

A STUDY TO COMPARE THE
EFFECTIVENESS OF INSTRUCTION IN THE
ALLSTATE GOOD DRIVER TRAINER AND ON
THE MULTIPLE CAR OFF-STREET DRIVING
RANGE WITH THE MULTIPLE CAR
OFF-STREET DRIVING RANGE

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Robert Earl Gustafson

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This is to certify that the

thesis entitled

A STUDY TO COMPARE THE EFFECTIVENESS OF INSTRUCTION
IN THE ALLSTATE GOOD DRIVER TRAINER AND ON THE
MULTIPLE CAR OFF-STREET DRIVING RANGE WITH
THE MULTIPLE CAR OFF-STREET DRIVING RANGE

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William A. Mann Ed.D.

Major professor

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ABSTRACT

A STUDY TO COMPARE THE EFFECTIVENESS OF INSTRUCTION IN THE ALLSTATE GOOD DRIVER TRAINER AND ON THE MULTIPLE CAR OFF-STREET DRIVING RANGE WITH THE MULTIPLE CAR OFF-STREET DRIVING RANGE

by Robert Earl Gustafson

Statement of the Problem

It was the purpose of this investigation (1) to determine whether students who were taught to drive by means of a combination program involving use of the Allstate Good Driver Trainer and the multiple car off-street driving range were comparable in driving knowledge, attitude, and skill with students who were taught on the multiple car off-street driving range exclusively; and (2) to determine whether students who were taught to drive by means of a combination program involving use of the Allstate Good Driver Trainer and the multiple car off-street driving range with some additional on-the-street instruction were comparable in driving knowledge, attitude, and skill with students who were taught on the multiple car off-street driving range, with the same additional on-the-street instruction.

Description of the Methods,
Techniques and Data Used

One hundred and sixty-four students from East Lansing, Michigan High School were selected for training and were assigned to the two instructional programs. Groups were matched on the basis of sex, age, grade level, intelligence quotients, and previous driving experience. Two staff members of the Highway Traffic Safety Center at Michigan State University were selected as the instructors for the two programs.

The combination simulator/range program (experimental group) consisted of six hours of instruction in the simulator correlated with four hours of instruction on the range. This instruction was followed by two hours of observation and two hours of instruction on-the-street. The range program (control group) consisted of ten hours of instruction on the range followed by two hours of observation and two hours of instruction on-the-street.

Before the instructional programs began, students of both groups were given three driving knowledge tests, two driving attitude tests, and a road test on-the-street to determine previous driving experience levels. At the completion of the simulator and/or range instruction the same knowledge and attitude tests were administered, as well as a driving skill test in the simulator, and driving skill tests on the range. The same knowledge and attitude tests were given

again along with a road test in traffic after the on-the-street instruction.

The groups were compared by testing the significance of the mean differences by "t" tests of critical ratios for driving knowledge, driving attitude, and driving skill. Significance of correlations between age, and intelligence quotients and the final criteria were tested by means of Pearson's Product Moment r ; and previous driving experience and the final criteria by means of Chi Square.

The Major Findings

The following is a summary of the major findings of this investigation:

1. On the pre-tests (before the simulator and/or range instruction) there were no significant differences between the experimental and control groups in general driving knowledge, specific driving knowledge, or in driving attitude.
2. On the mid-tests (after the simulator and/or range instruction) there were no significant differences between the experimental and control groups in general driving knowledge, specific driving knowledge, driving attitude, or on the simulator driving test. On the range skill tests, however, there was a significant difference in favor of the control group.
3. Between the pre- and mid-tests both the experimental and control groups showed significant improvement in general

driving knowledge, specific driving knowledge, and on the Siebrecht Attitude Scale. No significant improvement was shown for either group on the Mann Personal Attitude Survey.

4. On the post-tests (after the on-the-street instruction) there were no significant differences between the experimental and control groups in general driving knowledge, specific driving knowledge, driving attitude, or on the traffic problems and road problems sections of the final road test. There was a significant difference, however, on the vehicle handling section of the final road test in favor of the control group.

5. Between the mid- and post-tests neither the experimental or control groups showed significant improvement in general driving knowledge, on Part I of the specific driving knowledge test, or on the Mann Personal Attitude Survey. Significant improvement was shown by the control group on Part II of the specific driving knowledge test, and by the experimental group on the Siebrecht Attitude Scale.

6. Between the pre- and post-tests both the experimental and control groups showed significant improvement in general driving knowledge, specific driving knowledge and on the Siebrecht Attitude Scale. Neither group showed significant improvement on the Mann Personal Attitude Survey.

7. There was no significant correlation between age and any of the final criteria for either the experimental or control groups.

8. There were significant correlations for both the experimental and control groups between intelligence quotients and the final administrations of the general driving knowledge test, both parts of the specific driving knowledge test, and on the Siebrecht Attitude Scale. There were no significant correlations between intelligence quotients and the final administration of the Mann Personal Attitude Survey, or on any of the three parts of the final road test.

9. There were significant associations for both the experimental and control groups between previous driving experience and the final administration of the Mann Personal Attitude Survey. The experimental group also had a significant association between previous driving experience and the road problems section of the final road test. There were no significant associations for either group between previous driving experience and the general driving knowledge test, the specific driving knowledge test, the Siebrecht Attitude Scale, or on the vehicle handling and traffic problems sections of the final road test.

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By

Robert Earl Gustafson

A THESIS

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DEDICATION

This study is dedicated to Mr. William A. Kronberg, who taught one of the programs involved in this investigation.

After having served his country 20 years in the United States Marine Corps, seeing combat action in both World War II and the Korean Conflict, Bill retired in 1960 as a Major to embark upon a new career in teaching. He enrolled at Michigan State University in the fall of that year and earned a Bachelor of Science Degree in 1963. While working on this degree, Bill took the basic driver education course and through it became especially interested in traffic safety. He stayed on at Michigan State University earning a Master of Arts Degree in driver education and traffic safety in 1964 and had begun work on a doctoral program when during the evening of May 27, 1965, he suddenly and unexpectedly passed away at the age of 43.

With Bill's death, this writer has lost a dear friend, and the field of traffic safety has lost a person who could have had a brilliant career in his new chosen field. It is in recognition of his significant contributions, though in the field for such a very short time, that the writer dedicates this study to the memory of his friend and colleague, Bill Kronberg.

Robert Earl Gustafson

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The writer wishes to express his sincere appreciation to Dr. William A. Mann, who, as his Major Professor and Guidance Committee Chairman, provided assistance and guidance during all phases of this investigation. He also wishes to extend his appreciation to Dr. Charles A. Blackman, Dr. James W. Costar, and Mr. Gordon H. Sheehe for their time and constructive criticisms.

A special note of thanks is given to Dr. Marshall Crawshaw for his ideas on the original design of the study and to Evans Industries, Inc., for providing a twelve-place mobile trailer.

Appreciation is acknowledged to Dr. Robert Nolan, Mr. William Kronberg, Mr. Martin Dolan, and Mr. Lawrence Sain for their aid in teaching and testing the students.

A debt of gratitude is owed to Miss Mary Baumgras, who typed the preliminary drafts.

And finally, a special kind of appreciation is due his wife, Lucille, and daughters, Kathryn, Marilyn, and Jeanne for their patience and understanding which was so vitally necessary for the successful completion of this undertaking.

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CHAPTER I

THE PROBLEM

In 1956, a year in which this nation experienced 40,000 traffic fatalities, 1.4 million traffic injuries disabling beyond the day of the accident, and 9.3 million property damage accidents, at an economic loss of \$5 billion,¹ the National Commission on Safety Education conducted a survey of research needs in traffic safety education. This survey showed that a research need entitled, "the outcomes in student learning which may be expected from devices which simulate actual driving"² ranked 15th of 28 listed needs.

Today, the need for improved practice driving is even greater as evidenced by more recent statistics. In 1963, the last year for which complete figures are available, this nation experienced its worst traffic accident record in history with 43,600 traffic fatalities, 1.6 million traffic injuries disabling beyond the day of the accident, and 10.5 million property damage accidents. The economic costs of

¹National Safety Council, Accident Facts (Chicago: National Safety Council, 1957), p. 41.

²National Commission on Safety Education, Research Needs in Traffic Safety Education (Washington: National Commission on Safety Education, 1956), p. 14.

these accidents was estimated at \$8 billion.³ Young drivers under 20 years of age were involved in 14.5 per cent of these accidents, even though drivers of this age group comprised but an estimated 8.16 per cent of the driving population.⁴ Obviously, young drivers are contributing more than their share to the traffic accident problem.

Looking at the past, the nation's traffic accident record is not very encouraging, but of more importance, what of the future? This will depend on how well two critical needs can be satisfied. First, driver education courses must be made available to a greater percentage of the high school age population. In the 1963-64 school year, only 60 per cent of the nation's public high schools⁵ offered a recommended minimum course of 30 clock hours of classroom instruction and 6 clock hours of on-the-street instruction⁶ to 42 per cent of the eligible students enrolled in the public high schools.⁷ In addition, 14 per cent of the eligible public high school students received a sub-standard or

³National Safety Council, Accident Facts (Chicago: National Safety Council, 1964), p. 40.

⁴Ibid., p. 54.

⁵Insurance Institute for Highway Safety, 17th Annual National High School Driver Education Achievement Program (Washington: Insurance Institute for Highway Safety, 1965).

⁶National Commission on Safety Education, Policies and Practices for Driver and Traffic Safety Education (Washington: National Commission on Safety Education, 1964), p. 22.

⁷Insurance Institute for Highway Safety, loc. cit.

classroom only course from an additional 6 per cent of the nation's public high schools.⁸ These percentages must be increased until not only 100 per cent of all eligible public high school students are receiving the recommended minimum course, but until 100 per cent of all students of high school age are receiving the recommended minimum course.

Secondly, and of more importance, a better and more effective course must be provided. Although the records do show that drivers are doing better as measured by the number of fatalities in relation to the number of registered vehicles and vehicle miles driven,⁹ drivers are still having too many accidents. In addition, as the number of drivers, vehicles, and miles driven¹⁰ continue to increase, the problems of driving will become more and more complex, demanding of drivers even more knowledge, better attitudes, greater responsibility, more mature judgment, and increased skill. Thus, ways must be found to meet these increased needs. This study is an attempt to find one of these ways.

The Problem

Statement of the Problem

It was the purpose of this investigation (1) to determine whether students who were taught to drive by means

⁸Insurance Institute for Highway Safety, loc. cit.

⁹National Safety Council, op. cit., p. 59.

¹⁰National Safety Council, loc. cit.

of a combination program involving use of the Allstate Good Driver Trainer and the multiple car off-street driving range were comparable in driving knowledge, attitude, and skill with students who were taught on the multiple car off-street driving range exclusively; and (2) to determine whether students who were taught to drive by means of a combination program involving use of the Allstate Good Driver Trainer and the multiple car off-street driving range with some additional on-the-street instruction were comparable in driving knowledge, attitude, and skill with students who were taught on the multiple car off-street driving range, with the same additional on-the-street instruction.

The attack upon these problems involved determining answers to the following specific questions:

1. Do driver knowledge test scores of students trained in the Allstate Good Driver Trainer and on the range, differ significantly from similar test scores of students trained exclusively on the range, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

2. Do driver attitude test scores of students trained in the Allstate Good Driver Trainer and on the range, differ significantly from similar test scores of students trained exclusively on the range, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

3. Do driver skill test scores of students trained in the Allstate Good Driver Trainer and on the range, differ significantly from similar test scores of students trained exclusively on the range, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

4. Do driver knowledge test scores of students trained in the Allstate Good Driver Trainer, on the range, and on-the-street, differ significantly from similar test scores of students trained on the range, and on-the-street, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

5. Do driver attitude test scores of students trained in the Allstate Good Driver Trainer, on the range, and on-the-street, differ significantly from similar test scores of students trained on the range, and on-the-street, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

6. Do driver skill test scores of students trained in the Allstate Good Driver Trainer, on the range, and on-the-street, differ significantly from similar test scores of students trained on the range, and on-the-street, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

Importance of the Study

In the introduction to the 16th Annual Report of the National High School Driver Education Achievement Program, the Insurance Institute for Highway Safety stated:

The population explosion is having its impact on high school driver education, as it is in other areas of the school curriculum. Reports from the 50 states show a steady increase in the number of high school students. A projection of the 1962-63 figures indicates that more than three million eligible students will be enrolled in the 1963-64 school year.

While driver education held its own in the year ended last spring, it must be recognized that unless facilities are expanded and advanced teaching methods and aids fully utilized, a larger percentage of students will leave school each year without taking a driver education course.

Action must be taken now to reverse this trend.

Driving simulators and off-street multiple car driving ranges are two of the ways by which more students can be taught at a lower per pupil cost without sacrificing quality instruction and, education television is being introduced. Simulators have been used more widely than either of the other two methods. However, there are indications that many more ranges will be in operation in another year.¹¹

As an indication of the extent to which ranges and simulators have been accepted, in the 1962-63 school year, 457 schools in 35 states used driving simulators with over 141,000 students receiving a part of their practice driving phase by this method.¹² This is an increase of 58 schools

¹¹Insurance Institute for Highway Safety, 16th Annual National High School Driver Education Achievement Program (Washington: Insurance Institute for Highway Safety, 1964), p. 6.

¹²Insurance Institute for Highway Safety, 17th Annual National High School Driver Education Achievement Program (Washington: Insurance Institute for Highway Safety, 1965).

and 42,000 students over the previous year.¹³ Multiple car off-street driving ranges were used by 341 schools in 24 states, with 112,661 students receiving all or a portion of their behind-the-wheel instruction by this method.¹⁴ This is an increase of 43 schools and over 21,000 students over the previous year.¹⁵

It is readily apparent that both of these programs have received wide acceptance, and are showing rapid gains in the number of students taught. However, research concerning these programs is extremely limited. To date, only two research projects on the Allstate Good Driver Trainer have been conducted,^{16, 17} and no research has been carried out on programs which combine both range and simulator instruction. Thus, it was felt that this investigation might make a significant contribution by helping fill this void.

¹³Insurance Institute for Highway Safety, 16th Annual Achievement Program, op. cit., p. 15.

¹⁴Insurance Institute for Highway Safety, 17th Annual Achievement Program, op. cit.

¹⁵Insurance Institute for Highway Safety, 16th Annual Achievement Program, loc. cit.

¹⁶Richard W. Bishop, "Evaluating Simulator Instruction for Accomplishing Driver Education Objectives" (Tallahassee: The Florida Institute for Continuing University Studies, 1963). (Mimeographed.)

¹⁷Ivan J. Stehman, et al., Immediate Standardized Learning Reinforcement to a Complex Mental-Motor Skill (Driver Training) Using Electronically-Coordinated Motion Pictures (Harrisburg: John Harris High School).

Scope of the Study

This investigation was limited to students who elected to take driver education at East Lansing, Michigan High School during the second semester of the 1963-64 school year and the 1964 summer program. The students were predominantly sophomores and juniors, and varied considerably in the amount of previous driving experience. The students were almost exclusively Caucasian and came primarily from families in the middle and upper-middle socio-economic levels.

It would be desirable if this investigation could be repeated in several schools throughout the country to see how students with different characteristics would compare in performance with the students used in this study.

Definition of Terms Used

Driver Education

For the purpose of this investigation, driver education referred only to those aspects of traffic safety education which were formally taught in the regularly scheduled driver education classes. This education consisted of two parts, classroom instruction and practice driving. Any traffic safety education engaged in by the school, or taught in any of the other high school subjects, was not considered.

Classroom Instruction

The classroom instruction pertained to that part of the driver education course which took place in the regular high school classroom. During this phase of the course, students engaged in a variety of activities which were designed to increase their knowledge of and develop proper attitudes towards traffic safety.

Practice Driving

Practice driving is that phase of the driver education course during which students received actual practice in driving real and/or simulated cars. This practice can take place on off-street areas, on the public streets and highways, or in the case of simulators, in a classroom. This phase of the course is designed to develop skill in the manipulation of an automobile, as well as to increase the student's knowledge, and develop proper attitudes towards traffic safety.

Multiple Car Off-Street Driving Range (Range)

The multiple car off-street driving range (range) is an off-street area specially designed and constructed for the specific purpose of teaching practice driving. This area is designed so that one instructor can teach and supervise several students, each of whom is driving a driver education car. The range consists of specially designed areas for the

development of specific skills, common street layouts, and standard signs, signals, and markings. A more complete description of the Michigan State University range is contained in the following chapter.

Driving Simulator

A driving simulator is an electro-mechanical device which enables students in simulated cars to react to driving situations, projected on a motion picture screen. While the students are reacting, automatic checks programmed into the films check for incorrect responses. A more complete description of the Allstate Good Driver Trainer is contained in the next chapter.

On-the-Street Instruction

On-the-street instruction referred to that part of the practice driving phase of the course during which students had an opportunity to drive dual controlled cars, under the direction and supervision of driver education instructors, on the public streets and highways.

Dual Controlled Car

A dual controlled car is an automatic transmission car equipped with two brake pedals--one for the driver and one on the right side of the car for use by the instructor.

Experimental Program

The experimental program referred to the program in which students were taught to drive in the combination program involving both the range and the simulator with some additional on-the-street instruction.

Control Program

The control program referred to the program in which students were taught to drive on the range with some additional on-the-street instruction.

Organization of the Remaining Chapters

Chapter II contains detailed descriptions of the All-state Good Driver Trainer and the Michigan State University multiple car off-street driving range. Presented in Chapter III are (1) selection of school and instructors, (2) methods of obtaining the sample, (3) characteristics of the students, (4) the instructional and testing programs, (5) the testing devices, and (6) the sources, processing, and analysis of the data. Chapter IV contains the findings; and Chapter V presents the summary, conclusions, and recommendations.

CHAPTER II

THE ALLSTATE GOOD DRIVER TRAINER AND THE MULTIPLE CAR OFF-STREET DRIVING RANGE

Both the driving simulator and the multiple car off-street driving range were designed to enable schools to keep pace with the ever-increasing enrollments in high school driver education. These facilities make it possible for one instructor to teach more students, at less cost than the traditional on-the-street practice driving program. Research has indicated that this has been accomplished without any loss in the quality of instruction.

Bishop¹⁸ found that students who received twelve hours of instruction in the Allstate Good Driver Trainer supplemented with three hours of on-the-street instruction compared favorably in driving knowledge, attitude, and skill with students who received the traditional six hour on-the-street program. In a Pennsylvania study using the Allstate Good Driver Trainer, it was found that: "nine hours of simulator time can be successfully substituted for three of six

¹⁸Richard W. Bishop, "Evaluating Simulator Instruction for Accomplishing Driver Education Objectives" (Tallahassee: The Florida Institute for Continuing University Studies, 1963), p. 18. (Mimeographed.)

hours of behind-the-wheel instruction and three of six hours of observation in a dual control car."¹⁹

In a study involving use of the multiple car off-street driving range, Brazell found that: "students trained under 'primarily off-street' methods have driving performance records (equated per 1,000 months of driving exposure) which are equal to, or better than, those of students trained under 'primarily on-the-street' methods."²⁰ Nolan²¹ found that there were no significant differences in driving attitude, knowledge, or skill between students taught on the driving range (ten hours on the range and two hours on-the-street) and those taught in AEtna Drivotrainer (ten hours in the simulator and three hours on-the-street). (The primary difference between the AEtna Drivotrainer and the Allstate Good Driver Trainer is that the Allstate Good Driver Trainer provides instant feed-back on driving errors.)

Since this investigation is concerned with determining the relative effectiveness of driver education programs

¹⁹Ivan J. Stehman et al., Immediate Standardized Learning Reinforcement to a Complex Mental - Motor Skill (Driver Training) Using Electronically-Coordinated Motion Pictures (Harrisburg: John Harris High School), p. 1.

²⁰Robert E. Brazell, A Comparison of Various Behind-the-Wheel Training Methods (Detroit: Automobile Club of Michigan, 1962), p. 18.

²¹Robert O. Nolan, "A Comparative Study of the Teaching Effectiveness of the AEtna Drivotrainer and the Multiple Car Off-Street Driving Range" (unpublished Doctoral thesis, Michigan State University, East Lansing, Michigan, 1965), pp. 144-145.

using the Allstate Good Driver Trainer and the multiple car off-street driving range, the remainder of the chapter is devoted to a detailed description of these devices.

The Allstate Good Driver Trainer

The Allstate Good Driver Trainer was manufactured by the Link Division of General Precision, Inc., famous for its World War II Link Flight Trainer and more recently for its celestial navigation and missile simulators. It was designed to enable one instructor to give more students learning situations similar to those experienced in an actual car, but with less danger and at less cost per student.

The Allstate Good Driver Trainer was the second simulator developed for the purpose of teaching high school driver education which utilizes the principle of driving simulated cars, with actual automotive control devices, in simulated traffic settings, through the use of motion pictures. It is unique in that it is the only simulator available for high school driver education which provides instant feedback to the student on his driving performance. This principle makes it possible for the student to know when he is driving correctly as well as to make corrections in his driving immediately as errors occur.

The simulator first became available in the fall of 1962 and can be installed either in a regular classroom or in a special mobile trailer (Figure 1) as used in this investigation.

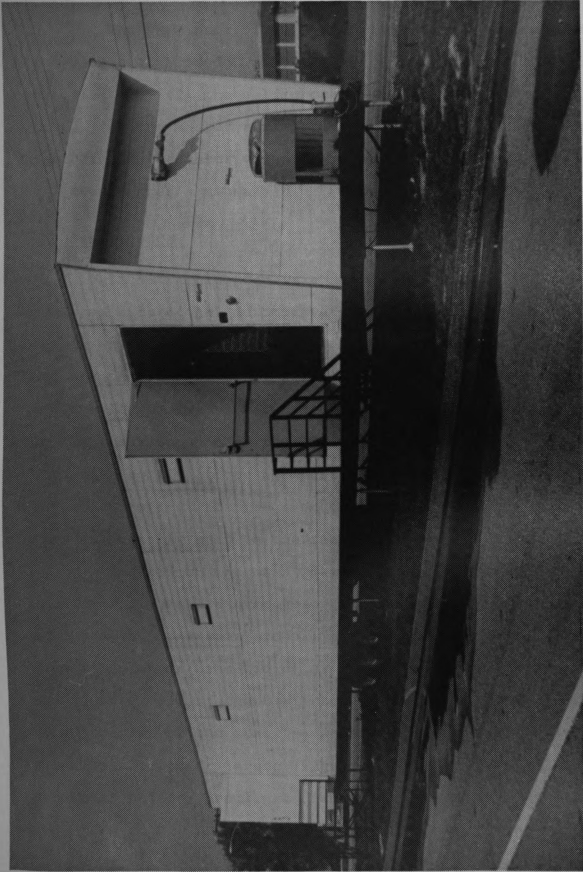


Figure 1. The Allstate Good Driver Trainer mobile trailer.

The remainder of this section explains the following components of a Good Driver Trainer installation: (1) the training car, (2) the self-checking error identification panel, (3) the master recorder, (4) the motion picture projector, (5) the instructional films, (6) the screen, and (7) the teacher's manual.

The Training Car

Each training car is a single place unit (Figure 2) equipped with actual automotive parts. Provided with each car is an adjustable seat, seat belt attachments (seat belts are optional and were not available for this investigation) and two large mirrors mounted on the rear of the seats--one on the right and one on the left. These mirrors are used when backing situations are presented, and when properly adjusted, reflect the image on the screen thus providing a view as normally seen to the rear of the car.

Located on the dash board are the following gauges, indicator lights and switches: speedometer, temperature and fuel gauges, generator and oil pressure lights, directional signal and upper beam indicator lights, and the headlight and ignition and starter switches (Figure 3). Control devices consist of the steering wheel and horn ring; directional signal and selector levers (Figure 3); foot brake, and accelerator pedals; headlight dimmer switch; and the hand



Figure 2. The Allstate Good Driver Trainer classroom.

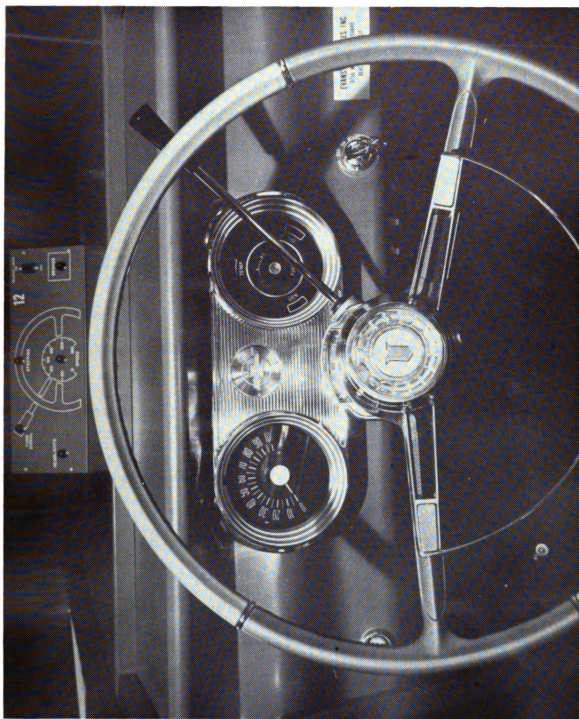


Figure 3. The training car dashboard and upper controls.

brake lever²² (Figure 4). All of these devices operate exactly as they do in a real car.

On the right side of the floor a special lever is located which can change the steering from standard to power; and on the right side of the fire wall are two special switches--one which changes the simulator from an automatic to a standard type transmission, and the other which makes the gas gauge read empty thus preventing the car from starting (Figure 4).

The Self-Checking Error Identification Panel

The self-checking error identification panel (Figure 5) is mounted to the front and on top of the training car. This panel is designed so that it visually represents the driving controls of an actual car as viewed from the normal driving position. Located on this panel are five small lights, each representing one of the five categories of driving errors that can be checked--steering, braking, speed, turn signals, and headlight beams. When the control switch, mounted on the panel, is "on" and an error is made, the light representing that category will go on and remain lit until the error is corrected or until the time allowed for that particular check has passed. Only one light will go on at a time.

²²A clutch pedal and a gear shift lever are also provided for teaching driving in standard shift cars.

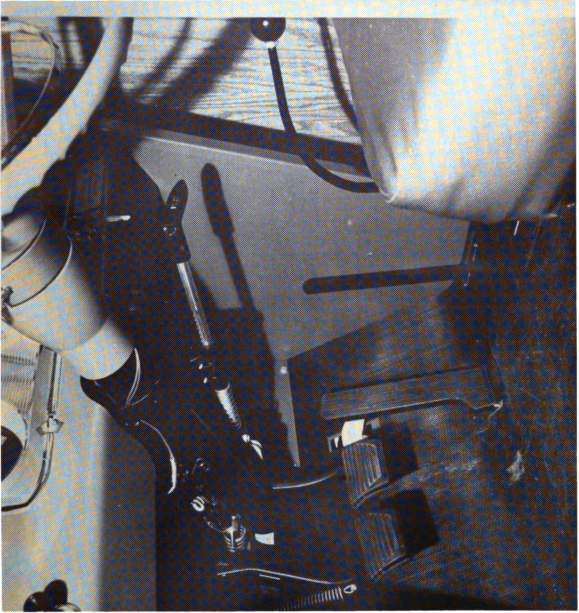


Figure 4. The training car lower controls.

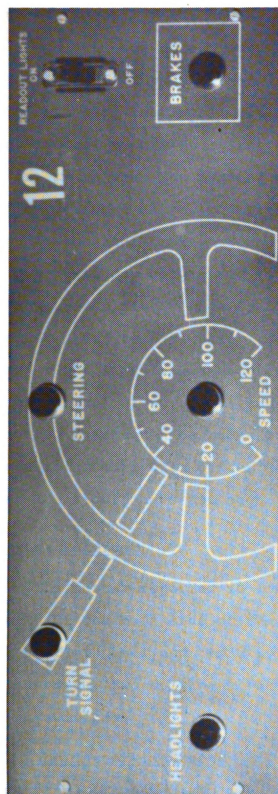


Figure 5. The self-checking error identification panel.

Each error category is broken down into degrees or conditions. Steering has seven degrees--straight ahead and three ranges in each direction. An error occurs when the steering wheel is turned either more or less than what the traffic situation requires. Braking has five degrees--parking brakes, no braking, little, medium, and hard braking. An error occurs when the parking brake is not set when it should be, or when either too little or too much pressure is applied to the foot brake. Speed has six degrees. In this particular category only speed too fast is considered as an error and speeds faster than 0, 15, 25, 35, 45, and 55 can be checked. For turn signals, checks can be made for both left and right signals and an error is indicated when either the wrong signal or no signal has been given. On the use of headlights, checks can be made for both lower and upper beams and an error occurs when either the wrong beam is being used or when the lights have not been turned on.

The Master Recorder

The master recorder is located at the rear of the trailer. On the back side of the recorder is located the master control panel and ten driving error panels; and on the right side, two driving error panels and the manual checking switches.

The master control panel. Located on the master control panel (Figure 6) is the main power switch, a fuse



Figure 6. The master control panel and driving error panels.

which protects the circuits within the master recorder from overloads in the simulators, reset buttons to reset all driving error counters at zero, and a switch to control the automatic counters.

Driving error panels. Every simulator within an installation has an individual driving error panel (Figure 7) on the master recorder. Each panel contains five mechanical counters which total the five classifications of driving errors contained on the self-checking error identification panel. These will total a maximum of 21 errors of each type, although more errors may be coded into the film. When the maximum total is reached, the lights on the self-checking error identification panel, described above, continue to go on, but the counter stops counting.

Manual checking switches. Located on the manual checking panel is a series of 22 switches (Figure 7) which can be used for manually checking driving errors. This manual checking can be done as a supplement to or as a replacement for the automatic checking.

The Motion Picture Projector

The motion picture projector (Figure 8) is a standard 16 m.m. projector with all the usual operating controls. The projector must be equipped with a special anamorphic lens for wide angle projection and must be plugged into the master recorder for automatic checking of driving errors.

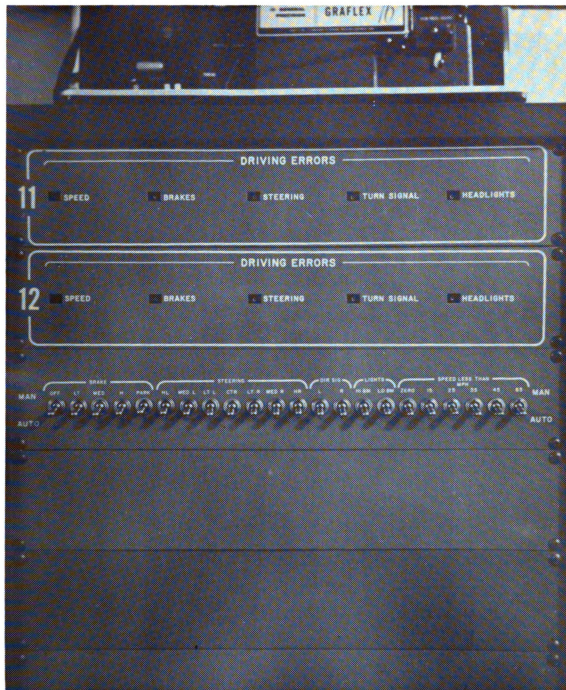


Figure 7. Driving error panels and manual checking switches.

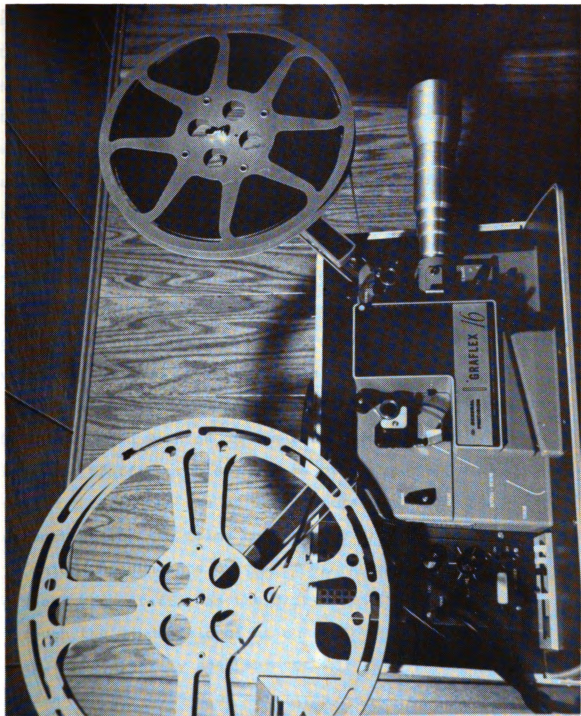


Figure 8. The motion picture projector.

The Instructional Films

A special series of twelve 16 m.m., colored, cinema-scope instructional films have been produced by the Training Division of Allstate Insurance Company, under the guidance of an Educational Advisory Committee, for use with the Good Driver Trainer. The first film is an introductory film which explains the components of the simulator installation and the various techniques that are used. Beginning with the second film, the series then progresses from the most basic operations on uncrowded streets to the more complicated maneuvers in heavy traffic, with each film providing the students an opportunity to make application of experiences gained from previous films. The final film is a review film which may be used as a final road test.

Each film contains several methods of instruction. They all begin with an on-the-street demonstration of specific traffic problems. Some of these are further illustrated through the use of model animation. Following the demonstration, the films contain two or more driving sequences to which the students drive. These were filmed within the car and show traffic as the driver would normally see it through the windshield of an actual car. Traffic to the rear, as ordinarily seen through the rear view mirror, is present on the screen at all times. At intersections, views to the left and right are presented to enable the students to check cross traffic before entering the intersection.

When traffic situations require that the driver look to the rear, traffic scenes to the rear are shown which when viewed through the special mirrors, previously described, the students see traffic as they normally would out the rear window or along the left side of a real car. Narration during these driving sequences is kept to a minimum so students have to perceive the driving cues from the traffic environment itself.

For the purpose of checking student performance, automatic checks have been programmed into the sound tracks of the films.

The Screen

A pull-down type screen especially designed for wide angle projection is located at the front of the trailer. This screen (approximately 10 feet wide) is the exact size needed for projection when the projector is located on top of the master recorder.

The Teacher's Manual

A teacher's manual has been developed to provide the teacher with a comprehensive sequential outline of each film, lists and descriptions of check points coded into the films, and suggested discussion topics. The manual is of the loose-leaf notebook type so that as new films are produced, and as current films are revised, new pages can easily be inserted into the manual.

[illegible]

The Multiple Car Off-Street Driving Range

The basic concept of teaching practice driving on an off-street area is generally credited to the late Gordon Graham. While with the National Safety Council, Mr. Graham, working with Chicago's Lane Technical High School, began a program which involved having one instructor and one student driver in the front seat of a dual control car with several other students observing from the rear seat. This instruction took place on an off-street area. This idea was further expanded in Detroit where, at Pershing High School, an off-street area was constructed so that one instructor, while standing outside, could give instruction to several student drivers at the same time.²³

The multiple car off-street driving range referred to in this study was designed by Robert O. Nolan and constructed on the campus of Michigan State University (Figure 9). This range was designed exclusively for driver education practice driving instruction and involves one instructor and twelve practice driving cars. (Only automatic transmission cars were used in this investigation.) Communication with all the drivers on the range is accomplished through the use of a portable transistorized horn.

The range contains basic street and intersection patterns as well as specifically designed driving exercises.

²³Ibid., pp. 13-15.

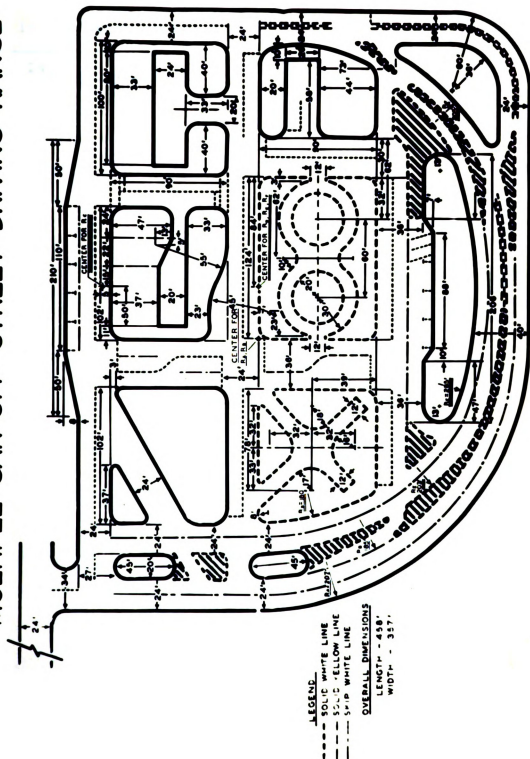


Figure 9. Michigan State University multiple car off-street driving range.

The objectives and procedures for each maneuver are contained within the range lesson plans in Appendix A, and enlarged diagrams and more detailed descriptions of each area can be found in the study by Nolan.²⁴

²⁴Ibid., pp. 15-37.

CHAPTER III

THE METHODS OF PROCEDURE

In the preceding chapter descriptions of the multiple car off-street driving range and the Allstate Good Driver Trainer were presented. This chapter contains the methods of procedure by which this investigation was conducted. Presented are (1) the selection of the school and instructors, (2) methods of obtaining the sample, (3) characteristics of the students, (4) the instructional and testing programs, (5) the testing devices, and (6) the sources, processing, and analysis of the data.

Selection of School and Instructors

For this investigation it would have been desirable if a number of representative schools throughout the state could have been selected. Practically, however, this was not possible because of the following limiting factors:

1. The schools would have to be located in close proximity to a range and simulator.
2. The schools would have to be willing to cooperate in this investigation.

3. The schools would have to be located in an area where an adequate number of competent instructors and driver education cars were available.
4. The schools would have to have an adequate number of students enrolled in the driver education program.

East Lansing, Michigan High School was able to meet these criteria and thus was selected as the school to be used for this investigation.

The School

East Lansing, Michigan High School is located in a community of approximately 30,000 population. The residents, for the most part, would be grouped in the middle, or upper middle classes in that they are either professors at Michigan State University, officials in the State Government, or executives in the surrounding businesses or industries. The school itself, based on its enrollment of 1250 students, is classified as a Class A Michigan high school. Four classes of driver education with a maximum enrollment of 24 students each are taught by one instructor each semester, and six classes of 24 students each are taught in a five week summer program. Three of these summer classes are taught by the regular driver education instructor and the remainder by another staff member who teaches other high school subjects during the regular school year.

The Instructors

Dr. Robert O. Nolan, a staff member of the Highway Traffic Safety Center at Michigan State University was selected as the instructor for the spring and summer experimental programs. Dr. Nolan has completed his own doctoral program in driver education and traffic safety, and had had four years of experience teaching high school driver education, and ten years teaching in university driver education teacher preparation programs. During this time, he had had considerable experience working and conducting research with both range and simulator programs.

Mr. William A. Kronberg, a doctoral student in driver education and traffic safety and presently a staff member of the Highway Traffic Safety Center at Michigan State University, was selected as the instructor for the spring and summer control programs. Mr. Kronberg had had considerable teaching experience in his 20 years as a member of the United States Marine Corps, and had had some experience in teaching university driver education teacher preparation courses. He was selected primarily on the basis of the writer's personal knowledge and observation of his abilities in teaching range programs.

Mr. Martin Dolan of East Lansing High School was the instructor for the classroom phase of both programs. Mr. Dolan had been the driver education teacher at East Lansing for a number of years during which he had had the opportunity

to teach all types of practice driving programs. He had worked closely with Michigan State University's driver education teacher preparation programs for the past several years.

Mr. Laurence Sain, a doctoral student in driver education and traffic safety at Michigan State University and the driver education professor at Northern Michigan University, was selected as the road tester. Mr. Sain had had considerable experience teaching driver education at the high school and university levels, which in the opinion of the writer, qualified him for this particular task.

Students in the second driver education teacher preparation course at Michigan State University were selected to administer the range skill tests and teach the on-the-street phase of both programs. The laboratory work of this particular course is designed to give students experience in both range and simulator programs, thus it was felt that these students would be ideal for these purposes. Both activities were carried out under the close personal supervision of the investigator.

Methods of Obtaining the Sample

This section presents the methods by which the students were selected for this investigation and the procedure for assigning them to the two programs.

Selecting the Students

All students who elected to take driver education in the East Lansing, Michigan High School during the second semester of the 1963-64 school year, and all students, who took driver education during the 1964 summer program and were assigned to the same teacher who taught the second semester program, were used in this investigation. This provided four classes during the second semester and three classes during the summer program of approximately 24 students each. It would have been ideal if only those students who had had no previous driving experience could have been selected. This, however, was not possible in that it would have limited the sizes of the groups to such an extent that they would have been of insufficient size for a good statistical analysis. The alternative of using every student was accepted because it was felt that they would at least be representative of all students who took driver education at East Lansing, and reasonably representative of all Michigan driver education students.

Assigning the Students

To determine which students would be assigned to each of the two programs the writer made two alphabetical lists--one for girls and one for boys--for each of the seven class periods. Each list was then numbered consecutively beginning with the first period and continuing through the

seventh period. All odd-numbered girls and odd-numbered boys were assigned to the experimental groups and all even-numbered girls and even-numbered boys were assigned to the control groups. By this procedure it was possible to equalize the sex variable, assign half of each class to each program, and still maintain a degree of randomness in assignment. After the original assigning, a quick check of the differences between means was made to see if there appeared to be any significant differences in age, grade level, intelligence quotients, and previous driving experience. Later, complete statistical analyses of these variables were made and are presented in the next section of this chapter.

Characteristics of the Students

In this section are presented the characteristics of the students assigned to the two instructional programs. Tables 1 through 12 present the differences and the levels of significance of these differences on sex, age, grade level, intelligence quotients, and previous driving experience categories.

Chronological Age Range

Tables 1 and 2 present the distributions of chronological age in years and months for the experimental and control groups, respectively. The age for each student was computed on the basis of his nearest full month on the first of the month in which the training period began. The mean

Table 1. Frequency distribution of experimental groups classified according to sex and age.

Age	Experimental 1			Experimental 2			Experimental totals		Grand Totals	
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Number	Per Cent
15-0 to 15-5	0	2	2	3	4	7	3	6	9	11.69
15-6 to 15-11	17	15	32	10	8	18	27	23	50	64.94
16-0 to 16-5	3	1	4	1	5	6	4	6	10	12.99
16-6 to 16-11	0	3	3	0	2	2	0	5	5	6.49
17-0 to 17-5	0	0	0	1	1	2	1	1	2	2.60
17-6 to 17-11	1	0	1	0	0	0	1	0	1	1.30
Grand Totals	21	21	42	15	20	35	36	41	77	100.01
Mean Age	15-10	15-10	15-10	15-9	15-10	15-10	15-9	15-10	15-10	

Table 2. Frequency distribution of control groups classified according to sex and age.

Age	Control 1			Control 2			Control Totals		Grand Totals	
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Number	Per Cent
15-0 to 15-5	3	1	4	4	5	9	7	6	13	16.67
15-6 to 15-11	16	16	32	8	8	16	24	24	48	61.54
16-0 to 16-5	2	3	5	2	5	7	4	8	12	15.38
16-6 to 16-11	2	1	3	0	0	0	2	1	3	3.85
17-0 to 17-5	0	0	0	0	2	2	0	2	2	2.56
17-6 to 17-11	0	0	0	0	0	0	0	0	0	0.00
Grand Totals	23	21	44	14	20	34	37	41	78	100.00
Mean Age	15-9	15-8	15-9	15-8	15-11	15-10	15-9	15-10	15-9	

age of the experimental group was fifteen years and ten months, and for the control group, fifteen years and nine months. Both the experimental and control boys had mean ages of fifteen years and nine months, and both the experimental and control girls had mean ages of fifteen years and ten months. The total range varied between fifteen years and zero months and seventeen years and eleven months. Approximately 77 per cent of the experimental group and 78 per cent of the control group were between fifteen and sixteen years of age. This closely conforms to the recommended policy of the Michigan State Department of Education of making driver education available to students immediately prior to the licensing age. No student was less than fifteen years of age as this is the minimum age permissible to enroll in a driver education course. Only 19 per cent of both the experimental and control groups were sixteen years of age, and only 4 per cent of the experimental students and 3 per cent of the control students were seventeen years of age.

Table 3 presents the levels of significance of mean ages between and within the experimental and control groups as measured by "t" tests of critical ratios. Table 3 shows that with one exception the mean differences were less than one month between and within all groups. None of these differences were significant at or beyond the .05 level.

Table 3. Comparison of mean ages between and within the experimental and control groups (significance of mean differences measured by "t" tests* of critical ratios).

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	.81	.82	.99	Not Significant	
Ex. Girls and Ex. Boys	77	.80	1.29	.62	Not Significant	
Con. Girls and Con. Boys	78	1.10	1.05	1.05	Not Significant	
Ex. Girls and Con. Girls	82	.66	1.17	.56	Not Significant	
Ex. Boys and Con. Boys	73	.96	1.18	.81	Not Significant	
Ex. 1 and Ex. 2	77	.07	1.28	.05	Not Significant	
Con. 1 and Con. 2	78	.94	1.10	.85	Not Significant	

* .05 (One-tail)

KEY: N = Number of students within groups compared

Md = Difference of means

SEnd = Standard error of difference of means

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean indicated at .05 level or lower

Grade Level Distribution

The grade level distributions of the experimental and control groups are presented in Tables 4 and 5, respectively. These tables show that 49 per cent of both the experimental and control groups were in the tenth grade. This percentage is low when considering the high percentage of fifteen year olds in the study but can be accounted for by the fact that those students who took the program during the summer were assigned to the next grade level rather than the grade level just completed. In the eleventh grade there were 43 per cent and 37 per cent in the experimental and control groups, respectively. In grades nine and twelve there was only one student in each group except for the control group of grade twelve which had two students. In the experimental group there was also one boy who had graduated from high school early and was now a sophomore (listed as grade 14) in college.

In Table 6 are presented the levels of significance in grade level distributions between the experimental and control groups when classified by sex as measured by Chi Squares. Table 6 shows that:

1. There were no significant differences in grade level between the total experimental and control boys or at any of the grade levels.

Table 4. Frequency distribution of experimental groups classified according to sex and grade level.

Grade Level	Experimental 1		Experimental 2		Experimental Totals		Grand Totals			
	Boys	Girls	Total	Boys	Girls	Total	Number	Per Cent		
9	1	0	1	0	0	1	1	1.30		
10	16	18	34	2	2	18	38	49.35		
11	3	3	6	12	15	27	18	42.86		
12	1	0	1	0	3	3	4	5.19		
14	0	0	0	1	0	1	1	1.30		
Grand Totals	21	21	42	15	20	35	36	41	77	100.00

Table 5. Frequency distribution of control groups classified according to sex and grade level.

Grade Level	Control 1		Control 2		Control Totals		Grand Totals	
	Boys	Girls	Total	Boys	Girls	Total	Number	Per Cent
9	1	0	1	0	0	0	1	1.28
10	21	18	39	4	3	7	46	58.97
11	1	3	4	10	15	25	29	37.18
12	0	0	0	0	2	2	2	2.56
Grand Totals	23	21	44	14	20	34	78	99.99

Table 6. Comparisons of the distribution of grade levels between the experimental and control groups classified by sex (significance of the distribution differences measured by Chi Square).

Grade Level	Boys			Girls			Boys and Girls		
	Chi Square	DF	P	Chi Square	DF	P	Chi Square	DF	P
9	.00	1	.99				.00	1	.99
10	1.14	1	.29	.02	1	.89	.76	1	.40
11	.62	1	.45	.00	1	.99	.26	1	.63
12	1.00	1	.32	.20	1	.67	.66	1	.43
14	1.00	1	.32				1.00	1	.32
Total	3.76	4	.45	.22	4	.99	2.68	4	.62

KEY: DF = Degrees of freedom

P = Level of significance of the Chi Square

2. There were no significant differences in grade level between the total experimental and control girls, or at any of the grade levels.
3. There were no significant differences in grade level between the total experimental or control groups, or at any of the grade levels.

Distribution of Intelligence Quotients

Tables 7 and 8 present the distributions of intelligence quotients as measured by the California Short Form Test of Mental Maturity for the experimental and control groups, respectively. These tables show that the mean I.Q. for the total experimental and control groups were practically identical, 113.57 to 113.60, respectively. The experimental girls outscored the control girls by over one score point, whereas, the reverse was true for the experimental and control boys. In all instances, the second experimental groups outscored the first experimental groups and the second control groups outscored the first control groups. With the exception of four students, all intelligence quotients were within a range of 90 to 139. For the experimental group, 32 per cent of the intelligence quotients fell within the 90 to 110 range, whereas, 30 per cent of the control group fell within this range. Sixty-seven per cent of the experimental group and 69 per cent of the control group had intelligence quotients of 110 or above, and 1 per cent of both the experimental and control groups ranged below 90.

Table 7. Frequency distribution of experimental groups classified according to sex and intelligence quotients.

I.Q.	Experimental 1			Experimental 2			Experimental Totals		Grand Totals	
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Number	Per Cent
140 to 149	0	0	0	1	1	2	1	1	2	2.63
130 to 139	1	1	2	1	2	3	2	3	5	6.58
120 to 129	2	5	7	5	3	8	7	8	15	19.74
110 to 119	7	7	14	4	11	15	11	18	29	38.16
100 to 109	7	6	13	4	0	4	11	6	17	22.37
90 to 99	4	1	5	0	2	2	4	3	7	9.21
80 to 89	0	0	0	0	0	0	0	0	0	0.00
70 to 79	0	1	1	0	0	0	0	1	1	1.32
Grand Totals	21	21	42	15	19	34	36	40	76	100.01
Mean I.Q.	109.19	111.29	110.24	117.67	117.68	117.68	112.72	114.33	113.57	

Table 8. Frequency distribution of control groups classified according to sex and intelligence quotients.

I.Q.	Control 1		Control 2		Control Totals		Grand Totals	
	Boys	Girls	Total	Boys	Girls	Total	Number	Per Cent
140 to 149	0	0	0	0	0	0	0	0.00
130 to 139	0	0	0	1	3	4	4	5.19
120 to 129	6	4	10	7	7	14	24	31.17
110 to 119	8	9	17	4	4	8	25	32.47
100 to 109	5	5	10	1	5	6	16	20.78
90 to 99	3	3	6	0	1	1	7	9.09
80 to 89	0	0	0	0	0	0	0	0.00
70 to 79	1	0	1	0	0	0	1	1.30
Grand Totals	23	21	44	13	20	33	77	100.00
Mean I.Q.	110.48	109.48	110.00	121.23	116.55	118.39	114.36	113.60

In Table 9 are presented the mean differences in intelligence quotients and the levels of significance of these differences between and within the experimental and control groups as measured by "t" tests of critical ratios. Table 9 shows that:

1. The difference of over 7 points in intelligence quotients between the first and second experimental groups was significant at the .01 level.
2. The difference of over 8 points in intelligence quotients between the first and second control groups was significant at the .001 level.
3. There were no significant differences in intelligence quotients between the remaining groups.

Distributions of Previous Driving Experience Categories

Presented in Tables 10 and 11, respectively, are the distributions of the previous driving experience categories. These tables show that 39 per cent of the experimental group and 44 per cent of the control group had either never driven at all prior to the beginning of the program or had merely driven back and forth a little on their own private driveway. Forty-nine per cent of the experimental and 40 per cent of the control students had driven from one to five miles on actual city streets or roads; and 12 per cent and 17 per cent of the experimental and control groups, respectively, had extensive driving experience.

Table 9. Comparison of mean intelligence quotients between and within the experimental and control groups (significance of mean differences measured by "t" tests* of critical ratios).

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	153	.03	1.84	.02	Not Significant	
Ex. Girls and Ex. Boys	76	1.61	2.73	.59	Not Significant	
Con. Girls and Con. Boys	77	1.43	2.49	.57	Not Significant	
Ex. Girls and Con. Girls	81	1.40	2.49	.56	Not Significant	
Ex. Boys and Con. Boys	72	1.64	2.73	.60	Not Significant	
Ex. 1 and Ex. 2	76	7.44	2.63	2.83	Significant at .01 level	Ex. 2
Con. 1 and Con. 2	77	8.39	2.27	3.70	Significant at .001 level	Con. 2

* .05 (One-tail).

KEY: N = Number of students within groups compared

Md = Difference of means

SEnd = Standard error of difference of means

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean indicated at .05 level or lower

Table 10. Frequency distribution of experimental groups classified according to sex and previous driving experience categories.

	<u>Experimental 1</u>		<u>Experimental 2</u>		<u>Experimental Totals</u>		<u>Grand Totals</u>			
	Boys	Girls	Total	Boys	Girls	Total	Number	Per Cent		
Slight	3	8	11	5	14	19	8	22	30	38.96
Moderate	16	9	25	8	5	13	24	14	38	49.35
Extensive	2	4	6	2	1	3	4	5	9	11.69
Grand Totals	21	21	42	15	20	35	36	41	77	100.00

KEY: Slight = None to a little on driveways

Moderate = One to five miles of driving on city streets or back roads

Extensive = Over five miles of driving

Table 11. Frequency distribution of control groups classified according to sex and previous driving experience categories.

	Control 1			Control 2			Control Totals		Grand Totals	
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Number	Per Cent
Slight	5	10	15	6	13	19	11	23	34	43.59
Moderate	10	10	20	4	7	11	14	17	31	39.74
Extensive	8	1	9	4	0	4	12	1	13	16.67
Grand Totals	23	21	44	14	20	34	37	41	78	100.00

KEY: Slight = None to a little on driveways

Moderate = One to five miles of driving on city streets or back roads

Extensive = Over five miles of driving

Table 12 shows the levels of significance in previous driving experience distributions between the experimental and control groups when classified by sex as measured by Chi Square. Table 12 shows that:

1. There was a significant difference in previous driving experience at the .03 level between the total experimental and control boys in favor of the control boys.
2. The only significant difference in previous driving experience between the experimental and control boys for any of the individual categories was in the extensive category significant at the .05 level in favor of the control boys.
3. There were no significant differences in previous driving experience between the total experimental and control girls, or for any of the individual previous driving experience categories.
4. There were no significant differences in previous driving experience between the total experimental and control groups, or for any of the individual previous driving experience categories.

Summary

The preceeding analysis shows that there were no significant differences between the total experimental and control groups in relation to sex, age, grade level, intelligence quotients, or previous driving experience categories.

Table 12. Comparisons of the distribution of previous driving experience categories between the experimental and control groups classified by sex (significance of the distribution differences measured by Chi Square).

	Boys			Girls			Boys and Girls		
	Chi Square	DF	P	Chi Square	DF	P	Chi Square	DF	P
Slight	.48	1	.49	.02	1	.89	.26	1	.63
Moderate	2.64	1	.11	.30	1	.60	.72	1	.41
Extensive	-4.00	1	.05	2.66	1	.10	.72	1	.41
All Experience Combined	-7.12	2	.03	2.98	2	.23	1.70	2	.44

KEY: DF = Degrees of freedom

P = Level of significance of the Chi Square

+ = Overloaded in experimental group

- = Overloaded in control group

The second experimental and control groups had significantly higher intelligence quotients than the first experimental and control groups, respectively; and the control boys had significantly more previous driving experience than the experimental boys. This would indicate that where intelligence is a factor the second experimental and control groups might do better than the first experimental and control groups, respectively; and where previous driving experience is a factor the control boys might do better than the experimental boys.

The Instructional and Testing Programs

In this section are contained the instructional and testing programs for the spring and summer experimental and control groups. Separate daily schedules for each of these programs are shown in Figures 10 through 13.

The Control Program

The total control program consisted of twelve 50 minute periods of driving on the multiple car off-street driving range, and four one-half hour periods of driving and four one-half hour periods of observation on-the-street in a dual control car. Twelve periods were set aside in both the second semester and summer programs for the range lessons, and six and five periods, respectively, for the on-the-street lessons.

For the range instruction, twelve pre-planned lessons were developed. The daily schedules contained in Figures 10

March	30	Knowledge & Attitude pre-tests
	31	Knowledge & Attitude pre-tests
April	1	Knowledge pre-test
		Film 1 Introductory film to simulator
	2	Previous driving proficiency test
	6	50 minutes on MCDR* - Lesson I
	7	50 minutes on MCDR - Lesson II
	9	50 minutes on MCDR - Lesson III
	13	50 minutes on MCDR - Lesson IV
	15	50 minutes on MCDR - Lesson V
	16	50 minutes on MCDR - Lesson VI
	21	50 minutes on MCDR - Lesson VII
	22	50 minutes on MCDR - Lesson VIII
	27	50 minutes on MCDR - Lesson IX
	28	50 minutes on MCDR - Lesson X
	30	50 minutes on MCDR - Lesson XI
May	4	50 minutes on MCDR - Lesson XII
	5	Simulator familiarization
	6	Simulator skill test - Film 12 Let's Review
	7	Range skill tests
	11	Knowledge & Attitude mid-tests
	12	Knowledge & Attitude mid-tests
	13	Knowledge mid-test
	14	BTW** (During this time each student will go out 4 times. He will receive 30 minutes driving and 30 minutes observation each time.)
	18	BTW
	19	BTW
	20	BTW
	21	BTW
	25	BTW
	26	Knowledge & Attitude post-tests
	27	Knowledge & Attitude post-tests
	28	Knowledge post-test -- Road tests
June	1	Road tests
	2	Road tests
	3	Road tests
	4	Road tests

Figure 10.--Daily schedule--Control group, spring term.

*Multiple Car Off-street Driving Range.

**Behind-the-wheel on-the-street.

and 11 show the days on which each of these lessons were taught and the detailed lesson plans themselves are contained in Appendix A. The on-the-street instruction consisted of four pre-planned routes designed to give the students experience in country, city, highway, and freeway driving. Every student drove the four routes in the above named order, and in addition, had the opportunity to observe his partner drive the identical route, but in the opposite direction. Detailed lesson plans of these routes are contained in Appendix B.

The Experimental Program

The total experimental program consisted of seven 50 minute periods in the Allstate Good Driver Trainer, five 50 minute periods on the multiple car off-street driving range, and four one-half hour periods of driving and four one-half hour periods of observation on-the-street in a dual control car. Twelve periods were set aside in both the second semester and summer programs for the range and simulator lessons, and six and five periods, respectively, for the on-the-street instruction.

The experimental groups followed the same set of range lesson plans as used by the control groups, but since they had fewer periods, it was necessary to offer more than one lesson in every period. For the simulator instruction, the instructor followed the individual film lesson plans contained within the Teacher's Manual. Figures 12 and 13 show how the

June	17	Knowledge & Attitude pre-tests
	18	Knowledge & Attitude pre-tests
	19	Knowledge pre-test
		Film 1 Introductory film to simulator
		Previous driving proficiency test
	22	50 minutes on MCDR* - Lesson I
	23	50 minutes on MCDR - Lesson II
	25	50 minutes on MCDR - Lesson III
	26	50 minutes on MCDR - Lesson IV
	30	50 minutes on MCDR - Lesson V
July	1	50 minutes on MCDR - Lesson VI
	3	50 minutes on MCDR - Lesson VII
	6	50 minutes on MCDR - Lesson VIII
	8	50 minutes on MCDR - Lesson IX
	9	50 minutes on MCDR - Lesson X
	13	50 minutes on MCDR - Lesson XI
	14	50 minutes on MCDR - Lesson XII
	15	Simulator familiarization
	16	Simulator skill test - Film 12 Let's Review
	17	Range skill tests
	20	Knowledge & Attitude mid-tests
	21	Knowledge & Attitude mid-tests
	22	BTW** (During this time each student will go out 4 times. He will receive 30 minutes driving and 30 minutes observation each time.)
	23	BTW
	24	BTW
	27	BTW
	28	BTW
	29	Knowledge & Attitude post-tests -- Road tests
	30	Knowledge & Attitude post-tests -- Road tests
	31	Road tests

Figure 11.--Daily schedule--Control group, summer term.

*Multiple Car Off-street Driving Range.

**Behind-the-wheel on-the-street.

March	30	Knowledge & Attitude pre-tests
	31	Knowledge & Attitude pre-tests
April	1	Knowledge pre-test
		Film 1 Introductory film to simulator
	2	Previous driving proficiency test
	6	50 minutes in GDT* - Film 2 The Start of Good Driving
	7	50 minutes in GDT - Film 3 The Good Turn Film 4 City Driving (Intro. only)
	8	50 minutes on MCDR** - Lessons I and III B
	13	50 minutes in GDT - Film 9 In Reverse
	14	50 minutes on MCDR - Lessons II, III A and IV
	16	50 minutes in GDT - Film 10 Parking
	20	50 minutes on MCDR - Lessons V, VI, VII and VIII
	22	50 minutes in GDT - Film 4 City Driving Film 5 Advanced City Driving
	23	50 minutes on MCDR - Lessons IX and X
	28	50 minutes in GDT - Film 5 Advanced City Driving Film 6 Highway Driving
	29	50 minutes on MCDR - Lessons XI and XII
May	4	50 minutes in GDT - Film 11 Driving after Dark Film 7 Expressways are Different (Sequence I only)
	5	Range skill tests
	6	Range skill tests
	7	Simulator skill test - Film 12 Let's Review
	11	Knowledge & Attitude mid-tests
	12	Knowledge & Attitude mid-tests
	13	Knowledge mid-test
	14	BTW*** (During this time each student will go out 4 times. He will receive 30 minutes driving and 30 minutes observation each time.)
	18	BTW
	19	BTW
	20	BTW
	21	BTW
	25	BTW
	26	Knowledge & Attitude post-tests
	27	Knowledge & Attitude post-tests
	28	Knowledge post-test -- Road tests
June	1	Road tests
	2	Road tests
	3	Road tests
	4	Road tests

Figure 12.--Daily schedule--Experimental group, spring term.

*Allstate Good Driver Trainer.

**Multiple Car Off-street Driving Range.

***Behind-the-wheel on-the-street.

June	17	Knowledge & Attitude pre-tests
	18	Knowledge & Attitude pre-tests
	19	Knowledge pre-test
		Film 1 Introductory film to simulator
		Previous driving proficiency test
	22	50 minutes in GDT* - Film 2 The Start of Good Driving
	23	50 minutes in GDT - Film 3 The Good Turn Film 4 City Driving (Intro. only)
	24	50 minutes on MCDR** - Lessons I and III B
	26	50 minutes in GDT - Film 9 In Reverse
	29	50 minutes on MCDR - Lessons II, III A and IV
July	1	50 minutes in GDT - Film 10 Parking
	2	50 minutes on MCDR - Lessons V, VI, VII and VIII
	6	50 minutes in GDT - Film 4 City Driving Film 5 Advanced City Driving
	7	50 minutes on MCDR - Lessons IX and X
	9	50 minutes in GDT - Film 5 Advanced City Driving Film 6 Highway Driving
	10	50 minutes on MCDR - Lessons XI and XII
	14	50 minutes in GDT - Film 11 Driving after Dark Film 7 Expressways are Different (Sequence I only)
	15	Range skill tests
	16	Range skill tests
	17	Simulator skill test - Film 12 Let's Review
	20	Knowledge & Attitude mid-tests
	21	Knowledge & Attitude mid-tests
	22	BTW*** (During this time each student will go out 4 times. He will receive 30 minutes driving and 30 minutes observation each time.)
	23	BTW
	24	BTW
	27	BTW
	28	BTW
	29	Knowledge & Attitude post-tests -- Road tests
	30	Knowledge & Attitude post-tests -- Road tests
	31	Road tests

Figure 13.--Daily schedule--Experimental group, summer term.

*Allstate Good Driver Trainer.

**Multiple Car Off-street Driving Range.

***Behind-the-wheel on-the-street.

twelve range lessons were combined so they could be taught in only five periods, the simulator films that were used and the order of presentation, and how the two parts of this program were integrated. For the on-the-street instruction, the same set of lesson plans (contained in Appendix B) and procedures were used as were used for the control students.

The Pre-Testing Program

The first four days of the second semester program, and the first three days of the summer program were set aside for the pre-testing program. During this time each class was tested for driving knowledge and driving attitude. In addition, the writer tested each student individually in a dual control car to determine his driving proficiency. Sufficient time was also available to show the film introducing the driving simulator.

The driving knowledge tests consisted of the final examination for the textbook Sportsmanlike Driving, and Parts I and II of a driver education achievement test developed at George Washington University. Driving attitude was tested through the use of the Mann Personal Attitude Survey and the Siebrecht Attitude Scale.

The instructions for the writing of the knowledge and attitude tests and the use of the answer sheets were given before each test was administered. When every student had completed the test, the tests and answer sheets were collected and the process repeated for the next test. For

the driving proficiency test, the students were instructed to leave the classroom in alphabetical order at two and one-half minute intervals and wait in front of the school. Each student then drove around the block.

Students who missed any of the tests because of their absence from school were required to come in after school and complete the tests before they began their training program.

The order in which the tests were administered are shown in Figures 10 through 13, and the tests themselves are more thoroughly described in the next section of this chapter.

The Mid-Testing Program

Six days during the second semester program and five days during the summer program were set aside, after the completion of the simulator and range instruction, for the mid-testing program. During the first two days of this period the experimental groups were given the range skill tests, while the control groups on the first day were given an opportunity to become familiar with the simulators by operating the simulators to the driving sequence portions of the "Start of Good Driving" and "The Good Turn" films. The portions of these films which were purely instructional in nature were not shown to minimize as much as possible the amount of information the control groups might receive by viewing these films. On the second day the control groups

received the simulator driving test. On the third day the groups changed places with the experimental groups receiving the simulator driving test and the control groups receiving the range skill tests. These tests are more thoroughly described in the next section of this chapter.

The simulator tests were administered by the two instructors to their own groups, and the range skill tests by college students taking the second driver education teacher preparation course at Michigan State University. Variations in scoring by the individual students were held to a minimum by instructing each student on the scoring of his particular skill test, and by keeping each student in the same skill area as much as possible. An attempt was also made to have each student check an equal number of experimental and control students, and no mention was made of which group was being tested at any time.

For the remainder of the testing program the two groups were combined and they received the same driving knowledge and driving attitude tests in identical order as administered during the pre-testing program. The writer personally administered these tests giving the same instructions and following the same procedures as in the pre-testing program. Figures 10 through 13 show the order in which the tests were administered.

The Post-Testing Program

At the completion of the on-the-street instruction seven days were set aside in the second semester program and three days in the summer program for administration of the post-testing program. At this time, all students were again tested for driving knowledge and driving attitude with the same battery of tests as given in the pre- and mid-testing programs. In addition, each student was given a 20 minute road test in traffic.

The driving knowledge and driving attitude tests were administered the first three and two days, respectively, of each program. These tests were given in the same order, using the same instructions, and following the same procedures as used in the two previous testing programs. This order is shown in Figures 10 through 13. Because of the shortage of time, it was necessary to schedule the road tests simultaneously with the knowledge and attitude tests. The following four and one days, respectively, were also available in the second semester and summer programs for the completion of these tests.

On the road test the precautions taken to minimize variations in testing procedure, and any external circumstances were as follows:

1. One person tested all the students. This person was personally instructed by the writer on the use of the test, and where along the route each item of the

test was to be checked. In addition, he was given an opportunity to test several persons before he tested any student involved in the study.

2. One route was used for all tests.
3. The students were instructed not to give the tester any information but their name.
4. Students from the two groups were assigned to take the test on an alternating basis. In addition, the order was reversed on alternate days.

A complete description of this test is contained in the next section of this chapter.

The Testing Devices

In this section are contained descriptions of the various tests used in the testing programs.

Achievement Test in Driver Education for Sportsmanlike Driving

The Sportsmanlike Driving²⁵ final examination is a general driving knowledge achievement test consisting of 50 multiple choice questions with four possible answers to each question. To develop the test, a group of psychologists who specialized in test construction, developed three forms of 50 questions each. These forms were administered to a selected

²⁵American Automobile Association, Sportsmanlike Driving (3rd ed., Washington, D. C.: The Association, 1955).

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number of high school students. An item analysis of the completed answer sheets was made and from this the 100 most reliable questions were selected. All questions which were either too easy or too difficult were discarded. The 100 questions were then arranged in order of difficulty and divided into two forms, C and D, of equal difficulty.²⁶ Form 6C was used in the three testing programs of this investigation.

Achievement Test in Driver Education by George Washington University

The George Washington University Test²⁷ is a two-part specific driving knowledge test consisting of 145 multiple choice questions with four or five possible answers to each question. Part I of the test contains 71 questions on standard driving situations, and Part II, 74 questions concerning driving emergency situations. This test was originally administered to 284 ninth-grade driver education students after they had been exposed to a series of programmed booklets which contained the information. On the basis of two administrations

²⁶American Automobile Association, Instructions for Sportsmanlike Driving Tests (Washington: American Automobile Association, 1960), p. 1.

²⁷This test was developed by Dr. Thelma Hunt and Dr. Edward H. Fisher, for the George Washington University's Driver Behavior Research Project, Dr. Lawrence E. Schlesinger, principal investigator. This project is supported by Education Grant 7-18-0100-197.

of the test to the same group, one month apart, the test had a correlation of .93 (Pearson correlational coefficient).

In a communication with the authors, they suggested that questions 11, 30, 32, 38, 52, 53, 58, 59, 60 and 64 from Part I of the test, and questions 83, 92, 93, 96, 99, 101, 103, 116 and 126 from Part II of the test not be used as their study indicated that they were poor questions. In addition, to conform to local ordinances, it was necessary to select a different answer as the correct answer to question number sixty-six. Sixty-one and 65 questions, respectively, were thus considered for the three testing programs of this investigation.

Mann Personal Attitude Survey

The Mann Personal Attitude Survey²⁸ consists of 63 statements concerning attitudes and feelings towards self and others. Students react to these statements by checking one of five listed responses--always, usually, sometimes, rarely, or never. The responses are then scored in terms of the number of deviations from what are considered the normal answers. The lower the score, the more favorable are the responses. The reliability of the scale is presently being established by Mr. Francis Kenel²⁹ for his doctoral dissertation.

²⁸This Survey was developed by Dr. William A. Mann of the College of Education, Michigan State University, East Lansing, Michigan.

²⁹Mr. Francis Kenel is an assistant professor in driver education at Illinois State University, Normal, Illinois.

On this particular Survey, since many of the statements reflect attitudes which are not subject to change over a short period of time, significant improvement between testing programs was not expected. The writer did, however, decide to use the Survey to see if significant improvements would still occur.

Siebrecht Attitude Scale

The Siebrecht Attitude Scale consists of 40 statements concerning factors thought to be important in the safe driving of an automobile. Students react to these statements by checking one of five listed responses--strongly agree, agree, undecided, disagree, or strongly disagree. These responses are then scored by counting the number of deviations from the normal response, and subtracting this total from 200. The higher the score the more favorable are the responses.

Standard responses for this scale were determined by 125 commissioners of motor vehicle departments, license examiners, and accident-free drivers of commercial fleets. By the split-half method, a reliability of .81+.02P.E. was secured on a group of 100 students enrolled in driver education courses.³⁰

³⁰ Elmer B. Siebrecht, Manual of Directions Siebrecht Attitude Scale (New York: Center for Safety Education, New York University), pp. 2-4.

The Simulator Driving Test

The Simulator Driving Test film--Let's Review--is a 26 minute film containing three driving sequences--city driving, country driving, and expressway driving. Programmed into the sound track of this film are automatic checks for speed, brakes, steering, and turn signals. Incorrect responses for each category are totaled on the master control tower. During the administration of the test the error identification panel lights were turned off so students were not aware of any mistakes they might be making. The score on the test is the total number of incorrect responses, thus the lower the score the better the responses.

The Range Skill Tests

The range skill tests are a series of skill tests developed by staff members of the Michigan State University Highway Traffic Safety Center covering thirteen maneuvers and/or skills taught in a range program. Each test consists of several step-by-step procedural items each of which has an assigned point value. The student is scored on the basis of his completing the required step, whether the step was in proper sequence, and by the skill in which the particular step was performed. The final score is the total number of points scored, thus the higher the score the better the performance. A copy of this test is contained in Appendix C.

The Road Test

The final road test was a test developed by the American Association of Motor Vehicle Administrators³¹ as a suggested road test for driver licensing purposes. This test has three main areas--vehicle handling, traffic problems, and road problems. Under each area are a series of items which can be scored as either good or bad. The final scores for each area are expressed in percentages which are derived by dividing the number of checks in the good column by the total number of good and bad checks, thus the higher the score the better the performance. A copy of this test is included in Appendix D.

The Sources, Processing, and Analysis of Data

In this section are presented (1) the sources of the data used in this investigation, (2) methods of processing the data, (3) the methods for statistically analyzing the data, and (4) determining the samples for analysis.

Sources of Data

Data for this investigation were obtained from the school's permanent record files, by riding with the students to test their previous driving experience, answer sheets for

³¹American Association of Motor Vehicle Administrators, A Manual for Driver-Licensing Authorities in the Examining of Applicants for Drivers Licenses (Washington: American Association of Motor Vehicle Administrators, 1959), p. 105.

the knowledge and attitude tests, master control tower of the simulator, and score sheets developed for the range skill tests and the final road tests.

Permanent record file. Information concerning the students' full name, sex, age, grade level, and intelligence quotients were obtained from the permanent records of the school. As a double check for accuracy, the students were asked to fill in the same information, with the exception of the intelligence quotients, on a 3 x 5 card. Any difference between the two sources were reconciled by asking the student which was correct.

Previous driving experience. To determine the driving proficiency of each student before the instruction period began, the writer rode with each student around one block. The writer observed each student as he started the engine, left the curb and proceeded around the block and finally parked by the curb. In addition, the writer also asked each student a series of questions to determine how much the student had driven and where this driving took place. From this the writer was able to determine whether the student had slight, moderate, or extensive experience.

Knowledge and attitude test answer sheets. The scores for all the driving knowledge and driving attitude tests were taken directly from the answer sheets provided for these tests. The writer hand scored every answer sheet by use of a scoring key placed on top of the answer sheet.

Simulator driving test. On the master control tower in the simulator is a panel for each simulator which shows the total number of driving errors for each of the five types of errors that the simulator checks. The two instructors recorded these totals for each of the three driving sequences contained within the film for their own group on a form provided for this purpose. The writer did the necessary additional totaling for the computation of the final scores.

Range skill tests. For the range skill tests, college driver education students were assigned to each of the skill areas for purposes of checking the students. Each high school student was given a test sheet which he gave to the checker before he attempted each skill. The checker merely filled in the number of points for each step of the skill. The writer then collected these sheets and totaled the number of points for each skill and for the test as a whole.

Final road test. The road tester was given a supply of road test forms on which he merely placed the student's name and checked the student's performance as either good or bad on each item of the test as the student drove over a prescribed route. The writer then took these sheets and computed the final scores for the three areas contained within the test.

Methods of Processing the Data

The writer recorded all the data on each student directly onto columnar sheets. Each of the seven class periods were recorded on separate sheets and were divided into experimental boys, experimental girls, control boys, and control girls. Each type of information, i.e., background data, knowledge tests, attitude tests, simulator test, range skill tests, and final road test were further grouped on these sheets. From this grouping it was relatively easy to compute the statistics necessary for the various groupings contained within the tables.

Methods for Statistically Analyzing the Data

The groups were compared by testing the significance of the mean differences by "t" tests of critical ratios for driving knowledge, driving attitude, and driving skill. Significance of correlations between age, and intelligence quotients and the final criteria were tested by means of Pearson's Product Moment r ; and previous driving experience and the final criteria by means of Chi Square.³²

³²Henry E. Garrett, Statistics in Psychology and Education (Fifth edition; New York: Longmans, Green and Co., Inc., 1958), pp. 27-28, 53-54, 142, 185-186, 198-199, 213-215, 226-227, 253-254, and 392-394.

Determining the Samples for Analysis

All students who completed the training, and all pre-, mid-, and post-tests with the exception of four students were used in this investigation. The exceptions were: (1) for two students it was impossible to obtain intelligence quotients, (2) one student was unable to take the simulator driving test and the range skill tests because of illness, and (3) one student was unable to complete the two post attitude tests. It was felt by the writer that since these students were able to complete all the other necessary requirements, they could be used in the investigation without any adverse effects. All necessary adjustments in computing the statistics were made because of the absence of these figures.

It was necessary to drop nine students from the investigation for the following reasons:

1. Four students either transferred or dropped out of school between the time they were assigned to a group and the time the study began.
2. Two students were taking the course for the second time.
3. One student was a foreign exchange student who was having some difficulty with the English language.
4. One student transferred to this school the day before the study began and had been exposed to different

classroom instruction and a portion of the on-the-street instruction.

5. One student obtained a driver's license during the study and was doing a considerable amount of driving outside of the school program.

Of 164 students who were assigned to the two groups, 160 actually went through the instructional program, and 155 were finally used in the investigation--77 in the experimental group and 78 in the control group.

Summary

In this chapter were presented the methods of procedure for this investigation. Included were (1) the selection of the school and instructors, (2) methods of obtaining the sample, (3) characteristics of the students, (4) the instructional and testing programs, (5) the testing devices, and (6) the sources, processing, and analysis of the data.

In the following chapter are contained the findings of this investigation.

CHAPTER IV

THE FINDINGS

In the preceding chapter the methods of procedure for this investigation were presented. In this chapter are the findings resulting from a statistical analysis of the data. These findings are presented under the following seven headings: (1) Comparisons of driving knowledge and driving attitude pre-test scores between and within the experimental and control groups, (2) Comparisons of driving knowledge, driving attitude, range skill tests, and simulator driving test mid-test scores between and within the experimental and control groups, (3) Comparisons of driving knowledge, driving attitude, and road test post-test scores between and within the experimental and control groups, (4) Mean changes in driving knowledge and driving attitude scores between pre-tests and mid-tests, (5) Mean changes in driving knowledge and driving attitude scores between mid-tests and post-tests, (6) Mean changes in driving knowledge and driving attitude scores between pre-tests and post-tests, and (7) Correlations between chronological age, intelligence quotients, and previous driving experience categories, respectively, and the final criteria.

Comparisons of Driving Knowledge and Driving
Attitude Pre-Test Scores Between and
Within the Experimental and
Control Groups

This section contains the findings resulting from statistically comparing mean group scores in general driving knowledge, specific driving knowledge, and driving attitude test scores administered before the simulator and/or range instruction. These findings are contained in Tables 13 through 17.

General Driving Knowledge Pre-
Test Scores

In Table 13 are contained the differences in mean general driving knowledge test scores and the levels of significance of these differences on the Sportsmanlike Driving Final Examination administered before the range and/or simulator instruction. Table 13 shows that:

1. The control boys had a 2.41 higher mean general driving knowledge score than the control girls, significant at the .05 level.
2. The difference of more than one score point in general driving knowledge between the experimental and control groups was not significant at the .05 level, thus the null hypothesis must be retained.
3. The null hypotheses were also retained for the measured differences between all other groups.

Table 13. Significance of the differences in mean general driving knowledge (Sportsman-like Driving) pre-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	1.13	.88	1.28	Not Significant	
Ex. Girls and Ex. Boys	77	1.48	1.24	1.19	Not Significant	
Con. Girls and Con. Boys	78	2.41	1.22	1.98	Significant at .05 Level	Con. Boys
Ex. Girls and Con. Girls	82	.68	1.17	.58	Not Significant	
Ex. Boys and Con. Boys	73	1.61	1.29	1.25	Not Significant	
Ex. 1 and Ex. 2	77	1.62	1.23	1.32	Not Significant	
Con. 1 and Con. 2	78	1.81	1.22	1.48	Not Significant	

* .05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Specific Driving Knowledge
Pre-Test Scores

Table 14 contains the differences in mean specific driving knowledge test scores and the levels of significance of these differences on Part I of the George Washington University Final Examination administered before the range and/or simulator instruction. Table 14 shows that:

1. The control boys outscored the control girls by 3.49 points in specific driving knowledge, significant at the .01 level.
2. The slight difference of less than one score point in specific driving knowledge between the experimental and control groups was not significant at the .05 level, thus the null hypothesis must be retained.
3. The differences between all other groups were not significant at the .05 level so the null hypotheses for these groups were also retained.

Table 15 shows the following differences in mean specific driving knowledge test scores and the levels of significance of these differences on Part II of the George Washington University Final Examination administered before the range and/or simulator instruction:

1. The control boys had a 2.91 higher mean specific driving knowledge score than the control girls, significant at the .05 level.
2. The mean difference of less than one score point in specific driving knowledge between the experimental

Table 14. Significance of the differences in mean specific driving knowledge (George Washington Univ.--Part I) pre-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.35	.82	.43	Not Significant	
Ex. Girls and Ex. Boys	77	1.59	1.14	1.39	Not Significant	
Con. Girls and Con. Boys	78	3.49	1.11	3.14	Significant at .01 Level	Con. Boys
Ex. Girls and Con. Girls	82	.56	1.01	.55	Not Significant	
Ex. Boys and Con. Boys	73	1.34	1.22	1.10	Not Significant	
Ex. 1 and Ex. 2	77	.26	1.13	.23	Not Significant	
Con. 1 and Con. 2	78	.38	1.18	.32	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 15. Significance of the differences in mean specific driving knowledge (George Washington Univ.--Part II) pre-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.72	.87	.83	Not Significant	
Ex. Girls and Ex. Boys	77	1.35	1.17	1.15	Not Significant	
Con. Girls and Con. Boys	78	2.91	1.24	2.35	Significant at .05 Level	Con. Boys
Ex. Girls and Con. Girls	82	.03	1.08	.03	Not Significant	
Ex. Boys and Con. Boys	73	1.53	1.32	1.16	Not Significant	
Ex. 1 and Ex. 2	77	.71	1.16	.61	Not Significant	
Con. 1 and Con. 2	78	1.44	1.21	1.19	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

and control groups was not significant at the .05 level, so the null hypothesis was retained.

3. The null hypothesis was retained for all other groups.

Driving Attitude Pre-Test Scores

Table 16 contains the differences in mean driving attitude test scores and the levels of significance of these differences on the Mann Personal Attitude Survey, administered before the range and/or simulator instruction. Table 16 shows that:

1. The experimental girls had a 5.12 lower driving attitude score than the experimental boys, significant at the .01 level. This indicates that the girls would have somewhat better attitudes than the boys.
2. The control girls had a 3.87 lower driving attitude score than the control boys, significant at the .05 level.
3. The second control group had a 4.25 lower driving attitude score than the first control group, significant at the .01 level.
4. The null hypothesis was retained for the difference measured between the experimental and control groups, as it was not sufficiently large to be significant at the .05 level.
5. The null hypothesis was also retained for all remaining groups.

Table 16. Significance of the differences in mean driving attitude (Mann) pre-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.52	1.26	.41	Not Significant	
Ex. Girls and Ex. Boys	77	5.12	1.77	2.89	Significant at .01 Level	Ex. Girls
Con. Girls and Con. Boys	78	3.87	1.73	2.24	Significant at .05 Level	Con. Girls
Ex. Girls and Con. Girls	82	1.07	1.26	.85	Not Significant	
Ex. Boys and Con. Boys	73	.18	2.14	.08	Not Significant	
Ex. 1 and Ex. 2	77	1.73	1.81	.96	Not Significant	
Con. 1 and Con. 2	78	4.25	1.60	2.66	Significant at .01 Level	Con. 2

*.05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

In Table 17 are contained the differences in mean driving attitude test scores and the levels of significance of these differences on the Siebrecht Attitude Scale administered before the range and/or simulator instruction. Table 17 shows that:

1. There was a difference of more than two score points in driving attitude between the experimental and control groups, but this difference was not significant at the .05 level.
2. The differences between all other groups were not significant at the .05 level so the null hypotheses pertaining to these groups were retained.

Comparisons of Driving Knowledge, Driving
Attitude, Range Skill Tests, and
Simulator Driving Test Mid-Test
Scores Between and Within the
Experimental and Control
Groups

In this section are presented the findings resulting from statistically comparing mean group scores in general driving knowledge, specific driving knowledge, driving attitude, range skill tests, and simulator driving test administered between the range and/or simulator instruction and the on-the-street instruction. These findings are shown in Tables 18 through 28.

Table 17. Significance of the differences in mean driving attitude (Siebrecht) pre-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	2.07	1.32	1.57	Not Significant	
Ex. Girls and Ex. Boys	77	3.29	2.01	1.64	Not Significant	
Con. Girls and Con. Boys	78	.03	1.75	.02	Not Significant	
Ex. Girls and Con. Girls	82	.51	1.70	.30	Not Significant	
Ex. Boys and Con. Boys	73	3.83	2.05	1.87	Not Significant	
Ex. 1 and Ex. 2	77	1.53	1.93	.79	Not Significant	
Con. 1 and Con. 2	78	1.16	1.71	.68	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

General Driving Knowledge Mid-Test Scores

Table 18 contains the differences in mean general driving knowledge scores and the levels of significance of these differences on the Sportsmanlike Driving Final Examination administered between the range and/or simulator instruction and the on-the-street instruction. Table 18 shows that:

1. The slight difference of less than one score point in general driving knowledge between the experimental and control groups was not significant at the .05 level, thus the null hypothesis must be retained.
2. The null hypothesis was also retained for all other groups.

Specific Driving Knowledge Mid-Test Scores

In Table 19 are contained the differences in mean specific driving knowledge scores and the levels of significance of these differences on Part I of the George Washington University Final Examination administered between the range and/or simulator instruction and the on-the-street instruction. Table 19 shows that:

1. The slight mean difference of less than one score point in specific driving knowledge between the experimental and control groups was not significant at the .05 level, so the null hypothesis was retained.

Table 18. Significance of the differences in mean general driving knowledge (Sportsman-like Driving) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.21	.85	.25	Not Significant	
Ex. Girls and Ex. Boys	77	1.07	1.19	.90	Not Significant	
Con. Girls and Con. Boys	78	1.23	1.22	1.01	Not Significant	
Ex. Girls and Con. Girls	82	.30	1.07	.28	Not Significant	
Ex. Boys and Con. Boys	73	.14	1.33	.11	Not Significant	
Ex. 1 and Ex. 2	77	1.16	1.16	1.00	Not Significant	
Con. 1 and Con. 2	78	1.54	1.15	1.34	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 19. Significance of the differences in mean specific driving knowledge (George Washington Univ.-Part I) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.23	.83	.28	Not Significant	
Ex. Girls and Ex. Boys	77	.42	1.25	.34	Not Significant	
Con. Girls and Con. Boys	78	.14	1.15	.12	Not Significant	
Ex. Girls and Con. Girls	82	.37	.90	.41	Not Significant	
Ex. Boys and Con. Boys	73	.09	1.44	.06	Not Significant	
Ex. 1 and Ex. 2	77	1.02	1.25	.82	Not Significant	
Con. 1 and Con. 2	78	.59	1.13	.52	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

2. The null hypothesis was also retained for all other differences between groups.

Table 20 contains the following differences in mean specific driving knowledge scores and the levels of significance of these differences on Part II of the George Washington University Final Examination administered between the range and/or simulator instruction and the on-the-street instruction:

1. The slight difference of less than one score point between the experimental and control groups was not significant at the .05 level, thus the null hypothesis was retained.
2. The null hypothesis was also retained for all other differences between groups.

Driving Attitude Mid-Test Scores

In Table 21 are contained the differences in mean driving attitude scores and the levels of significance of these differences on the Mann Personal Attitude Survey administered between the range and/or simulator instruction and the on-the-street instruction. Table 21 shows that:

1. The control girls had a 5.48 lower mean driving attitude score than the control boys, significant at the .01 level.
2. The second control group had a 4.06 lower mean driving attitude score than the first control group, significant at the .05 level.

Table 20. Significance of the differences in mean specific driving knowledge (George Washington Univ.-Part II) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	.36	1.04	.35	Not Significant	
Ex. Girls and Ex. Boys	77	1.66	1.39	1.19	Not Significant	
Con. Girls and Con. Boys	78	.31	1.60	.19	Not Significant	
Ex. Girls and Con. Girls	82	1.29	1.15	1.12	Not Significant	
Ex. Boys and Con. Boys	73	.68	1.78	.38	Not Significant	
Ex. 1 and Ex. 2	77	.58	1.40	.41	Not Significant	
Con. 1 and Con. 2	78	.82	1.57	.52	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

Table 21. Significance of the differences in mean driving attitude (Mann) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	.58	1.25	.46	Not Significant	
Ex. Girls and Ex. Boys	77	2.81	1.57	1.79	Not Significant	
Con. Girls and Con. Boys	78	5.48	1.90	2.88	Significant at .01 Level	Con. Girls
Ex. Girls and Con. Girls	82	.71	1.39	.51	Not Significant	
Ex. Boys and Con. Boys	73	1.96	2.03	.97	Not Significant	
Ex. 1 and Ex. 2	77	.88	1.57	.56	Not Significant	
Con. 1 and Con. 2	78	4.06	1.88	2.16	Significant at .05 Level	Con. 2

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

3. The slight difference of less than one score point in driving attitude between the experimental and control groups was not significant at the .05 level so the null hypothesis was retained.
4. The null hypothesis was also retained for the differences between all other groups.

Table 22 contains the differences in mean driving attitude and the levels of significance of these differences on the Siebrecht Attitude Scale administered between the range and/or simulator instruction and the on-the-street instruction. Table 22 shows that:

1. The difference of less than one score point between the experimental and control groups in driving attitude was not significant at the .05 level, so the null hypothesis was retained.
2. The null hypotheses with respect to differences between all other groups were retained.

Range Skill Tests

Table 23 contains the differences in mean driving skill and the levels of significance of these differences on the Range Skill Tests administered between the range and/or simulator instruction and the on-the-street instruction.

Table 23 shows that:

1. The control group had a 15.22 higher mean driving skill test score than the experimental group, significant at the .001 level.

Table 22. Significance of the differences in mean driving attitude (Siebrecht) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	.87	1.18	.74	Not Significant	
Ex. Girls and Ex. Boys	77	2.80	1.50	1.87	Not Significant	
Con. Girls and Con. Boys	78	3.03	1.77	1.71	Not Significant	
Ex. Girls and Con. Girls	82	1.00	1.47	.68	Not Significant	
Ex. Boys and Con. Boys	73	.77	1.80	.43	Not Significant	
Ex. 1 and Ex. 2	77	.53	1.53	.35	Not Significant	
Con. 1 and Con. 2	78	1.48	1.79	.83	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 23. Significance of the differences in mean driving skill (Range Skill Tests) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	154	15.22	2.42	6.29	Significant at .001 Level	Control
Ex. Girls and Ex. Boys	77	6.31	3.88	1.63	Not Significant	
Con. Girls and Con. Boys	77	2.67	2.72	.98	Not Significant	
Ex. Girls and Con. Girls	81	16.89	3.49	4.84	Significant at .001 Level	Con. Girls
Ex. Boys and Con. Boys	73	13.25	3.21	4.13	Significant at .001 Level	Con. Boys
Ex. 1 and Ex. 2	77	12.69	3.56	3.56	Significant at .001 Level	Ex. 2
Con. 1 and Con. 2	77	8.79	2.41	3.65	Significant at .001 Level	Con. 2

*.05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

2. The control girls outscored the experimental girls by 16.89 points in driving skill, significant at the .001 level.
3. The control boys exceeded the experimental boys by 13.25 points in driving skill, significant at the .001 level.
4. The second experimental group outscored the first group in driving skill by 12.69 points, significant at the .001 level.
5. The second control group exceeded the first group in driving skill by 8.79 points, significant at the .001 level.
6. The null hypotheses with respect to the differences between the experimental girls and boys, and between the control girls and boys were retained.

Simulator Driving Test

Table 24 contains the differences in mean driving skill and the levels of significance of these differences on the Simulator Driving Test administered between the range and/or simulator instruction and the on-the-street instruction. The writer also broke this test down into the four types of errors contained within the test. These errors were with respect to speed, braking, steering, and signalling. Tables 25 through 28 contain the differences and the levels of significance of these differences. Table 24 which contains the total driving errors on the Simulator Driving Test

Table 24. Significance of the differences in mean driving skill (Simulator Driving Test) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	154	.05	2.12	.02	Not Significant	
Ex. Girls and Ex. Boys	77	.31	3.38	.09	Not Significant	
Con. Girls and Con. Boys	77	4.52	2.44	1.85	Not Significant	
Ex. Girls and Con. Girls	81	1.97	3.16	.62	Not Significant	
Ex. Boys and Con. Boys	73	2.24	2.62	.85	Not Significant	
Ex. 1 and Ex. 2	77	1.72	3.43	.50	Not Significant	
Con. 1 and Con. 2	77	2.77	2.65	1.05	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

administered after the range and/or simulator instruction and before the on-the-street instruction shows that:

1. The slight difference between the experimental and control groups on the simulator driving test was not significant at the .05 level, so the null hypothesis was retained.
2. The null hypotheses with respect to differences between all other groups were also retained.

Table 25 which contains the driving errors with respect to speed shows that:

1. The experimental girls had a 1.20 lower mean score in errors with respect to speed on the simulator driving test than the experimental boys, significant at the .05 level.
2. The second experimental group had a 1.51 lower mean score in errors with respect to speed on the simulator driving test than the first group, significant at the .05 level.
3. The measured difference between the experimental and control groups in errors with respect to speed on the simulator driving test was not significant.
4. The differences between all other groups were not significant.

Table 26 which contains the driving errors with respect to braking shows that:

1. The first control group had a 3.92 lower mean score in braking errors on the simulator driving test than

Table 25. Significance of the differences in mean driving skill (Simulator Driving Test-Speed) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	154	.10	.48	.21	Not Significant	
Ex. Girls and Ex. Boys	77	1.20	.61	1.97	Significant at .05 Level	Ex. Girls
Con. Girls and Con. Boys	77	.25	.71	.35	Not Significant	
Ex. Girls and Con. Girls	81	.34	.74	.46	Not Significant	
Ex. Boys and Con. Boys	73	.61	.58	1.05	Not Significant	
Ex. 1 and Ex. 2	77	1.51	.59	2.56	Significant at .05 Level	Ex. 2
Con. 1 and Con. 2	77	.78	.77	1.01	Not Significant	

* .05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 26. Significance of the differences in mean driving skill (Simulator Driving Test-Brakes) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	154	1.97	1.50	1.31	Not Significant	
Ex. Girls and Ex. Boys	77	.02	2.49	.01	Not Significant	
Con. Girls and Con. Boys	77	1.87	1.59	1.18	Not Significant	
Ex. Girls and Con. Girls	81	1.08	2.28	.47	Not Significant	
Ex. Boys and Con. Boys	73	2.93	1.89	1.55	Not Significant	
Ex. 1 and Ex. 2	77	4.29	2.57	1.67	Not Significant	
Con. 1 and Con. 2	77	3.92	1.72	2.28	Significant at .05 Level	Con. 1

* .05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

the second control group, significant at the .05 level.

2. The measured difference between the experimental and control groups in braking errors on the simulator driving test was not significant.
3. The differences between all other groups were not significant.

Table 27 which contains the driving errors with respect to steering shows that:

1. The difference of over one score point in steering errors on the simulator driving test between the experimental and control groups was not significant.
2. The measured differences for all other groups were not significant.

Table 28 which contains the driving errors with respect to signalling shows that:

1. The experimental girls had a .95 lower mean score than the control girls in signalling errors on the simulator driving test, significant at the .05 level.
2. The measured difference between the experimental and control groups in signalling errors on the simulator driving test was not significant.
3. There were no other significant differences between the remaining groups.

Table 27. Significance of the differences in mean driving skill (Simulator Driving Test-Steering) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	154	1.17	1.01	1.16	Not Significant	
Ex. Girls and Ex. Boys	77	1.10	1.33	.83	Not Significant	
Con. Girls and Con. Boys	77	2.34	1.46	1.60	Not Significant	
Ex. Girls and Con. Girls	81	1.78	1.56	1.14	Not Significant	
Ex. Boys and Con. Boys	73	.54	1.22	.44	Not Significant	
Ex. 1 and Ex. 2	77	.50	1.32	.38	Not Significant	
Con. 1 and Con. 2	77	2.01	1.43	1.41	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 28. Significance of the differences in mean driving skill (Simulator Driving Test-Turn Signals) mid-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	154	.56	.34	1.65	Not Significant	
Ex. Girls and Ex. Boys	77	.25	.54	.46	Not Significant	
Con. Girls and Con. Boys	77	.57	.40	1.43	Not Significant	
Ex. Girls and Con. Girls	81	.95	.47	2.02	Significant at .05 Level	Ex. Girls
Ex. Boys and Con. Boys	73	.13	.49	.27	Not Significant	
Ex. 1 and Ex. 2	77	.53	.54	.98	Not Significant	
Con. 1 and Con. 2	77	.09	.41	.22	Not Significant	

* .05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Comparisons of Driving Knowledge, Driving
Attitude, and Road Test Post-Test Scores
Between and Within the Experimental
and Control Groups

In this section are presented the findings resulting from statistically comparing mean group scores in general driving knowledge, specific driving knowledge, driving attitude, and the final road test administered after completion of the on-the-street instruction. These findings are shown in Tables 29 through 36.

General Driving Knowledge Post-
Test Scores

In Table 29 are contained the differences in mean general driving knowledge test scores and the levels of significance of these differences on the Sportsmanlike Driving Final Examination administered after the on-the-street instruction. Table 29 shows that:

1. The null hypothesis with respect to the difference in general driving knowledge between the experimental and control groups was retained as the measured difference was not sufficiently large to be significant at the .05 level.
2. The null hypotheses with respect to the differences between all remaining groups were also retained.

Table 29. Significance of the differences in mean general driving knowledge (Sportsman-like Driving) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.36	.93	.39	Not Significant	
Ex. Girls and Ex. Boys	77	1.35	1.38	.98	Not Significant	
Con. Girls and Con. Boys	78	.22	1.24	.18	Not Significant	
Ex. Girls and Con. Girls	82	.17	1.13	.15	Not Significant	
Ex. Boys and Con. Boys	73	.96	1.47	.65	Not Significant	
Ex. 1 and Ex. 2	77	1.04	1.35	.77	Not Significant	
Con. 1 and Con. 2	78	1.34	1.15	1.17	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Specific Driving Knowledge
Post-Test Scores

Table 30 contains the differences in mean specific driving knowledge test scores and the levels of significance of these differences on Part I of the George Washington University Final Examination administered after the on-the-street instruction. Table 30 shows that:

1. The null hypothesis with respect to the difference between the experimental and control groups in specific driving knowledge was retained.
2. The differences between all other groups were not significant so the null hypotheses with respect to these groups were also retained.

Table 31 contains the differences in mean specific driving knowledge test scores and the levels of significance of these differences on Part II of the George Washington University Final Examination administered after the on-the-street instruction. Table 31 shows that:

1. The difference of less than one score point between the experimental and control groups in specific driving knowledge was not significant at the .05 level, so the null hypothesis must be retained.
2. The null hypothesis was also retained for the differences between all other groups.

Table 30. Significance of the differences in mean specific driving knowledge (George Washington Univ.-Part I) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	.23	.96	.24	Not Significant	
Ex. Girls and Ex. Boys	77	.82	1.35	.61	Not Significant	
Con. Girls and Con. Boys	78	.63	1.46	.43	Not Significant	
Ex. Girls and Con. Girls	82	.32	.86	.37	Not Significant	
Ex. Boys and Con. Boys	73	.13	1.79	.07	Not Significant	
Ex. 1 and Ex. 2	77	1.40	1.35	1.04	Not Significant	
Con. 1 and Con. 2	78	.09	1.51	.06	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 31. Significance of the differences in mean specific driving knowledge (George Washington Univ.--Part II) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	.45	1.03	.44	Not Significant	
Ex. Girls and Ex. Boys	77	2.01	1.47	1.37	Not Significant	
Con. Girls and Con. Boys	78	.72	1.48	.49	Not Significant	
Ex. Girls and Con. Girls	82	.83	1.14	.73	Not Significant	
Ex. Boys and Con. Boys	73	1.90	1.75	1.09	Not Significant	
Ex. 1 and Ex. 2	77	.35	1.51	.23	Not Significant	
Con. 1 and Con. 2	78	1.52	1.47	1.03	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Driving Attitude Post-
Test Scores

Table 32 contains the differences in mean driving attitude test scores and the levels of significance of these differences on the Mann Personal Attitude Survey administered after the on-the-street instruction. Table 32 shows that:

1. The experimental girls had a 4.92 lower mean driving attitude test score than the experimental boys, significant at the .05 level.
2. The control girls had a 5.51 lower mean driving attitude test score than the control boys, significant at the .01 level.
3. The second control group had a 5.02 lower mean driving attitude test score than the first control group, significant at the .05 level.
4. The difference of more than one score point in driving attitude between the experimental and control groups was not significant at the .05 level, thus the null hypothesis must be retained.
5. The null hypotheses with respect to the measured differences between the remaining groups were retained.

Table 33 contains the differences in mean driving attitude test scores and the levels of significance of these differences on the Siebrecht Attitude Scale administered after the on-the-street instruction. Table 33 shows that:

Table 32. Significance of the differences in mean driving attitude (Mann) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	154	.37	1.46	.25	Not Significant	
Ex. Girls and Ex. Boys	76	4.92	1.97	2.50	Significant at .05 Level	Ex. Girls
Con. Girls and Con. Boys	78	5.51	2.09	2.64	Significant at .01 Level	Con. Girls
Ex. Girls and Con. Girls	82	.02	1.51	.01	Not Significant	
Ex. Boys and Con. Boys	72	.61	2.44	.25	Not Significant	
Ex. 1 and Ex. 2	76	.17	2.05	.08	Not Significant	
Con. 1 and Con. 2	78	5.02	2.02	2.49	Significant at .05 Level	Con. 2

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 33. Significance of the differences in mean driving attitude (Siebrecht) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	154	1.08	1.20	.90	Not Significant	
Ex. Girls and Ex. Boys	76	2.65	1.68	1.58	Not Significant	
Con. Girls and Con. Boys	78	3.98	1.64	2.43	Significant at .05 Level	Con. Girls
Ex. Girls and Con. Girls	82	.41	1.54	.27	Not Significant	
Ex. Boys and Con. Boys	72	1.74	1.77	.98	Not Significant	
Ex. 1 and Ex. 2	76	.91	1.75	.52	Not Significant	
Con. 1 and Con. 2	78	2.85	1.62	1.76	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

1. The control girls had a 3.98 higher mean driving attitude test score than the control boys, significant at the .05 level.
2. The difference of slightly more than one score point in driving attitude between the experimental and control groups was not significant at the .05 level, so the null hypothesis must be retained.
3. The null hypotheses with respect to the measured differences between the remaining groups were retained.

Final Road Test

Tables 34, 35, and 36 contain the differences in mean driving skill and the levels of significance of these differences on the three sections of the Final Road Test administered after the on-the-street instruction. These sections pertain to vehicle handling, traffic problems, and road problems, respectively.

Table 34 which contains the vehicle handling section of the Final Road Test shows that:

1. The control group had a 3.25 higher mean score on vehicle handling than the experimental group, significant at the .05 level.
2. The control boys exceeded the experimental boys in vehicle handling by 5.00 points, significant at the .05 level.

Table 34. Significance of the differences in mean driving skill (Road Test-Vehicle Handling) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	3.25	1.55	2.10	Significant at .05 Level	Control
Ex. Girls and Ex. Boys	77	1.83	2.57	.71	Not Significant	
Con. Girls and Con. Boys	78	1.49	1.74	.86	Not Significant	
Ex. Girls and Con. Girls	82	1.68	2.03	.83	Not Significant	
Ex. Boys and Con. Boys	73	5.00	2.35	2.13	Significant at .05 Level	Con. Boys
Ex. 1 and Ex. 2	77	2.29	2.52	.91	Not Significant	
Con. 1 and Con. 2	78	2.45	1.62	1.51	Not Significant	

* .05 (one-tail).

KEY: N = Number of students within groups compared
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
Direction = Higher mean score indicated at .05 level or lower

Table 35. Significance of the differences in mean driving skill (Road Test-Traffic Problems) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEmd	CR	Comments	Direction
Experimental and Control	155	1.28	1.70	.75	Not Significant	
Ex. Girls and Ex. Boys	77	3.51	2.74	1.28	Not Significant	
Con. Girls and Con. Boys	78	2.79	1.91	1.46	Not Significant	
Ex. Girls and Con. Girls	82	4.24	2.44	1.74	Not Significant	
Ex. Boys and Con. Boys	73	2.06	2.28	.90	Not Significant	
Ex. 1 and Ex. 2	77	4.75	2.65	1.79	Not Significant	
Con. 1 and Con. 2	78	.82	1.80	.46	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEmd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher mean score indicated at .05 level or lower

Table 36. Significance of the differences in mean driving skill (Road Test-Road Problems) post-test scores between and within the experimental and control groups as measured by "t" tests* of critical ratios.

Groups Compared	N	Md	SEnd	CR	Comments	Direction
Experimental and Control	155	1.61	1.65	.98	Not Significant	
Ex. Girls and Ex. Boys	77	.45	2.59	.17	Not Significant	
Con. Girls and Con. Boys	78	.14	2.02	.07	Not Significant	
Ex. Girls and Con. Girls	82	1.88	2.30	.82	Not Significant	
Ex. Boys and Con. Boys	73	1.29	2.35	.55	Not Significant	
Ex. 1 and Ex. 2	77	5.64	2.41	2.34	Significant at .05 Level	Ex. 2
Con. 1 and Con. 2	78	2.35	1.92	1.22	Not Significant	

*.05 (one-tail).

KEY: N = Number of students within groups compared

Md = Difference of mean scores

SEnd = Standard error of difference of mean scores

CR = Critical ratio

Comments = Level of significance of the critical ratio

Direction = Higher score indicated at .05 level or lower

3. The null hypotheses with respect to the differences between all other groups were retained.

Table 35 which contains the traffic problems section of the Final Road Test shows that:

1. The null hypothesis with respect to the differences between the experimental and control groups on traffic problems was retained.
2. The differences between all other groups were not significant at the .05 level, so the null hypotheses with respect to these groups were retained.

Table 36 which contains the road problems section of the Final Road Test shows that:

1. The second experimental group outscored the first group by 5.64 points in road problems, significant at the .05 level.
2. The difference between the experimental and control groups in road problems was not significant, so the null hypothesis must be retained.
3. The null hypotheses were also retained for the differences between all remaining groups.

Mean Changes in Driving Knowledge and
Driving Attitude Scores Between Pre-
Tests and Mid-Tests

In this section are reported the mean changes and significance of these changes in general driving knowledge, specific driving knowledge, and driving attitude from tests administered before and after the range and/or simulator

instruction. These findings are shown in Tables 37 through 39.

Mean Changes in General Driving
Knowledge Scores

Table 37 reveals the following positive mean changes on the Sportsmanlike Driving Final Examination administered before and after the range and/or simulator instruction:

1. The total experimental group improved over three score points in general driving knowledge, significant at the .001 level.
2. There was a considerable difference in improvement in general driving knowledge between the two experimental groups. The second group improved over five score points, whereas, the first group improved only over two points. Both improvements, however, were significant at the .001 level.
3. Both the experimental boys and the experimental girls improved over three score points in general driving knowledge, both significant at the .001 level.
4. The total control group improved over two score points in general driving knowledge, significant at the .001 level.
5. There was a considerable difference in improvement in general driving knowledge between the two control groups. The second group improved over four score

Table 37. Significance of the mean changes between pre-test and mid-test general driving knowledge (Sportsmanlike Driving) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+3.69	.44	8.39	Significant at .001 Level
Boys	36	+3.47	.69	5.03	Significant at .001 Level
Girls	41	+3.88	.57	6.81	Significant at .001 Level
1	42	+2.42	.54	4.48	Significant at .001 Level
2	35	+5.20	.65	8.00	Significant at .001 Level
Control	78	+2.35	.49	4.80	Significant at .001 Level
Boys	37	+1.72	.73	2.36	Significant at .05 Level
Girls	41	+2.90	.68	4.26	Significant at .001 Level
1	44	+ .89	.67	1.33	Not Significant
2	34	+4.24	.56	7.57	Significant at .001 Level

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

points, which was significant at the .001 level, whereas, the first control group improved less than one score point which was not significant.

6. There was a considerable difference in improvement in general driving knowledge between the control girls and boys. The control girls improved nearly three score points which was significant at the .001 level, whereas, the control boys only improved over one score point, significant at the .05 level.

Mean Changes in Specific Driving Knowledge Scores

The following positive mean changes on Part I of the George Washington University Final Examination administered before and after the range and/or simulator instruction are revealed in Table 38:

1. Both the total experimental group and the first experimental group improved over three score points in specific driving knowledge, significant at the .001 level.
2. The second experimental group improved less than three score points in specific driving knowledge, but still showed significant improvement at the .01 level.
3. The experimental girls showed more improvement than the experimental boys in specific driving knowledge. The girls improved nearly four score points,

Table 38. Significance of the mean changes between pre-test and mid-test specific driving knowledge (George Washington Univ.-Part I) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEmd	CR	Comments
Experimental	77	+3.01	.50	6.02	Significant at .001 Level
Boys	36	+1.94	.81	2.40	Significant at .05 Level
Girls	41	+3.95	.57	6.93	Significant at .001 Level
1	42	+3.36	.55	6.11	Significant at .001 Level
2	35	+2.60	.86	3.02	Significant at .01 Level
Control	78	+2.43	.50	4.86	Significant at .001 Level
Boys	37	+ .51	.70	.73	Not Significant
Girls	41	+4.14	.60	6.90	Significant at .001 Level
1	44	+2.00	.59	3.39	Significant at .01 Level
2	34	+2.97	.86	3.45	Significant at .01 Level

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

significant at the .001 level, whereas, the boys only improved nearly two score points, significant at the .05 level.

4. The total control group improved more than two score points in specific driving knowledge, significant at the .001 level.
5. Both halves of the control group improved more than two score points in specific driving knowledge, both significant at the .01 level.
6. The control girls improved more than four score points in specific driving knowledge, significant at the .001 level.
7. The slight improvement in specific driving knowledge attained by the control boys was not significant.

Table 39 shows the following positive mean changes in specific driving knowledge on Part II of the George Washington University Final Examination administered before and after the range and/or simulator instruction:

1. Both the total experimental group and the second experimental group showed improvement of over four score points in specific driving knowledge, significant at the .001 level.
2. The first experimental group improved less than four score points in specific driving knowledge which was significant at the .01 level.
3. The experimental girls improved three score points more than the experimental boys in specific driving

Table 39. Significance of the mean changes between pre-test and mid-test specific driving knowledge (George Washington Univ.-Part II) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+4.15	.52	7.98	Significant at .001 Level
Boys	36	+2.55	.85	3.00	Significant at .01 Level
Girls	41	+5.56	.54	10.30	Significant at .001 Level
1	42	+3.57	.72	4.96	Significant at .001 Level
2	35	+4.86	.73	6.66	Significant at .001 Level
Control	78	+3.07	.57	5.39	Significant at .001 Level
Boys	37	+1.70	.88	1.93	Not Significant
Girls	41	+4.30	.66	6.52	Significant at .001 Level
1	44	+2.79	.71	3.93	Significant at .001 Level
2	34	+3.41	.93	3.67	Significant at .001 Level

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

knowledge, but both groups still improved significantly at the .001 and .01 levels, respectively.

4. Both the total control group and the second control group improved more than three score points in specific driving knowledge, significant at the .001 level.
5. The first control group showed less than three score points of improvement in specific driving knowledge which was significant at the .001 level.
6. The control girls improved more than four score points in specific driving knowledge, significant at the .001 level.
7. The control boys showed improvement of nearly two score points in specific driving knowledge, but this improvement was not significant.

Mean Changes in Driving Attitude Scores

Table 40 reveals the following mean changes on the Mann Personal Attitude Survey administered before and after the range and/or simulator instruction:

1. The only significant improvement in driving attitude by any of the experimental groups was made by the first experimental group. This group improved over two score points, significant at the .05 level.
2. The mean improvements in driving attitude shown by the total experimental group and the experimental

Table 40. Significance of the mean changes between pre-test and mid-test driving attitude (Mann) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+ .96	.64	1.50	Not Significant
Boys	36	+2.19	1.10	1.99	Not Significant
Girls	41	- .12	.68	- .18	Not Significant
1	42	+2.15	.84	2.56	Significant at .05 Level
2	35	- .46	.96	- .48	Not Significant
Control	78	+ .90	.66	1.36	Not Significant
Boys	37	+ .05	1.07	.05	Not Significant
Girls	41	+1.66	.80	2.08	Significant at .05 Level
1	44	+ .98	.78	1.26	Not Significant
2	34	+ .79	1.15	.69	Not Significant

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change
- = Negative mean change

boys of one and two score points, respectively, were not significant.

3. The slight regression in driving attitude shown by the second experimental group and the experimental girls were not significant.
4. The only significant improvement in driving attitude by any of the control groups was obtained by the control girls. This group improved over one score point which was significant at the .05 level.
5. The improvements in driving attitude of nearly one score point shown by the total control group and the first and second control groups were not significant.
6. The slight improvement in driving attitude attained by the control boys was not significant.

Table 41 shows the following mean improvements in driving attitude on the Siebrecht Attitude Scale administered before and after the range and/or simulator instruction:

1. The total experimental group and the first experimental group had an improvement of approximately four score points in driving attitude, significant at the .001 level.
2. The second experimental group improved over three score points in driving attitude, significant at the .05 level.
3. Both the experimental boys and girls had improvements of over three score points in driving attitude which

Table 41. Significance of the mean changes between pre-test and mid-test driving attitude (Siebrecht) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEmd	CR	Comments
Experimental	77	+3.72	.86	4.33	Significant at .001 Level
Boys	36	+3.98	1.51	2.64	Significant at .05 Level
Girls	41	+3.49	.92	3.79	Significant at .001 Level
1	42	+4.17	.80	5.21	Significant at .001 Level
2	35	+3.17	1.22	2.60	Significant at .05 Level
Control	78	+2.52	.77	3.27	Significant at .01 Level
Boys	37	+ .92	.85	1.08	Not Significant
Girls	41	+3.98	1.21	3.29	Significant at .01 Level
1	44	+2.39	1.13	2.12	Significant at .05 Level
2	34	+2.71	1.03	2.63	Significant at .05 Level

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

were significant at the .05 and .001 levels, respectively.

4. The total control group improved over two score points in driving attitude, significant at the .01 level.
5. Both halves of the control group also improved over two score points in driving attitude but these improvements were significant only at the .05 level.
6. The control girls improved nearly four score points in driving attitude, significant at the .01 level.
7. The improvement of less than one score point in driving attitude attained by the control boys was not significant.

Mean Changes in Driving Knowledge and Driving
Attitude Scores Between Mid-Tests
and Post-Tests

In this section are reported the mean changes and the significance of these changes in general driving knowledge, specific driving knowledge, and driving attitude from tests administered before and after the on-the-street instruction. These findings are shown in Tables 42 through 46.

Mean Changes in General Driving
Knowledge Scores

The following mean changes on the Sportsmanlike Driving Final Examination administered before and after the on-the-street instruction are revealed in Table 42.

Table 42. Significance of the mean changes between mid-test and post-test general driving knowledge (Sportsmanlike Driving) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+ .49	.38	1.29	Not Significant
Boys	36	+ .64	.55	1.16	Not Significant
Girls	41	+ .36	.52	.69	Not Significant
1	42	+ .55	.48	1.15	Not Significant
2	35	+ .43	.74	.58	Not Significant
Control	78	+ .34	.36	.94	Not Significant
Boys	37	- .18	.56	- .32	Not Significant
Girls	41	+ .83	.46	1.80	Not Significant
1	44	+ .43	.47	.91	Not Significant
2	34	+ .23	.59	.39	Not Significant

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change
- = Negative mean change

1. None of the slight improvements in general driving knowledge attained by the experimental groups were significant.
2. None of the slight improvements in general driving knowledge attained by the total control group, the two halves of the control group or the control girls were significant.
3. The slight regression in general driving knowledge of less than one score point shown by the control boys was not significant.

Mean Changes in Specific
Driving Knowledge Scores

Table 43 reveals the following positive mean changes on Part I of the George Washington University Final Examination administered before and after the on-the-street instruction:

1. None of the slight improvements in specific driving knowledge attained by the experimental groups were significant.
2. The only significant improvement shown by any of the control groups in specific driving knowledge was attained by the first control group. This group improved less than one score point, significant at the .05 level.
3. The slight improvements in specific driving knowledge attained by the total control group, the second half

Table 43. Significance of the mean changes between mid-test and post-test specific driving knowledge (George Washington Univ.-Part I) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+ .52	.48	1.08	Not Significant
Boys	36	+ .31	.90	.34	Not Significant
Girls	41	+ .71	.45	1.58	Not Significant
1	42	+ .69	.38	1.82	Not Significant
2	35	+ .31	.95	.33	Not Significant
Control	78	+ .52	.39	1.33	Not Significant
Boys	37	+ .27	.69	.39	Not Significant
Girls	41	+ .76	.41	1.85	Not Significant
1	44	+ .82	.41	2.00	Significant at .05 Level
2	34	+ .14	.72	.19	Not significant

* .05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

of the control group, and the control boys and control girls were not significant.

Table 44 reveals the following mean changes on Part II of the George Washington University Final Examination administered before and after the on-the-street instruction:

1. The slight improvements in specific driving knowledge shown by the total experimental group, the first half of the experimental group, and the experimental girls were not significant.
2. The slight losses in specific driving knowledge by the second experimental group and the experimental boys were not significant.
3. The total control group showed an improvement of slightly less than one score point in specific driving knowledge, significant at the .05 level.
4. The improvement of over one score point in specific driving knowledge attained by the first control group was significant at the .05 level.
5. The control boys improved more than one score point in specific driving knowledge but this improvement was not significant.
6. The slight improvements of less than one score point attained by the second control group and the control girls in specific driving knowledge were not significant.

Table 44. Significance of the mean changes between mid-test and post-test specific driving knowledge (George Washington Univ.-Part II) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+ .11	.46	.24	Not Significant
Boys	36	- .08	.85	- .09	Not Significant
Girls	41	+ .27	.42	.64	Not Significant
1	42	+ .53	.50	1.06	Not Significant
2	35	- .40	.81	- .49	Not Significant
Control	78	+ .92	.42	2.19	Significant at .05 Level
Boys	37	+1.14	.60	1.90	Not Significant
Girls	41	+ .73	.61	1.20	Not Significant
1	44	+1.23	.61	2.02	Significant at .05 Level
2	34	+ .53	.55	.96	Not Significant

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change
- = Negative mean change

Mean Changes in Driving
Attitude Scores

In Table 45 are presented the mean changes on the Mann Personal Attitude Survey administered before and after the on-the-street instruction. Table 45 shows that:

1. The total experimental group had a slight loss of less than one score point in driving attitude, not significant at the .05 level.
2. There was a considerable difference between the experimental girls and the experimental boys in driving attitude. The girls improved over one score point, whereas the boys showed a loss of less than one score point. Neither change was significant.
3. The first experimental group regressed less than one score point in driving attitude which was not significant.
4. The second experimental group showed no change in driving attitude.
5. Both the total control group and the first control group showed slight losses in driving attitude, neither of which was significant.
6. The second control group improved less than one score point in driving attitude which was not significant.
7. The control boys had a very slight loss in driving attitude but this loss was not significant.
8. The control girls had no change in driving attitude.

Table 45. Significance of the mean changes between mid-test and post-test driving attitude (Mann) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	76	- .30	.61	- .49	Not Significant
Boys	35	-1.51	.98	-1.54	Not Significant
Girls	41	+ .73	.73	1.00	Not Significant
1	42	- .55	.67	- .82	Not Significant
2	34	.00	1.10	.00	Not Significant
Control	78	- .01	.44	- .02	Not Significant
Boys	37	- .03	.71	- .04	Not Significant
Girls	41	.00	.51	.00	Not Significant
1	44	- .43	.55	- .78	Not Significant
2	34	+ .53	.71	.75	Not Significant

* .05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change
- = Negative mean change

Table 46 reveals the following mean changes on the Siebrecht Attitude Scale administered before and after the on-the-street instruction:

1. The total experimental group improved over two score points in driving attitude, significant at the .001 level.
2. The experimental boys and the second experimental group improved over two score points in driving attitude, significant at the .01 level.
3. The experimental girls and the first experimental group improved over two score points in driving attitude, significant at the .05 level.
4. Both the total control group and the control girls improved less than one score point in driving attitude, neither of which was significant.
5. The second control group improved more than one score point in driving attitude, but this improvement was not significant.
6. The slight losses in driving attitude shown by the control boys and the first control group were not significant.

Mean Changes in Driving Knowledge and Driving
Attitude Scores Between Pre-Tests
and Post-Tests

In this section are presented the mean changes and significance of these changes in general driving knowledge,

Table 46. Significance of the mean changes between mid-test and post-test driving attitude (Siebrecht) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	76	+2.17	.60	3.62	Significant at .001 Level
Boys	35	+2.23	.80	2.79	Significant at .01 Level
Girls	41	+2.12	.88	2.41	Significant at .05 Level
1	42	+2.04	.94	2.17	Significant at .05 Level
2	34	+2.33	.69	3.38	Significant at .01 Level
Control	78	+ .26	.65	.40	Not Significant
Boys	37	- .24	.86	- .28	Not Significant
Girls	41	+ .71	.98	.72	Not Significant
1	44	- .34	.81	- .42	Not Significant
2	34	+1.03	1.09	.94	Not Significant

* .05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change
- = Negative mean change

specific driving knowledge, and driving attitude test scores administered before the range and/or simulator instruction and after the on-the-street instruction. These findings are presented in Tables 47 through 51.

Mean Changes in General
Driving Knowledge Scores

Table 47 shows the following mean changes on the Sportsmanlike Driving Final Examination administered before the range and/or simulator instruction and after the on-the-street instruction:

1. The total experimental group, the experimental boys, and the experimental girls improved more than four score points in general driving knowledge all of which were significant at the .001 level.
2. The second experimental group improved more than two score points more than the first experimental group in general driving knowledge, over five to nearly three score points respectively. Improvements of both groups, however, were significant at the .001 level.
3. The total control group improved over two score points in general driving knowledge, significant at the .001 level.
4. The control girls improved more than three score points in general driving knowledge, significant at the .001 level.

Table 47. Significance of the mean changes between pre-test and post-test general driving knowledge (Sportsmanlike Driving) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEnd	CR	Comments
Experimental	77	+4.18	.59	7.08	Significant at .001 Level
Boys	36	+4.11	.90	4.57	Significant at .001 Level
Girls	41	+4.24	.79	5.37	Significant at .001 Level
1	42	+2.97	.78	3.81	Significant at .001 Level
2	35	+5.63	.85	6.62	Significant at .001 Level
Control	78	+2.69	.58	4.64	Significant at .001 Level
Boys	37	+1.54	.87	1.77	Not Significant
Girls	41	+3.73	.72	5.18	Significant at .001 Level
1	44	+1.32	.73	1.81	Not Significant
2	34	+4.47	.83	5.39	Significant at .001 Level

* .05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEnd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

5. The second control group improved more than four score points in general driving knowledge, significant at the .001 level.
6. Both the control boys and the first control group improved more than one score point in general driving knowledge, neither of which was significant.

Mean Changes in Specific
Driving Knowledge Scores

In Table 48 are presented the mean changes on Part I of the George Washington University Final Examination administered before the range and/or simulator instruction and after the on-the-street instruction. Table 48 shows that:

1. The total experimental group gained more than three score points in specific driving knowledge, significant at the .001 level.
2. Both the experimental girls and the first experimental group showed improvements of over four score points in specific driving knowledge, significant at the .001 level.
3. The second experimental group improved nearly three score points in specific driving knowledge, significant at the .01 level.
4. The experimental boys improved over two score points in specific driving knowledge, significant at the .05 level.

Table 48. Significance of the mean changes between pre-test and post-test specific driving knowledge (George Washington Univ.-Part I) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEmd	CR	Comments
Experimental	77	+3.53	.54	6.54	Significant at .001 Level
Boys	36	+2.25	.95	2.37	Significant at .05 Level
Girls	41	+4.66	.50	9.32	Significant at .001 Level
1	42	+4.05	.55	7.36	Significant at .001 Level
2	35	+2.91	.98	2.97	Significant at .01 Level
Control	78	+2.95	.68	4.34	Significant at .001 Level
Boys	37	+ .78	1.15	.68	Not Significant
Girls	41	+4.90	.62	7.90	Significant at .001 Level
1	44	+2.82	.59	4.78	Significant at .001 Level
2	34	+3.11	1.36	2.29	Significant at .05 Level

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

5. Both the total control group and the first half of the control group showed improvements of nearly three score points in specific driving knowledge, both of which were significant at the .001 level.
6. The control girls gained nearly five score points in specific driving knowledge, significant at the .001 level.
7. The second control group improved over 3 score points in specific driving knowledge, significant at the .05 level.
8. The slight improvement of less than one score point in specific driving knowledge by the control boys was not significant.

Table 49 shows the following positive mean changes on Part II of the George Washington University Final Examination administered before the range and/or simulator instruction and after the on-the-street instruction:

1. The total experimental group and both halves of the group showed improvements of over four score points in specific driving knowledge, all of which were significant at the .001 level.
2. The experimental girls gained better than three score points more in specific driving knowledge than the experimental boys, improving over five and over two score points respectively. The improvement shown by the girls was significant at the .001 level,

Table 49. Significance of the mean changes between pre-test and post-test specific driving knowledge (George Washington Univ.-Part II) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEmd	CR	Comments
Experimental	77	+4.26	.52	8.19	Significant at .001 level
Boys	36	+2.47	.86	2.87	Significant at .01 Level
Girls	41	+5.83	.50	11.66	Significant at .001 Level
1	42	+4.10	.59	6.95	Significant at .001 Level
2	35	+4.46	.90	4.96	Significant at .001 Level
Control	78	+3.99	.62	6.44	Significant at .001 Level
Boys	37	+2.84	.92	3.09	Significant at .01 Level
Girls	41	+5.03	.81	6.21	Significant at .001 Level
1	44	+4.02	.79	5.09	Significant at .001 Level
2	34	+3.94	.97	4.06	Significant at .001 Level

* .05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

whereas, the boys improvement was significant only at the .01 level.

3. The total control group and both halves of the control group improved approximately four score points in specific driving knowledge, all of which were significant at the .001 level.
4. The control girls improved more than two score points more than the control boys in specific driving knowledge, improving over five and nearly three score points, respectively. The improvement shown by the girls was significant at the .001 level, whereas, the boys improvement was significant at the .01 level.

Mean Changes in Driving Attitude Scores

Table 50 reveals the following changes on the Mann Personal Attitude Survey administered before the range and/or simulator instruction and after the on-the-street instruction:

1. The total experimental group, the experimental girls, and the experimental boys improved less than one score point in driving attitude which were not significant.
2. The first experimental group improved over one score point in driving attitude, whereas, the second experimental group lost less than one score point. Neither change was significant.

Table 50. Significance of the mean changes between pre-test and post-test driving attitude (Mann) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEmd	CR	Comments
Experimental	76	+ .74	.77	.96	Not Significant
Boys	35	+ .89	1.06	.84	Not Significant
Girls	41	+ .61	1.09	.56	Not Significant
1	42	+1.60	.84	1.90	Not Significant
2	34	- .33	1.34	- .25	Not Significant
Control	78	+ .89	.70	1.27	Not Significant
Boys	37	+ .02	1.16	.02	Not Significant
Girls	41	+1.66	.78	2.13	Significant at .05 Level
1	44	+ .55	.94	.59	Not Significant
2	34	+1.32	1.03	1.28	Not Significant

*.05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change
- = Negative mean change

3. The only significant improvement for the control group in driving attitude was attained by the girls. Their improvement of over one score point was significant at the .05 level.
4. The total control group, the control boys, and the first control group each of which improved less than one score point in driving attitude, and the second control group which improved more than one score point, all failed to improve significantly.

Table 51 shows the following positive mean changes on the Siebrecht Attitude Scale administered before the range and/or simulator instruction and after the on-the-street instruction:

1. The total experimental group, the experimental girls, and the second experimental group all improved more than five score points in driving attitude, all of which were significant at the .001 level.
2. The experimental boys and the first experimental group improved more than six score points in driving attitude, both of which were significant at the .001 level.
3. The total control group showed improvement of over two score points in driving attitude, significant at the .001 level.
4. The second control group improved over three score points in driving attitude, significant at the .001 level.

Table 51. Significance of the mean changes between pre-test and post-test driving attitude (Siebrecht) test scores for the experimental and control groups as measured by "t" tests* of critical ratios.

Group	N	Md	SEmd	CR	Comments
Experimental	76	+5.95	.93	6.40	Significant at .001 Level
Boys	35	+6.35	1.60	3.97	Significant at .001 Level
Girls	41	+5.61	1.05	5.34	Significant at .001 Level
1	42	+6.21	1.03	6.03	Significant at .001 Level
2	34	+5.62	1.22	4.61	Significant at .001 Level
Control	78	+2.78	.75	3.71	Significant at .001 Level
Boys	37	+ .68	.98	.69	Not Significant
Girls	41	+4.69	1.05	4.47	Significant at .001 Level
1	44	+2.05	1.10	1.86	Not Significant
2	34	+3.74	.97	3.86	Significant at .001 Level

* .05 (one-tail).

KEY: N = Number of students assigned to two instructional programs
Md = Difference of mean scores
SEmd = Standard error of difference of mean scores
CR = Critical ratio
Comments = Level of significance of the critical ratio
+ = Positive mean change

5. The first control group improved over two score points in driving attitude but failed to improve significantly.
6. The control girls improved four score points more than the control boys in driving attitude, improving over four score points and less than one score point, respectively. The improvement of the girls was significant at the .001 level, whereas, the boys failed to attain significant improvement.

Correlations Between Chronological Age,
Intelligence Quotients, and Previous
Driving Experience Categories,
Respectively, and the
Final Criteria

In this section are presented the correlations and the significance of these correlations between chronological age, intelligence quotients, and previous driving experience categories, respectively, and the post-tests on general driving knowledge, specific driving knowledge, driving attitude, and the final road test. These findings are shown in Tables 52, 53 and 54.

Correlations Between Chrono-
logical Age and the Final
Criteria

Table 52 contains the correlations and the levels of significance of the correlations between chronological age and the post-tests. Table 52 shows that:

Table 52. Correlations between age and post-test scores for the experimental and control groups as measured by Pearson's Product Moment r .

Post Test	Experimental (N=77)			Control (N=78)		
	r	SEr	P	r	SEr	P
General Driving Knowledge	+ .05	.11	.65	+ .04	.11	.72
Specific Driving Knowledge - Part I	- .06	.11	.58	+ .10	.11	.36
Part II	+ .02	.11	.86	+ .05	.11	.65
Driving Attitude - Mann	+ .10	.11	.36	- .15	.11	.17
- Siebrecht	+ .10	.11	.36	+ .10	.11	.36
Road Test - Vehicle Handling	+ .04	.11	.72	- .01	.11	.93
- Traffic Problems	- .01	.11	.93	- .13	.11	.24
- Road Problems	- .03	.11	.79	- .11	.11	.32

KEY: r = Product moment correlation

SEr = Probable error of correlation

P = Level of significance

1. There were no significant positive or negative correlations between age and the three driving knowledge tests for either the experimental or control groups.
2. There were no significant positive or negative correlations between age and the two driving attitude tests for either the experimental or control groups.
3. There were no significant positive or negative correlations between age and the three parts of the road test for either the experimental or control groups.

Correlations Between Intelligence Quotients and the Final Criteria

Table 53 contains the correlations and the levels of significance of these correlations between intelligence quotients and the post-tests. Table 53 shows that:

1. There was a substantial positive correlation between intelligence quotients and the general driving knowledge test scores, significant at the .001 level for both the experimental and control groups.
2. There was a substantial positive correlation between intelligence quotients and specific driving knowledge test scores, significant at the .001 level for both the experimental and control groups.
3. There was no significant positive or negative correlation between intelligence quotients and the Mann

Table 53. Correlations between intelligence quotients and post-test scores for the experimental and control groups as measured by Pearson's Product Moment r .

Post Test	Experimental (N=76)			Control (N=77)		
	r	SEr	P	r	SEr	P
General Driving Knowledge	+ .57	.08	.001	+ .60	.07	.001
Specific Driving Knowledge - Part I	+ .45	.09	.001	+ .55	.08	.001
- Part II	+ .44	.09	.001	+ .43	.09	.001
Driving Attitude - Mann	- .18	.11	.10	- .21	.11	.06
- Siebrecht	+ .29	.11	.01	+ .27	.11	.01
Road Test - Vehicle Handling	+ .01	.11	.93	- .08	.11	.47
- Traffic Problems	+ .05	.11	.65	+ .05	.11	.65
- Road Problems	+ .15	.11	.17	+ .17	.11	.12

KEY: r = Product moment correlation

SEr = Probable error of correlation

P = Level of significance

Personal Attitude Survey for either the experimental or control groups.

4. There was a slight positive correlation between intelligence quotients and the Siebrecht Attitude Scale, significant at the .01 level for both the experimental and control groups.
5. There were no significant positive or negative correlations between intelligence quotients and the three parts of the road test for either the experimental or control groups.

Associations Between Previous
Driving Experience Categories
and the Final Criteria

In Table 54 are contained the associations and the levels of significance of these associations between the previous driving experience categories and the post-tests.

Table 54 shows that:

1. There was no significant association between previous driving experience and the three driving knowledge tests for either the experimental or control groups.
2. There was a significant association between previous driving experience and the Mann Personal Attitude Survey for both groups. The experimental group had a Chi Square of over twelve points, significant at the .01 level, whereas the control group had a Chi Square of over six points, significant at the .05 level. In both groups this relationship was the

Table 54. Associations between previous driving experience categories and post-test scores for the experimental and control groups as measured by Chi Square.

Post Test	Experimental (N=77)				Control (N=78)			
	DF	Chi Square	P	C	DF	Chi Square	P	C
General Driving Knowledge	2	.1997	.91		2	.6155	.74	
Specific Driving Knowledge - Part I	2	2.9643	.23		2	.1857	.91	
- Part II	2	2.0011	.38		2	.5769	.75	
Driving Attitude - Mann	2	12.6370	.01	.50	2	6.1467	.05	.36
- Siebrecht	2	4.7258	.10		2	1.7347	.43	
Road Test - Vehicle Handling	2	3.9270	.15		2	1.8760	.40	
- Traffic Problems	2	3.3733	.19		2	1.7149	.44	
- Road Problems	2	9.2054	.01	.44	2	5.5550	.07	

KEY: DF = Degrees of freedom

P = Probability of occurrence of the Chi Square

C = Coefficient of contingency (based on Chi Square) calculated only for those Chi Squares significant at or beyond the .05 level

result of a larger number of students with the least amount of driving experience scoring the best on the Mann Personal Attitude Survey; and by a larger number of students with the most driving experience scoring the worst on the Survey than would normally happen by chance alone.

3. There was no significant association between previous driving experience and the Siebrecht Attitude Scale for either the experimental or control groups.
4. There was no significant association between previous driving experience and the vehicle handling and traffic problems sections of the Road Test for either the experimental or control groups.
5. There was no significant relationship between previous driving experience and the road problems section of the Road Test for the control group. The experimental group, however, had a Chi Square of over 9 points, significant at the .01 level. This relationship was the result of those students having the least driving experience scoring lower on this section than would normally happen by chance alone.

Summary

This chapter presented the findings of this investigation. These findings showed comparisons between and within the experimental and control groups on various tests administered three times during the investigation. Also

presented were the mean changes and the levels of significance of these changes on the driving knowledge and driving attitude tests. Finally, correlations were made between certain selected criteria and the post-tests. In the following chapter are the conclusions and recommendations based upon these findings.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

In the preceding chapter the findings of this investigation were presented. This chapter contains (1) a summary of the investigation, (2) conclusions based upon the findings, and (3) recommendations for further research.

Summary

Statement of the Problem

It was the purpose of this investigation (1) to determine whether students who were taught to drive by means of six hours of instruction in the Allstate Good Driver Trainer and four hours of instruction on the multiple car off-street driving range were comparable in driving knowledge, attitude, and skill with students who received ten hours of instruction on the multiple car off-street driving range; and (2) to determine whether students who were taught to drive by means of six hours of instruction in the Allstate Good Driver Trainer, four hours of instruction on the multiple car off-street driving range, and two hours of observation and two hours of instruction behind the wheel on-the-street were comparable in driving knowledge, attitude, and skill

with students who received ten hours of instruction on the multiple car off-street driving range, and two hours of observation and two hours of instruction behind the wheel on-the-street. This investigation was designed to answer the following specific questions:

1. Do driver knowledge test scores of students trained in the Allstate Good Driver Trainer and on the range, differ significantly from similar test scores of students trained exclusively on the range, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

2. Do driver attitude test scores of students trained in the Allstate Good Driver Trainer and on the range, differ significantly from similar test scores of students trained exclusively on the range, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

3. Do driver skill test scores of students trained in the Allstate Good Driver Trainer and on the range, differ significantly from similar test scores of students trained exclusively on the range, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

4. Do driver knowledge test scores of students trained in the Allstate Good Driver Trainer, on the range, and on-the-street, differ significantly from similar test scores of

students trained on the range, and on-the-street, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

5. Do driver attitude test scores of students trained in the Allstate Good Driver Trainer, on the range, and on-the-street, differ significantly from similar test scores of students trained on the range, and on-the-street, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

6. Do driver skill test scores of students trained in the Allstate Good Driver Trainer, on the range, and on-the-street, differ significantly from similar test scores of students trained on the range, and on-the-street, when these students are grouped by sex, age, intellectual levels, and previous driving experience?

The Methods of Procedure

East Lansing, Michigan High School was selected for this investigation on the basis of its proximity to both a range and simulator. Two instructors, one for each program, were selected on the basis of their background and ability in teaching the particular program assigned to them. One hundred and sixty-four students were selected for training. These students were all of the students who elected to take driver education at East Lansing, Michigan High School and had the same classroom instructor during the 1963-64 school

year, and the 1964 summer program. One-half of each class period was assigned to each program.

Before either of the programs began, all students were tested with a general driving knowledge test, two specific driving knowledge tests, and two driving attitude tests. The experimental group then received six hours of instruction in the Allstate Good Driver Trainer correlated with four hours of instruction on the range, while the control group received ten hours of instruction on the range alone. At the end of this instructional period all students were again tested with the same driving knowledge and driving attitude tests, and in addition, were given a driving test in the simulator, and driving skill tests on the range. All students were then given the same two hours of observation and two hours of actual driving behind the wheel on-the-street. The final testing program consisted of the same driving knowledge and driving attitude tests, plus a final road test in traffic.

The groups were compared by testing the significance of the mean differences by "t" tests of critical ratios for driving knowledge, driving attitude, and driving skill. Significance of correlations between age, and intelligence quotients and the final criteria were tested by means of Pearson's Product Moment r ; and previous driving experience and the final criteria by means of Chi Square.

The Major Findings

The following is a summary of the major findings of this investigation:

1. On the pre-tests (before the simulator and/or range instruction) there were no significant differences between the experimental and control groups in general driving knowledge, specific driving knowledge, or in driving attitude.

2. On the mid-tests (after the simulator and/or range instruction) there were no significant differences between the experimental and control groups in general driving knowledge, specific driving knowledge, driving attitude, or on the simulator driving test. On the range skill tests, however, there was a significant difference in favor of the control group.

3. Between the pre- and mid-tests both the experimental and control groups showed significant improvement in general driving knowledge, specific driving knowledge, and on the Siebrecht Attitude Scale. No significant improvement was shown for either group on the Mann Personal Attitude Survey.

4. On the post-tests (after the on-the-street instruction) there were no significant differences between the experimental and control groups in general driving knowledge, specific driving knowledge, driving attitude, or on the traffic problems and road problems sections of the final road test. There was a significant difference, however, on

the vehicle handling section of the final road test in favor of the control group.

5. Between the mid- and post-tests neither the experimental or control groups showed significant improvement in general driving knowledge, on Part I of the specific driving knowledge test, or on the Mann Personal Attitude Survey. Significant improvement was shown by the control group on Part II of the specific driving knowledge test, and by the experimental group on the Siebrecht Attitude Scale.

6. Between the pre- and post-tests both the experimental and control groups showed significant improvement in general driving knowledge, specific driving knowledge and on the Siebrecht Attitude Scale. Neither group showed significant improvement on the Mann Personal Attitude Survey.

7. There was no significant correlation between age and any of the final criteria for either the experimental or control groups.

8. There were significant correlations for both the experimental and control groups between intelligence quotients and the final administrations of the general driving knowledge test, both parts of the specific driving knowledge test, and on the Siebrecht Attitude Scale. There were no significant correlations between intelligence quotients and the final administration of the Mann Personal Attitude Survey, or on any of the three parts of the final road test.

9. There were significant associations for both the experimental and control groups between previous driving experience and the final administration of the Mann Personal Attitude Survey. The experimental group also had a significant association between previous driving experience and the road problems section of the final road test. There were no significant associations for either group between previous driving experience and the general driving knowledge test, the specific driving knowledge test, the Siebrecht Attitude Scale, or on the vehicle handling and traffic problems sections of the final road test.

Conclusions and Commentary

The following are the conclusions based upon the findings of this investigation.

Conclusions on Programs Exclusive of On-the-Street Instruction

1. There was no significant difference between the simulator/range group and the range group in driving knowledge.

Upon completion of the simulator and/or range training there was no significant difference between the groups on any of the three driving knowledge tests; and both groups showed significant improvement on all three tests as a result of this training. One interesting occurrence which the writer wishes to call attention to is that the improvement

of the simulator/range group tended to be greater, but not significantly so, than the range group on all three of the knowledge tests. It is possible that had the scores of the three tests been combined, and considered as one knowledge test rather than as three individual tests, a significant difference in favor of the simulator/range group might have occurred.

2. There was no significant difference between the simulator/range group and the range group in driving attitude.

No significant difference between groups occurred on either the Siebrecht Attitude Scale or on the Mann Personal Attitude Survey upon completion of the simulator and/or range training; and both groups showed significant improvement in attitude as measured by the Siebrecht Attitude Scale as a result of this training. As expected no significant improvement was shown by either group on the Mann Personal Attitude Survey as many of the statements contained within this Survey reflect attitudes which are not subject to change over a short period of time. As with the knowledge tests, the simulator/range group tended to show a greater improvement in driving attitude than the range group (on the Siebrecht Attitude Scale), but the improvement was not sufficiently greater to be significant. The writer wishes to call to the attention of the reader that there is research on the Siebrecht Attitude Scale to show that increased knowledge influences the results. It is possible that the

improvement shown on this Scale was not the result of improved attitude, but merely resulted from the significant improvement in knowledge as indicated above.

3. There was no significant difference between the simulator/range group and the range group in general driving ability as measured by the simulator driving test; but the range group was significantly better than the simulator/range group in driving skill as measured by the range skill tests.

At the end of the simulator and/or range training the range group was definitely superior to the simulator/range group on the range skill tests. When the thirteen individual skills contained within the test were considered as one test the mean score of the range group was significantly better than the mean score of the simulator/range group. This would indicate that since the range group had more time to practice these skills they became more proficient in performing the skills. It might be pointed out, however, that when the writer checked the mean scores between groups on the thirteen tests individually, even though the range group tended to be better on practically all of the skills, a significant difference probably would have occurred on only two of the individual skills. These particular skills were the most complex, and were the ones that were taught towards the end of the training program. From the writer's own personal observation, students in the simulator/range program did not

have sufficient time to practice them. As a matter of fact, several students did not have the opportunity to practice a couple of the skills even once before the testing program began. Because of this the writer would recommend that the ratio of time spent in the simulator and on the range be changed. He would suggest that the study be repeated giving students 5 hours on the range and 5 hours in the simulator, to see if the one hour increase in range time would be sufficient to offset the difference in driving skill. It would also be interesting to see with the new proportion of time (one hour less in the simulator) whether the improvement in driving attitude and knowledge of the simulator/range group would be as great.

As far as the no significant difference between groups on the driving simulator test was concerned, this was somewhat unexpected. One would have expected that since the simulator/range group had six hours of instruction in the simulator compared to a one hour practice period for the range group, that the simulator/range group would have been significantly better, if for no other reason than that they would have had a better "feel" of the controls. Apparently the simulator effectively simulates a real car so that the range group was able to successfully make the transition, and apparently range instruction effectively prepares students for successful driving on-the-street as well as can be determined in a simulated situation.

Conclusions on Programs In-
clusive of On-the-Street
Instruction

1. There was no significant difference between the simulator/range group and the range group in driving knowledge.

At the end of the on-the-street training there was no significant difference between groups on any of the three driving knowledge tests; and both groups showed significant improvement on all three tests as a result of the simulator and/or range, and the on-the-street training. It is interesting to note that for both groups most of the improvement in knowledge occurred during the simulator and/or range training with very little additional knowledge being acquired during the on-the-street training. Significant improvement was shown for both groups during the simulator and/or range instruction, whereas, during the on-the-street phase, except for the range group on one of the tests, the improvement was not significant. Possible explanations for this occurrence might be that the two hours of observation and two hours of driving on-the-street was so little that there was not sufficient information being provided that would increase the students' knowledge significantly. Secondly, since the tests before and after this phase of the training were given so close together the student might have become careless in answering the questions. It is also quite possible that the testing instruments were not sophisticated enough to determine any significant improvements, and finally, since the

mean scores on the tests were quite high after the simulator and/or range instruction, there really was not much room left for significant improvement to occur.

It might also be pointed out that at the end of the on-the-street instruction the improvement shown by the simulator/range group tended to be greater, but not significantly so, than the range group on all three of the knowledge tests. As indicated in the previous section it is possible that had the scores of the three tests been combined, and considered as one knowledge test rather than as three individual tests, a significant difference in favor of the simulator/range program might have occurred.

2. There was no significant difference between the simulator/range group and the range group in driving attitude.

No significant difference between groups occurred on either the Siebrecht Attitude Scale or on the Mann Personal Attitude Survey at the end of the on-the-street instruction; and both groups showed significant improvement in attitude as a result of the simulator and/or range, and the on-the-street training as measured by the Siebrecht Attitude Scale. As with the knowledge tests, the simulator/range group tended to show a greater improvement in driving attitude than the range group (on the Siebrecht Attitude Scale), but the improvement was not sufficiently greater to be significant. One interesting significant difference, however, did occur. Both groups showed significant improvement during the

simulator and/or range instruction, but only the simulator/range group showed additional significant improvement on the Scale as a result of the on-the-street instruction. One would have expected that since the on-the-street instruction was the same for both groups, either both groups would have improved significantly, or neither group would have improved significantly. As pointed out in the previous section, there is research to show that increased knowledge influences the results of this Scale. It is possible that the improvement shown on the Scale was not the result of improved attitude, but merely resulted from the significant improvement in knowledge. In addition, the fact that the simulator/range group improved their driving attitude significantly during the on-the-street instruction, whereas the range group did not, might also be explained by this relationship, since the driving knowledge of the simulator/range group did improve more, though not significantly, than the range group.

This study also shows that intelligence influences the results. When the writer correlated intelligence quotients with the final administration of the Scale, a significant correlation occurred.

On the Mann Personal Attitude Survey, as expected, no significant improvement in driving attitude occurred as a result of the simulator and/or range instruction or as a result of the on-the-street instruction. As pointed out in the previous section, many of the items contained within the

Survey reflect attitudes which are not subject to change over a short period of time.

3. There was no significant difference between the simulator/range group and the range group in driving ability related to traffic problems and road problems; but there was a significant difference in favor of the range group on vehicle handling as measured by the final road test.

The results on the final road test tend to support the findings of the simulator road test and the range skill tests. As far as general driving ability was concerned, there was no difference between groups as determined by the simulator driving test administered at the completion of the simulator and/or range training and as determined by the traffic problems and road problems section of the final road test administered upon completion of the on-the-street instruction. There was a difference, however, in favor of the control group in the ability to skillfully handle a vehicle as evidenced by the range skill tests administered at the end of the simulator and/or range instruction, and as determined by the vehicle handling section of the final road test administered after the on-the-street instruction. Whether this difference would disappear if the simulator/range group was given one additional hour on the range and one hour less in the simulator as suggested in the previous section, or whether a little additional time on-the-street

must be given to the simulator/range group must still be determined.

In conclusion, whether one program is better than the other, either exclusive or inclusive of the on-the-street instruction, depends upon what the individual driver education instructor feels is most important in driver education. If he feels that attitudes and knowledge are more important than skill, then the results of this study would tend to favor the simulator/range program. If the instructor feels that skill is more important than attitudes and knowledge, then the study would tend to favor the range program. If the instructor feels that attitudes, knowledge, and skill are of equal importance, then the study would tend to indicate that there is no significant difference between programs, in that the simulator/range program is slightly stronger in certain aspects and the range program stronger in others, with the strengths and weaknesses tending to cancel each other.

A final point worth considering is that as students gain more experience through additional practice driving, driving skill is likely to increase, whereas, improvement in driving knowledge and driving attitude is not as likely to occur. It would have been interesting to see how the groups would have compared in driving skill if the road test could have been administered again two months after the training programs were completed.

Recommendations

The following research on combination simulator/range programs is recommended.

1. Determine how the simulator/range program compares with the traditional six hour on-the-street program.

2. Determine how the simulator/range program compares with the traditional simulator program.

3. Determine how the simulator/range program compares with a range program when the range facility is nothing more than a parking lot with painted lines and traffic cones.

4. This investigation should be repeated taking into consideration:

- a. the effects of various combinations of hours on the range and in the simulator.

- b. the effects of showing the simulator films in various sequences.

- c. The effects of different ways of correlating the simulator with the range, including giving all of the simulator instruction before the range instruction, and vice versa.

- d. the effects of the simulator/range when students had no previous driving experience and no classroom work to determine how the program alone increases knowledge and improves attitudes.

e. the effect of the simulator/range program when the simulator is not only correlated with the range, but also with the on-the-street instruction.

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APPENDIX A

INSTRUCTIONAL LESSONS

MULTIPLE CAR OFF-STREET DRIVING RANGE

Lesson I

- A. Pre-ignition procedure
- B. Starting procedure
- C. Stopping procedure
- D. Steering procedure
- E. Driving forward and backward
- F. Driving around area - Left turn procedure

Lesson II

- A. Lane changing
- B. Review procedures from Lesson I

Lesson III

- A. "T" exercise
- B. Two-way traffic - Right turn procedure

Lesson IV

- A. "X" exercise
- B. Figure "8"

Lesson V

- A. Stopping and starting on hill
- B. Maintaining safety

Lesson VI

- A. Traffic signal
- B. Garage exercise
- C. Individual work with students that are behind

Lesson VII

- A. Parking on an upgrade with a curb
- B. Parking on a downgrade with a curb
- C. Individual work with students that are behind

Lesson VIII

- A. Angle parking
- B. Individual work with students that are behind

Lesson IX

- A. "Y" turn
- B. Individual work with students that are behind

Lesson X

- A. Parallel parking
- B. Individual work with students that are behind

Lesson XI

- A. Passing
- B. Individual work with students that are behind

Lesson XII

- A. Review of all past exercises
- B. Individual work with students that are behind

LESSON I

Aims and objectives:

- A. Explain pre-ignition procedure
- B. Explain starting procedure
- C. Explain stopping procedure
- D. Explain steering procedure
- E. Driving forward and backward
- F. Driving around area - Left turn procedure

Procedure:

- A. Pre-ignition procedure
 - 1. Enter car from curb side
 - 2. Put key into ignition
 - 3. Adjust seat and mirrors
 - 4. Check doors, open one window
 - 5. Fasten seatbelt
 - 6. Parking brake set
 - 7. Gear selector lever in "Park"
- B. Starting procedure
 - 1. Foot on brake
 - 2. Selector lever to "Neutral" or "Park"
 - 3. Key to "On" position
 - 4. Check all gauges
 - 5. Depress gas pedal slightly
 - 6. Key to "Start" position
 - 7. When engine starts, release key and gas pedal
 - 8. Recheck all gauges
 - 9. Selector lever to "Drive"
 - 10. Release parking brake
 - 11. Check traffic - front, sides, and rear
 - 12. Signal
 - 13. Check over left shoulder
 - 14. Apply soft gas, proceed cautiously
- C. Stopping procedure
 - 1. Check traffic behind with mirrors
 - 2. Signal
 - 3. Release gas pedal
 - 4. Apply soft brake
 - 5. After stopping, put selector lever in "Park"
 - 6. Set parking brake
 - 7. Key to "Off" position

8. Remove key
 9. Leave car by curb side
- D. Steering procedure
1. Forward - hands at 10-2 position
 2. Backward - right hand on back of seat, left hand on top of wheel, look over right shoulder at distant target
- E. Driving forward and backward
1. Purpose of this exercise is to get the feel of the car.
 2. Procedure:
 - a. Drive forward to first flag line using correct starting and stopping procedures
 - b. Drive forward to second flag line
 - c. Back to first flag line
 - d. Back to starting point
 - e. Continue same procedure, check to see who is having trouble
 3. Points to emphasize:
 - a. Car control
 - b. Smooth, gentle acceleration
 - c. Smooth, even braking
 - d. Stopping even with line
 - e. Turn in the direction you want to go for both forward and backward
 - f. When backing aim at a distant target
 - g. When backing car should be creeping slowly
 - h. Look to rear as long as car is moving to the rear
- F. Driving around area - Left turn procedure
1. Start first student around area counter clockwise, talking him through the proper procedure by using the loud speaker while others observe.
 2. Procedure for left turns
 - a. Check mirror
 - b. Signal
 - c. Position vehicle
 - d. Reduce speed
 - e. Brake
 - f. Check traffic
 - g. Turn - hand-over-hand technique
 - h. Unwind by allowing wheel to slip through hands (Power steering must be turned back)
 - i. Enter proper lane
 - j. Accelerate about $\frac{1}{2}$ way through turn
 3. Points to emphasize:
 - a. Maintain four car-lengths apart
 - b. When the car in front of you stops, you stop
 - c. Even acceleration and braking

- d. Signal and slow down for all turns
 - e. Use hand-over-hand steering technique
 - f. Maximum speed of 10 m.p.h.
4. Start whole group keeping them about four car-lengths apart.

Materials:

Loud speaker
Cars lined up as shown in diagram
Flags set up as shown in diagram

Things to look for:

Pre-ignition procedure
Starting procedure
Stopping procedure
Steering procedure
Backing
Following distance
Left turns

Evaluation:

Check daily progress card for each student

LESSON II

Aims and objectives:

- A. Explain, then demonstrate lane changing
- B. Review procedures from Lesson I

Procedure:

- A. Lane changing
 - 1. Point out on range the different areas where lane changes are required (See diagram)
 - 2. Procedure to be used in making a lane change:
 - a. Check rear view mirrors
 - b. Signal
 - c. Visual check over shoulder in direction you anticipate moving
 - d. If safe, turn into the appropriate lane increasing acceleration slightly
 - 3. Points to emphasize:
 - a. Be sure it is safe before changing lanes - check mirrors and blind spot
 - b. Let other drivers know you are about to change lanes - signal
 - c. Don't pull out too sharply
 - d. Be sure to increase speed as you change lanes
 - 4. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- B. Review procedures
 - 1. Return to cars and prepare to start
 - 2. Talk students through pre-ignition procedures over the loud speaker
 - 3. Check starting procedures as they start engine
 - 4. Start students around area counter-clockwise

Materials:

Loud speaker
Cars lined up as shown in diagram
Flags set up as shown in diagram

Things to look for:

- Maintaining following distance
- Proper signals
- Hand-over-hand turning
- Lane changing
- Critical corner
- Left turns
- Stop signs
- Car control

Evaluation:

Check daily progress card for each student

LESSON III

Aims and objectives:

- A. Explain, then demonstrate the "T"
- B. Two-way traffic - Right turn procedure

Procedure:

- A. "T" exercise
 - 1. Purpose of the "T" is to teach distance judgment, backing in a straight line, and handling the car in a tight place.
 - 2. Procedure for "T" exercise:
 - a. Making correct signal before entering "T"
 - b. Turn into proper lane
 - c. Signal for left turn
 - d. Drive forward slowly; stop 1 foot from flag with car centered on flag; move forward slowly until bumper is 3 inches from flag
 - e. Back (using proper procedure as outlined in Lesson I) and stop when back bumper is 1 foot from flag with car centered on flag; move car slowly until car is 3 inches from flag
 - f. Leave exercise by correct lane, using correct signals
 - g. Stop before entering street
 - 3. Points to emphasize
 - a. Car control (Coordination of acceleration and braking)
 - b. Car should be moved very slowly both forward and backward
 - c. When backing look over right shoulder with right arm on back of front seat
 - d. Look to rear as long as car is moving to the rear
 - e. Only one person in the exercise at a time
 - 4. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- B. Two-way traffic - Right turn procedure
 - 1. Move students out alternating them between clockwise and counter-clockwise.
 - 2. Procedure for right turn
 - a. Position car
 - b. Check mirror
 - c. Signal
 - d. Control speed

- e. Brake
- f. Check traffic
- g. Turn - hand-over-hand technique
- h. Unwind by allowing wheel to slip through hands (Power steering must be turned back)
- i. Enter proper lane
- j. Accelerate about $\frac{1}{2}$ way through the turn
- 3. Points to emphasize:
 - a. Stay on your own side of center line
 - b. Maintain four car lengths between you and the car in front of you
 - c. Signal and slow down for all turns
 - d. Proper lane position for turns
 - e. Only one car should be in the northeast corner at a time
 - f. Use hand-over-hand steering technique
 - g. Maximum speed of 15 m.p.h.
- 4. As students drive around area check that they are lane changing when required.
- 5. Have someone in the "T" at all times.
- 6. At end of period, check stopping procedures as they turn off engines.

Materials:

Loud speaker
 Cars lined up as shown in diagram
 Flags set up as shown in diagram

Things to look for:

Maintaining following distance
 Proper signals
 Hand-over-hand turning
 Lane changing
 Critical corner
 Left and right turns
 Stop signs
 Car control

Evaluation:

Check daily progress card for each student

LESSON IV

Aims and objectives:

- A. Explain, then demonstrate the "X"
- B. Explain, then demonstrate the figure "8"

Procedure:

- A. "X" exercise
 - 1. Purpose of the "X" is to teach skills in turning, backing and distance judgment.
 - 2. Procedure for "X" exercise:
 - a. Signal intention to turn
 - b. Enter correct lane (See diagram)
 - c. Signal for turn, then turn
 - d. Hand-over-hand turning
 - e. Stop smoothly, 3 inches from flag and centered on flag
 - f. Back smoothly into correct lane, (see diagram) and stop 3 inches from flag and centered on flag
 - g. Stay off yellow lines
 - h. Signal and stop when leaving
 - 3. Points to emphasize
 - a. Car control
 - b. When backing aim at a distant target
 - c. When backing look in the direction you are turning
 - d. When leaving exercise it is necessary to stay close to left side to be able to make the sharp right turn
 - e. Stop and turn right only when leaving
 - f. Only one person in the exercise at a time
 - 4. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- B. Figure "8" exercise
 - 1. Purpose of the figure "8" is to develop hand-over-hand steering, judgment and car control
 - 2. Procedure for figure "8" exercise:
 - a. Signal and always enter from right (See diagram)
 - b. Maintain steady speed
 - c. Hand-over-hand turning
 - d. Keep car between lines at all times
 - e. Stop and signal before leaving

3. Points to emphasize:
 - a. Car control
 - b. Aim high in steering
 - c. Hand-over-hand steering technique
 - d. Stop and turn right only when leaving exercise
 - e. Only one person in the exercise at a time
4. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
5. Move students out by alternating them between clockwise and counter-clockwise.

Materials:

Loud speaker
 Cars lined up as shown in diagram
 Flags set up as shown in diagram

Things to look for:

Signaling
 Stop signs
 Correct turns
 Correct lane changes

Evaluation:

Check daily progress card for each student as they complete an exercise

LESSON V

Aims and objectives:

- A. Open hill, explain dangers involved with hill
- B. Maintain safety on range

Procedure:

- A. Stopping and starting on hill
 - 1. Purpose of the hill is to teach proper judgment in turning on a curve and the correct method of starting and stopping on a hill.
 - 2. Procedure to be followed: Stopping
 - a. Check rear view mirror
 - b. Signal
 - c. Stop, put into "Park" and set brake
 - 3. Procedure to be followed: Starting
 - a. Foot on foot brake firmly
 - b. Put selector lever in "Low"
 - c. Release parking brake
 - d. Light pressure on gas pedal
 - e. Release foot brake
 - f. When car is past hill move selector lever into "Drive"
 - 4. Points to emphasize:
 - a. Must reduce speed to negotiate turn
 - b. Stay on your own side of center line
 - c. When leaving hill and travelling in a clockwise direction stop should be made so that car is perpendicular to intersecting street
 - d. Don't hold car with accelerator on hill
 - e. Be sure to accelerate slightly before releasing foot brake
 - f. Only one person should be on the hill at a time
 - 5. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
 - 6. Move students out by alternating them between clockwise and counter-clockwise. Keep someone in all the previously demonstrated exercises at all times.
- B. Maintain safety on range
 - 1. Due to more exercises being opened, care of driving on the range should be stressed. By this time some students may be over confident or careless. Check speed and following distance.

Materials:

Loud speaker
Cars lined up as shown in diagram
Flags set up as shown in diagram
Open hill
Rotate cars today

Things to look for:

Signaling
Stop signs
Correct turns
Correct lane changes
Do not let cars meet on hill or northeast corner

Evaluation:

Check daily progress card for each student as they complete an exercise

LESSON VI

Aims and objectives:

- A. Traffic signal
- B. Explain, then demonstrate the garage exercise
- C. Individual work with students that are behind

Procedure:

- A. Traffic signal
 - 1. Caution students that the traffic signal is operating
 - 2. Emphasize proper stopping position
 - 3. Suggest that students approach the light from all directions and try the various movements from each direction (right turn, left turn, straight ahead)
- B. Garage exercise
 - 1. The purpose of the garage exercise is to acquaint students with turning into narrow driveways, getting into an offset garage and backing out into a street in the proper lane.
 - 2. Procedure for garage exercise:
 - a. Give proper signal and check traffic conditions
 - b. Turn into driveway, hand-over-hand steering
 - c. Enter garage slowly, left side first (see diagram)
 - d. Back slowly to rear. Left hand on top of wheel; right arm on seat
 - e. Stop before entering street; check traffic; back into correct lane
 - f. Drive into driveway again, this time parking in the right side of garage
 - g. Follow same backing procedure as before only back out in opposite direction this time and into correct lane; stop and check traffic before entering street
 - 3. Points to emphasize:
 - a. Student must decide which lane he plans on backing into before beginning his backing movement
 - b. Stay close to the left side when backing into the far lane
 - c. Stay close to the right side when backing into the near lane

- d. Always back into the lane in which you expect to travel
- e. Stop and look in both directions before leaving exercise
- f. Only one person in the exercise at a time
- 4. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- 5. Move students out by alternating them between clockwise and counter-clockwise. Keep someone in all the previously demonstrated exercises at all times.

- C. Individual work with students that are behind
 - 1. Make sure all students are up to date at this point; check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
 Cars lined up as shown in diagram
 Flags set up as shown in diagram

Things to look for:

Watch for students "following the leader"
 Have someone in exercise areas at all times
 Look for opportunities to suggest defensive driving tips
 Make sure students are using all the streets

Evaluation:

Check daily progress charts; try to get all students through exercises covered up to this point

LESSON VII

Aims and objectives:

- A. To teach correct method of parking on an upgrade with a curb
- B. To teach correct method of parking on a downgrade with a curb
- C. Individual work with students that are behind

Procedure:

- A. Parking on an upgrade with a curb
 - 1. The purpose of teaching correct parking on an upgrade is to prevent a car from rolling into the path of traffic in the event the parking brake should not hold.
 - 2. Procedure for parking on an upgrade with a curb:
 - a. Check rear view mirror and signal for stop
 - b. Pull over to within 6 inches of curb and stop
 - c. Let car roll back slowly, turning wheel to the left until tire strikes curb lightly
 - d. Shift to drive and move about 1" from curb to relieve pressure on tires
 - e. Put selector lever into "Park"; set parking brake; turn off ignition; then release foot brake
 - 3. To get car into motion after parking on upgrade:
 - a. Follow starting procedure as outlined in Lesson I
 - b. Caution students to remember that wheel is turned to the left
 - 4. Points to emphasize:
 - a. Swing front end out slightly before stopping
 - b. Ease back slowly into curb
 - c. Turn wheels only when car is in motion
 - d. Only one person should be on the hill at a time
 - 5. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- B. Parking on a downgrade with a curb
 - 1. The purpose of teaching parking on a downgrade is to prevent a car from rolling into the path of traffic in the event the parking brake should not hold.

2. Procedure for parking on a downgrade with a curb
 - a. Check rear view mirror and signal for stop
 - b. Pull over to within 6 inches of curb and stop
 - c. Let car roll forward slowly, turning wheel to right until tire strikes curb lightly
 - d. Put selector lever into "Park"; set parking brake; turn off ignition; and release foot brake
3. To get car into motion after parking on downgrade:
 - a. Follow starting procedure as outlined in Lesson I
 - b. Back up a few feet to straighten wheels
 - c. Check traffic, signal, and move out
4. Points to emphasize:
 - a. Ease forward slowly into curb
 - b. Turn wheels only when car is in motion
 - c. Only one person should be on the hill at a time
5. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
6. Move students out by alternating them between clockwise and counter-clockwise. Keep someone in all the previously demonstrated exercises at all times.

- C. Individual work with students that are behind
 1. Make sure all students are up to date at this point; check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
 Cars lined up as shown in diagram
 Flags set up as shown in diagram
 Rotate cars today

Things to look for:

Some students may have difficulty getting close enough to curb in hill parking
 Check for signals
 Watch for students turning wheels while car is standing still

Evaluation:

Check daily progress charts

LESSON VIII

Aims and objectives:

- A. To teach correct method of angle parking
- B. Individual work with students that are behind

Procedure:

- A. Angle parking
 - 1. The purpose of teaching angle parking is to acquaint students with the correct procedure of parking.
 - 2. Procedure for angle parking:
 - a. Check traffic with rear view mirror
 - b. Signal intention to slow down
 - c. Slow down and move car as far to the left as you can in your lane of traffic
 - d. When front bumper is even with the first line extended, turn at average speed, hand-over-hand
 - e. As car moves into center of space, straighten wheels
 - f. Let car roll slowly, until tire touches curb lightly and back off slightly
 - g. Follow procedure as outlined in Lesson I for turning off engine
 - 3. Leaving angle parking space
 - a. Start engine as outlined in Lesson I
 - b. Move car straight back using correct steering method; slow speed
 - c. When car is out far enough for driver to check traffic, stop and check both left and right
 - d. When clear, continue backing and when left front will clear car on the left, turn wheel sharply to right
 - e. Back into correct lane and straighten wheel before stopping
 - f. Do not cross lane line
 - g. Move forward
 - 4. Points to emphasize:
 - a. Car control
 - b. Approach space at a slow speed
 - c. Watch left front and right rear fenders. Student should be instructed to back off if he is getting too close to parked car on right or left

- d. When parked, car should be centered in space, parallel to lines, with right front wheel about 1" from curb
- e. When backing out creep straight back very slowly and stop when you can see both ways down the street
- f. Do not cross center line into next lane
- 5. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- 6. Move students out by alternating them between clockwise and counter-clockwise. Keep someone in all the previously demonstrated exercises at all times.

- B. Individual work with students that are behind
 - 1. Make sure all students are up to date at this point; check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
 Cars lined up as shown in diagram
 Flags set up as shown in diagram

Things to look for:

Check for signals
 Car control as students enter and leave parking stall
 Check that students are stopping and checking traffic as they leave parking stall
 Check that students back into the correct lane

Evaluation:

Check daily progress charts

LESSON IX

Aims and objectives:

- A. Explain, then demonstrate the turn around or "Y" turn
- B. Remind students to be thinking and looking ahead in their driving
- C. Individual work with students that are behind

Procedure:

- A. "Y" turn
 - 1. Purpose of the turn around is to teach car control and handling; being able to turn around in the width of the road in case there is no other means available.
 - 2. Procedure for "Y" turn
 - a. Signal on entering
 - b. Stop in right lane
 - c. Signal for left turn
 - d. Check traffic left and right before moving to left
 - e. Full left, hand-over-hand
 - f. Stop about 18" from curb
 - g. Let car roll up to curb turning right
 - h. Move to rear continuing right, turn hand-over-hand, watching over right shoulder
 - i. Stop about 18" from curb
 - j. Turn wheels left as you complete backing slowly
 - k. Move car forward turning left, hand-over-hand
 - l. Stop and signal before leaving
 - 3. Points to emphasize:
 - a. Car control
 - b. Car must be parked as close to curb as possible
 - c. Car must be driven slowly, while turning the wheel rapidly
 - d. Turn wheels only when car is moving
 - e. When backing look in the direction you are turning
 - f. Look to rear as long as car is moving to the rear
 - g. Avoid hitting curbs--touching is permitted
 - h. Only one person in the exercise at a time
 - 4. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.

5. Move students out by alternating them between clockwise and counter-clockwise. Keep someone in all the previously demonstrated exercises at all times.
- B. Remind students to be thinking and looking ahead in their driving
- C. Individual work with students that are behind
 1. Make sure all students are up to date at this point; check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
Cars lined up as shown in diagram
Flags set up as shown in diagram
Rotate cars today

Things to look for:

Watch for car control
Watch for students turning wheels while car is standing still

Evaluation:

Check daily progress charts

LESSON X

Aims and objectives:

- A. Explain, then demonstrate parallel parking
- B. Individual work with students that are behind

Procedure:

- A. Parallel parking
 - 1. The purpose of teaching parallel parking is to acquaint students with the correct procedure of parking.
 - 2. Procedure for parallel parking:
 - a. Approach in correct lane
 - b. Slow speed
 - c. Signal
 - d. Brake slightly
 - e. Stop 2 feet away and parallel to the other car with your back bumpers even
 - f. Back slowly and slowly turn wheels all the way to the right
 - g. At approximately a 45 degree angle start turning wheels slowly to the left while continuing to the rear
 - h. When front bumper of your car is even with the rear bumper of the other car, turn sharply to the left
 - i. Stop before touching rear car
 - j. Move forward slowly; straighten wheels; and center car
 - 3. Leaving parking area
 - a. Back slowly and stop just before hitting rear car
 - b. Signal
 - c. Check traffic over shoulder
 - d. Move forward slowly turning hard to the left
 - e. Enter nearest lane
 - f. Straighten wheels and proceed
 - 4. Points to emphasize:
 - a. Car control
 - b. Correct stopping position is important. If this is off, the procedure will not work correctly
 - c. Creep back slowly and stop at check points-- 45° angle and when front bumper is even with rear bumper of front car
 - d. Driver should continually check right front fender until his car clears front car

- e. Turn wheel only when car is in motion
- f. When parked, car should be 6" from curb, parallel to curb, centered in space, with front wheels pointed straight ahead
- g. When leaving, driver must watch right front fender
- 5. Demonstrate by talking a student through the proper procedure by using the loud speaker while others observe.
- 6. Move students out by alternating them between clockwise and counter-clockwise. Keep someone in all the previously demonstrated exercises at all times.
- B. Individual work with students that are behind
 - 1. Make sure all students are up to date at this point; check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
 Cars lined up as shown in diagram
 Flags set up as shown in diagram

Things to look for:

Check car control
 Check that students are signalling before entering and leaving parking stall
 Watch for students turning wheels while car is standing still

Evaluation:

Check daily progress charts

LESSON XI

Aims and objectives:

- A. To teach passing on the open road
- B. Individual work with students that are behind

Procedure:

A. Passing

1. The purpose of the lesson is to teach the proper procedure for passing on the open road.
2. Procedure for passing:
 - a. Check for passing distance
 - b. Check for following traffic in rear view mirrors
 - c. Signal for left turn
 - d. Sound horn, check blind spot and move into left lane
 - e. Accelerate to pass car
 - f. Stay in left lane
 - g. Check rear view mirror for car you are passing--when you can see him, signal right, pull back into right lane
 - h. Adjust speed
3. Points to emphasize:
 - a. Front car should be travelling between 5 and 7 m.p.h.
 - b. Be sure it is safe before passing - check front, rear, and blind spot
 - c. Let other drivers know you are about to pass - signal with directional signal and horn
 - d. Don't pull out too sharply
 - e. Don't decrease acceleration until you are back in your own lane
 - f. When you can see the car you have just passed in the rear view mirror, signal and return to your own lane
 - g. Avoid cutting back too soon or too sharply
4. Start with two cars for demonstration; have one going slow for passing.
5. After all students have had an opportunity to pass and be passed, have them work in areas in which they feel they need additional practice.

B. Individual work with students that are behind

1. Make sure all students are up to date at this point; check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
Cars lined up as shown in diagram
Flags set up as shown in diagram
Rotate cars today

Things to look for:

Make sure students are using the correct signals
Watch for students turning out too sharply
Watch for students weaving in left lane
Watch for students cutting in too soon and too sharply

Evaluation:

Check daily progress charts

LESSON XII

Aims and objectives:

- A. Review of all past exercises
- B. Individual work with students that are behind

Procedure:

- A. Review of all past exercises
 - 1. Students should try to review every exercise on the range.
 - 2. Students should try to work in areas in which they feel they need additional practice.
- B. Individual work with students that are behind
 - 1. Check all daily progress charts; give individual help when needed.

Materials:

Loud speaker
Cars lined up as shown in diagram
Flags set up as shown in diagram

Things to look for:

Watch for individual problems

Evaluation:

Check daily progress charts

APPENDIX B

INSTRUCTIONAL LESSONS

ON-THE-STREET

- I. Country Driving - Park Lake Road Trip
- II. City Driving - Capitol Trip
- III. Highway Driving - Williamston Trip
- IV. Freeway Driving - I 96 Trip

The following lessons are designed to give the students a variety of driving experiences to which they may apply that which has been learned on the range and/or in the driving simulator. Each route is specifically laid out. For ease of use, the lessons have been outlined with the following design:

- 1. The capital letters give the route to be followed.
- 2. The numbers give the experiences that will be encountered. These experiences generally are in relation to physical features, i.e., roads, signals, signs, and markings. Other experiences in relation to traffic will also be encountered and these should be pointed out as they occur. (Some experiences will be encountered several times but they are listed only once for each segment of the trip.)
- 3. The small letters are suggested comments that can be given by the instructor or questions that can be asked of the student(s). These are by no means exhaustive but merely suggestions of the kinds of things that can be pointed out.

The instructor should be responsible for helping the student bridge the gap between what he has learned on the range or in the simulator, and what he will encounter on the street. This can be done most effectively by making a comment such as: "The procedure for this right turn is exactly as you did it in the simulator." or "The procedure for a lane change is exactly as you did it on the range." etc.

LESSON I

Country Driving - Park Lake Road Trip

- A. Begin at curb in front of school and proceed to Old Hickory Lane
 - 1. Pre-ignition procedures
 - a. Entering car on curb side
 - b. Importance and necessity of car adjustments
 - c. Importance of seat belts
 - 2. Starting procedures
 - a. Signalling before leaving curb
 - b. Looking over left shoulder before pulling out
- B. Turn left onto Old Hickory Lane and proceed to Saginaw Street (M 78)
 - 1. Left turn from 2-lane street to 2-lane street
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Proper lane position for stop
 - c. Proper stopping position in relation to sign
 - d. Proper lane to turn into
 - e. Use of hand-over-hand steering technique
 - 2. Yield right-of-way situation (Yield sign)
 - a. Checking left-right-left at yield sign
 - b. Yielding to traffic from both sides
 - 3. Sharp turn to right and left (S curve)
 - a. Control of speed
 - b. Staying in own lane
- C. Turn right onto M 78 and proceed to Park Lake Road
 - 1. Right turn from 2-lane street to 4-lane undivided highway
 - a. Signalling for turn - $\frac{1}{2}$ block ahead
 - b. Proper distance to stop from highway
 - c. Stopping perpendicular to highway for good view of both directions
 - d. Proper lane to turn into - nearest lane going in the direction you wish to go
 - e. Accelerating to highway speed
 - f. Reduced speed zone on highway
 - 2. 4-lane divided highway, 65/55 speed limit
 - a. Proper lane to drive in
 - b. Proper driving speed
 - c. Maintaining even speed
 - d. Correct following distances
 - 3. Flashing yellow light
 - a. Meaning of light
 - b. What a person should do and look for

4. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes
- D. Turn left onto Park Lake Road and proceed to Coleman Road (about $\frac{1}{2}$ mile beyond Ingham Co. - Clinton Co. line)
1. Left turn from 4-lane divided highway to 2-lane road
 - a. Need to signal well in advance on highways
 - b. Proper use of deceleration lane
 - c. Proper method of lining up in median
 2. Stopping at bottom of steep hill
 - a. Proper method of braking on steep hill
 - b. Proper stopping position in relation to sign
 - c. Dangers involved with limited side vision
 3. Sharply crowned blacktop road; low, narrow shoulders; no escape route; deep ditches; trees, etc.
 - a. Dangers involved with this type of road
 - b. Effect of side slope on steering and braking
 - c. Need for reduced speed
 4. Sharp left and right turns
 - a. Importance of reducing speed for sharp turns
 - b. Effect of centrifugal force on sharp turns
 5. Steep upgrades and downgrades
 - a. Importance of staying on own side of road on upgrades
 - b. Effects of gravity on hills in relation to speed and stopping distances
 6. Curve speed limit situation (25 m.p.h.)
 - a. Meaning of sign
 - b. Why sign is placed there
- E. Turn right onto Coleman Road and proceed to Kaiser Road (white church on left)
1. Right turn from 2-lane road to 2-lane road
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Need for reducing speed before turning
 - c. Proper lane to turn into
 - d. Use of hand-over-hand steering technique
 2. Narrow, hilly, bumpy, gravel road
 - a. Effects of bumpy gravel road on car control
 - b. Effects of bumpy gravel road on stopping distances
 - c. Importance of not getting too close to side of road in loose gravel

- d. Staying on own side of road on sharp up-grades
 - e. Staying well behind other traffic - stone chips
 - f. How to handle dust in summer
- F. Turn right onto Kaiser Road, cross M 78. Kaiser Road will merge into Okemos-Haslett Road. Proceed to Haslett Road in Haslett. (At flashing red signal)
- 1. Right turn from 2-lane road to 2-lane road
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Need for reducing speed before turning
 - c. Proper lane to turn into
 - d. Use of hand-over-hand steering technique
 - 2. Stopping at highway (M 78)
 - a. Proper distance to stop from highway
 - b. Stopping perpendicular to highway for good view in both directions
 - c. Hill to left, short sight distance - 65/55 m.p.h. speed limit on highway
 - 3. Yield sign in median
 - a. Meaning of yield sign
 - b. Proper method of lining up in median
 - 4. Cross roads sign
 - a. What does the sign mean
 - b. What should a person do and look for
 - 5. Traffic signal and flashing red arrow
 - a. Proper state of mind when approaching signal
 - b. What does the red arrow mean
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When the light changes to green what should a driver do before proceeding
 - 6. 4-way stop and flashing red light situation
 - a. What does the sign mean
 - b. Who should proceed first
 - c. Dangers involved with this kind of signing
 - d. What does the flashing red light mean
- G. Turn right onto Haslett Road and proceed to Greencrest Avenue just beyond Eastern Orthodox Church
- 1. Right turn from 2-lane road to 2-lane road
 - 2. 50 mile per hour speed limit
 - 3. Fire station caution sign
 - 4. Private drives entering street
 - a. Need for continually looking from side to side
 - 5. Yellow no passing lines; do not pass; and pass with care signs
 - a. Emphasize use of these when anticipating passing

- b. Have student tell when it is safe to pass and not safe to pass in relation to these signs and markings
 - 6. Change from 2-lane road to 3-lane road (center lane for passing and left turns)
 - a. Dangers involved with this kind of road
 - b. When it is safe to and not safe to pass
- H. Turn right onto Greencrest Avenue and into church parking lot to change drivers
 - 1. Right turn from 3-lane road to 2-lane street
 - a. Proper lane to turn from - extreme right lane
 - 2. Stopping procedure
 - a. Importance of placing car in "Park" and setting parking brake
 - b. Leaving car on curb side
- I. Begin in church parking lot and proceed to Haslett Road
 - 1. Pre-ignition procedures
 - a. Entering car on curb side
 - b. Importance and necessity of car adjustments
 - c. Importance of seat belts
 - 2. Starting procedures
- J. Turn left onto Haslett Road and proceed to Okemos-Haslett Road (at flashing red signal in Haslett)
 - 1. Left turn from 2-lane street to 3-lane road
 - a. Proper lane to turn into
 - b. Dangers involved with this kind of road
 - c. When it is safe to and not safe to pass
 - 2. Cross roads sign
 - a. What does the sign mean
 - b. What should a person do and look for
 - 3. Yellow no passing lines; do not pass; and pass with care signs
 - a. Emphasize use of these when anticipating passing
 - b. Have student tell when it is safe to pass and not safe to pass in relation to these signs and markings
 - 4. Private drives entering street
 - a. Need for continually looking from side to side
 - 5. 50 mile per hour speed limit
 - 6. Fire station caution sign
 - 7. 4-way stop and flashing red light situation
 - a. What does the sign mean
 - b. Who should proceed first
 - c. Dangers involved with this kind of signing
 - d. What does the flashing red light mean

- K. Turn left onto Okemos-Haslett Road; keep left at Y junction, cross M 78 and proceed to Coleman Road
 - 1. Left turn from 2-lane road to 2-lane road
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Proper position for stop
 - c. Proper stopping position in relation to sign
 - d. Proper lane to turn into
 - 2. Traffic signal and flashing red arrow
 - a. Proper state of mind when approaching signal
 - b. What does the red arrow mean
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When the light changes to green what should a driver do before proceeding
 - 3. Turn sign and sharp turn
 - a. What the sign means
 - b. Importance of reading road signs
 - 4. Stopping at highway (M 78)
 - a. Proper distance to stop from highway
 - b. Stopping perpendicular to highway for good view in both directions
 - 5. Yield sign in median
 - a. Meaning of yield sign
 - b. Proper method of lining up in median
 - c. Hill to right, short sight distance - 65/55 m.p.h. speed limit on highway

- L. Turn left onto Coleman Road and proceed to Park Lake Road
 - 1. Left turn from 2-lane road to 2-lane road
 - 2. Blacktop road changing to gravel road
 - 3. Narrow, hilly, bumpy, gravel road
 - a. Effects of bumpy gravel road on car control
 - b. Effects of bumpy gravel road on stopping distances
 - c. Importance of not getting too close to side of road in loose gravel
 - d. Staying on own side of road on sharp upgrades
 - e. Staying well behind other traffic - stone chips
 - f. How to handle dust in summer

- M. Turn left onto Park Lake Road and proceed to M 78 (Saginaw Street)
 - 1. Left turn from 2-lane road to 2-lane road
 - a. Proper stopping position in relation to sign
 - b. Need to creep out after stopping - limited view from right side

2. Sharply crowned blacktop road; low, narrow shoulders; no escape route; deep ditches; trees, etc.
 - a. Dangers involved with this type of road
 - b. Effect of side slope on steering and braking
 - c. Need for reduced speed
 3. Sharp left and right turns
 - a. Importance of reducing speed for sharp turns
 - b. Effect of centrifugal force on sharp turns
 4. Steep upgrades and downgrades
 - a. Importance of staying on own side of road on upgrades
 - b. Effects of gravity on hills in relation to speed and stopping distances
 5. Curve speed limit situation (25 m.p.h.)
 - a. Meaning of sign
 - b. Why sign is placed there
 6. Stopping at Lake Lansing Road
 - a. Dangers involved with limited side vision
- N. Turn right onto M 78 and proceed to Old Hickory Lane
1. Right turn from 2-lane road to 4-lane divided highway
 - a. Proper distance to stop from highway
 - b. Stopping perpendicular to highway for good view in both directions
 - c. Proper lane to turn into - nearest lane going in the direction you wish to go
 - d. Accelerating to highway speed
 2. 4-lane divided highway, 65/55 speed limit
 - a. Proper lane to drive in
 - b. Proper driving speed
 - c. Maintaining even speed
 - d. Correct following distances
 3. Speed limit 50 ahead situation
 - a. Meaning of sign
 - b. When does the reduced speed limit begin
 4. Flashing yellow light
 - a. Meaning of light
 - b. What a person should do and look for
 5. Merging traffic from left
 - a. What a person must be careful of in this situation
 - b. Why a person shouldn't pass here
 - c. Proper lane use - get away from merging traffic
 6. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes

7. Divided highway changing to undivided
- O. Turn left onto Old Hickory Lane and proceed to road turning into school
 1. Left turn from 4-lane undivided highway to 2-lane street
 - a. Need to signal well in advance on highways
 - b. Proper lane to turn from - extreme left lane
 - c. Yielding to oncoming traffic
 2. Sharp right and left turn (S turn)
 - a. Control of speed
 - b. Staying in own lane
 3. Yield right-of-way situation (Yield sign)
 - a. Checking left-right-left at yield sign
 - b. Yielding to traffic from both sides
- P. Turn right into school and park by curb
 1. Right turn from 2-lane street to 2-lane street
 2. Parking by curb
 - a. Checking traffic behind before stopping
 - b. Proper signal for stopping by curb
 - c. How to judge distance from curb
 - d. Turning wheels into curb on downgrade with curb
 - e. Turning wheels away from curb on upgrade with curb
 - f. Turn wheels toward side of road on both upgrades and downgrades when there is no curb
 3. Stopping procedure
 - a. Importance of placing car in "Park" and setting parking brake
 - b. Leaving car on curb side

NOTE: If time is running short, stop in a convenient place when the period is half over, change drivers, and follow the route back. If there is some extra time, try some parallel parking.

It is important to get the students back to school on time.

LESSON II

City Driving - Capitol Trip

- A. Begin in angle parking stall in front of school and proceed to Old Hickory Lane
 - 1. Pre-ignition procedures
 - a. Importance and necessity of car adjustments
 - b. Importance of seat belts
 - 2. Starting procedures
 - a. Creeping out until driver can see
 - b. Yielding to traffic on the street
 - c. Watch right front fender
 - d. Backing into correct lane
- B. Turn right onto Old Hickory Lane and proceed to Burcham Drive
 - 1. Right turn from 2-lane street to 2-lane street
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Proper lane position for stop
 - c. Proper stopping position in relation to sign
 - d. Proper lane to turn into
 - e. Use of hand-over-hand technique
- C. Turn right onto Burcham Drive and proceed to Abbott Road
 - 1. Right turn from 2-lane street to 4-lane street
 - a. Need to creep out for better view of left side after stopping in correct position in relation to stop sign
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 - 2. 25 m.p.h. speed limit
 - a. Watch speed carefully - there is a tendency to go faster than the limit on this wide 4-lane street
 - 3. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes
- D. Turn left onto Abbott Road and proceed to Grand River Avenue
 - 1. Left turn from 4-lane street to 4-lane street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go

- c. Why should students remain in the left lane after turning - right lane changes to parking in a couple of blocks and this avoids a lane change to right and then having to come back again to the left
 - 2. Traffic signal
 - a. Proper state of mind when approaching signal
 - b. Correct stopping position
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When light changes to green what should a driver do before proceeding
 - 3. Overhead signs and lane markings for proceeding onto or across Grand River Avenue
 - a. Right lane for right turn only
 - b. Left lane for right turn or going straight - student should be in left lane so he is in the proper position for the next maneuver
- E. Turn right onto Grand River Avenue (M 43) and proceed to Michigan Avenue (M 143) (1½ blocks away - Y intersection - Grand River Avenue goes straight and Michigan Avenue angles off to the left)
 - 1. Right turn from 4-lane street to 6-lane divided highway
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - either of the two extreme left lanes - this maneuver puts student in the proper position for following Michigan Avenue
 - c. Eliminates necessity of having to lane change across 1 or 2 lanes after turn is completed - this would have had to be done in 1½ blocks which is an impossibility in heavy traffic
 - d. As student turns he should be cautious of cars on his right - some driver may be planning on going straight from right lane or turning into the same lane in which he plans on going
- F. Follow Michigan Avenue (left leg of Y) to Capitol Avenue (street directly in front of Capitol Building)
 - 1. Overhead signs
 - a. Point out signs to show how highways divide
 - b. Center lane can go either way - necessity of signalling when in this lane

2. 4-lane divided highway, 30 m.p.h. speed limit
 - a. Proper lane to drive in
 - b. Proper driving speed
 - c. Maintaining even speed
 - d. Correct following distances
3. Merging traffic from left - the 2 lanes change into 3 lanes
 - a. What a person must be careful of in this situation
 - b. Why a person shouldn't pass here
 - c. Proper lane usage - get away from merging traffic
4. 6-lane divided highway, 40 m.p.h. speed limit
 - a. Proper lane to drive in
 - b. Which lane to turn right from
 - c. Which lane to turn left from
5. 3 lanes narrowing to 2 (2 lanes on right merge)
 - a. Importance of checking rear view mirror and over shoulder as lanes merge
6. Median strip ends - 5-lane undivided highway with center lane used for left turns for both directions, 30 m.p.h. speed limit
 - a. Overhead signs indicating left turn lane
 - b. Need for caution when entering center lane
 - c. Pavement markings indicating when traffic can enter center lane
 - d. Lane change procedure to enter lane
 - e. Yielding to oncoming traffic
 - f. Position in intersection while yielding to oncoming traffic
 - g. Why front wheels should be kept straight while yielding
7. Parallel parking on right
 - a. Dangers involved in this type of situation
 - b. Staying as far away from parked cars as lane permits
8. Traffic signal - pedestrian controlled (By Sparrow Hospital)
9. Railroad crossing - Electric signals
 - a. Need to slow down
 - b. Should use ears as well as eyes in this situation
 - c. Need to look in both directions before crossing
 - d. What to do if signals are red but no train can be seen from either direction
10. 25 m.p.h. speed limit
11. Lane change to left - when about 3 blocks from Capitol
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes

12. End of left turn lane - 2 lanes change to 3 - 6-lane undivided highway
 - a. At end of left turn lane the left lane divides into 2 lanes - stay in the right lane of these two lanes so you end up in the middle of the 3 lanes
 - b. This avoids getting caught behind left turning traffic
 - c. This change is difficult to see as it occurs on a slight downgrade
 13. Lane change to left - this will put the student in the extreme left lane of the 3 lanes which to in the direction he is going
- G. Turn right onto Capitol Avenue and proceed to Ottawa Street
1. Right turn from 5-lane 2-way street (3 lanes in direction you are travelling) to 4-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - extreme left lane
 - c. This procedure eliminates necessity of having to lane change across several lanes after turn is completed - this would have had to been done in 1 block which is an impossibility in heavy traffic
 - d. Point out pavement markings showing that all 3 lanes turn to the right
 - e. Point out into which lane each of the three lanes should turn
 - f. As student turns he should be cautious of cars on his right - some driver may not turn into the correct lane
- H. Turn left onto Ottawa Street and proceed to Walnut Street
1. Left turn from 4-lane 1-way street to 2-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 - c. Meaning of red flashing arrow
 - d. What should a driver do if the red flashing arrow is on
 2. Parallel parking on left side of street
 - a. Dangers involved in this type of situation
 - b. Staying as far away from parked cars as lane permits

3. Driving on left side of street - student should remain in left lane so he is in proper position for next turn
- I. Turn left onto Walnut Street and proceed to Allegan Street
 1. Left turn from 3-lane 1-way street to 3-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. Driving on the left side of street - student should remain in left lane so he is in proper position for next turn
 - J. Turn left onto Allegan Street and proceed to Capitol Avenue
 1. Left turn from 3-lane 1-way street to 2-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
 3. Right lane divides into 2 lanes - Keep to left of this lane so you are in the middle lane of the 3 lanes at the end of the block
 - a. Point out pavement markings to show which directions a driver can go from each of the three lanes
 - K. Turn left onto Capitol Avenue and proceed to Michigan Avenue
 1. Left turn from 3-lane 1-way street to 5-lane 1-way street
 - a. Proper lane to turn into
 - b. Pavement markings which direct the two left turn lanes into the proper lanes on Capitol Avenue
 - c. Keep to the right of the lane markings - do not cross
 - d. Watch traffic on your left for drivers turning into the wrong lane
 2. Lane change to right - only one lane
 - a. Avoid going into furthest right lane as quite often there are illegally parked cars in it

- b. Point out pavement markings to show which directions a driver can go from each of the five lanes
- L. Turn right onto Michigan Avenue and proceed to N. Larch Street
 - 1. Right turn from 5-lane 1-way street to 5-lane 2-way street (2 lanes going in the direction you are travelling)
 - a. Proper lane to turn from
 - b. Proper lane to turn into
 - c. Pavement markings which direct the two right turn lanes into the proper lanes on Michigan Avenue
 - d. Keep to the left of the lane markings - do not cross
 - e. Watch traffic on your right for drivers turning into the wrong lane
 - f. Meaning of flashing red arrow
 - g. What should a driver do if the red flashing arrow is on
 - 2. 5-lane 2-way street (center lane for left turns)
 - a. Proper lane to drive in - remain in left lane
- M. Turn left onto N. Larch Street and proceed to Ottawa Street
 - 1. Left turn from 5-lane 2-way street (center lane for left turns for both directions) to 3-lane 1-way street
 - a. Overhead signs indicating left turn lane
 - b. Need for caution when entering center lane
 - c. Pavement markings indicating when traffic can enter center lane
 - d. Lane change procedure to enter lane
 - e. Yielding to oncoming traffic
 - f. Position in intersection while yielding to oncoming traffic
 - g. Why front wheels should be kept straight while yielding
 - h. Green arrow after green light - to permit left turns - opposing traffic is stopped
 - i. Proper lane to turn into - nearest lane going in the direction you wish to go
- N. Turn left onto Ottawa Street and park in angle parking stalls to change drivers
 - 1. Left turn from 3-lane 1-way street to 2-lane 2-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into

2. Angle parking on right side of street
 - a. Proper signal
 - b. Emphasize car control
 - c. Watch left front fender and right rear fender
 3. Stopping procedures
 - a. Importance of putting car in "Park" and setting parking brake
- O. Begin in angle parking stall and proceed to Cedar Street
1. Pre-ignition procedures
 - a. Importance and necessity of car adjustments
 - b. Importance of seat belts
 2. Backing out of angle parking stall
 - a. Creeping out until driver can see
 - b. Yielding to traffic on the street
 - c. Watch left front fender
 - d. Backing into the correct lane
- P. Turn left onto Cedar Street and proceed to Michigan Avenue
1. Left turn from 2-lane 2-way street to 3-lane 1-way street
 - a. Turning into the proper lane - nearest lane going in direction you wish to go
 2. Lane change to the right (2 lanes)
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
- Q. Turn right onto Michigan Avenue and proceed to Capitol Avenue
1. Right turn from 3-lane 1-way street to 5-lane 2-way street
 - a. Proper lane to turn from - extreme right lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. 5-lane 2-way street, 25 m.p.h. speed limit
 - a. Proper lane to drive in
 - b. Proper driving speed
 - c. Maintaining even speed
 - d. Correct following distances
 3. Lane change to left - when about 3 blocks from Capitol
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes

4. End of left turn lane - 2 lanes change to 3 - 6-lane undivided highway
 - a. At end of left turn lane the left lane divides into 2 lanes - stay in the right of these 2 lanes so you end up in the middle of the 3 lanes
 - b. This avoids getting caught behind left turning traffic
 - c. This change is difficult to see as it occurs on a slight downgrade
 5. Lane change to left - this will put the student in the extreme left lane of the 3 lanes which go in the direction you are travelling
- R. Turn right onto Capitol Avenue and proceed to Ottawa Street
1. Right turn from 2-lane 2-way street (3 lanes in direction you are travelling) to 4-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - extreme left lane
 - c. This procedure eliminates necessity of having to lane change across several lanes after turn is completed - this would have had to been done in 1 block which is an impossibility in heavy traffic
 - d. Point out pavement markings showing that all three lanes turn to the right
 - e. Point out into which lane each of the 3 lanes should turn
 - f. As student turns he should be cautious of cars on his right - some driver may not turn into the correct lane
- S. Turn left onto Ottawa Street and proceed to Walnut Street
1. Left turn from 4-lane 1-way street to 2-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 - c. Meaning of red flashing arrow
 - d. What should a driver do if the red flashing arrow is on
 2. Parallel parking on left side of street
 - a. Dangers involved in this type of situation
 - b. Staying as far away from parked cars as lane permits

3. Driving on left side of street - student should remain in left lane so he is in proper position for next turn
- T. Turn left onto Walnut Street and proceed to Allegan Street
1. Left turn from 3-lane 1-way street to 3-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. Driving on left side of street - student should remain in left lane so he is in proper position for next turn
- U. Turn left onto Allegan Street and proceed to Capitol Avenue
1. Left turn from 3-lane 1-way street to 2-lane 1-way street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
 3. Right lane divides into 2 lanes - keep to left of this lane so you are in the middle lane of the 3 lanes at the end of the block
 - a. Point out pavement markings to show which directions a driver can go from each of the three lanes
- V. Turn left onto Capitol Avenue and proceed to Michigan Avenue
1. Left turn from 3-lane 1-way street to 5-lane 1-way street
 - a. Proper lane to turn into
 - b. Pavement markings which direct the two left turn lanes into the proper lanes on Capitol Avenue
 - c. Keep to the right of the lane markings - do not cross
 - d. Watch traffic on your left for drivers turning into the wrong lane
 2. Lane change to right - only one lane
 - a. Avoid going into furthest right lane as quite often there are illegally parked cars in it

- b. Point out pavement markings to show which directions a driver can go from each of the five lanes
- W. Turn right onto Michigan Avenue and proceed to Grand River Avenue (M 43)
 - 1. Right turn from 5-lane 1-way street to 5-lane 2-way street (2 lanes going in the direction you are travelling)
 - a. Proper lane to turn from
 - b. Proper lane to turn into
 - c. Pavement markings which direct the two right turn lanes into the proper lanes on Michigan Avenue
 - d. Keep to the left of the lane markings - do not cross
 - e. Watch traffic on your right for drivers turning into the wrong lane
 - f. Meaning of red flashing arrow
 - g. What should a driver do if the red flashing arrow is on
 - h. Yielding to pedestrians on red arrow
 - 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
 - 3. 5-lane 2-way street (center lane for left turns)
 - a. Proper lane to drive in
 - b. Proper driving speed
 - c. Maintaining even speed
 - d. Correct following distances
 - 4. Railroad crossing - Electric signals
 - a. Need to slow down
 - b. Should use ears as well as eyes in this situation
 - c. Need to look in both directions before crossing
 - d. What to do if signals are red but no train can be seen from either direction
 - 5. Parallel parking on right
 - a. Dangers involved in this type of situation
 - b. Staying as far away from parked cars as lane permits
 - 6. Traffic signal - pedestrian controlled (By Sparrow Hospital)
 - 7. Left turn lane ends - median strip begins - 6-lane divided highway, 40 m.p.h. speed limit
 - a. Proper lane to drive in
 - b. Proper driving speed
 - c. Maintaining even speed
 - d. Correct following distances
 - e. Use of left turning lanes

8. 3 lanes reduced to 2 lanes
 - a. Need to be looking ahead
 - b. Should signal and check over shoulder if driver is in the center lane
 9. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes
 10. Grand River Avenue (M 43) merging into Michigan Avenue (M 143) from left
 - a. Watch traffic on Grand River so you can merge with it
 - b. Lane change 2 lanes to the left to prepare for turn on Abbott Road
- X. Turn left onto Abbott Road and proceed to Burcham Drive
1. Left turn from 6-lane divided highway to 4-lane street
 - a. Proper lane to turn from - extreme left lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 - c. Lining up correctly in the median
 - d. Sign indicating to complete turn after light changes to green
 2. Stay in left lane - right lane changes to parallel parking in one block
 3. Traffic signal
 - a. Proper state of mind when approaching signal
 - b. Correct stopping position
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When light changes to green what should a driver do before proceeding
- Y. Turn right onto Burcham Drive and proceed to Old Hickory Lane
1. Right turn from 4-lane street to 4-lane street
 - a. Proper lane to turn from - extreme right lane
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. 25 m.p.h. speed limit
 - a. Watch speed carefully - there is a tendency to go faster than the limit on this wide 4-lane street
 3. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes

- Z. Turn left onto Old Hickory Lane and proceed to road into school
 - 1. Left turn from 4-lane street to 2-lane street
 - a. Proper lane to turn from - extreme left lane

- AA. Turn left into school and angle park
 - 1. Left turn from 2-lane street to 2-lane street
 - 2. Angle parking on left side of street
 - a. Proper signal
 - b. Checking traffic over left shoulder
 - c. Watch right front fender and left rear fender
 - 3. Stopping procedure
 - a. Importance of putting car in "Park" and setting parking brake

NOTE: If time is running short, stop in a convenient place when the period is half over, change drivers, and follow the route back. If there is some extra time, try some parallel parking.

It is important to get the students back to school on time.

LESSON III

Highway Driving - Williamston Trip

- A. Begin at curb in front of school and proceed to Old Hickory Lane
 - 1. Pre-ignition procedures
 - a. Entering car on curb side
 - b. Importance and necessity of car adjustments
 - c. Importance of seat belts
 - 2. Starting procedure
 - a. Signalling before leaving curb
 - b. Looking over left shoulder before pulling out
- B. Turn right onto Old Hickory Lane and proceed to Burcham Drive
 - 1. Right turn from 2-lane street to 2-lane street
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Proper lane position for stop
 - c. Proper stopping position in relation to sign
 - d. Proper lane to turn into
 - e. Use of hand-over-hand technique
- C. Turn left onto Burcham Drive and proceed to Hagadorn Road
 - 1. Left turn from 2-lane street to 4-lane street
 - a. Need to creep out for better view of left side after stopping in correct position in relation to stop sign
 - b. Turning into proper lane - nearest lane going in the direction you wish to go
 - 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
 - 3. 25 m.p.h. speed limit
 - a. Watch speed carefully - there is a tendency to go faster than the limit on this wide 4-lane street
 - 4. School zone
 - a. Need for reduced speed
 - b. Being especially alert for pedestrians
 - c. Impulsiveness of children
- D. Turn right onto Hagadorn Road and proceed to Grand River Avenue (M 43)
 - 1. Right turn from 4-lane street to 2-lane street
 - a. Proper stopping position
 - b. Proper lane to turn from - extreme right lane

2. 25 m.p.h. speed limit
 - a. General tendency to speed on this street
 3. Traffic signal
 - a. Proper state of mind when approaching signal
 - b. Correct stopping position
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When light changes to green what should a driver do before proceeding
- E. Turn left onto M 43. Follow highway through Williamston to M 47
1. Left turn from 2-lane street to 4-lane undivided highway
 - a. Yielding to oncoming traffic
 - b. Position in intersection while yielding to oncoming traffic
 - c. Why front wheels should be kept straight while yielding
 - d. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. Lane change to right
 3. Speed limits 40 - 50 - 65/55
 - a. Need for caution in built up area
 - b. Proper driving speed for conditions
 - c. Maintaining even speed
 - d. Correct following distances
 4. Pavement narrows situation - 4 lanes to 3 lanes
 - a. Need to drive ahead
 - b. Need to recognize sign before being close enough to read what's on it
 - c. Lane changing early to avoid being trapped
 5. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes
 6. Flashing yellow light
 - a. Meaning of light
 - b. What a person should do and look for
 7. 3-lane pavement
 - a. Dangers involved in this type of roadway
 - b. When it is safe to and not safe to pass
 - c. Proper lane to turn left from - center lane
 8. Yellow no passing lines; do not pass; pass with care; and white and yellow delineators
 - a. Emphasize use of these when anticipating passing
 - b. Have student tell when it is safe to pass and not safe to pass in relation to these signs and markings

9. Cross roads sign
 - a. What does the sign mean
 - b. What should a person do and look for
10. 3 lanes changing to 4 lanes
 - a. Avoid moving from one lane to the other without going through a lane change procedure
11. Smith system of driving
 - a. Aim high in steering
 - b. Get the big picture
 - c. Keep your eyes moving
 - d. Leave yourself an out
 - e. Make sure others see you
12. Passing
 - a. Reason for signalling before pulling out
 - b. Why is it necessary to check over the left shoulder before pulling out
 - c. Watch pulling out too sharply
 - d. Watch pulling in too soon or too sharply
13. Drive off pavement
 - a. Have student let right wheels drop off pavement for proper procedure in getting back on - be sure no traffic is behind you
14. Speed 45 ahead sign
 - a. What does the sign mean
 - b. Where does the reduced limit begin
- F. Turn left onto M 47 and proceed to roadside park on left side of highway (approximately 3/4 mile)
 1. Left turn from 3-lane highway to 2-lane highway
 - a. Proper lane to turn from - center lane
 - b. Need for caution before entering center lane
- G. Turn left into park to change drivers
 1. Left turn from 2-lane highway to 2-lane road
 2. Stopping procedure
 - a. Importance of placing car in "Park" and setting parking brake
- H. Begin in roadside park and proceed to M 47
 1. Pre-ignition procedures
 - a. Importance and necessity of car adjustments
 - b. Importance of seat belts
 2. Starting procedures
- I. Turn right onto M 47 and proceed to M 43
 1. Right turn from 2-lane road to 2-lane highway
 - a. Proper stopping position in relation to sign
 - b. Proper lane to turn into
 - c. Use of hand-over-hand technique

- J. Turn right onto M 43. Drive through Williamston to Hagadorn Road in East Lansing
1. Right turn from 2-lane highway to 3-lane highway
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Proper lane position for stop
 - c. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. 65/55 speed limit
 - a. Proper driving speed for conditions
 - b. Maintaining even speed
 - c. Correct following distances
 3. 3-lane pavement
 - a. Dangers involved in this type of roadway
 - b. When it is safe to and not safe to pass
 - c. Proper lane to turn left from - center lane
 4. Yellow no passing lines; do not pass; pass with care; and white and yellow delineators
 - a. Emphasize use of these when anticipating passing
 - b. Have student tell when it is safe to pass and not safe to pass in relation to these signs and markings
 5. Drive off pavement
 - a. Have student let right wheels drop off pavement for proper procedure in getting back on - be sure no traffic is behind you
 6. Speed 45 ahead sign
 - a. What does the sign mean
 - b. Where does the reduced limit begin
 7. Speed limits 45 - 35 - 25
 - a. Reasons for reduced limits
 - b. Need for caution in built up area
 8. Traffic signal
 - a. Proper state of mind when approaching signal
 - b. Correct stopping position
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When light changes to green what should a driver do before proceeding
 9. Smith system of driving
 - a. Aim high in steering
 - b. Get the big picture
 - c. Keep your eyes moving
 - d. Leave yourself an out
 - e. Make sure others see you
 10. Passing
 - a. Reason for signalling before pulling out
 - b. Why is it necessary to check over the left shoulder before pulling out
 - c. Watch pulling out too sharply
 - d. Watch pulling in too soon and too sharply

11. Cross roads sign
 - a. What does the sign mean
 - b. What should a person do and look for
 12. 4 lanes reduced to 3 lanes - 2 lanes merging into 1
 - a. Need for looking over left shoulder
 13. Flashing yellow light
 - a. Meaning of light
 - b. What a person should do and look for
 14. 3 lanes changing to 4 lanes
 - a. Avoid moving from one lane to the other without going through a lane change procedure
 15. Paint test section
 - a. Ask students what lines mean to see if they read the sign
 16. Speed limits 50 - 40 - 35
- K. Turn right onto Hagadorn Road and proceed to Burcham Drive
1. Right turn from 4-lane highway to 2-lane street
 - a. Proper lane to turn from - extreme right lane
 2. 25 m.p.h. speed limit
 - a. General tendency to speed on this street
 3. School zone
 - a. Need for reduced speed
 - b. Being especially alert for pedestrians
 - c. Impulsiveness of children
- L. Turn left onto Burcham Drive and proceed to Old Hickory Lane
1. Left turn from 2-lane street to 4-lane street
 - a. Proper lane to turn into - nearest lane going in the direction you wish to go
 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
- M. Turn right onto Old Hickory Lane and proceed to road into school
1. Right turn from 4-lane street to 2-lane street
 - a. Proper lane to turn from - extreme right lane
- N. Turn left into school and park by curb
1. Left turn from 2-lane street to 2-lane street
 2. Parking by curb
 - a. Checking traffic behind before stopping
 - b. Proper signal for stopping by curb

- c. How to judge distance from curb
 - d. Turn wheels into curb on downgrade
 - e. Turn wheels away from curb on upgrade
 - f. Turn wheels toward side of road on both upgrades and downgrades when there is no curb
3. Stopping procedure
- a. Importance of putting car in "Park" and setting parking brake
 - b. Leaving car on curb side

NOTE: Two cars should team up for this trip so students have an opportunity to pass each other.

If time is running short, stop in a convenient place when the period is half over, change drivers, and follow the route back. If there is some extra time, try some parallel parking.

It is important to get the students back to school on time.

LESSON IV

Freeway Driving - I 96 Trip

- A. Begin at curb in front of school and proceed to Old Hickory Lane
 - 1. Pre-ignition procedures
 - a. Entering car on curb side
 - b. Importance and necessity of car adjustments
 - c. Importance of seat belts
 - 2. Starting procedure
 - a. Signalling before leaving curb
 - b. Looking over left shoulder before pulling out
- B. Turn right onto Old Hickory Lane and proceed to Burcham Drive
 - 1. Right turn from 2-lane street to 2-lane street
 - a. Signalling for turns - $\frac{1}{2}$ block ahead
 - b. Proper lane position for stop
 - c. Proper stopping position in relation to sign
 - d. Proper lane to turn into
 - e. Use of hand-over-hand technique
- C. Turn left onto Burcham Drive and right onto Bailey Street (off-set intersection) and proceed to Grand River Avenue (M 43)
 - 1. Left turn from 2-lane street to 4-lane street
 - a. Need to creep out for better view of left side after stopping in correct position in relation to stop sign
 - b. Proper lane to turn into - furthest right lane to be in proper position for right turn
 - 2. Right turn from 4-lane street to 2-lane street
 - a. Proper lane to turn from - extreme right lane
 - 3. 25 m.p.h. speed limit, open intersections
 - a. Need to slow down for each intersection
 - b. Looking left-right-left before proceeding through intersection
 - c. Yielding to cars on the right
 - d. Driving defensively
 - 4. School zone
 - a. Need for reduced speed
 - b. Being especially alert for pedestrians
 - c. Impulsiveness of children

- D. Turn left onto Grand River Avenue and proceed to Okemos Road (Look for To I 96 signs)
 - 1. Left turn from 2-lane (with extra left turn lane) street to 6-lane divided highway
 - a. Using left turn lane
 - b. Need for caution - poor vision from left
 - c. Correct procedure for lining up in median
 - d. Proper lane to turn into - nearest lane going in the direction you wish to go
 - 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
 - 3. 3 lanes reduced to 2, median strip ending
 - a. Importance of checking rear view mirror and over shoulder as lanes merge
 - 4. Traffic signal
 - a. Proper state of mind when approaching signal
 - b. Correct stopping position
 - c. Meaning of yellow light
 - d. Does the green mean go
 - e. When light changes to green what should a driver do before proceeding
 - 5. 4-lane highway, 40 m.p.h. speed limit
 - a. Need for caution in built up area
 - b. Proper driving speed for conditions
 - c. Maintaining even speed
 - d. Correct following distances
- E. Turn right onto Okemos Road. Proceed through Okemos to I 96
 - 1. Right turn from 4-lane undivided highway to 2-lane street
 - a. Proper lane to turn from - extreme right lane
 - 2. 25 m.p.h. speed limit
 - a. Need to watch speed carefully after driving on highway
 - 3. Traffic signal
 - 4. School zone
 - a. Need for reduced speed
 - b. Being especially alert for pedestrians
 - c. Impulsiveness of children
 - 5. 2-lane to 4-lane divided road
 - a. Proper lane to drive in
 - 6. Pavement narrows situation
 - a. Need to drive ahead
 - b. Need to recognize sign before being close enough to read what's on it
 - c. Lane changing early to avoid being trapped

7. Lane change to left
 - a. Signal for left turn
 - b. Check over left shoulder
 - c. Increase speed slightly while changing lanes
 8. Railroad crossing - Electric signals
 - a. Need to slow down
 - b. Should use ears as well as eyes in this situation
 - c. Need to look in both directions before crossing
- F. Enter I 96 via interchange and proceed west toward Lansing to U. S. 27 North exit (4th interchange after entering - I 496, U.S. 127, and M 99 are in between)
1. Left turn on entry ramp
 - a. Watch turning into the correct ramp
 - b. Entry ramp is just a few feet beyond an exit ramp
 - c. Proper ramp speed
 2. Merging into I 96
 - a. Use of acceleration lane to get to freeway speed
 - b. Lane change procedure when leaving acceleration lane
 3. 4-lane divided freeway, 70 m.p.h. speed limit, 45 m.p.h. minimum
 - a. Proper driving speed for conditions
 - b. Proper lane use
 - c. Maintaining even speed
 - d. Correct following distances
 4. White and yellow delineators
 - a. Meaning of the two colors
 - b. How they can help the driver at night
 5. Reading exit signs
 - a. Necessity of knowing where to exit before getting on a freeway
 - b. Proper lane usage at each exit
 6. Merging traffic
 - a. Watching entry ramps for merging cars
 - b. Dangers in passing at interchanges
 - c. Proper lane use - get away from merging traffic
 7. Roads across median - No U Turn signs
 - a. Purpose of these roads
 - b. Emphasize that drivers are not permitted to cross here
 8. Smith system of driving
 - a. Aim high in steering
 - b. Get the big picture
 - c. Keep your eyes moving
 - d. Leave yourself an out
 - e. Make sure others see you

- G. Exit on U.S. 27 North interchange. Proceed several hundred feet down U.S. 27 and park along highway to change drivers
 - 1. Use of deceleration lane
 - a. Slow down on deceleration lane to ramp speed
 - b. Proper ramp speed
 - 2. Merging with traffic on U.S. 27
 - a. Use of acceleration lane to get to highway speed
 - b. Lane change procedure when leaving acceleration lane
 - 3. Parking along highway
 - a. Signal for stop
 - b. Slow down on the pavement
 - c. Pull completely off the pavement and as far off as possible
 - 4. Stopping procedures
 - a. Importance of placing car in "Park" and setting parking brake
 - b. Leaving car on curb side
 - c. Dangers involved in being parked along the highway

- H. Begin along U.S. 27 and proceed to first road across median
 - 1. Pre-ignition procedures
 - a. Entering car on curb side
 - b. Importance and necessity of car adjustments
 - c. Importance of seat belts
 - 2. Starting procedure
 - a. Signalling and looking over left shoulder before pulling out
 - 3. Lane change to left
 - a. Signal for left turn
 - b. Check traffic over left shoulder
 - c. Increase speed slightly while changing lanes

- I. Cross median and proceed back U.S. 27 to I 96
 - 1. Crossing median
 - a. Proper method of lining up in median
 - b. Proper lane to turn into - nearest lane going in the direction you wish to go
 - 2. Lane change to right
 - a. Signal for right turn
 - b. Check traffic over right shoulder
 - c. Increase speed slightly while changing lanes

- J. Enter I 96 via interchange and proceed east toward Detroit to Okemos-Mason exit (4th interchange after entering - M 99, U.S. 127, I 496 are in between)
 - 1. Right turn on entry ramp
 - a. Watch turning into the correct ramp
 - b. West entry ramp is on near side of I 96 and east entry ramp is on far side of I 96
 - c. Proper ramp speed
 - 2. Merging into I 96
 - a. Use of acceleration lane to get to free-way speed
 - b. Lane change procedure when leaving acceleration lane
 - 3. 4-lane divided freeway, 70 m.p.h. speed limit, 45 m.p.h. minimum
 - a. Proper driving speed for conditions
 - b. Proper lane use
 - c. Maintaining even speed
 - d. Correct following distances
 - 4. White and yellow delineators
 - a. Meaning of the two colors
 - b. How they can help the driver at night
 - 5. Reading exit signs
 - a. Necessity of knowing where to exit before getting on a freeway
 - b. Proper lane usage at each exit
 - 6. Merging traffic
 - a. Watching entry ramps for merging cars
 - b. Dangers in passing at interchanges
 - c. Proper lane use - get away from merging traffic
 - 7. Roads across median - No U Turn signs
 - a. Purpose of these roads
 - b. Emphasize that drivers are not permitted to cross here
 - 8. Smith system of driving
 - a. Aim high in steering
 - b. Get the big picture
 - c. Keep your eyes moving
 - d. Leave yourself an out
 - e. Make sure others can see you
- K. Exit on Okemos-Mason exit
 - 1. Use of deceleration lane
 - a. Slow down on deceleration lane to ramp speed
 - b. Proper ramp speed
- L. Turn left onto Okemos Road. Proceed through Okemos to M 43
 - 1. Left turn from 2-lane 1-way ramp to 2-lane 2-way road

- a. proper lane to turn from - extreme left lane
 - b. Need for caution - limited sight distance from left on Okemos Road, 50 m.p.h. speed limit
 - 2. 2-lane road, 50 m.p.h. speed limit
 - a. Need to watch speed carefully after driving on freeway
 - 3. Railroad crossing - Electric signals
 - a. Need to slow down
 - b. Should use ears as well as eyes in this situation
 - c. Need to look in both directions before crossing
 - 4. 35 m.p.h. speed limit
 - 5. School zone, 25 m.p.h. speed limit
 - a. Need for reduced speed
 - b. Being especially alert for pedestrians
 - c. Impulsiveness of children
 - 6. 2-lane to 4-lane divided road
 - a. Proper lane to drive in
 - 7. Traffic signal
- M. Turn left onto M 43 and proceed to Bailey Street in E. Lansing
- 1. Left turn from 2-lane street to 4-lane highway
 - a. Proper distance to stop from highway
 - b. Stopping perpendicular to highway for good view of both directions
 - c. Proper lane to turn into - nearest lane going in the direction you wish to go
 - 2. Lane change to right
 - a. Signal for right turn
 - b. Check over right shoulder
 - c. Increase speed slightly while changing lanes
 - 3. 4-lane undivided highway, speed limits 50 - 40 - 35
 - a. Need for caution in built up area
 - b. Proper driving speed for conditions
 - c. Maintaining even speed
 - d. Correct following distances
 - 4. 4-lane undivided to 6-lane divided highway, 25 m.p.h. speed limit
 - a. Proper lane use
- N. Turn right onto Bailey Street (Prince Brothers Store) and proceed to Burcham Drive
- 1. Right turn from 6-lane divided highway to 2-lane street
 - a. Proper lane to turn from - extreme right lane

2. School zone
 - a. Need for reduced speed
 - b. Being especially alert for pedestrians
 - c. Impulsiveness of children
3. 25 m.p.h. speed limit, open intersections
 - a. Need to slow down for each intersection
 - b. Looking left-right-left before proceeding through intersection
 - c. Yielding to cars on the right
 - d. Driving defensively
- O. Turn left onto Burcham Drive and right onto Old Hickory Lane (off-set intersection) and proceed to road into school
 1. Left turn from 2-lane street to 4-lane street
 - a. Need to creep out for better view of right side after stopping in correct position in relation to stop sign
 - b. Proper lane to turn into - furthest right lane to be in proper position for right turn
 2. Right turn from 4-lane street to 2-lane street
 - a. Proper lane to turn from - extreme right lane
- P. Turn left into school and park by curb
 1. Left turn from 2-lane street to 2-lane street
 2. Parking by curb
 - a. Checking traffic behind before stopping
 - b. Proper signal for stopping by curb
 - c. How to judge distance from curb
 - d. Turn wheels into curb on downgrade
 - e. Turn wheels away from curb on upgrade
 - f. Turn wheels toward side of road on both upgrades and downgrades when there is no curb
 3. Stopping procedure
 - a. Importance of putting car in "Park" and setting parking brake
 - b. Leaving car on curb side

NOTE: If time is running short, leave the freeway at one of the interchanges preceeding the one given, change drivers, and follow the route back. If there is some extra time, try some parallel parking.

It is important to get the students back to school on time.

APPENDIX C

SKILL TESTS

MULTIPLE CAR OFF-STREET DRIVING RANGE

Name_____ Semester_____ Period_____ Date _____

A. Starting Procedure

9 Points

- | | | |
|---|--------|-------|
| 1. Enters car by curb side | 1 pt. | _____ |
| 2. Adjusts seat and mirrors | 2 pts. | _____ |
| 3. Fastens seat belt | 3 pts. | _____ |
| 4. Selects proper gear - "P" or "N" | 1 pt. | _____ |
| 5. Puts left foot on brake | 1 pt. | _____ |
| 6. Turn switch on to start and releases | 1 pt. | _____ |
| | TOTAL | _____ |

B. Moving the Car

15 Points

- | | | |
|---------------------------|--------|-------|
| 1. Has left foot on brake | 3 pts. | _____ |
| 2. Selects proper gear | 2 pts. | _____ |
| 3. Releases parking brake | 2 pts. | _____ |
| 4. Checks traffic | 3 pts. | _____ |
| 5. Signals | 3 pts. | _____ |
| 6. Accelerates properly | 2 pts. | _____ |
| | TOTAL | _____ |

C. Left Turn

12 Points

- | | | |
|---------------------------|--------|-------|
| 1. Proper speed | 2 pts. | _____ |
| 2. Proper lane position | 3 pts. | _____ |
| 3. Signals | 3 pts. | _____ |
| 4. Turns hand-over-hand | 1 pt. | _____ |
| 5. Turns into proper lane | 1 pt. | _____ |
| 6. Proper recovery | 2 pts. | _____ |
| | TOTAL | _____ |

D.	<u>Right Turn</u>	<u>12 Points</u>	
	1. Proper speed	2 pts.	_____
	2. Proper lane position	3 pts.	_____
	3. Signals	3 pts.	_____
	4. Turns hand-over-hand	1 pt.	_____
	5. Turns into proper lane	1 pt.	_____
	6. Proper recovery	2 pts.	_____
		TOTAL	_____
E.	<u>"T"</u>	<u>15 Points</u>	
	1. Signals for entry	3 pts.	_____
	2. Enters via proper lane	1 pt.	_____
	3. Stops proper distance from flag #1	2 pts.	_____
	4. Uses correct backing technique	3 pts.	_____
	5. Stops proper distance from flag #2	2 pts.	_____
	6. Leaves via correct lane	1 pt.	_____
	7. Stops before entering street	3 pts.	_____
		TOTAL	_____
F.	<u>"X"</u>	<u>16 Points</u>	
	1. Signals for entry	3 pts.	_____
	2. Enters via correct lane	1 pt.	_____
	3. Turns hand-over-hand	1 pt.	_____
	4. Stops proper distance from flag #1	2 pts.	_____
	5. Uses correct backing technique	4 pts.	_____
	6. Doesn't turn wheels while car is still	1 pt.	_____
	7. Stops correct distance from flag #2	2 pts.	_____
	8. Stops before entering street	2 pts.	_____
		TOTAL	_____
G.	<u>Garage</u>	<u>16 Points</u>	
	1. Signals for entry	3 pts.	_____
	2. Uses correct backing technique	2 pts.	_____
	3. Stops - checks traffic	4 pts.	_____
	4. Turns into correct lane	2 pts.	_____
	5. Doesn't turn wheels while car is still	1 pt.	_____
	6. Looks to rear while car moves to rear	3 pts.	_____
	7. Clears lane - moves ahead	1 pt.	_____
		TOTAL	_____

H. Parking on Hill10 Points

- | | | |
|--|--------|-------|
| 1. Signals for stop | 3 pts. | _____ |
| 2. Stops correct distance from curb | 1 pt. | _____ |
| 3. Turns wheels in or out depending on grade | 3 pts. | _____ |
| 4. Puts selector lever in "P" | 1 pt. | _____ |
| 5. Sets parking brake - ignition off | 2 pts. | _____ |
| | TOTAL | _____ |

I. "Y" Turn20 Points

- | | | |
|---|--------|-------|
| 1. Signals for entry | 3 pts. | _____ |
| 2. Brings car to full stop - proper lane | 2 pts. | _____ |
| 3. Checks traffic | 3 pts. | _____ |
| 4. Signals (left) | 3 pts. | _____ |
| 5. Uses correct turning procedure | 2 pts. | _____ |
| 6. Stops car just before reaching other side - permits car to roll forward slowly, straightening wheels as he does so | 1 pt. | _____ |
| 7. Moves to rear - correct turning procedure | 2 pts. | _____ |
| 8. Stops before reaching curb - permits car to roll backward slowly, straightening wheels as he does so | 1 pt. | _____ |
| 9. Moves car forward - uses correct turning procedure | 1 pt. | _____ |
| 10. Stops and signals before leaving | 2 pts. | _____ |
| | TOTAL | _____ |

J. Angle Parking20 Points

- | | | |
|--|--------|-------|
| 1. Checks traffic | 2 pts. | _____ |
| 2. Proper lane position | 1 pt. | _____ |
| 3. Signals | 3 pts. | _____ |
| 4. Moves car into stall - good spacing; does not strike curb | 4 pts. | _____ |
| 5. Backs out (straight) | 1 pt. | _____ |
| 6. Pauses - checks traffic | 3 pts. | _____ |
| 7. Checks left front fender clearance | 2 pts. | _____ |
| 8. Turns into proper lane - looks to rear | 2 pts. | _____ |
| 9. Straightens wheels before car stops moving | 1 pt. | _____ |
| 10. Clears lane | 1 pt. | _____ |
| | TOTAL | _____ |

K.	<u>Parallel Parking</u>	<u>27 Points</u>	
1.	Checks traffic - signals	3 pts.	___
2.	Proper stopping position	2 pts.	___
3.	As car moves to the rear, turns wheels all the way to the right	2 pts.	___
4.	At 45 degree angle begins straightening wheels	2 pts.	___
5.	When front bumper is even with the rear bumper of the other car, begins turning all the way to the left	2 pts.	___
6.	Continually checks front and rear as he enters parking stall	2 pts.	___
7.	Centers car in stall	2 pts.	___
8.	Proper distance from curb	2 pts.	___
9.	Checks traffic - signals	4 pts.	___
10.	Clears stall correctly	2 pts.	___
11.	Makes right front fender check	2 pts.	___
12.	Turns correctly into proper lane	2 pts.	___
	TOTAL		___
L.	<u>Lane Changing</u>	<u>10 Points</u>	
1.	Checks traffic (mirrors)	2 pts.	___
2.	Signals	3 pts.	___
3.	Checks blind spot	3 pts.	___
4.	Enters new lane correctly	2 pts.	___
	TOTAL		___
M.	<u>Passing</u>	<u>15 Points</u>	
1.	Checks traffic (mirrors and blind spot)	3 pts.	___
2.	Signals - directional signals and horn	3 pts.	___
3.	Proper acceleration - makes pass	2 pts.	___
4.	Checks mirror - signals	3 pts.	___
5.	Returns to lane correctly	2 pts.	___
6.	Resumes speed	2 pts.	___
	TOTAL		___
	GRAND TOTAL (197 Points)		___

APPENDIX D

REPORT OF DRIVING TEST

First	Middle or maiden		Last name		License No.	
Place	Hour	Day	Month	Registration	Class	
<input checked="" type="checkbox"/> Original <input type="checkbox"/> Re-exam.	<input checked="" type="checkbox"/> Change class <input type="checkbox"/> Review exam	<input type="checkbox"/> Acceptable <input type="checkbox"/> Needs training	<input type="checkbox"/> Violation <input type="checkbox"/> Accident	<input type="checkbox"/> Unsafe Act <input type="checkbox"/> Incomplete	Examiner	
Notes						
VEHICLE HANDLING		Good	ROAD PROBLEMS		Good	Needs train.
Start	Car readiness Loc'n controls Motor operat'n	- - -	Stop signs	Braking Placement	- - -	- - -
Quick stop		- - -	Traffic lights	Braking Placement	- - -	- - -
Backing	Speed Lane	- - -	Left turns	Lane Speed Signal Turn Waiting	- - -	- - -
Parking	Signal Positioning Backing Placement	- - -			- - -	- - -
Turn about	Positioning Maneuvering	- - -	Left turn at signal	Lane Speed Signal Turn Waiting	- - -	- - -
Stop on up grade	Braking Wheel turn	- - -			- - -	- - -
Start on up grade	Signalling Brake control Motor oper'n	- - -	Left turn from one-way street	Lane Speed Signal	- - -	- - -

<u>Posture</u>	<u>Body</u> <u>Arms</u>																																																												
<u>SCORE</u>	<u>%</u>	<u>COUNTS</u>																																																											
<u>TRAFFIC PROBLEMS</u>			<u>Good</u>	<u>Needs train.</u>																																																									
<u>Following</u>	<u>Distance</u> <u>Observation</u> <u>Placement</u>	<u>-</u> <u>-</u> <u>-</u>			<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u>																																																	
<u>Overtaking</u>	<u>Judgment</u> <u>Signal</u> <u>Speed</u> <u>Return</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u>																																																		
<u>Being overtaken</u>	<u>Speed</u> <u>Yielding</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																																																		
<u>Use of horn</u>	<u>Helpful</u> <u>Unnecessary</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																																																		
<u>Right of way</u>	<u>Yielding</u> <u>Taking</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																																																		
<u>SCORE</u>	<u>%</u>	<u>COUNTS</u>																																																											
<u>Right turn</u>	<u>Turn</u> <u>Waiting</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>																																																		
												<u>Blind inter-sect'n</u>	<u>Speed</u> <u>Placement</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																																								
																						<u>Multiple lanes</u>	<u>Placement</u> <u>Changing</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																																
																														<u>One way street</u>	<u>Placement</u> <u>Changing</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																								
																																						<u>Other signs</u>	<u>Observation</u> <u>Action</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>	<u>-</u> <u>-</u>																
																																														<u>Attention</u>	<u>Starts</u> <u>Back & turn</u> <u>Left turn</u> <u>Parking</u> <u>Other</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>								
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