	251	163	35	4	1578
	12.8	15.0	26.9	16.6	15.9	10.3	2.2	0.3	100.0

RAW CHI SQUARE = 12.03876 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0993

NUMBER OF MISSING OBSERVATIONS = 2446

Objects Involved

In Table 77 a summary of the analysis of type of accident involvement by item 49 (objects involved) between DSPC students and TC students is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 4.36410 was obtained which was not significant.

Table 77

Objects Involved: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM49)

SCHOOL	ITEM49 COUNT / ROW PCT / COL PCT / TOT PCT	1	2	3	4	5	6	7	8	ROW TOTAL
1		509	55	127	4	7	1	114	61	878
		58.0	6.3	14.5	0.5	0.8	0.1	13.0	6.9	55.9
		56.8	59.8	51.4	66.7	53.8	50.0	57.9	51.7	
		32.4	3.5	8.1	0.3	0.4	0.1	7.3	3.9	
2		387	37	120	2	6	1	83	57	693
		55.8	5.3	17.3	0.3	0.9	0.1	12.0	8.2	44.1
		43.2	40.2	48.6	33.3	46.2	50.0	42.1	48.3	
		24.6	2.4	7.6	0.1	0.4	0.1	5.3	3.6	
COLUMN TOTAL		896	92	247	6	13	2	197	118	1571
		57.0	5.9	15.7	0.4	0.8	0.1	12.5	7.5	100.0

RAW CHI SQUARE = 4.36410 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.7370

NUMBER OF MISSING OBSERVATIONS = 2453

Type of Road Conditions

In Table 78 a summary of the analysis of type of accident involvement as measured by item 50 (type of road conditions) between DSPC students and TC students is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 6.69516 was obtained which was not significant.

Table 78

Type of Road Conditions: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM50)

SCHOOL	ITEM50 1	2	3	4	5	6	7	8	ROW TOTAL
1	284	155	136	56	59	56	64	60	870
	32.6	17.8	15.6	6.4	6.8	6.4	7.4	6.9	55.9
	58.7	57.2	55.5	55.4	56.2	46.3	54.7	53.1	
	18.2	10.0	8.7	3.6	3.8	3.6	4.1	3.9	
2	200	116	109	45	46	65	53	53	687
	29.1	16.9	15.9	6.6	6.7	9.5	7.7	7.7	44.1
	41.3	42.8	44.5	44.6	43.8	53.7	45.3	46.9	
	12.8	7.5	7.0	2.9	3.0	4.2	3.4	3.4	
COLUMN TOTAL	484	271	245	101	105	121	117	113	1557
	31.1	17.4	15.7	6.5	6.7	7.8	7.5	7.3	100.0

RAW CHI SQUARE = 6.69516 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.4613

NUMBER OF MISSING OBSERVATIONS = 2467

Avoidance Procedures

In Table 79 a summary of the analysis of type of accident involvement as measured by item 53 (avoidance procedures) between DSPC students and TC students is presented. A x^2 value of 11.070 or greater was needed for significance at the .05 level. A x^2 value of 1.66595 was obtained which was not significant.

Table 79

Avoidance Procedure: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM53)

SCHOOL	ITEM53 1	2	3	4	5	6	ROW TOTAL
1	226	60	105	225	56	177	849
	26.6	7.1	12.4	26.5	6.6	20.8	55.9
	55.0	53.1	58.0	56.4	54.9	57.0	
	14.9	4.0	6.9	14.8	3.7	11.6	
2	185	53	76	174	46	135	669
	27.7	7.9	11.4	26.0	6.9	20.2	44.1
	45.0	46.9	42.0	43.6	45.1	43.0	
	12.2	3.5	5.0	11.5	3.0	8.8	
COLUMN TOTAL	411	113	181	399	102	312	1518
	27.1	7.4	11.9	26.3	6.7	20.6	100.0

RAW CHI SQUARE = 1.66595 WITH 5 DEGREES OF FREEDOM. SIGNIFICANCE = 0.9477

NUMBER OF MISSING OBSERVATIONS = 2506

Driver Error

In Table 80 a summary of the analysis of type of accident involvement as measured by item 53 (driver error) between DSPC students and TC students is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 15.13489 was obtained which was significant at the .05 level.

Table 80

Driver Error: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM55)

SCHOOL	ITEM55	1	2	3	4	5	6	7	8	ROW TOTAL
1	COUNT	307	147	62	40	20	6	123	132	837
	ROW PCT	36.7	17.6	7.4	4.8	2.4	0.7	14.7	15.8	55.8
	COL PCT	53.6	63.9	56.9	63.5	55.6	37.5	49.8	58.1	
	TOT PCT	20.5	9.8	4.1	2.7	1.3	0.4	8.2	8.8	
2	COUNT	266	83	47	23	16	10	124	95	664
	ROW PCT	40.1	12.5	7.1	3.5	2.4	1.5	18.7	14.3	44.2
	COL PCT	46.4	36.1	43.1	36.5	44.4	62.5	50.2	41.9	
	TOT PCT	17.7	5.5	3.1	1.5	1.1	0.7	8.3	6.3	
COLUMN TOTAL		573	230	109	63	36	16	247	227	1501
		38.2	15.3	7.3	4.2	2.4	1.1	16.5	15.1	100.0

RAW CHI SQUARE = 15.13489 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.0343

NUMBER OF MISSING OBSERVATIONS = 2523

On the basis of information summarized in Tables 73 through 79 there was no significant difference between the DSPC students and TC students in type of accident involvement as measured by location of accident, type of roadway, condition of road surface, time of day, objects involved, type of road conditions and avoidance procedures. On the basis of information summarized in Table 80 there was a significant difference between the DSPC students and the TC students with regard to driver error. Based on information summarized in Table 80 the null hypothesis (HO_{15}) of no significant difference in type of

accident involvement based on location of accident, type of roadway, condition of road surface, time of day, objects involved, type of road conditions, avoidance procedures and driver errors made between seniors successfully completing driver education courses using the DSPC and seniors successfully completing driver education courses using the TC was rejected.

DRIVING EXPERIENCE

Tables 81 through 86 summarize the analysis of driving experience between students successfully completing driver education courses using the DSPC and students successfully completing driver education courses using the TC.

In Table 81 a summary of the analysis of driving experience as measured by item 23 (time between completing driver education and receiving a driver's license) between students successfully completing courses using the DSPC and students successfully completing courses using the TC is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 7.66214 was obtained which was not significant. Based on the information summarized in Table 81 there was no significant difference between groups based on time between completing driver education and receiving a driver's license.

Table 81

Time Between Completing Driver Education and Receiving a Driver's License: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM23)

SCHOOL	ITEM23 1	2	3	4	5	6	7	8	ROW TOTAL
1	1656	250	87	23	12	12	7	7	2054
	80.6	12.2	4.2	1.1	0.6	0.6	0.3	0.3	52.0
	51.5	56.3	50.3	53.5	66.7	57.1	41.2	38.9	
	41.9	6.3	2.2	0.6	0.3	0.3	0.2	0.2	
2	1559	194	86	20	6	9	10	11	1895
	82.3	10.2	4.5	1.1	0.3	0.5	0.5	0.6	48.0
	48.5	43.7	49.7	46.5	33.3	42.9	58.8	61.1	
	39.5	4.9	2.2	0.5	0.2	0.2	0.3	0.3	
COLUMN TOTAL	3215	444	173	43	18	21	17	18	3949
	81.4	11.2	4.4	1.1	0.5	0.5	0.4	0.5	100.0

RAW CHI SQUARE = 7.66214 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.3633

NUMBER OF MISSING OBSERVATIONS = 75

In Table 82 a summary of the analysis of driving experience as measured by item 24 (length of time licensed to drive) between students successfully completing courses using the DSPC and students successfully completing courses using the TC is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 2.31238 was obtained which was not significant. On the basis of the information summarized in Table 82 there was no significant difference between groups based on length of time licensed to drive.

Table 82

Length of Time Licensed to Drive: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM24)

SCHOOL	ITEM24 1	2	3	4	5	6	7	8	ROW TOTAL
1	78	181	439	790	464	82	21	8	2063
	3.8	8.8	21.3	38.3	22.5	4.0	1.0	0.4	52.0
	52.0	52.6	50.7	53.1	51.6	48.8	53.8	57.1	
	2.0	4.6	11.1	19.9	11.7	2.1	0.5	0.2	
2	72	163	427	698	436	86	18	6	1906
	3.8	8.6	22.4	36.6	22.9	4.5	0.9	0.3	48.0
	48.0	47.4	49.3	46.9	48.4	51.2	46.2	42.9	
	1.8	4.1	10.8	17.6	11.0	2.2	0.5	0.2	
COLUMN TOTAL	150	344	866	1488	900	168	39	14	3969
	3.8	8.7	21.8	37.5	22.7	4.2	1.0	0.4	100.0

RAW CHI SQUARE = 2.31238 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.9406

NUMBER OF MISSING OBSERVATIONS = 55

In Table 83 a summary of the analysis of driving experience as measured by item 28 (age at time of licensing) between students successfully completing courses using the DSPC and students successfully completing courses using the TC is presented. A x^2 value of 11.070 or greater was needed for significance at the .05 level. A x^2 value of 7.49622 was obtained which was not significant. Based on the above findings there was no significant difference between groups based on age at time of licensing.

Table 83

Age at Time of Licensing: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM28)

SCHOOL	ITEM28 1	2	3	4	5	6	ROW TOTAL
1	1499	390	118	30	27	8	2072
	72.3	18.8	5.7	1.4	1.3	0.3	52.1
	53.4	48.8	50.0	50.0	45.0	50.0	
	37.7	9.8	3.0	0.8	0.7	0.2	
2	1309	409	118	30	33	9	1908
	68.6	21.4	6.2	1.6	1.7	0.5	47.9
	46.6	51.2	50.0	50.0	55.0	50.0	
	32.9	10.3	3.0	0.8	0.8	0.2	
COLUMN TOTAL	2808	799	236	60	60	17	3980
	70.6	20.1	5.9	1.5	1.5	0.4	100.0

RAW CHI SQUARE = 7.49622 WITH 5 DEGREES OF FREEDOM. SIGNIFICANCE = 0.2774

NUMBER OF MISSING OBSERVATIONS = 44

In Table 84 a summary of the analysis of driving experience as measured by item 33 (amount of time spent driving during an average week) between students successfully completing courses using the DSPC and students successfully completing courses using the TC is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 4.06384 was obtained which was not significant. On the basis of information summarized in Table 84 there was no

significant difference between groups based on amount of time spent driving during an average week.

Table 84

Time Spent Driving During Average Week: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM33)

SCHOOL	ITEM33 1	2	3	4	5	6	7	8	ROW TOTAL
1	356	548	407	297	203	118	76	63	2068
	17.2	26.5	19.7	14.4	9.8	5.7	3.7	3.0	52.0
	51.0	51.4	50.9	54.7	53.3	49.6	54.7	55.3	
	8.9	13.8	10 2	7.5	5.1	3.0	1.9	1.6	
2	342	518	392	246	178	120	63	51	1910
	17.9	27.1	20.5	12.9	9.3	6.3	3.3	2.7	48.0
	49.0	48.6	49.1	45.3	46.7	50.4	45.3	44.7	
	8.6	13.0	9.9	6.2	4.5	3.0	1.6	1.3	
COLUMN TOTAL	698	1066	799	543	381	238	139	114	3978
	17.5	26.8	20.1	13.7	9.6	6.0	3.5	2.9	100.0

RAW CHI SQUARE = 4.06384 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.7724

NUMBER OF MISSING OBSERVATIONS = 46

In Table 85 a summary of the analysis of driving experience as measured by item 34 (average miles driver per month) between students successfully completing courses using the DSPC and students successfully completing courses using the TC is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 7.21395 was obtained which was not significant. Based on the findings summarized in Table 85 there was no significant difference between groups based on average miles driver per month.

Table 85

Miles Driven Per Month: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM34)

SCHOOL	COUNT / ROW PCT / COL PCT / TOT PCT	ITEM34 1	2	3	4	5	6	7	8	ROW TOTAL
1		263	362	258	271	213	190	257	232	2046
	ROW PCT	12.9	17.7	12.6	13.2	10.4	9.3	12.6	11.3	51.8
	COL PCT	52.6	52.2	51.8	51.4	54.3	48.5	55.2	48.4	
	TOT PCT	6.7	9.2	6.5	6.9	5.4	4.8	6.5	5.9	
2		237	332	240	256	179	202	209	247	1902
	ROW PCT	12.5	17.5	12.6	13.5	9.4	10.6	11.0	13.0	48.2
	COL PCT	47.4	47.8	48.2	48.6	45.7	51.5	44.8	51.6	
	TOT PCT	6.0	8.4	6.1	6.5	4.5	5.1	5.3	6.3	
COLUMN TOTAL		500	694	498	527	392	392	466	479	3948
		12.7	17.6	12.6	13.3	9.9	9.9	11.8	12.1	100.0

RAW CHI SQUARE = 7.21395 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.4070

NUMBER OF MISSING OBSERVATIONS = 76

In Table 86 a summary of the analysis of driving experience as measured by item 35 (number of miles driven in last 12 months) between subjects successfully completing courses using the DSPC and students successfully completing courses using the TC is presented. A x^2 value of 14.067 or greater was needed for significance at the .05 level. A x^2 value of 8.69939 was obtained which was not significant. On the basis of information summarized in Table 86 there was no significant difference between groups based on number of miles driven during the last twelve months.

Table 86

Number of Miles Driven Last 12 Months: Control Group vs. Experimental Group

(CROSSTABULATION OF SCHOOL BY ITEM35)

SCHOOL	ITEM35 1	2	3	4	5	6	7	8	ROW TOTAL
1	413	336	265	226	180	177	120	303	2020
	20.4	16.6	13.1	11.2	8.9	8.8	5.9	15.0	51.8
	51.6	49.1	48.4	53.1	54.7	53.5	51.9	55.1	
	10.6	8.6	6.8	5.8	4.6	4.5	3.1	7.8	
2	388	349	282	200	149	154	111	247	1880
	20.6	18.6	15.0	10.6	7.9	8.2	5.9	13.1	48.2
	48.4	50.9	51.6	46.9	45.3	46.5	48.1	44.9	
	9.9	8.9	7.2	5.1	3.8	3.9	2.8	6.3	
COLUMN TOTAL	801	685	547	426	329	331	231	550	3900
	20.5	17.6	14.0	10.9	8.4	8.5	5.9	14.1	100.0

RAW CHI SQUARE = 8.69939 WITH 7 DEGREES OF FREEDOM. SIGNIFICANCE = 0.2750

NUMBER OF MISSING OBSERVATIONS = 124

Based on information summarized in Tables 81 through 86 there was no significant difference between the DSPC students and the TC students with regard to driving experience as measured by:

1. time between completing driver education and receiving a driver's license,
2. length of time licensed to drive,
3. age at time of licensing,
4. amount of time spent driving during an average week,
5. average miles driven per month, and
6. number of miles driven during the last twelve months.

SUMMARY

Statistical analysis of the data revealed:

1. There was a significant difference in accident involvement between students in the experimental group (DSPC) and students in the control group (TC) at the .05 level of significance (t = 3.84). Students in the experimental group had significantly fewer accidents than students in the control group.

2. There was a significant difference in severity of accident involvement between students in the experimental group and students in the control group with regard to use of active restraints at the .05 level of significance ($x^2 = 7.67822$). Students in the experimental group involved in accidents wore restraint systems significantly more often than students in the control group. There was no significant difference between groups with regard to extent of personal injury, amount of property damage and/or a combination of personal injury, use of restraints and property damage.

3. There was a significant difference in accident involvement between female students in the experimental group and female students in the control group at the .05 level of significance ($t = 2.33$). Students in the experimental group had significantly fewer accidents than students in the control group.

4. There was no significant difference in severity of accident involvement between female students in the experimental group and female students in the control group with regard to extent of personal injury sustained, use of active restraint systems, amount of property damage and/or a combination of these factors.

5. There was a significant difference in accident involvement between male students in the experimental group and male students in the control group at the .05 level of significance ($t = 3.09$). Male students in the experimental group had significantly fewer accidents than male students in the control group.

6. There was a significant difference in severity of accident involvement between male students in the experimental group and male students

in the control group with regard to use of active restraints at the .05 level of significance (x^2 = 7.20283). Male students in the experimental group involved in accidents wore restraint systems significantly more often than male students in the control group. There was no significant difference between groups with regard to extent of personal injury, amount of property damage and/or a combination of personal injury, use of restraints and property damage.

7. There was a significant difference in accident involvement between male students (experimental and control groups) and female students (experimental and control groups) at the .05 level of significance (t = 8.29). Female students had significantly fewer accidents than male students.

8. There was a significant difference in severity of accident involvement between male students (experimental and control groups) and female students (experimental and control groups) with regard to property damage at the .05 level of significance (x^2 = 9.83915). Female students involved in accidents had significantly less property damage done than male students involved in accidents. There was no significant difference between male and female students with regard to extent of personal injury, use of restraints and/or a combination of personal injury, use of restraints and property damage.

9. There was a significant difference in accident involvement between the various types of driver education programs (2-phase, 3-phase range, 3-phase simulation and 4-phase), experimental and control groups combined. Specifically: a) students involved in 3-phase simulation programs had significantly fewer accidents at the .05 level of significance (t = 5.46) than students involved in 2-phase programs and b)

students involved in 3-phase simulation programs had significantly fewer accidents at the .05 level of significance (t = -2.31) than students involved in 4-phase programs. There was no significant difference between students involved in 2-phase programs compared with students in 3-phase range programs, students involved in 2-phase programs compared with students in 4-phase programs or students in 3-phase range programs compared with students involved in 3-phase simulation or 4-phase programs.

10. There was no significant difference between the various types of driver education programs with regard to severity of accident involvement as measured by extent of personal injury, use of active restraint systems, amount of property damage and/or a combination of the three.

11. There was a significant difference in accident involvement between students (experimental and control) based on the types of community. Specifically: a) students living in urban communities had significantly more accidents at the .05 level of significance (t = 2.87) than students living in suburban communities; b) students living in urban communities had significantly fewer accidents at the .05 level of significance (t = -3.22) than students living in rural communities; and c) students living in suburban communities had significantly fewer accidents at the .05 level of significance (t = -6.20) than students living in rural communities.

12. There was a significant difference in severity of accident involvement with regard to use of active restraint systems between the various types of communities at the .05 level of significance (x^2 = 8.49806). Students living in urban and suburban communities involved in accidents wore restraint systems more often than students living in rural communities. There was no significant difference between students living in

various types of communities with regard to extent of personal injury, property damage and/or a combination of personal injury, use of restraint systems and property damage.

13. There was a significant difference in accident involvement between students scoring 70%+ (experimental group) and students scoring 69%- (experimental group) on the On-Road Situation test at the .05 level of significance ($t = 2.41$). There was no significant difference in accident involvement between students scoring 70%+ and students scoring 69%- on module tests 1 - Controls, 2 - HTS, 4 - Vehicle Capabilities, 8 - Identification, 10 - Evaluation and 11 - Plan of Action.

14. There was no significant difference in severity of accident involvement between students scoring 70%+ and students scoring 69%- on any of the module tests with regard to extent of personal injury, use of active restraint systems, amount of property damage and/or a combination of the three.

15. There was a significant difference in type of accident involvement between students in the experimental group and students in the control group with regard to "driver error made" at the .05 level of significance ($x^2 = 15.13489$). There was no significant difference in type of accident involvement between students in the experimental group and students in the control group with regard to a) location of accident, b) type of roadway, c) conditions of roadway, d) time of day, e) type of road conditions and f) avoidance procedures made.

16. There was no significant difference in driving experience between students in the experimental group and students in the control group with regard to a) time between completing driver education and receiving a driver's license, b) length of time licensed to drive, c) age at time

of licensing, d) amount of time spent driving during an average week, e) average miles driven per month or f) number of miles driven during the last twelve months.

A summary of the findings of this study is presented in Figure 2.

FIGURE 2

PICTORIAL ANALYSIS of RESULTS

Null Hypothesis	Statistical Test	Calculated Value of Significance	Critical Value* of Test Statistic	Decision
HO_1	t	±1.960	3.84	Reject
HO_2	X^2	3.841	7.678**	Reject
HO_3	t	±1.960	2.33	Reject
HO_4	X^2	3.841	1.095***	Fail to Reject
HO_5	t	±1.960	3.09	Reject
HO_6	X^2	3.841	7.203**	Reject
HO_7	t	±1.960	8.29	Reject
HO_8	X^2	3.841	9.839**	Reject
HO_9	t	±1.960	5.46**	Reject
HO_{10}	X^2	7.815	5.504***	Fail to Reject
HO_{11}	t	±1.960	-6.20**	Reject
HO_{12}	X^2	5.199	8.498**	Reject
HO_{13}	t	±1.960	2.42**	Reject
HO_{14}	X^2	3.841	0.546***	Fail to Reject
HO_{15}	X^2	14.067	15.135**	Reject

*ALPHA LEVEL = .05 Was used to determine the critical value of each hypothesis.
**Several checks were conducted of which one or more were significant at the .05 level.
***Several checks were conducted of which none were significant at the .05 level.

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

Chapter 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND DISCUSSION

SUMMARY

The central purpose of this study was to examine the relationship between a specific driver performance curriculum and motor vehicle accident involvement among novice drivers.

A secondary purpose of the study was to examine the feasibility of using a self-reporting accident survey as a measure of driver performance.

A review of the literature indicated that: (1) there were numerous studies conducted in an attempt to evaluate driver education as an effective accident countermeasure; (2) the quality of research in most of the studies was inadequate; (3) the most common variable for program evaluation was accident involvement; (4) the most common criterion used to evaluate accident involvement was official driving records; (5) official driving records were a poor criterion for program improvement and evaluation and (6) self-reporting accident surveys represented a viable alternative to use of official accident records.

The Illinois Demonstration-Satellite Performance Curriculum (DSPC) was developed as part of a four year curriculum development project funded by the Illinois Department of Transportation and sponsored by the Illinois Office of Education.

The goal of the project was twofold: to provide assistance to public schools in Illinois in the implementation of the new state curriculum guide (Driver Education for Illinois Youth, 1972) and to provide the Illinois Office of Education with methods and data for evaluating the effectiveness of driver education programs in producing competent and responsible users of the highway transportation system. (27)

The demonstration-satellite schools selected to participate in the project were selected on the basis of their interest, staff qualifications and program organization.

The role of the demonstration-satellite schools was to implement the instructional materials into their individual programs, identify strengths and weaknesses of the materials, make recommendations for revision and assist in the collection of data for curriculum evaluation.

Due to a time lag between development, implementation and revision of the curriculum, the project came to an end before any statistical analysis could be done on those demonstration-satellite schools which utilized all thirteen modules. Of special significance to this study was the fact that of the fifty-seven schools involved in the project during the four year time span (1972-1976) only twelve schools during the 1975-76 school year were provided with the thirteen finalized modules identified as key modules to the project.

The sample population consisted of 4024 seniors drawn from twenty-four high schools in Illinois who graduated in the Spring of 1978 and who had successfully completed driver education during the 1975-76 school year within the school from which they graduated.

The twenty-four schools involved in the study consisted of twelve schools (experimental group) which was participated in the utilization of the Demonstration-Satellite Performance Curriculum (DSPC) during the 1975-76 school year and twelve schools (control group) which had not participated in the utilization of the DSPC during the 1975-76 school year.

The control group was matched to the experimental group based on the following criteria: (1) Type of program, (2) Educational make-up, (3) Insurance rating tables, (4) Enforcement Index and (5) City size and location. In addition, the control group schools had to have their course curriculum tied directly to the textbook used in that school, with no additional resources used to set program objectives and/or course objectives.

During the Spring of 1978 pre-graduation exercises, the students were asked to respond to the Driver Education Evaluation Survey. The data collected on the survey consisted of the students' responses to the best choice in three or more of the following five categories: (1) Suggestions for Improving Driver Education Courses, (2) Driving Experience, (3) Collision Experience, (4) Severity of Collision Experience and (5) Type of Crash. Students not involved in collisions would not respond to items in category 4 or 5.

The data collected from responses to the survey and tabulated on IBM data cards were analyzed using parametric and non-parametric statistical procedures. Specifically, a parametric t-test was performed on all items dealing with accident involvement and a non-parametric Chi-square test was used for all items dealing with severity of accident

involvement.

The analysis to be reported on was performed with the use of the Statistical Package for the Social Sciences.

The major findings of the study were:

1. Students exposed to the DSPC had significantly fewer accidents than students exposed to the TC. This difference was significant for both males and females.
2. There was no significant relationship between students exposed to the DSPC and students exposed to the TC with regard to severity of accident involvement, however, male students exposed to the DSPC wore active restrains more often than male students exposed to the TC.
3. Female students (experimental and control combined) had significantly fewer accidents than male students (experimental and control combined) and experienced significantly less property damage than male students.
4. Students exposed to 3-phase simulation had significantly fewer accidents than students exposed to 2-phase or 4-phase programs. No significant differences were found between 2-phase and 3-phase range, 2-phase and 4-phase, 3-phase range and 3-phase simulation, or 3-phase range and 4-phase programs. There was no relationship between severity of accident involvement and type of program.
5. Students living in suburban communities had significantly fewer accidents than students living in either urban or rural communities and students living in urban communities had significantly fewer accidents than students living in rural communities. There was no relationship between type of community and severity of accident involvement, however, students living in urban and suburban communities wore active restraints

more than students in rural communities.

6. There was no relationship between high (70%+) and low (69%-) scores on the knowledge tests and accident frequency or severity. Students scoring 70%+ on the On-Road Test, however, had significantly fewer accidents than students scoring 69%-.

7. There was a significant difference in type of accident involvement between students in the experimental group and students in the control group with regard to "driver error". There was no difference in type of accident involvement between groups with regard to a) location of accident, b) type of roadway, c) condition of roadway, d) time of day, e) type of road condition, or f) avoidance procedures made.

CONCLUSIONS

Conclusions based upon the stated purpose of the study, the conditions under which it was conducted and the results of the analysis of the data are as follows:

1. A curriculum can have a favorable influence on the probability of an individual being involved in an accident.
2. The type of community in which a person lives can influence his/her probability of being involved in an accident.
3. The type of program (2-phase, 3-phase range, 3-phase simulation, and 4-phase) can influence an individual's probability of being involved in an accident.
4. The DSPC had little influence on the severity of accident involvement for students exposed to it.
5. There is no relationship between high and low scores on a knowledge test and accident frequency or severity.

6. A self-reporting accident survey can provide reliable information for purposes of curriculum evaluation.

RECOMMENDATIONS

The following are recommendations based on the findings and onclusions of the study:

1. That the DSPC be implemented into those driver education programs not currently utilizing a performance based curriculum. Costs associated with the implementation of the DSPC would entail a teacher inservice workshop and duplication of curriculum materials provided by Illinois. These costs would only be slightly higher than those incurred when changing a course text book.
2. That a minimum level of performance be identified for each of the key modules of instruction.
3. That a modified form of the Driver Education Survey be adopted for use in curriculum improvement and program evaluation.

RECOMMENDATIONS FOR FURTHER RESEARCH

On the basis of the data from this study, the following are recommendations for further research:

1. A study should be done comparing students exposed to a performance based driver education curriculum with students exposed to a non-performance based curriculum and students not exposed to driver education.

2. A replication of this study using an evenly distributed sample size of 2-phase, 3-phase range, 3-phase simulation and 4-phase programs.
3. A replication of this study in a large school district where students could be randomly assigned to treatment groups within the same school.
4. A study should be done to identify and evaluate the severity of accident involvement measures.
5. A follow-up study to determine if students exposed to the DSPC continue to experience a reduction in accident involvement over time.
6. A study to be done to evaluate factors influencing active restraint usage.
7. A study to be done to evaluate the feasibility of incorporating factors influencing active restraint usage into a viable curricular format.
8. A replication of this study using a modified survey tool designed to better evaluate severity of accident involvement. Modification of the survey tool should be such that more continuous type data could be obtained.
9. Additional research should be conducted to determine how the concept of "reducing the severity of an accident" can be incorporated into a performance based curriculum.
10. Additional research should be conducted to identify those components of the laboratory phase (behind-the-wheel, range, and simulation) that contribute to reduction in accident involvement and reduction in the severity of accident

involvement.

11. Additional research should be conducted to itdentify minimum levels of performance for each of the key units of the DSPC.

DISCUSSION

Driving takes place in the Highway Transportation System (HTS) which represents a highly complex system that can be broken down into three highly complex components: (1) Operators (users of the system), (2) Machines (vehicles operated within the system) and (3) Environment (the surroundings within which operators utilize machines). The fact that each of these components is complex and acts and interacts within each of the other components exemplifies the complexity of the HTS. The goal of the HTS is the safe, efficient, economical movement of people and goods from one place to another within the HTS. (27) (35) (42) (56)

It is reasonable to expect that as a system, such as the HTS, becomes more complex the chances of system breakdown (ultimate breakdown represented by accidents in the HTS) increase. Over the years a number of countermeasure programs have been instituted in each of the components in an effort to hold down the frequency of accidents. (19) (56) (59) (70)

Of special concern, to this study, was oneaccident countermeasure designed to reduce the impact of accidents on America's youth, that of driver education. (44) (70)

Driver education was instituted as a countermeasure in the early thirties. It was not until the late sixties however, that research was

conducted to evaluate the driving task, so that curriculums could be designed that would provide the youth of America with viable accident avoidance skills. (42) (52) (69) (70)

This study represented one of many studies conducted in an attempt to evaluate the effectiveness of one component of driver education, that of curriculum. (44) (70) Specifically, this study attempted to evaluate the effectiveness of one curricular format to determine its potential in reducing the probability of accident involvement. (26) For without answers to questions concerning what type of curriculum is most productive, the field of traffic safety would never be in a position to evaluate the full potential of driver education in the educational setting. (8) (57) (64)

For clarity sake, it should be stressed that this study, as with two similar studies, Kansas City (69) and DeKalb County(72), was designed to evaluate curriculum effectiveness not the value of driver education which would involve a far more complex analysis of interrelated factors. (15) (72)

The findings of this study pointed to two conclusions of importance. The first dealt with the use of self-reporting surveys as a viable tool in program evaluation. Although there were some problems associated with the evaluation survey used, it provided the researcher with accurate and functional information which would not have been available from any other source. The accuracy of the accident involvement information was important for it not only provided a picture of the motor vehicle accident problem, but also provided information

which could be incorporated into curriculum evaluation and change.

The second major conclusion dealt with the question, Can safe driving be taught? Through the conduct of this study, even though no individuals were used for comparison who had not received driver education, there was strong evidence supporting the conclusion that the type of accident avoidance curriculum an individual is exposed to can affect that individual's probability of being involved in an accident.

A number of problems confronted this study. One problem dealt with the survey's check for severity of accident involvement. The study evaluated three measured of severity of involvement, two of which represented post-crash measures and one represented a pre-crash measure. The two post-crash measures were: 1) extent of personal injury and 2) amount of property damage. The fact that neither of these measures demonstrated a significant difference between the two types of curriculum raises concern over whether or not the topic is being properly addressed. The pre-crash measure of severity was the use of active restraints. Even though a significant relationship was found between the two curriculums in favor of the performance based curriculum, with regard to this measure, due to an inappropriate placement of the measure in the survey, its true effectiveness or lack of will remain unanswered. This resulted because the item appeared in the section dealing with accident involvement and over half of the students not having had an accident were directed not to respond to this section. Had the item been placed prior to accident involvement a better picture of who was and who was not using active restraints would have been obtained and in turn that information could have been used to make any needed

curriculum modifications. Although one of driver educations' prime directives is that of providing individuals with skills that will reduce their probability of being involved in an accident, it is also known that the human component of the HTS is most prone to malfunctions and therefore driver education should also prepare the individual in the art of reducing the consequences of accidents when involvement occurs.

Another problem concerning the study dealt with its design. Ideally, it would have been best if the curriculum had been implemented into a random selection of schools and/or in several representative schools in which students would have been randomly assigned to the performance based curriculum or the traditional curriculum. Assignment to no driver education would not have been possible under Illinois' 16-18 year old law. Even though assignment to randomized groups was not possible efforts were made through matching techniques to control for a number of variables considered vital to curriculum evaluation. Both groups received approximately the same number of hours of instruction. Both groups were instructed by similarly prepared instructors. Both groups demonstrated similar driving expereinces (see Tables 81-86). Both groups drove in similar environments. And, both groups were exposed to similar types of program structure. As a result of the matching techniques and sample size employed, the findings of the analysis of data are statistically sound as they relate to schools similar to those found in the study.

A final problem dealing with the study was the comparison of Module Test performance and its relationship to accident involvement. Although there were 1927 students involved in the Demonstration-

Satellite project, data regarding test performance were only available on 515 students and out of that 515 only 441 were still involved in the schools at the time of the evaluation. With test information on over 1400 students unavailable, much information was lost which would have aided in the identification of minimum levels of performance and identification of the effectiveness of key units of instruction.

In summary, despite the limitations of the study much was learned about: 1) the value of using self-reporting accident surveys as a criteria for program improvement and evaluation, 2) the potential of one curricular format over another in reducing the probability of individuals being involved in an accident and 3) the need for more research to be done to identify under what conditions and at what level of performance a curriculum, like the Illinois Demonstration-Satellite Curriculum, would be most cost effective.

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APPENDICES

APPENDIX A

SUGGESTED SEQUENCE AND NUMBERING SYSTEM FOR MODULES

SUGGESTED SEQUENCE AND NUMBERING SYSTEM FOR MODULES

1. TRAFFIC CONTROLS (Episodes 2.1-2)
2. OUR HIGHWAY TRANSPORTATION SYSTEM (Episode 1.1)
3. BASIC HABITS AND SKILLS FOR CAR CONTROL (Episodes 4.1-2)
4. AUTOMOTIVE CONTROL AND PERFORMANCE CAPABILITIES (Episode 3.1)
5. BASIC MANEUVERS (Episode 4.3)
* 6. DRIVER ROLE IN HTS (Episode 1.2)
* 7. TRACTION (Episodes 3.2 and 3.3)
8. THE IDENTIFICATION OF HTS ELEMENTS AND CLUES (Episodes 5.2-3)
* 9. PERFORMANCE CAPABILITIES OF VARIOUS VEHICLES (Episode 3.4)
10. THE EVALUATION OF HTS SITUATIONS AND HAZARDS (Episodes 6.2-6.3)
11. A PLAN OF ACTION FOR DRIVER DECISIONS (Episodes 7.1-2)
* 12. PASSING AND MERGING (Episodes 2.3 and 4.3)
* 13. PARKING (Episodes 2.3 and 4.3)
* 14. TRIP PLANNING (Episode 7.3)
15. DRIVER CONDITION (Episodes 8.1-8.3)
16. DRINKING AND DRIVING (Episodes 9.1-9.3)
* 17. DRUGS AND DRIVING (Episodes 9.3 and 9.4)
18. TRAFFIC LAW OBSERVANCE AND ENFORCEMENT (Episodes 10.1-10.3)
19. COLLISIONS AND INSURANCE (Episodes 11.1 and 11.2)
20. TIRE SELECTION AND CARE (Episodes 12.127 and 12.224)
* 21. VEHICLE MAINTENANCE (Episodes 12.2 and 12.3)

( ) Refers to State Guide, DRIVER EDUCATION FOR ILLINOIS YOUTH.
* Modules suggested for local school development.

APPENDIX B

GUIDES FOR THE ADMINISTRATION OF WIU/ISU DRIVER EDUCATION SURVEY

GUIDES FOR THE ADMINISTRATION OF
WIU/ISU DRIVER EDUCATION SURVEY

For High School Seniors School Name _____

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

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

Introduction

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

(Pass out survey forms and ask student to read the need and purpose with you) -- "Please read to yourself the need and importance to the survey as I read it aloud."

Instructions

"Now print the date, your name and address. . . "

"Place a ✓ in the box that identifies your sex."

"Place a ✓ in the box that indicates whether you took driver education at this school or another school."

"If any of you did not complete a regular driver education course, leave both boxes for driver education blank."

"Leave the School Code number line blank."

"Leave the Survey Code number line blank."

"Now turn to page two."

(Over Please)

"Please note that you may check one or more of the items numbered 16-22. All other questions from number 23 on call for the one best choice. Feel free to write an explanation of your choice if necessary."

(Make a statement as to how the completed forms are to be collected. You may wish to have them collected all at once or have them turned in as they are completed.)

"Begin the questionnaire."

(Collect and Return to Principal)

Thank you for your assistance!!!

Eric L. Van Fleet
Western Illinois University

APPENDIX C

DRIVER EDUCATION SURVEY

CURRICULUM PROJECT - ILLINOIS STATE UNIVERSITY

DRIVER EDUCATION EVALUATION SURVEY
Curriculum Project - Illinois State University

Need and Importance of Survey

The purpose of this survey is to obtain information which can help improve the driver education program in the State of Illinois. Several high schools are trying out new methods and materials in their programs. With your help, we can find out which programs are best.

The main objective of driver education is to help drivers avoid traffic collisions and, when they can not be avoided, to help drivers reduce the severity of 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 kind, and 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 ones 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 complete questionnaire will be mailed to Western Illinois University where all information will be processed by computer. The results will be summarized and reported by driver groups and type of school programs. Then recommendations for program improvement can be made.

Some of the information reigted to driving experience requested may be difficult to recall. However, it is important to find out if the time, 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!

Traffic and Safety Staff
Illinois State University
Western Illinois University

Date _____

1-3 _____
State School Code No.

4-15 _____
Survey Code No.

Name _____
First Last

Address _____

_____
City Zip

Check the appropriate box:
Sex: Male ☐ Female ☐
Took Driver Education:
At this school ☐
At another school ☐

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.

_____ 16. Judging space needed
_____ 17. Seeing hazards in time
_____ 18. Driving at night
_____ 19. Driving on slick pavements
_____ 20. Passing other cars
_____ 21. Judging safe speed
_____ 22. 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.

_____ 23. How many months after you completed driver education did you receive your license?
1. up to 4 months
2. four to eight months
3. eight to twelve months
4. twelve to sixteen months
5. sixteen to twenty months
6. twenty to twenty-four months
7. twenty-four to twenty-eight months
8. twenty-eight to thirty-two months

_____ 24. How long has it been since you were licensed to drive?
1. six months or less
2. six months to one year
3. one to one and ½ years
4. one and ½ years to two years
5. two to two and ½ years
6. two and ½ years to three years
7. three to three and ½ years
8. three and ½ years to four years

_____ 25. Where does most of your driving take place?
1. within 15 miles of home
2. within 30 miles of home
3. within 45 miles of home
4. within 60 miles of home
5. within 75 miles from home
6. within 90 miles from home
7. within 105 miles from home
8. within 120 miles from home

_____ 26. On what kind of highways or streets do you do most of your driving?
1. city business streets
2. city residential streets
3. expressways or freeways
4. county blacktop or gravel roads
5. rural two-lane highways

_____ 27. With whom do you do most of your driving?
1. alone
2. parents
3. friends
4. relatives
5. other, such as employer or workers

_____ 28. How old were you when you received your drivers license?
1. 16
2. 16½
3. 17
4. 17½
5. 18
6. 18½

_____ 29. In whose car do you usually drive?
1. your own
2. parents
3. relatives
4. friends
5. employer
6. other

_____ 30. How much of your driving is done on weekends? (Friday evening, Saturday, and Sundays)
1. less than 20 percent
2. 20-40 percent
3. 40-60 percent
4. 60-80 percent
5. 80-100 percent

_____ 31. On weekends, when do you do most of your driving?
1. mornings
2. afternoons
3. night time
4. mornings and afternoons
5. afternoons and night time

_____ 32. During the week (Monday to 6 p.m. Friday), when do you do most of your driving?
1. mornings
2. afternoons
3. night time
4. mornings and afternoons
5. afternoons and night time

_____ 33. About how much time do you spend driving during an average week? (Monday - Sunday)
1. 0-4 hours
2. 5-9 hours
3. 10-14 hours
4. 15-19 hours
5. 20-24 hours
6. 25-29 hours
7. 30-34 hours
8. 35-39 hours

_____ 34. About how many miles, on the average, do you drive each month?
1. 0-50 miles
2. 51-100 miles
3. 101-150 miles
4. 151-200 miles
5. 201-250 miles
6. 251-300 miles
7. 301-500 miles
8. over 500 miles

_____ 35. About how many miles have you driven the last twelve months?
1. 0-1000 miles
2. 1001-2000 miles
3. 2001-3000 miles
4. 3001-4000
5. 4001-5000 miles
6. 5001-6000 miles
7. 6001-7000 miles
8. 7001-8000 miles

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.

_____ 36. How many traffic collisions have you had upon completetion of driver education?

1. none
2. one
3. two
4. three
5. four
6. five
7. six
8. seven

_____ 37. If you had a collision, how many months after you completed driver education had you been driving before the first collision happened?

1. 0-4 months
2. 4-8 months
3. 8-12 months
4. 12-16 months
5. 16-20 months
6. 20-24 months
7. 24-28 months
8. 28-32 months

_____ 38. If you had a second collision, how many months had you been driving between the first and second collision?

1. 0-3 months
2. 3-6 months
3. 6-9 months
4. 9-12 months
5. 12-15 months
6. 15-18 months
7. 18-21 months
8. 21-24 months

_____ 39. If you had a third collision, how many months had you been driving between the second and third collision?

1. 0-3 months
2. 3-6 months
3. 6-9 months
4. 9-12 months
5. 12-15 months
6. 15-18 months
7. 18-21 months
8. 21-24 months

Severity of Collision Experience - Severity deals with how much injury and-or property damage resulted from a given collision. Write the number that best describes your experience in the blank before the question number. When responding to damage costs, base your answer on repair costs. Leave blank those questions that do not apply to you.

_____ 40. If you had a collision, how much injury was sustained by you and all other individuals involved in the first collision?

1. no injury
2. minor injury
   (bumps, bruises, small cuts, no stitches)
3. major injury
   (broken bones, cuts needing stitches, hospitalization)
4. minor and major injury
5. death to one or more
6. minor injury and death to one or more
7. major injury and death to one or more
8. minor and major injury and death to one or more

_____ 41. If you had a second collision, how much injury was sustained by you and all other individuals involved in the second collision?

1. no injury
2. minor injury
   (bumps, bruises, small cuts, no stitches)
3. major injury
   (broken bones, cuts needing stitches, hospitalization)
4. minor and major injury
5. death to one or more
6. minor injury and death to one or more
7. major injury and death to one or more
8. minor and major injury and death to one or more

_____ 42. If you had a third collision, how much injury was sustained by you and all other individuals involved in the third collision?

1. no injury
2. minor injury
   (bumps, bruises, small cuts, no stitches)
3. major injury
   (broken bones, cuts needing stitches, hospitalization)
4. minor and major injury
5. death to one or more
6. minor injury and death to one or more
7. major injury and death to one or more
8. minor and major injury and death to one or more

_____ 43. If you had a collision, were you wearing your safety lap and shoulder belts?

1. no safety belts available
2. safety belts available but not worn
3. seat belt worn only
4. shoulder belt worn only
5. seat and shoulder belt worn

_____ 44. If you had more than one collision, were you wearing your safety (lap and-or shoulder) belts?

1. worn first collision
2. worn second collision
3. worn third collision
4. worn more than one collision
5. worn all collisions
6. worn none of the collisions
7. do not wear safety belts

Type of Crash - Please write the number of the one best choice by the question number in the proper column. Use question numbers 45-56 only for the first crash, use question numbers 57-68 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.

First Crash	Second Crash	Third Crash
_____ 45.	_____ 57.	_____ 69.
_____ 46.	_____ 58.	_____ 70.
_____ 47.	_____ 59.	_____ 71.
_____ 48.	_____ 60.	_____ 72.
_____ 49.	_____ 61.	_____ 73.
_____ 50.	_____ 62.	_____ 74.
_____ 51.	_____ 63.	_____ 75.
_____ 52.	_____ 64.	_____ 76.
_____ 53.	_____ 65.	_____ 77.
_____ 54.	_____ 66.	_____ 78.
_____ 55.	_____ 67.	_____ 79.
_____ 56.	_____ 68.	_____ 80.

Where did the crash happen?
1. at intersection
2. in between intersections
3. driveway
4. parking lot
5. interchange
6. underpass
7. RR crossing
8. none of these (explain)

What type of roadway?
1. straight-level
2. straight-uphill
3. straight-downhill
4. straight-hilltop
5. curve-level
6. curve-uphill
7. curve-downhill
8. curve-hilltop

Condition of road surface?
1. dry
2. wet
3. snow-packed
4. icy
5. oily
6. gravel
7. loose material on roadway

When did crash happen?
1. 7 a.m.-10 a.m.
2. 10 a.m.-1 p.m.
3. 1 p.m.-4 p.m.
4. 4 p.m.-7 p.m.
5. 7 p.m.-10 p.m.
6. 10 p.m.-1 a.m.
7. 1 a.m.-4 a.m.
8. 4 a.m.-7 a.m.

What other object was involved?
1. another moving car
2. truck or bus
3. parked vehicle
4. pedestrian or bicycle
5. motorcycle
6. RR train
7. fixed object (post, tree, etc.)
8. none of these (explain)

How did the crash take place?
1. rear end
2. slight angle from right side
3. slight angle from left side
4. right angle from left side
5. right angle from right side
6. sideswipe
7. head on
8. none of these (explain)

What maneuver were you making?
1. going straight
2. turning
3. entering traffic
4. lane changing
5. passing
6. backing
7. merging
8. parking

What maneuver was the other driver making? (Leave blank if no other driver)
1. going straight
2. turning
3. entering traffic
4. lane changing
5. passing
6. backing
7. merging
8. parking

How did you try to avoid the crash?
1. hard braking
2. pump brakes
3. quick steering
4. steer and brake
5. increased speed
6. none of these (explain)

What mistake did the other driver make, if any?
1. none
2. speed too fast for conditions
3. failed to yield
4. following too close
5. did not see signals or signs
6. did not give proper signal
7. misjudged distance or space needed
8. did not see other car or pedestrian

What mistake did you make, if any?
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How much damage to property and-or cars was done?
1. up to $500
2. $501 to $1000
3. $1001 to $1500
4. $1501 to $2000
5. $2001 to $2500
6. $2501 to $3000
7. $3001 to $3500
8. over $3500