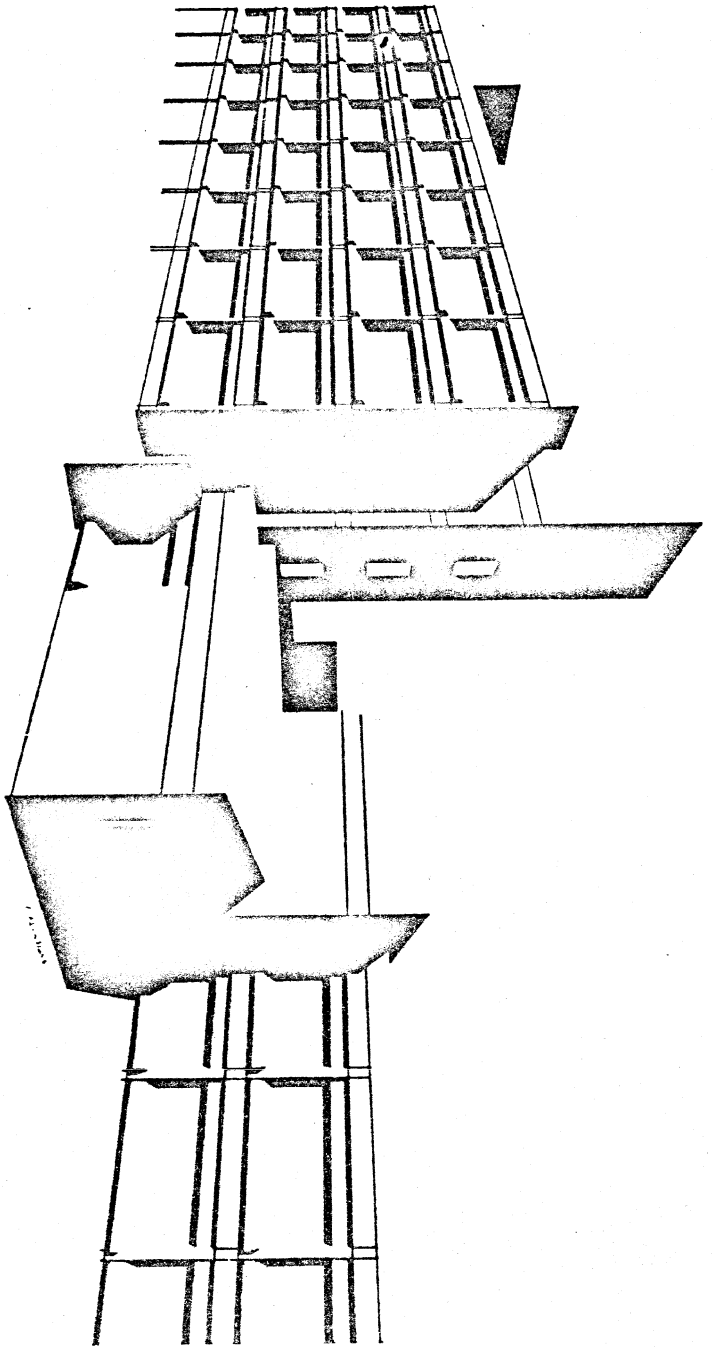


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Re-examination at
Renewal --
An Evaluation



HIGHWAY SAFETY RESEARCH INSTITUTE
THE UNIVERSITY OF MICHIGAN ANN ARBOR

Charles Gray
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Highway Safety
Research Institute

Re-examination at
Renewal --
An Evaluation

Final Report
March 15 - September 30, 1969

William K. Hall
October 20, 1969

Prepared by
Highway Safety Research Institute
Institute of Science and Technology
The University of Michigan
Ann Arbor, 48108

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It should be pointed out that the conclusions and opinions expressed in this report are those of the author, and they should not be construed to represent those of the Michigan Department of State.

ABSTRACT

The objective of this study is to evaluate various aspects of the re-examination at license renewal pilot program conducted by the State of Michigan Department of State during the period May 15, 1969 through September 30, 1969. Specifically we consider the usefulness of the re-examination in accomplishing three tasks:

- (i) Measuring areas of weakness in driver knowledge.
- (ii) Providing the driver with information.
- (iii) Detecting the problem driver.

Written and machine test instruments were developed and these were implemented in sixteen examining stations throughout the State.

Statistical analyses were then conducted on these data, leading to the following conclusions:

- (i) The re-examination program does provide valuable information on deficiencies in driver knowledge and or driver attitudes.
- (ii) The re-examination program does provide the driver with new information. The written test with personal feedback results in the largest increase in knowledge and the machine test results in the smallest increase.
- (iii) No significant relationship exists between the re-examination score and the driver's previous accident and conviction experience.

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Chapter I

Introduction

1.1 BACKGROUND INFORMATION

The National Highway Safety Bureau, in Highway Safety Program Standard 4.4.5, Driver Licensing, has stated that all states shall have a driver licensing program which provides that each driver "is re-examined at an interval not to exceed four years, for at least visual acuity and knowledge of rules of the road." While the State of Michigan currently requires a test for visual acuity at re-examination, no test is given for knowledge of rules of the road. Consequently, in October, 1968, the Michigan Department of State initiated a project to develop and evaluate such a re-examination program. This report summarizes an evaluation of certain aspects of this program which was conducted by the University of Michigan Highway Safety Research Institute. The evaluation was conducted during the period May 1, 1969 to September 30, 1969.

We shall begin the discussion by briefly summarizing the potential benefits which can be attributed to driver re-examination. Most persons agree that the ultimate benefit from such a program will be a reduction in highway crashes as a consequence of driver improvement and restriction. Specifically, this reduction must result from the successful completion of some or all of the following re-examination tasks:

1. Obtaining information from the driver
 - (a) To evaluate the individual operator's qualification to operate a motor vehicle in a safe manner.
 - (b) To measure areas of weakness in the driving population as a basis for action programs.
2. Imparting information to the driver
 - (a) To review basic laws and safe driving practices.
 - (b) To provide new information on
 - (i) Recent laws or changes in old laws.
 - (ii) Changing driving conditions and problems.

Task (1a), the evaluation of the individual's qualification to drive in a safe manner, has been a basic objective of driver examining programs since their inception. Unfortunately, there are several problems in accomplishing this task and in relating such an accomplishment to improved highway safety. These problems arise because:

- (i) The research community has not been able to devise an examination which predicts subsequent unsafe driving behavior with sufficient accuracy and consistency to serve as a basis for permanent license restriction.
- (ii) Under existing procedures, a person who fails a test can usually "cram" and eventually pass. In this case, he has obtained temporary information, but not the understanding necessary for improved performance.
- (iii) Persons who fail a test and are subsequently restricted may continue to drive anyway. Some evidence for this is provided by the fact that a very large percentage of drivers with suspended or revoked licenses continue to drive (see, for instance, reference 1, pp. 271-272).
- (iv) There is an increasing tendency in our society for the driver's license to be viewed as a necessity more than as a privilege.

Consequently, the utilization of the re-examination to evaluate the driver and subsequently to restrict his driving is a difficult and possibly ineffective task. More detailed research is needed into this topic. Because of this need for further research, and because restriction of the driving privilege is not an objective of this project, we shall not explicitly consider this task in this report.

On the other hand, Task (1b), determining areas of weakness in the driving population, is an important task which can be accomplished by a re-examination program. While almost all driver sanctions operate through the legal system, we have essentially no information as to whether the Michigan driver knows these laws and, if so, whether he understands them. Similarly, we have little knowledge as to the driver's awareness of "safe" driving practices, accident factors, and other related topics. A great deal of information on deficiencies in the driving public's knowledge and attitudes can be obtained by aggregating statistics from a carefully constructed re-examination. This statistical information can then be utilized as a basis for informational programs designed to eliminate such deficiencies. The development and tabulation of re-examination questions designed to measure various aspects of knowledge and attitudes is a major activity undertaken in this project.

Tasks (2a) and (2b) are closely related, since these both are concerned with using the re-examination as a method of eliminating the deficiencies in driver knowledge measured in Task (1b). By

designing a re-examination with appropriate feedback mechanisms, it may be possible to provide the driver with a review of the pertinent information he should possess and with new information as this becomes available through the passage of new laws or the publication of new research findings. An evaluation of this feedback concept is a major part of this report.

1.2 PROJECT REVIEW

The objective of this project was stated in the proposal to the National Highway Safety Bureau as:

"(1) Formulate a battery of test questions which will serve not as an administrative attempt to restrict driving privileges but to prompt licensees to upgrade and up-date their thinking with respect to traffic laws, conditions, emergency situations and attempt an honest self-appraisal of their own limits as well as their capabilities.

(2) Validate and evaluate the questions.

(3) Collect information on cost of administering tests."

To accomplish this objective, staff members of the Michigan Department of State and the Highway Safety Research Institute jointly prepared a battery of potential test questions. These included questions of a "true-false" and "multiple choice" nature. A "pre-pilot" test of certain of these questions was conducted at the Ingham County Driver Examining Bureau during the period May 22-29, 1969. Information obtained from this pre-pilot study was used to improve both question content and construction.

Four test instruments, each containing fifteen factual questions and five attitude questions, were prepared for implementation through-

out the state. These were then administered to all applicants for licensed renewal at sixteen examining stations during specified time periods. The sixteen stations were chosen to provide a variety of geographical and demographic testing environments, to provide a mixture of small, medium, and large stations for measuring administrative feasibility, and to provide an environment where the different test instruments and feedback mechanisms could be evaluated.

The sixteen stations, the testing dates, and the number of persons tested in each station are tabulated below:

<u>Station</u>	<u>Test Date</u>	<u>Number Tested</u>	(Written Version)
Detroit #4	7/21-7/24	248	
Detroit #8	7/7 -7/11	409	
Wayne #2	7/16-7/18	324	
Oakland #2	7/7 -7/11	411	
Ingham	6/23-6/27	481	
Washtenaw	7/30-8/15	1009	
Kalamazoo	7/29-8/8	880	
Muskegon	6/30-7/11	592	
Ottawa	6/30-7/3	122	
St. Clair	8/18-8/22	268	
Howell	8/11-8/15	130	
Lake	8/11-8/15	21	
Bay	8/18-8/22	162	
Jackson	7/22-7/24	182	
Barry	8/18-8/22	33	
Branch	8/18-8/22	93/5365	

A frequency distribution of the ages of those persons re-examined is presented below. The driver age distribution from Michigan Driver Statistics (2) is also presented for reference purposes:

Age Group	<u>16-19</u>	<u>20-25</u>	<u>26-35</u>	<u>36-45</u>	<u>46-55</u>	<u>56-64</u>	<u>65+</u>
Re-examination* (%)	5.9	16.0	22.0	20.3	17.4	12.0	5.6
<u>Mich. Driver Statistics (%)</u>	8.04	15.81	20.35	19.42	16.42	10.36	9.5

These data indicate that the young driver (16-19) and the old driver are underrepresented in the re-examination sample. It is easy to explain the underrepresentation of the young driver; a sixteen year old who begins to drive does not have to renew his license until age nineteen. Therefore, the re-examination sample contains no sixteen year olds and very few seventeen year olds. However, no simple explanation exists for the underrepresentation of the older drivers in the re-examination sample.

A frequency distribution of the sexes of those persons re-examined is presented below.

<u>Sex</u>	<u>Male</u>	<u>Female</u>
Re-examination (%)	57.1	42.6
<u>Mich Driver Statistics (%)</u>	57.2	42.8

In this case very close agreement is present in the two populations.

Tests were prepared in written form and as slides for use on the GEMCO testing machine.* A comparison of the machine test and the written test was undertaken to examine (a) the administrative benefits and the costs of both techniques, and (b) the benefits of each in providing feedback to the testee. The number of tests administered in the machine and written versions is tabulated on the next page.

* See Appendix D for a brief description of the machine.

<u>Test Version</u>	<u>Written</u>	<u>Machine</u>
1	1266	--
2	1503	94
3	1355	222
4	<u>1241</u>	<u>152</u>
TOTAL	5365	468

1.3 EVALUATION OBJECTIVES

The need for carefully evaluating highway safety projects is well documented (3,4). It is clear that these evaluations will ultimately lead to a better allocation of resources and to safety programs which can be justified on a cost-effectiveness basis. In particular, the evaluation of driver re-examination programs is of importance for two reasons. First, it is essential to determine whether such programs can accomplish some or all of the tasks outlined earlier in section 1.1. Second, it is important to compare various types of testing concepts, test instruments, and administrative procedures in order to determine the relative costs and effectiveness of various mixtures of these components.

The evaluation presented in this report yields results pertinent to both of these. In Chapter II we present an analysis of the re-examination questions developed in this project. This analysis fulfills the second project objective -- question validation and evaluation. In addition, it provides information as to the ability of a re-examination to accomplish Task (1b)--the measurement of areas of weakness in the driving population.

In Chapter III we evaluate the capability of the re-examination to accomplish tasks (2a) and (2b) -- provide useful information to the driver. Furthermore, we measure the relative feedback potential of

three alternative testing procedures--a written test, a written test with "extensive" feedback, and a machine test.

In Chapter IV we conduct a preliminary analysis of the relationship between re-examination performance and the driving record. It is clear that such relationships must be determined and validated before a re-examination can be utilized to restrict the driving privilege. The analysis of this chapter was conducted to obtain additional insights and experience in searching for these relations.

A summary of the results of the above analyses and some recommendations are presented in Chapter V. The four written test versions are reproduced in Appendix A, and the machine test versions are reproduced in Appendix B. The interview form used in the evaluation of test feedback is reproduced in Appendix C.

Chapter II

Question Analysis

In this chapter we shall analyze the test questions to evaluate their content and structure and to examine their potential in measuring areas of driver weakness. Only the written version of the test is included in this analysis. The sample of testees selected for a follow-up interview has been removed; these are analyzed in Chapter III. Machine test results are presented in Appendix B.

The development of re-examination questions which are both meaningful and feasible is an extremely difficult task. First, vocabulary and question length must be such that the majority of drivers can read and understand the content. Unfortunately, it is extremely difficult to reduce the essence of many laws and procedures to such a level. Second, the utilization of only "true-false" and "multiple choice" questions places certain constraints on the content and detail of the examination questions. Some attempt was made to develop questions based upon illustrations of driving situations, but these questions were not incorporated into the pilot versions of the re-examination. Third, there are many driving problems for which there is no answer which is always completely correct. However, the mental stimulation introduced by such questions can make these as valuable as those for which one answer is always right. At the outset of this project it was decided to limit the set of factual questions to those which have a single correct answer. As we shall see, it was impossible to maintain this limitation in all cases. Fourth, it is difficult to determine and remove those biases caused by guessing at the

at the correct answer. Ideally, one could examine these by pilot testing several versions of the same question and by randomizing the order of the possible answers. Time limitations precluded this in the present project. However, some attempt was made to reduce the extent of guessing by informing the testee that the test was not of a "pass/fail" nature. Further attempts were made to measure the extent of guessing by incorporating a "don't know" response in two of the written test instruments.

The four versions of the written test are presented in Appendix A. To facilitate the analysis we have combined the questions from these into homogeneous categories in this chapter. The test version and question number are placed by each question in brackets for reference purposes. The correct answer is marked with an asterisk (*) and the frequencies of the various responses are placed in parentheses.

2.1 FACTUAL QUESTION ANALYSIS

2.2.1 Rules of the Road

{1-9} When driving on a 4-lane divided highway, it is illegal for me to use the right lane to pass another vehicle.

1. True* (54.9%)
- * 2. False (49.1%)

Many persons who missed this question felt that passing on the right is unsafe, even if it is legal.

{1-13} A flashing red arrow shown together with a red traffic signal means I can:

1. Turn in the direction it points after stopping* (92.0%)
2. Make a turn only after the traffic signal turns green (5.9%)
3. Turn in the direction it points without stopping (2.0%)

{2-1} On a 2-lane road, it is illegal to drive off the pavement to pass another car on the right.

1. True* (82.6%)
2. False (17.4%)

{2-2} A flashing red light at an intersection means I should:

1. Slow down (6.9%)
2. Stop, and then go when traffic is clear * (90.9%)
3. Stop, and wait for the light to turn green. (2.2%)

{2-13} The police cannot arrest me for driving recklessly on private property (like a shopping center) which is open to public use.

1. True (9.0%)
2. False * (91.0%)

{2-15} I must stop for a school bus:

1. At least 10 feet from the bus (9.1%)
2. Outside cities and villages when the red lights on the bus are flashing (1.8%)
3. Inside cities and villages when signs are posted and when the red lights on the bus are flashing (2.1%)
4. All of the above * (86.9%)

{3-8} A ticket for going "too fast for conditions" means that you were driving faster than the posted speed limit.

1. True (17.9%)
2. False * (81.1%)
3. Don't know (1.0%)

{3-12} You must stop before entering a street or highway from an alley or driveway.

1. True * (97.5%)
2. False (2.1%)
3. Don't Know (0.4%)

{4-3} It is not legal to drive with only your parking lights on at any time from a half hour after sunset to a half hour before sunrise.

1. True * (80.9%)
2. False (16.8%)
3. Don't know (2.3%)

Comments: The most frequently missed question in this category involved the legality of passing on the right on a four-lane divided highway. The second most frequently missed question was on the proper use of parking lights. In general, the Michigan driver seems to be quite familiar with the remainder of the questions on "rules of the road" which were asked on the re-examination.

2.2.2 "Safe" Driving Practices

{1-6} When merging with freeway traffic, I should usually stop at the entrance ramp, look around, and then go.

1. True (17.3%)
2. False* (82.7%)

{1-7} You have just driven through a deep pool of water on the road. The first thing you should do is apply pressure on your brake pedal to dry off the brakes.

1. True * (74.8%)
2. False (25.2%)

{1-8} When driving behind a motorcycle, a driver should leave extra following distance because most motorcycles are:

1. Unpredictable * (41.2%)
2. Able to stop in a shorter distance than cars * (53.2%)
3. Not equipped with brake lights (5.6%)

Unfortunately, this question had two responses which were substantially correct; therefore the results are of questionable significance.

{2-4} If I have a blowout while driving, I should brake very hard and steer to the right shoulder.

1. True (11.7%)
2. False * (88.3%)

{2-5} Whenever I leave my car unoccupied, it is always good practice to set the parking brake.

1. True* (97.1%)
2. False (2.9%)

{2-7} If your brake pedal can be pushed within two inches of the floor, it is time to have your brakes checked.

1. True * (90.1%)
2. False (9.9%)

{3-10} If you go past your exit on a freeway, the best action to take is:

1. Move to the left lane and make a U-turn across the divider strip. (0.7%)
2. Stop and back up to the exit ramp you missed. (0.1%)
3. Keep going to the next exit. * (98.9%)
4. Don't know (0.3%)

{3-11} You should use your high headlight beams instead of your low beams when driving in fog.

1. True (11.9%)
2. False * (86.7%)
3. Don't know (1.4%)

{4-12} If you suddenly realize that you are going the WRONG WAY on a freeway, you should:

1. Keep going until you reach an exit where you can get off. (12.5%)
2. Keep going, but stay in the left lane only. (2.7%)
3. Immediately pull off onto the shoulder and wait until it is safe to make a U-turn.* (77.4%)
4. Don't know. (7.6%)

Comments: The question of drying the brakes after driving through water was the most frequently missed of this group. The proper response to going the wrong way on a freeway was second. In general, drivers did better on the other two freeway questions. {1-6} and {3-10}.

2.2.3 Accident-Related "Factors"

{1-1} In most cases, your chances of being killed in an accident are greater if you are thrown from the car.

1. True * (76.0%)
2. False (24.0%)

{1-3} Most fatal accidents happen when there is:

1. Snow and ice on the roads. (24.4%)
2. Rainy weather and wet roads. (26.3%)
3. Good weather and dry roads. * (49.3%)

{1-5} More traffic deaths occur on country roads than on city streets.

1. True (40.2%)
2. False * (59.8%)

{2-3} Recent records of traffic deaths in Michigan show that:

1. Fewer people are getting killed (2.4%)
2. More people are getting killed in one-car, run-off-the-road type of accidents* (64.0%)
3. Country roads are safer than city streets (4.0%)
4. Fatal accidents increase during snow storms and ice storms. (29.6%)

{2-6} Most fatal accidents occur at speeds:

1. Below 45 miles per hour * (15.9%)
2. Between 40-50 miles per hour (10.3%)
3. Between 50-65 miles per hour (18.8%)
4. Above 65 miles per hour (55.0%)

{3-6} Studies of fatal accidents show that about 50% of the drivers involved have been drinking.

1. True * (71.6%)
2. False (8.6%)
3. Don't know (19.8%)

{4-5} More fatal accidents occur at speeds over 45 mph than under 45 mph.

1. True (64.9%)
2. False * (24.8%)
3. Don't know (10.2%)

{4-6} Recent records of traffic deaths in Michigan show that:

1. More people are getting killed in one-car, run-off-the-road type of accidents. * (58.8%)
2. Country roads are safer than city streets (3.3%)
3. Fatal accidents increase during snow storms (11.6%)
4. Don't know (26.3%)

{4-13} At least 30% of the adult pedestrians killed last year in traffic accidents were legally "under the influence of alcohol."

1. True * (38.6%)
2. False (19.0%)
3. Don't know (42.4%)

Comments: The percentage of correct answers on these questions ranged from 15.9% to 76%. The most frequently missed questions were those indicating that most fatalities occur at lower speeds.

2.2.4 Drivers License

{1-11} If I move, I must go to an examining station and have the address changed on my driver license. If I don't, my license may be revoked.

- 1. True * (78.5%)
- 2. False (21.5%)

{1-12} The license of a minor under the age of 18 can be cancelled upon written request of the person who signed the application of the minor driver.

- 1. True * (77.5%)
- 2. False (22.5%)

{2-11} Your driver license cannot be suspended, revoked or denied if it would result in hardship for you and your family.

- 1. True (12.2%)
- 2. False * (87.8%)

{2-14} If I am driving, I must show my driver license whenever a uniformed police officer asks to see it.

- 1. True * (98.3%)
- 2. False (1.7%)

{3-2} If you move, you must go to an examining station and have the address changed on your driver license. If you don't, you license may be revoked.

- 1. True * (70.7%)
- 2. False (19.2%)
- 3. Don't know (10.2%)

{3-5} A conviction for altering your driver's license will result in a 1 year suspension of your license.

- 1. True * (66.7%)
- 2. False (3.6%)
- 3. Don't know (29.7%)

Comments: Comparison of the responses to {1-11} and {3-2} indicates that about 10 percent of the driver's "guessed" on version {1-11}. However, most of those who guessed picked the correct answer. In general, the proportion of correct responses on these questions was less than that on rules of the road.

2.2.5 Financial Responsibility

{1-4} Financial Responsibility insurance is a specific type of automobile insurance coverage intended to protect all motorists.

- | | |
|-----------|---------|
| 1. True * | (67.2%) |
| 2. False | (32.8%) |

This question is misleading, and consequently the results are difficult to interpret.

{3-4} If an accident occurs (involving \$200 or more property damage or personal injury), and all drivers have liability insurance, no accident report need to sent to the Department of State.

- | | |
|---------------|---------|
| 1. True | (6.9%) |
| 2. False * | (88.4%) |
| 3. Don't know | (4.7%) |

{4-4} If an accident occurs (involving \$200 or more property damage or personal injury) and one driver has no liability insurance, all drivers must file an accident report with the Department of State.

- | | |
|---------------|---------|
| 1. True * | (74.7%) |
| 2. False | (8.8%) |
| 3. Don't know | (16.5%) |

2.2.6 Uninsured Motorist

{1-10} If I do not have insurance and pay the \$35.00 uninsured motorist fee, this means I am insured by the State.

- | | |
|------------|-------|
| 1. True | (32%) |
| 2. False * | (68%) |

{3-1} If you do not have insurance and pay the \$35 Uninsured Motorist fee, this means you are insured by the State.

- | | |
|---------------|---------|
| 1. True | (31.6%) |
| 2. False * | (60.3%) |
| 3. Don't know | (8.1%) |

(3-14) The Michigan Accident Claims Fund protects you against the uninsured motorist only while you are driving in Michigan.

1. True * (40.8%)
2. False (19.2%)
3. Don't know (40.0%)

(3-15) If your insurance company cancels your liability insurance, you should wait until the next time you buy license plates before paying the \$35 Uninsured Motorist fee.

1. True (3.2%)
2. False * (79.3%)
3. Don't know (17.5%)

(4-1) If you drive an uninsured vehicle without having paid the \$35 Uninsured Motorist Fee, you can be punished by up to 90 days in jail and \$100 fine.

1. True * (71.0%)
2. False (8.7%)
3. Don't know (20.3%)

(4-9) If an uninsured motorist causes an accident and a claim is paid out of the Accident Claims Fund, he will have to pay back the entire amount.

1. True * (64.4%)
2. False (9.0%)
3. Don't know (26.6%)

(4-15) If you cancel your liability insurance policy, you should wait until the next time you buy license plates before paying the \$35 Uninsured Motorist fee.

1. True (4.7%)
2. False * (78.7%)
3. Don't know (16.6%)

Comments: The percentage correct on these questions ranged from 40.8% to 79.3%. Although these results indicate a lack of knowledge on the uninsured motorist law, it is very likely that this lack of knowledge exists because most motorists have insurance and therefore have little need for this information. This comment was made by several persons taking the test.

2.2.7 "Alcohol-Related" Laws

(1-14) If I am arrested for either "driving under the influence" or "Impaired driving", I must take a test for alcohol or I can lose my license.

- 1. True * (84.3%)
- 2. False (15.7%)

(2-9) One conviction for "driving under the influence of alcohol" means automatic suspension of your driver license for at least 90 days.

- 1. True * (86.1%)
- 2. False (13.9%)

(2-10) Michigan's new "Implied Consent" law has to do with:

- 1. Vehicle Safety check lanes (9.6%)
- 2. Financial Responsibility (6.3%)
- 3. Chemical tests for the amount of alcohol in the blood * (64.6%)
- 4. Automobile insurance (12.0%)

(4-2) Michigan's new "Implied Consent" Law has to do with:

- 1. Vehicle safety check lanes (6.0%)
- 2. Financial responsibility (6.0%)
- 3. Chemical tests for the amount of alcohol in the blood. * (64.6%)
- 4. Don't know (23.4%)

(4-10) Your driver license may be suspended when you knowingly permit an intoxicated person to drive your car, and that person is convicted of driving under the influence of alcohol.

- 1. True * (74.7%)
- 2. False (9.5%)
- 3. Don't know (15.8%)

(4-14) "Driving while impaired" results in:

- 1. A more serious penalty than "driving under the influence". (8.7%)
- 2. A less serious penalty than "driving under the influence". * (18.0%)
- 3. The same penalty as "driving under the influence". (34.8%)
- 4. Don't know (38.4%)

Comments: Examination of the responses to question (4-2) indicates that about 35% of the Michigan drivers cannot recognize the implied consent law by name. However, inspection of question (1-14) indicates that a much higher percentage (85%) understand the basic concepts of the law. The most frequently missed question in this group involved the distinction between DUIL and "driving while impaired".

2.2.8 Penalties

(1-2) Under the Michigan point system, a driver who has acquired 6 points within a 24 month period can expect:

1. To have his license suspended. (20.9%)
2. To be called in for a hearing before a driver improvement officer. (28.5%)
3. A warning letter containing a listing of traffic offenses. * (47.6%)
4. A letter of caution from the Governor. (3.0%)

(1-15) If I fail to appear in court for a traffic violation, my license can be suspended.

1. True * (92.8%)
2. False (7.2%)

(3-9) Points can not be put on your Michigan driving record for convictions on traffic violations received in another state.

1. True (20.6%)
2. False * (46.5%)
3. Don't know (32.9%)

(3-13) If you fail to answer a citation or a notice to appear in court for a traffic offense, you are given 1 point on your driving record.

1. True * (29.6%)
2. False (16.5%)
3. Don't know (53.9%)

2.2.9 Miscellaneous

(2-8) In Michigan, all motor vehicles must be equipped with an outside rear view mirror on the driver's side.

- 1. True * (89.4%)
- 2. False (10.6%)

(2-12) The State Police may set up a "safety check lane" to find out if my car is safe.

- 1. True * (96.3%)
- 2. False (3.7%)

At this time we do not know whether this result comes from using "common sense" in answering the question or whether the public is actually aware of the check lane program to this extent.

(3-3) Studded tires (those with plastic or metal studs or ice grips) may be used on Michigan roads only between November 1 and May 1.

- 1. True * (69.3%)
- 2. False (13.3%)
- 3. Don't know (17.4%)

(3-7) Ice on a highway is usually more slick at temperatures near 32° than it is at a temperature of zero.

- 1. True * (76.8%)
- 2. False (14.6%)
- 3. Don't know (8.6%)

(4-7) You should deflate the tires on your car to increase traction when driving on ice and snow.

- 1. True (54.7%)
- 2. False * (33.1%)
- 3. Don't know (12.2%)

This question was placed on the test solely to evaluate feedback aspects. During the test administration, several automotive engineers pointed out that recent research may indicate that the correct answer is "true". However, the question still is useful for feedback evaluation purposes.

(4-8) If you are involved in an accident which requires you to file an accident report with the Department of State, the report must be filed within 30 days.

1. True * (77.6%)
2. False (9.3%)
3. Don't know (13.1%)

(4-11) "Hydro-planing" is a term used to describe why the front wheels leave contact with the pavement when a car is going at increased speeds (usually over 40 mph), and when the road surface is:

1. Made of gravel (6.2%)
2. Made of asphalt and is very hot (6.3%)
3. Wet, usually from heavy rain *(52.0%)
4. Don't know (35.4%)

General Comments: It is difficult to make any general and inclusive inferences on the driving public's knowledge (or lack of knowledge) from these results. We do note that the percentage of correct responses varies significantly, depending both upon the question category and upon alternative responses available--especially "don't know".

Furthermore, we note that many of the questions may be irrelevant to the task of improving driver performance. For instance, the relevance of questions on "traction" and "hydroplaning" were questioned on this basis. Unfortunately, no one has determined what information is important in the driving task, and until this is done, definite guidelines cannot be established.

Finally we note that the utilization of short "true and false" or "multiple-choice" questions may not be the best way to measure the understanding of driving problems and tasks. This is true because it is difficult to reduce these problems into such questions without over-simplifying or without leaving out possible exceptions which invalidate the correct response. Many persons who missed a question justified their incorrect answer from personal experience. This

points out the fact that perception and judgement may be as important in determining driving performance as knowledge of rote facts and statistical averages.

2.2 ATTITUDE QUESTION ANALYSIS

{1-1} All cars should be inspected once a year by the police to make sure they are safe.

- | | |
|----------------------|---------|
| 1. Strongly agree | (35.2%) |
| 2. Agree | (54.0%) |
| 3. Don't know | (4.1%) |
| 4. Disagree | (6.0%) |
| 5. Strongly disagree | (0.8%) |

Eighty-nine percent of the drivers responding to this statement favored an annual vehicle inspection.

{1-2} Drivers with a lot of "points" are not always unsafe drivers--just unlucky ones who get caught.

- | | |
|----------------------|---------|
| 1. Strongly agree | (3.6%) |
| 2. Agree | (19.1%) |
| 3. Don't know | (10.3%) |
| 4. Disagree | (45.0%) |
| 5. Strongly disagree | (22.1%) |

Only sixty-seven percent of those responding disagreed with this statement.

{1-3} Courts don't like to convict drivers for serious violations, since loss of the driver's license makes it hard to get to work.

- | | |
|----------------------|---------|
| 1. Strongly agree | (2.8%) |
| 2. Agree | (22.6%) |
| 3. Don't know | (20.7%) |
| 4. Disagree | (43.0%) |
| 5. Strongly disagree | (10.9%) |

Approximately 25% of those responding agreed that courts tend to be lenient in restricting the driving privilege.

{1-4} Penalties for drunk driving should be reduced so that courts will convict more drunk drivers than they do now.

1. Strongly agree (7.4%)
2. Agree (18.0%)
3. Don't know (12.3%)
4. Disagree (40.6%)
5. Strongly disagree (21.8%)

Here again, approximately 25% of those responding thought that lower penalties for drunk driving would help in improving conviction rates.

{2-1} Poor roads and unsafe cars cause more accidents than driver mistakes do.

1. Strongly agree (10.0%)
2. Agree (27.7%)
3. Don't know (8.9%)
4. Disagree (44.0%)
5. Strongly disagree (9.4%)

Approximately 38% felt that driver error was a less important factor in accidents than problems with the road and vehicle.

{2-2} In many cases it's necessary to break the law to avoid having an accident.

1. Strongly agree (5.1%)
2. Agree (37.2%)
3. Don't know (13.1%)
4. Disagree (38.8%)
5. Strongly disagree (5.8%)

Forty two percent of the respondents agreed that it may be necessary to break the law to avoid an accident.

{2-3} Under good driving conditions, each driver should be free to select the speed which he feels is safe.

1. Strongly agree (1.8%)
2. Agree (14.3%)
3. Don't know (3.4%)
4. Disagree (62.3%)
5. Strongly disagree (18.2%)

{2-4} There is very little I can do to keep from being involved in an accident.

- | | |
|----------------------|---------|
| 1. Strongly agree | (1.2%) |
| 2. Agree | (4.3%) |
| 3. Don't know | (4.2%) |
| 4. Disagree | (58.0%) |
| 5. Strongly disagree | (32.2%) |

Only 5.5% of the respondents felt that "fate" dictates accident causation.

{1-5} & {2-5} I feel that all Michigan drivers should be given a written test when renewing their driver's license.

- | | |
|----------------------|---------|
| 1. Strongly agree | (13.4%) |
| 2. Agree | (50.8%) |
| 3. Don't know | (8.6%) |
| 4. Disagree | (22.9%) |
| 5. Strongly disagree | (4.3%) |

Sixty-four percent of the respondents on test one and two felt that a compulsory written test at re-examination was a good idea.

{3-1} Most drivers tend to over-rate their own driving ability.

- | | |
|----------------------|---------|
| 1. Strongly agree | (19.9%) |
| 2. Agree | (68.7%) |
| 3. No opinion | (7.1%) |
| 4. Disagree | (4.2%) |
| 5. Strongly disagree | (0.2%) |

Over 88% of the respondents felt that drivers over-rate themselves.

{3-2} Most of the time you can't predict what the other driver is going to do.

- | | |
|----------------------|---------|
| 1. Strongly agree | (28.1%) |
| 2. Agree | (49.1%) |
| 3. No opinion | (2.9%) |
| 4. Disagree | (17.8%) |
| 5. Strongly disagree | (2.1%) |

Seventy-seven percent of the respondents attested to the unpredictability of the "other guy".

(3-3) Most drivers are usually polite and helpful on the road.

1. Strongly agree (4.1%)
2. Agree (61.1%)
3. No opinion (10.4%)
4. Disagree (22.3%)
5. Strongly disagree (2.1%)

Sixty-five percent of the respondents attested to the politeness of the "other guy".

(3-4) Automobile insurance policies should be changed so that each driver in an accident is repaid by his own insurance company regardless of whose fault it is.

1. Strongly agree (6.4%)
2. Agree (19.8%)
3. No opinion (28.6%)
4. Disagree (37.9%)
5. Strongly disagree (7.3%)

This question was designed to obtain preliminary opinions on the "Keaton-O'Connell" insurance plan. Only 26% of the respondents favored such a plan. This result may be biased by a general lack of understanding of the advantages and disadvantages of the plan.

(4-1) Michigan's traffic laws and penalties seem to be harder on drivers than traffic laws and penalties in other states.

1. Strongly agree (1.5%)
2. Agree (9.2%)
3. No opinion (43.2%)
4. Disagree (42.2%)
5. Strongly disagree (3.9%)

(4-2) It is too easy for a person to get a driver's license in Michigan.

1. Strongly agree (4.2%)
2. Agree (21.2%)
3. No opinion (23.3%)
4. Disagree (49.1%)
5. Strongly disagree (2.2%)

Twenty five percent of the respondents thought licensing procedures are too easy in Michigan.

{4-3} Drivers are seldom caught after breaking serious driving laws.

1. Strongly agree (6.2%)
2. Agree (25.7%)
3. No opinion (17.2%)
4. Disagree (48.0%)
5. Strongly disagree (2.9%)

{4-4} Driving too slow is more dangerous than driving too fast.

1. Strongly agree (8.9%)
2. Agree (42.5%)
3. No opinion (13.3%)
4. Disagree (33.7%)
5. Strongly disagree (1.5%)

Over one half of the respondents agreed with this statement.

{3-5} & {4-5} I feel that all Michigan drivers should, when renewing their driver license:

1. Take a written test to refresh their understanding of their responsibilities as a driver. (37.3%)
2. Take a driving skills test on the road. (11.9%)
3. Show evidence that they are physically fit to drive. (35.7%)
4. No tests or exams should be required. (7.7%)
5. Don't know. (7.5%)

General Comments: It is well known that the decision to obey a law must come from knowledge of the law, belief in the rationality of the law, and belief in enforcement of the law. Several of the attitude questions were designed to measure certain aspects of the latter two factors. Others were designed to measure opinions on such things as licensing, motor vehicle inspection, insurance, and driver re-examination.

The results on questions (1-5, 2-5, 3-5 and 4-5) indicate that Michigan drivers generally favor the concept of re-examination at license renewal.

Chapter III

Evaluation of Re-examination Feedback

We turn now to an evaluation of the capability of the re-examination to provide the driver with new information. If a re-examination can accomplish this, if the information is relevant to improved driver performance, and if the driver chooses to utilize the information, we would expect the re-examination program to result in reductions in both violations of the law and highway crashes. As we have observed, detailed research projects are required to determine what information is needed by the driver. Furthermore, additional research is needed to determine if and how the driver uses such information.

Therefore, in this report we shall only examine the change in knowledge which can be attributed to re-examination. No attempt will be made to relate such changes, if they exist, to subsequent reductions in violations and/or crashes.

In the Washtenaw County examining station, drivers coming in for license renewal were randomly assigned to one of three "treatments": the written version of test 4, the written version of test 4 with feedback, or the machine version of test 4. The feedback consisted of a planned interaction between the driver and a representative of the Secretary of States' office. The representative was instructed to indicate the concern in Secretary of State's office about the highway safety problem and to inform the driver of the objectives of

the re-examination program. The representative then briefly reviewed the test with the driver, pointing out the reasons for his incorrect answers on the test and answering any other questions. For the other treatments, the representative was instructed to answer questions, but not to encourage such a detailed interaction.

Random sub-samples of size fifty were then selected by HSRI from the groups of drivers exposed to each of the three treatments. These drivers were then interviewed approximately two weeks after the test to measure their change in knowledge.

It is useful to discuss the evaluation methodology in some detail before proceeding to the analysis. The random sub-samples were generated by numbering all tests and then by selecting a sub-sample through the utilization of random numbers. The individuals in this sub-sample were then called to schedule an interview appointment. (At the examining office drivers were told a representative of the Secretary of State's office would be contacting them to obtain their opinions about the re-examination. No more detailed information on the content of the interview was given out at the office or in the appointment call.) In eighty-three cases no interview appointment was made. In these cases, the test with the next-highest number was selected, and the scheduling was repeated.

A frequency count of the reasons for failing to make an appointment in the eighty three cases is presented below:

Out of County (Living or On Vacation)	24
No phone	5
Could not contact	7
Not available/too busy	9
Refused	5
Error in test administration*	7
Other	3
No reason given	<u>23</u>
	83

* The machine version of test four had an error which was not corrected until after test administration had commenced.

The interview appointments were scheduled approximately two weeks after the test administration. The mean number of days which elapsed was 12.04. Scheduling problems and project timing resulted in some deviations from the two week lag: 26% of the interviews were administered within one week of the re-examination, and 8% were administered more than three weeks after the examination. It is felt that these deviations will not significantly affect the results.

The interviews were conducted at the scheduled time in the driver's home. A home interview was chosen to eliminate the problem of non-response and to control biases and mis-understandings which might arise in question interpretation. The number of interviews conducted was 148, since only 48 interviews were conducted with those drivers who took the machine test.

It is useful to compare the characteristics of this sample population with the characteristics of the entire population of drivers which took the test. The age and sex distribution in these populations are tabulated below.

	<u>Driver Age</u>					
	16-20	21-25	26-35	36-45	46-55	56+
Re-examination Sample (%)	5.9	16.0	22.0	20.3	17.4	17.6
Washtenaw Sub-sample (%)	7.5	29.9	26.0	23.3	12.3	12.0

	<u>Driver Sex</u>	
	<u>Male</u>	<u>Female</u>
Re-examination Sample (%)	57.4	42.6
Washtenaw Sub-sample (%)	36.5	63.5

From these data we observe that female drivers in the 21-25 year age bracket seem to be over-represented in the Washtenaw sub-sample. This over-representation may be due to the fact that persons in this group are more likely to be at home during the day, and hence are more apt to be contacted for an interview appointment. Alternatively, this group of drivers may simply be larger in Washtenaw County than in the rest of the state. Regardless of the cause, we shall show in Section 3.2 that this over-representation does not bias any conclusions we might draw from the evaluation. Other information collected on the interviewees is tabulated below.

MARITAL STATUS		LAST YEAR SCHOOL	
Married	70.9%	1-9 grade	8.1%
Single	16.9%	10-12 grade	33.8%
Divorced	6.1%	1-4 college	40.5%
Other	6.1%	4 + college	17.6%

TYPE CAR DRIVEN	
Sports	5.4%
Sedan	67.6%
Station wagon	10.8%
Convertible	.7%
Foreign (non-sports)	12.2%
Other	3.4%

The interviewers were asked to rate the interviewees in terms of their friendliness and eagerness to obtain new information. Although certain guidelines were established for these ratings, they are fairly subjective and should be interpreted with caution.

	<u>FRIENDLINESS</u>		<u>EAGERNESS</u>
Friendly	53.4%	Eager	13.5%
Neutral	35.8%	Neutral	68.2%
Unfriendly	1.4%	Not eager	8.8%
Missing Data	9.5%	Missing Data	9.5%

A sample interview form is presented in Appendix C. The first six questions obtain general background information on the driver. Questions 7-11 are included to obtain driver opinions on the re-examination and State of Michigan driver information programs. Questions 14-23 are reworded versions of ten of the questions appearing on the re-examination (version 4). These questions were reworded and restructured to determine whether the driver seems to understand the underlying concept or whether he has merely memorized the response to a set of test questions.

The results of the interviews are presented in the next two sections.

3.1 DRIVER OPINIONS ON RE-EXAMINATION AND STATE INFORMATION PROGRAMS

The frequencies of responses to the questions on the sources of knowledge about driving (Questions 9 and 10) are tabulated below:

<u>Source of Most Information about Driving</u>	<u>Had Driver Education (n=60)</u>	<u>No Driver Education (n=88)</u>
Experience	65.0%	82.9%
Driver Education	28.3%	1.1%
Public Information	1.7%	5.7%
Other Drivers	5.0%	10.2%

<u>Source of Least Information about Driving</u>	<u>Had Driver Education</u>	<u>No Driver Education</u>
Experience	3.3%	0.0%
Driver Education	11.7%	69.1%
Public Information	41.7%	17.0%
Other Drivers	43.3%	23.9%

From these results we see that public information programs are seldom the source of most driving information. For 42% of the drivers with driver education, they are the source of the least information.

Approximately seventy four percent of those drivers who were interviewed felt they learned from the test (Question 7). This percentage is tabulated below for the three treatments.

<u>Treatment</u>	<u>Percent who learned from test</u>
Written/Feedback (n=50)	80.0%
Written (n=50)	74.0%
Machine (n=48)	66.7%

A Chi-square test was used to test the hypothesis that these three percentages are the same. It was found that this hypothesis could not be rejected at a .05 significance level. Hence, we are led to the inference that the three treatments do not result in differential learning as measured by the driver's opinion.

Approximately thirteen percent of the drivers interviewed indicated they had sought information on highway safety practices since renewal (Question 8). This percentage is tabulated for the three treatments below:

<u>Treatment</u>	<u>Percent who sought information since test</u>
Written/Feedback	16.0%
Written	18.0%
Machine	4.2%

Although those who took the machine test recorded a lower percentage, this difference is not significant at a .05 level. Hence we conclude that there is no treatment effect on the likelihood of seeking post-examination information.

Forty-two percent of the interviewed drivers thought that the Michigan Secretary of State gives enough information about changes in laws and driver responsibility (Question 11). Another eleven percent had no opinion. The responses to this question are tabulated as a function of the treatment below:

<u>MSS provides Enough Information?</u>	<u>Written/ Feedback</u>	<u>Written</u>	<u>Machine</u>
Good Job	26.0%	16.0%	22.9%
Fair Job	22.0%	18.0%	20.8%
Adequate Job	14.0%	8.0%	4.2%
Poor Job	24.0%	48.0%	41.7%
No Opinion	14.0%	10.0%	10.4%

We note that the percentage who feel that the Secretary of State is doing a poor job is much less for those subjected to the extensive feedback than for the other two treatments. This difference is statistically significant at a .05 level, and it probably can be attributed to the interest and concern on the part of the State which was expressed in the feedback message.

3.2 CHANGE IN KNOWLEDGE ATTRIBUTABLE TO RE-TEST PROGRAM

In the previous section we examined the effect of the re-examination program on driver opinions. We turn now to an examination of the effect of re-testing on driver knowledge.

As we have indicated, modified versions of ten questions on test version 4 were included on the home interview questionnaire. Consequently, one measure of test effectiveness can be obtained by subtracting the number wrong on the interview from the number (of the ten questions) wrong on the original re-examination. However, inspection of the results of this procedure revealed that in many cases drivers missed questions on the interview that they had answered correctly on the re-examination. This problem was especially acute for those who took the machine test. In fact, the average number of questions missed significantly increased on the interview for these drivers.

There are two possible explanations for this problem. First, drivers may have forgotten the answers to some of the questions they answered correctly on the re-test during the interval between re-examination and the home interview. Second, drivers may have guessed on the re-examination. In this case the questions which were correct on the re-test but were wrong on the interview provide a measure of the extent of such guessing.

We conjecture that the second explanation---guessing on the test---is the major source of the problem. The fact that the problem was greater on the machine test attests to this conjecture, since the option "don't know" was not available on the machine.

Therefore, the measure of test effectiveness was modified to eliminate the biasing effect of guessing. The resulting measure was developed by subtracting the number wrong on both tests from the

number wrong on the original re-examination. This measure provides an indication of the learning which can be attributed to feedback from the re-examination, and it avoids the problem discussed above. From this point we shall denote this measure by the phrase "change in number wrong."

For the sub-sample of 148, the mean change in number wrong was 2.534, indicating that, on the average, feedback from the re-examination provided the drivers with the answers to about $2\frac{1}{2}$ questions they had missed. (The average number of questions missed on the re-examination was 4.48).

The mean change in the number wrong for each treatment is tabulated below:

<u>Treatment</u>	<u>Mean Change in Number Wrong</u>
Written Test/Extensive Feedback	3.520
Written Test/No Feedback	2.420
Machine Test	1.625

Inspection of these data indicates that the extensive feedback provides the largest change in knowledge, the written test with no feedback the next largest change, and the machine test the smallest change. However, before we can draw such a conclusion, the variability of these results must be examined to determine whether these differences can be attributed to statistical error. The standard statistical procedure for examining this variability is known as the analysis of variance (See, for instance, references 5 or 6). Essentially, the analysis of variance procedure compares the variation between the treatment effects (the mean changes) with the residual variation in

the data about these effects. The results are usually presented in an analysis of variance table, and this table is presented below for these data.

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>Degrees of Freedom</u>	<u>Mean Square</u>	<u>F Ratio</u>
Total	336.831	147		
Treatments	88.921	2	44.46	26.004
Residual	247.910	145	1.71	

The significance of the treatment effects can be measured by comparing the observed F-ratio with tables of the "F" distribution. In the present case, the treatment effects are significantly different from zero at a .05 level of significance. This indicates that the mean changes in the number wrong are significantly different for the three treatments.

It is natural to ask which of the three treatments are statistically different. The answer to this question can be provided by performing a statistical test known as the Scheffe' method of multiple comparisons. Using this test it was found that all three mean changes are statistically different at a .05 level. Consequently we can conclude that the extensive feedback provides a greater decrease in the number of questions wrong than the written test without feedback, and that the written test without feedback provides a greater change than the machine test.

It is useful to determine whether factors other than the type of test influence the change in the number of questions missed. To examine this question, two-factor analysis of variance tests were

conducted to examine both the treatment effects and the potential influence of sex, driver education, and level education. The analysis of variance tables for these are presented below. Significance at the .05 level is indicated with an asterisk (*).

(i) Effects of Sex & Treatment

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>Degrees of Freedom</u>	<u>Mean Square</u>	<u>F-Ratio</u>
Treatment	88.92	2	44.46	26.32 *
Sex	7.30	1	7.30	4.32 *
Sex-Treatment Interaction	.77	2	.38	.23
Grand Mean	950.16	1		
Error	239.84	142	1.69	

(ii) Effects of Education & Treatment

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>Degrees of Freedom</u>	<u>Mean Square</u>	<u>F-Ratio</u>
Treatment	88.92	2	44.96	25.70 *
Education level	8.52	3	2.84	1.64
Treatment-Education Interaction	4.15	6	.69	.40
Grand Mean	950.16	1		
Error	235.24	136	1.73	

(iii) Effects of Driver Education & Treatment

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>Degrees of Freedom</u>	<u>Mean Square</u>	<u>F-Ratio</u>
Treatment	88.92	2	44.46	25.51 *
Driver Education	.01	1	.01	.01
Treatment - Driver Education Interaction	.42	2	.21	.12
Grand Mean	950.16	1		
Error	247.48	142	1.74	

From these three tables we can conclude the following:

- (a) There is a significant difference between the three test versions when the variations introduced by sex, education level, and driver education are taken into account.
- (b) There is a significance difference between men and women in the change in the number of questions wrong. The average change for women is 2.72, and the average change for men is 2.2.
- (c) There is no significance difference in the number of questions wrong for those persons of varying education levels and for those persons who had (or did not have) driver education.

Preliminary analyses were also conducted to determine whether other factors might influence learning. It was found that the age of the driver, the martial status of the driver, and the person who administered the follow-up interview did not significantly influence the change in the number of questions missed.

From the analyses of this section we can conclude that the type of test has a significant influence on the change in driver knowledge. The largest increase is obtained from the written test with feedback, and the smallest increase is obtained from the machine test. The increase in knowledge is greater for females than males. No significant differences were found in the change in knowledge for persons of various educational levels, for persons with driver education, or for persons of different ages and martial status.

Chapter IV

The Relationship Between Re-examination Results and Driving Performance

As we pointed out in the introduction, accurate and consistent relationships between re-examination results and driving performance must be established before the re-examination becomes a viable tool for driver restriction. We have also observed that the primary objective of this re-examination program is to explore its educational aspects--not the restrictive aspects. Nevertheless, it is important to examine the feasibility of these restrictive aspects, and we shall conduct a preliminary analysis directed toward this goal in this chapter.

In general, attempts to relate test scores to driving performance have not achieved much success. Crancer et. al. (7), in their summary of a research project conducted in the State of Washington, conclude: "The results of the studies indicate that the ability of the present licensing examination to achieve its stated purpose is questionable. It is clear that the use of total test scores from either the written or the road test has little predictive value (in determining subsequent driver performance)."

In the present study, time limitation made any attempt to relate the re-examination score to subsequent performance impossible. However, the driving records of 146 of the 148 drivers interviewed in

the evaluation of re-examination feedback were obtained to determine what relationships exist between the exam score and previous driving performance. The results of these analyses are presented in this chapter.

These results must be interpreted with caution for two reasons. First, the questions on the re-examination were not selected to predict driving performance. Hence, there is no reason why we should expect any relationship other than perhaps the general relation between lack of knowledge and poor performance. Second, the sample size of 148 is not large enough to detect specific, infrequent problems in driving performance. For instance, no alcohol-related convictions appeared in the driving records.

The mean number wrong on the examination is tabulated below as a function of the number of traffic-related convictions in the last three years.

Number Convictions in last three years	Number of Persons	Mean Number Wrong
0	108	4.48
1	23	4.39
2	7	3.71
3	2	4.50
4 +	3	6.33

No significant difference exists at a .05 level between the mean number wrong for the various conviction levels.

The procedure was repeated using the number of accidents in the last three years as the independent variable.* Results are tabulated on the next page.

<u>Number of Accidents in last three years</u>	<u>Number of Persons</u>	<u>Mean Number Wrong</u>
0	118	4.48
1	22	4.04
2	2	7.00
3	1	6.00

Here again, no statistical difference is detected in the mean number of questions wrong in the various accident groups.

The above analyses were also conducted using the number of "points" and an accident severity index (derived by weighting injury-producing and fatal accidents more heavily) as independent variables. As before, no statistical differences were detected in the mean number of questions missed for these classifications.

From these results we can draw the inference that the variation in the number of questions missed on the re-examination cannot be explained by previous convictions or accident experience.

It is possible, however, that the change in knowledge attributable to the re-examination is influenced by previous convictions and/or accidents. For instance, we might hypothesize that persons with "bad" driving records will learn less on the examination than those persons with "good" records. To examine this hypothesis, analyses of variance were conducted to determine the variation in the change in number of questions missed caused by the three treatments and the number of previous convictions and by the three treatments and the number of previous accidents (over a three year period). The analysis of variance tables are presented on the next page.

* The mean number of accidents in the last three years was 0.20. This result is in close agreement with the mean accident rate for Michigan drivers as estimated by other researchers. (8).

(i) Effects of Previous Convictions and Treatment

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>Degrees of Freedom</u>	<u>Mean Square</u>	<u>F-Ratio</u>
Treatment	82.63	2	41.32	23.86 *
Convictions	5.76	2	2.88	1.66
Treatment-Conviction Interaction	4.85	4	1.21	.70
Grand Mean	922.52	1		
Error	237.23	137	1.73	

(ii) Effects of Previous Accidents and Treatment

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>Degrees of Freedom</u>	<u>Mean Square</u>	<u>F-Ratio</u>
Treatment	85.31	2	42.66	24.48 *
Accidents	.03	1	.03	.02
Treatment-Accident Interaction	1.17	2	.59	.34
Grand Mean	922.52	1	922.52	
Error	243.96	140	1.74	

In both of these analyses, the only significant effect (at the .05 level) is the treatment effect (written test with feedback, written test, or machine test). Hence we can conclude that previous convictions and accidents do not influence the extent of learning on the re-examination.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

We shall now briefly summarize the major results of this evaluation. From the analyses of Chapter III we can draw the following conclusions as to the effects of re-examination on driver knowledge:

- (1) Seventy four percent of the driving population feel that they obtained some new information on driving from the re-examination.
- (2) The written examination with feedback results in a significantly lower proportion of the driving population feeling that the Secretary of State is doing a poor job in providing enough information on changes in laws and driver responsibility.
- (3) The re-examination program results in a significant increase in driver knowledge as measured by the decrease in the number of re-examination questions missed. The written test with feedback provides the largest increase in knowledge, and the machine test provides the smallest increase.
- (4) The increases in knowledge discussed above are not affected by the driver's education, age, marital status or by driver education. They are affected by sex, with females having a larger increase. From Chapter IV we see that these increases are also not affected by previous accident and violation experience.

From Chapter IV we can conclude that:

- (1) The average test score does not vary for groups having different previous accident experience.
- (2) The average test score does not vary for groups having different previous conviction experience.

It is important to note that these two conclusions are based upon a limited sample and therefore should be regarded as tentative. In addition, we observe that the stated objective of the program is not to restrict the driving privilege by measuring potentially unsafe

behavior but to educate the driving population. Furthermore, we observe that we are not measuring subsequent driving behavior, but only historical behavior in this study. The change in subsequent behavior as a function of the change in knowledge attributable to the re-examination is clearly a much more desirable measure of test effectiveness with respect to driving behavior.

The following recommendations are based upon these conclusions and upon other observations made during this research project.

- (1) The Department of State should continue to develop internal expertise in the construction of relevant re-examination questions. This expertise should be supplemented by consultation with educational and research organizations throughout the state.
- (2) A significant effort should be made to continually improve the structure of re-examination questions and the design of the re-examination. For instance, different versions of the same questions and alternative orderings of the questions are desirable to improve test reliability. Consultation with various testing groups within the state universities is desirable in this regard.
- (3) Alternative types of questions should be explored--especially those involving the use of figures and illustrations.
- (4) The Department of State should decide whether the re-examination will be utilized as part of a license restriction program.
 - (a) If license restriction is not an objective, more "thought provoking" questions should be placed on the re-examination. It may not be necessary for these to have one "correct" answer.
 - (b) If license restriction is an objective, more detailed research should be sponsored to relate re-examination results to driving performance.
- (5) The Department of State should continue to develop statistical summaries of the re-examination results. These can be utilized to determine deficiencies in driver know-

ledge and to measure the effectiveness of various public information programs sponsored by the Department of State.

- (6) The Department of State should encourage and sponsor research designed to determine the information requirements necessary for the safe performance of the driving task.

Appendix A
Written Test Instruments

The purpose of this quiz is to refresh your thinking. It is not a pass or fail quiz.

PLEASE PRINT

Name: _____ (First) _____ (Middle) _____ (Last)

Address: _____ City _____

Phone _____ Age _____ Sex: M _____ F _____

Driver License No. _____

INSTRUCTIONS: For each of the following questions or statements, circle the one best answer. Read each question completely before marking your answer.

TEST #1

1. In most cases, your chances of being killed in an accident are greater if you are thrown from the car.
 1. True
 2. False
2. Under the Michigan point system, a driver who has acquired 6 points within a 24 month period can expect:
 1. To have his license suspended.
 2. To be called in for a hearing before a driver improvement officer.
 3. A warning letter containing a listing of traffic offenses.
 4. A letter of caution from the Governor.
3. Most fatal accidents happen when there is:
 1. Snow and ice on the roads.
 2. Rainy weather and wet roads.
 3. Good weather and dry roads.
4. Financial Responsibility insurance is a specific type of automobile insurance coverage intended to protect all motorists.
 1. True
 2. False
5. More traffic deaths occur on country roads than on city streets.
 1. True
 2. False
6. When merging with freeway traffic, I should usually stop at the entrance ramp, look around, and then go.
 1. True
 2. False
7. You have just driven through a deep pool of water on the road. The first thing you should do is apply pressure on your brake pedal to dry off the brakes.
 1. True
 2. False
8. When driving behind a motorcycle, a driver should leave extra following distance because most motorcycles are:
 1. Unpredictable.
 2. Able to stop in a shorter distance than cars.
 3. Not equipped with brake lights.
9. When driving on a 4-lane divided highway, it is illegal for me to use the right lane to pass another vehicle.
 1. True
 2. False
10. If I do not have insurance and pay the \$35.00 uninsured motorist fee, this means I am insured by the State.
 1. True
 2. False
11. If I move, I must go to an examining station and have the address changed on my driver license. If I don't, my license may be revoked.
 1. True
 2. False
12. The license of a minor under the age of 18 can be cancelled upon the written request of the person who signed the application of the minor driver.
 1. True
 2. False
13. A flashing red arrow shown together with a red traffic signal means I can:
 1. Turn in the direction it points after stopping.
 2. Make a turn only after the traffic signal turns green.
 3. Turn in the direction it points without stopping.
14. If I am arrested for either "driving under the influence" or "impaired driving", I must take a test for alcohol or I can lose my license.
 1. True
 2. False
15. If I fail to appear in court for a traffic violation, my license can be suspended.
 1. True
 2. False

ATTITUDE QUESTIONS

The purpose of the following questions is to give you a chance to state your opinion on certain driving subjects. There are no right or wrong answers. You are just letting us know how you feel.

DIRECTIONS: Read the statement and then check the response which best describes how you feel about it.

TEST #1

- (1) All cars should be inspected once a year by the police to make sure they are safe.

Strongly agree
 Agree
 Don't know
 Disagree
 Strongly disagree

- (2) Drivers with a lot of "points" are not always unsafe drivers--just unlucky ones who get caught.

Strongly agree
 Agree
 Don't know
 Disagree
 Strongly disagree

- (3) Courts don't like to convict drivers for serious violations, since loss of the driver's license makes it hard to get to work.

Strongly agree
 Agree
 Don't know
 Disagree
 Strongly disagree

- (4) Penalties for drunk driving should be reduced so that courts will convict more drunk drivers than they do now.

Strongly agree
 Agree
 Don't know
 Disagree
 Strongly disagree

- (5) I feel that all Michigan drivers should be given a written test when renewing their driver's license.

Strongly agree
 Agree
 Don't know
 Disagree
 Strongly disagree

The purpose of this quiz is to refresh your thinking. It is not a pass or fail quiz.

PLEASE PRINT

Name: _____
(First) (Middle) (Last)

Address: _____ City _____

Phone _____ Age _____ Sex: M _____ F _____

Driver License No. _____

INSTRUCTIONS: For each of the following questions or statements, circle the one best answer. Read each question completely before marking your answer.

TEST #2

1. On a 2-lane road, it is illegal to drive off the pavement to pass another car on the right.
 1. True
 2. False
2. A flashing red light at an intersection means I should:
 1. Slow down.
 2. Stop, and then go when traffic is clear.
 3. Stop, and wait for the light to turn green.
3. Recent records of traffic deaths in Michigan show that:
 1. Fewer people are getting killed.
 2. More people are getting killed in one-car, run-off-the-road type of accidents.
 3. Country roads are safer than city streets.
 4. Fatal accidents increase during snow storms and ice storms.
4. If I have a blowout while driving, I should brake very hard and steer to the right shoulder.
 1. True
 2. False
5. Whenever I leave my car unoccupied, it is always good practice to set the parking brake.
 1. True
 2. False
6. Most fatal accidents occur at speeds:
 1. Below 45 miles per hour
 2. Between 45-50 miles per hour
 3. Between 50-65 miles per hour
 4. Above 65 miles per hour
7. If your brake pedal can be pushed within two inches of the floor, it is time to have your brakes checked.
 1. True
 2. False
8. In Michigan, all motor vehicles must be equipped with an outside rear view mirror on the driver's side.
 1. True
 2. False
9. One conviction for "driving under the influence of alcohol" means automatic suspension of your driver license for at least 90 days.
 1. True
 2. False
10. Michigan's new "Implied Consent" law has to do with:
 1. Vehicle Safety check lanes
 2. Financial Responsibility
 3. Chemical tests for the amount of alcohol in the blood
 4. Automobile insurance
11. Your driver license cannot be suspended, revoked or denied if it would result in hardship for you and your family.
 1. True
 2. False
12. The State Police may set up a "safety check lane" to find out if my car is safe.
 1. True
 2. False
13. The police cannot arrest me for driving recklessly on private property (like a shopping center) which is open to public use.
 1. True
 2. False
14. If I am driving, I must show my driver license whenever a uniformed police officer asks to see it.
 1. True
 2. False
15. I must stop for a school bus:
 1. At least 10 feet from the bus.
 2. Outside cities and villages when the red lights on the bus are flashing.
 3. Inside cities and villages when signs are posted and when the red lights on the bus are flashing.
 4. All of the above.

ATTITUDE QUESTIONS

The purpose of the following questions is to give you a chance to state your opinion on certain driving subjects. There are no right or wrong answers. You are just letting us know how you feel.

DIRECTIONS: Read the statement and then check the response which best describes how you feel about it.

TEST #2

(1) Poor roads and unsafe cars cause more accidents than driver mistakes do.

- Strongly agree
- Agree
- Don't know
- Disagree
- Strongly disagree

(2) In many cases it's necessary to break the law to avoid having an accident.

- Strongly agree
- Agree
- Don't know
- Disagree
- Strongly disagree

(3) Under good driving conditions, each driver should be free to select the speed which he feels is safe.

- Strongly agree
- Agree
- Don't know
- Disagree
- Strongly disagree

(4) There is very little I can do to keep from being involved in an accident.

- Strongly agree
- Agree
- Don't know
- Disagree
- Strongly disagree

(5) I feel that all Michigan drivers should be given a written test when renewing their driver's license.

- Strongly agree
- Agree
- Don't know
- Disagree
- Strongly disagree

The purpose of this quiz is to refresh your thinking. It is not a pass or fail quiz.

PLEASE PRINT

NAME: _____
(First) (Middle) (Last)

Address: _____ City _____

Phone _____ Age _____ Sex: M _____ F _____

Driver License No. _____

INSTRUCTIONS: Please read each of the following questions or statements completely, then circle your answer.

TEST #3

1. If you do not have insurance and pay the \$35 Uninsured Motorist fee, this means you are insured by the State.
 1. True
 2. False
 3. Don't Know
2. If you move, you must go to an examining station and have the address changed on your driver license. If you don't, your license may be revoked.
 1. True
 2. False
 3. Don't Know
3. Studded tires (those with plastic or metal studs or ice grips) may be used on Michigan roads only between November 1 and May 1.
 1. True
 2. False
 3. Don't Know
4. If an accident occurs (involving \$200 or more property damage or personal injury), and all drivers have liability insurance, no accident report need be sent to the Department of State.
 1. True
 2. False
 3. Don't Know
5. A conviction for altering your driver's license will result in a 1 year suspension of your license.
 1. True
 2. False
 3. Don't Know
6. Studies of fatal accidents show that about 50% of the drivers involved have been drinking.
 1. True
 2. False
 3. Don't Know
7. Ice on a highway is usually more slick at temperatures near 32° than it is at a temperature of zero.
 1. True
 2. False
 3. Don't Know
8. A ticket for going "too fast for conditions" means that you were driving faster than the posted speed limit.
 1. True
 2. False
 3. Don't Know
9. Points can not be put on your Michigan driving record for convictions on traffic violations received in another state.
 1. True
 2. False
 3. Don't Know
10. If you go past your exit on a freeway, the best action to take is:
 1. Move to the left lane and make a U-turn across the divider strip.
 2. Stop and back up to the exit ramp you missed.
 3. Keep going to the next exit.
 4. Don't Know
11. You should use your high headlight beams instead of your low beams when driving in fog.
 1. True
 2. False
 3. Don't Know
12. You must stop before entering a street or highway from an alley or driveway.
 1. True
 2. False
 3. Don't Know
13. If you fail to answer a citation or a notice to appear in court for a traffic offense, you are given 1 point on your driving record.
 1. True
 2. False
 3. Don't Know
14. The Michigan Accident Claims Fund protects you against the uninsured motorist only while you are driving in Michigan.
 1. True
 2. False
 3. Don't Know
15. If your insurance company cancels your liability insurance, you should wait until the next time you buy license plates before paying the \$35 Uninsured Motorist fee.
 1. True
 2. False
 3. Don't Know

ATTITUDE - OPINION QUESTIONS

The purpose of the following questions is to give you a chance to state your opinion on certain driving subjects. There are no right or wrong answers. You are just letting us know how you feel.

INSTRUCTIONS: Read the statement and then check the response which best describes how you feel about it.

TEST #3

1. Most drivers tend to over-rate their own driving ability.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

2. Most of the time you can't predict what the other driver is going to do.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

3. Most drivers are usually polite and helpful on the road.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

4. Automobile insurance policies should be changed so that each driver in an accident is repaid by his own insurance company regardless of whose fault it is.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

5. I feel that all Michigan drivers should, when renewing their driver license:

- 1. Take a written test to refresh their understanding of their responsibilities as a driver.
- 2. Take a driving skills test on the road.
- 3. Show evidence that they are physically fit to drive.
- 4. No tests or exams should be required.
- 5. Don't know.

The purpose of this quiz is to refresh your thinking. It is not a pass or fail quiz.

PLEASE PRINT

Name: _____ (First) _____ (Middle) _____ (Last)

Address: _____ City _____

Phone _____ Age _____ Sex: M _____ F _____

Driver License No. _____

INSTRUCTIONS: Please read each of the following questions or statements completely, then circle your answer.

TEST # 4

1. If you drive an uninsured vehicle without having paid the \$35 Uninsured Motorist Fee, you can be punished by up to 90 days in jail and \$100 fine.
 1. True
 2. False
 3. Don't Know
2. Michigan's new "Implied Consent" Law has to do with:
 1. Vehicle safety check lanes.
 2. Financial responsibility.
 3. Chemical tests for the amount of alcohol in the blood.
 4. Don't know.
3. It is not legal to drive with only your parking lights on at any time from a half hour after sunset to a half hour before sunrise.
 1. True
 2. False
 3. Don't Know
4. If an accident occurs (involving \$200 or more property damage or personal injury) and one driver has no liability insurance, all drivers must file an accident report with the Department of State.
 1. True
 2. False
 3. Don't Know
5. More fatal accidents occur at speeds over 45 mph than under 45 mph.
 1. True
 2. False
 3. Don't Know
6. Recent records of traffic deaths in Michigan show that:
 1. More people are getting killed in one-car, run-off-the-road type of accidents.
 2. Country roads are safer than city streets.
 3. Fatal accidents increase during snow storms.
 4. Don't know.
7. You should deflate the tires on your car to increase traction when driving on ice and snow.
 1. True
 2. False
 3. Don't Know
8. If you are involved in an accident which requires you to file an accident report with the Department of State, the report must be filed within 30 days.
 1. True
 2. False
 3. Don't Know
9. If an uninsured motorist causes an accident and a claim is paid out of the Accident Claims Fund, he will have to pay back the entire amount.
 1. True
 2. False
 3. Don't Know
10. Your driver license may be suspended when you knowingly permit an intoxicated person to drive your car, and that person is convicted of driving under the influence of alcohol.
 1. True
 2. False
 3. Don't Know
11. "Hydro-planing" is a term used to describe why the front wheels leave contact with the pavement when a car is going at increased speeds (usually over 40 mph), and when the road surface is:
 1. Made of gravel.
 2. Made of asphalt and is very hot.
 3. Wet, usually from heavy rain.
 4. Don't know.
12. If you suddenly realize that you are going the WRONG WAY on a freeway, you should:
 1. Keep going until you reach an exit where you can get off.
 2. Keep going, but stay in the left lane only.
 3. Immediately pull off onto the shoulder and wait until it is safe to make a U-turn.
 4. Don't know.
13. At least 30% of the adult pedestrians killed last year in traffic accidents were legally "under the influence of alcohol."
 1. True
 2. False
 3. Don't Know
14. "Driving while impaired" results in:
 1. A more serious penalty than "driving under the influence".
 2. A less serious penalty than "driving under the influence".
 3. The same penalty as "driving under the influence".
 4. Don't know.
15. If you cancel your liability insurance policy, you should wait until the next time you buy license plates before paying the \$35 Uninsured Motorist fee.
 1. True
 2. False
 3. Don't Know

ATTITUDE - OPINION QUESTIONS

The purpose of the following questions is to give you a chance to state your opinion on certain driving subjects. There are no right or wrong answers. You are just letting us know how you feel.

INSTRUCTIONS: Read the statement and then check the response which best describes how you feel about it.

TEST #4

1. Michigan's traffic laws and penalties seem to be harder on drivers than traffic laws and penalties in other states.

Strongly agree
 Agree
 No opinion
 Disagree
 Strongly disagree

2. It is too easy for a person to get a driver's license in Michigan.

Strongly agree
 Agree
 No opinion
 Disagree
 Strongly disagree

3. Drivers are seldom caught after breaking serious driving laws.

Strongly agree
 Agree
 No opinion
 Disagree
 Strongly disagree

4. Driving too slow is more dangerous than driving too fast.

Strongly agree
 Agree
 No opinion
 Disagree
 Strongly disagree

5. I feel that all Michigan drivers should, when renewing their driver license:

1. Take a written test to refresh their understanding of their responsibilities as a driver
 2. Take a driving skills test on the road.
 3. Show evidence that they are physically fit to drive.
 4. No tests or exams should be required.
 5. Don't know.

APPENDIX B

Machine Test Instruments

The machine test instruments utilized in this pilot program are presented in this appendix. The percentage of drivers answering each question correctly is tabulated next to the correct response. Machine test version #1 was not implemented in the pilot program. In addition, the responses to question number 16 on the other versions are not tabulated.

The attitude questions were administered on separate forms to those persons taking the machine test. These results are also included in this appendix.

ITEM MACHINE TEST #1

1/17/33/49/65

In most cases, your chances of being killed in an accident are greater if you are thrown from the car.

- ① True
- 2. False

2/18/34/50/66

Under the Michigan point system, a driver who has acquired 6 points within a 24 month period can expect:

- 1. To have his license suspended.
- 2. To be called in for a hearing before a driver improvement officer.
- ③ A warning letter containing a listing of traffic offenses.
- 4. A letter of caution from the Governor.

3/19/35/51/67

Most fatal accidents happen when there is:

- 1. Snow and ice on the roads.
- 2. Rainy weather and wet roads.
- ③ Good weather and dry roads.

4/20/36/52/68

Financial Responsibility insurance is a specific type of automobile insurance coverage intended to protect all motorists.

- ① True
- 2. False

5/21/37/53/69

Most pedestrian deaths occur to middle age persons.

- 1. True
- ② False

6/22/38/54/70

When merging with freeway traffic, I should usually stop at the entrance ramp, look around, and then go.

- 1. True
- ② False

7/23/39/55/71

You have just driven through a deep pool of water on the road. The first thing you should do is apply pressure on your brake pedal to dry off the brakes.

- ① True
- 2. False

8/24/40/56/72

In a city or village where there are no signs posted, the speed limit is 30 mph.

- 1. True
- ② False

9/25/41/57/73 I should use my low headlight beams in fog or a snow storm.

- ①. True
- 2. False

10/26/42/58/74 If I do not have insurance and pay the \$35.00 uninsured motorist fee, this means I am insured by the State.

- 1. True
- ②. False

11/27/43/59/75 If I move, I must go to an examining station and have the address changed on my driver license. If I don't, my license may be revoked.

- ①. True
- 2. False

12/28/44/60/76 The license of a minor under the age of 18 can be cancelled upon the written request of the person who signed the application of the minor driver.

- ①. True
- 2. False

13/29/45/61/77 A flashing red arrow shown together with a red traffic signal means I can:

- ①. Turn in the direction it points after stopping.
- 2. Make a turn only after the traffic signal turns green.
- 3. Turn in the direction it points without stopping.

14/30/46/62/78 If I am arrested for either "driving under the influence" or "impaired driving", I must take a test for alcohol or I can lose my license.

- ①. True
- 2. False

15/31/47/63/79 If I fail to appear in court for a traffic violation, my license can be suspended.

- ①. True
- 2. False

16/32/48/64/80 When meeting a car with glaring head lights at night, I should:

- ①. Watch the right edge of the roadway.
- 2. Turn on my bright lights.
- 3. Watch the center line of the highway.

ITEM MACHINE TEST #2

2/17/33/49/65 On a 2-lane road, it is illegal to drive off the pavement to pass another car on the right.

71.6%

- ① True
- 2. False

2/18/34/50/66 A flashing red light at an intersection means I should:

64.8%

- 1. Slow down.
- ② Stop, and the go when traffic is clear.
- 3. Stop, and wait for the light to turn green.

3/19/35/51/67 Recent records of traffic deaths in Michigan show that:

60.2%

- 1. Fewer people are getting killed.
- ② More people are getting killed in one-car, run-off-the-road type of accidents.
- 3. Country roads are safer then city streets.
- 4. Fatal accidents increase during snow storms and ice storms.

4/20/36/52/68 If I have a blowout while driving, I should brake very hard and steer to the right shoulder.

73.9%

- 1. True
- ② False

5/21/37/53/69 Whenever I leave my car unoccupied, it is always good practice to set the parking brake.

63.6%

- ① True
- 2. False

6/22/38/54/70 Most fatal accidents occur at speeds:

45.5%

- ① Below 45 miles per hour
- 2. Between 45-50 miles per hour
- 3. Between 50-65 miles per hour
- 4. Above 65 miles per hour

7/23/39/55/71 A conviction for altering my driver's license will result in a 1 year suspension of my license.

77.3%

- ① True
- 2. False

8/24/40/56/72 In Michigan, all motor vehicles must be equipped with an outside rear view mirror on the driver's side.

68.2%

- ① True
- 2. False

ITEM MACHINE TEST #2

Page #2

9/25/41/57/73 One conviction for "driving under the influence of alcohol" means automatic suspension of your driver license for at least 90 days.

56.8%

- ①. True
- 2. False

10/26/42/58/74 Michigan's new "Implied Consent" law has to do with:

59.1%

- 1. Vehicle Safety check lanes
- 2. Financial Responsibility
- ③. Chemical tests for the amount of alcohol in the blood
- 4. Automobile insurance

11/27/43/59/75 Your driver license cannot be suspended, revoked or denied if it would result in hardship for you and your family.

76.1%

- 1. True
- ②. False

12/28/44/60/76 The State Police may set up a "safety check lane" to find out if my car is safe.

38.4%

- ①. True
- 2. False

13/29/45/61/77 The police cannot arrest me for driving recklessly on private property (like a shopping center) which is open to public use.

94.3%

- 1. True
- ②. False

14/30/46/62/78 If I am driving, I must show my driver license whenever a uniformed police officer asks to see it.

90.9%

- ①. True
- 2. False

15/31/47/63/79 I must stop for a school bus:

86.4%

- 1. At least 10 feet from the bus.
- 2. Outside cities and villages when the red lights on the bus are flashing.
- 3. Inside cities and villages when signs are posted and when the red lights on the bus are flashing.
- ④. All of the above.

16/32/48/64/80 If you drive an uninsured vehicle without having paid the \$35 uninsured motorist fee, you can be punished by 90 days in jail and \$100 fine.

- ①. True
- 2. False

ITEM MACHINE - TEST #3

1/17/33/49/65 If you do not have insurance and pay the \$35 Uninsured Motorist fee, this means you are insured by the State.

- 65.4% 1. True
 ② False

2/18/34/50/66 If you move, you must go to an examining station and have the address changed on your driver license. If you don't, your license may be revoked.

- 67.3% ① True
 2. False

3/19/35/51/67 Studded tires (those with plastic or metal studs or ice grips) may be used on Michigan roads only between November 1 and May 1.

- 67.3% ① True
 2. False

4/20/36/52/68 If an accident occurs (involving \$200 or more property damage or personal injury), and all drivers have liability insurance, no accident report need be sent to the Department of State.

- 17.3% ① True
 2. False

5/21/37/53/69 A conviction for altering your driver's license will result in a 1 year suspension of your license.

- 85.0% ① True
 2. False

6/22/38/54/70 Studies of fatal accidents show that about 50% of the drivers involved have been drinking.

- 86.4% ① True
 2. False

7/23/39/55/71 Ice on a highway is usually more slick at temperatures near 32° than it is at a temperature of zero.

- 83.6% ① True
 2. False

8/24/40/56/72 A ticket for going "too fast for conditions" means that you were driving faster than the posted speed limit.

- 74.8% 1. True
 ② False

9/25/41/57/73 Points can not be put on your Michigan driving record for convictions on traffic violations received in another state.

- 65.0% 1. True
 ② False

10/26/42/58/74 If you go past your exit on a freeway, the best action to take is:

- 94.4% 1. Move to the left lane and make a U-turn across the divider strip.
 2. Stop and back up to the exit ramp you missed.
 ③ Keep going to the next exit.

11/27/43/59/75 You should use your high headlight beams instead of your low beams when driving in fog.

- 87.9% 1. True
 ② False

12/28/44/60/76 You must stop before entering a street or highway from an alley or driveway.

- 92.5% ① True
 2. False

13/29/45/61/77 If you fail to answer a citation or a notice to appear in court for a traffic offense, you are given 1 point on your driving record.

- 73.8% ① True
 2. False

14/30/46/62/78 The Michigan Accident Claims Fund protects you against the uninsured motorist only while you are driving in Michigan.

- 69.6% ① True
 2. False

15/31/47/63/79 If your insurance company cancels your liability insurance, you should wait until the next time you buy license plates before paying the \$35 Uninsured Motorist fee.

- 93.0% 1. True
 ② False

16/32/48/64/80 Most pedestrian deaths occur to middle age persons.

1. True
 ② False

ITEM MACHINE - TEST #4

1/17/33/49/65 If you drive an uninsured vehicle without having paid the \$35 Uninsured Motorist Fee, you can be punished by up to 90 days in jail and \$100 fine.

81.8%

- ① True
- 2. False

2/18/34/50/66 Michigan's new "Implied Consent" Law has to do with:

74.7%

- 1. Vehicle safety check lanes.
- 2. Financial responsibility.
- ③ Chemical tests for the amount of alcohol in the blood.

3/19/35/51/67 It is not legal to drive with only your parking lights on at any time from a half hour after sunset to a half hour before sunrise.

82.8%

- ① True
- 2. False

4/20/36/52/68 If an accident occurs (involving \$200 or more property damage or personal injury) and one driver has no liability insurance, all drivers must file an accident report with the Department of State.

84.8%

- ① True
- 2. False

5/21/37/53/69 More fatal accidents occur at speeds over 45 mph than under ⁴⁵mph.

33.3%

- 1. True
- ② False

6/22/38/54/70 Recent records of traffic deaths in Michigan show that:

74.7%

- ① More people are getting killed in one-car, run-off-the-road type of accidents.
- 2. Country roads are safer than city streets
- 3. Fatal accidents increase during snow storms.

7/23/39/55/71 You should deflate the tires on your car to increase traction when driving on ice and snow.

47.5%

- ① True
- 2. False

8/24/40/56/72 If you are involved in an accident which requires you to file an accident report with the Department of State, the report must be filed within 30 days.

89.9%

- ① True
- 2. False

9/25/41/57/73 If an uninsured motorist causes an accident and a claim is paid out of the Accident Claims Fund, he will have to pay back the entire amount.

76.8%

1. True
2. False

10/26/42/58/74 Your driver license may be suspended when you knowingly permit an intoxicated person to drive your car, and that person is convicted of driving under the influence of alcohol.

93.9%

1. True
2. False

11/27/43/59/75 "Hydro-planing" is a term used to describe why the front wheels leave contact with the pavement when a car is going at increased speeds (usually over 40 mph), and when the road surface is:

68.7%

1. Made of gravel.
2. Made of asphalt and is very hot.
3. Wet, usually from heavy rain.

12/28/44/60/76 If you suddenly realize that you are going the WRONG WAY on a freeway, you should:

67.7%

1. Keep going until you reach an exit where you can get off.
2. Keep going, but stay in the left lane only.
3. Immediately pull off onto the shoulder and wait until it is safe to make a U-turn.

13/29/45/61/77 At least 30% of the adult pedestrians killed last year in traffic accidents were legally "under the influence of alcohol."

64.6%

1. True
2. False

14/30/46/62/78 "Driving while impaired" results in:

31.3%

1. A more serious penalty than "driving under the influence".
2. A less serious penalty than "driving under the influence".
3. The same penalty as "driving under the influence".

15/31/47/63/79 If you cancel your liability insurance policy, you should wait until the next time you buy license plates before paying the \$35 Uninsured Motorist fee.

91.9%

1. True
2. False

16/32/48/64/80 Most pedestrian deaths occur to middle age persons.

1. True
2. False

PLEASE PRINT

Name: _____ (First) _____ (Middle) _____ (Last)

Address: _____ City _____

Phone _____ Age _____ Sex: M _____ F _____

Driver License No.: _____

STAPLE
SCORE
TAPE
HERE

The purpose of the following questions is to give you a chance to state your opinion on certain driving subjects. There are no right or wrong answers. You are just letting us know how you feel.

DIRECTIONS: Read the statement and then check the response which best describes how you feel about it.

(1) All cars should be inspected once a year by the police to make sure they are safe.

36.3% Strongly agree

53.9% Agree

2.5% Don't know

6.0% Disagree

1.3% Strongly disagree

(2) Drivers with a lot of "points" are not always unsafe drivers--just unlucky ones who get caught.

5.3% Strongly agree

15.4% Agree

12.9% Don't know

46.2% Disagree

20.2% Strongly disagree

(3) Courts don't like to convict drivers for serious violations, since loss of the driver's license makes it hard to get to work.

2.3% Strongly agree

17.2% Agree

28.9% Don't know

40.5% Disagree

11.1% Strongly disagree

(4) Penalties for drunk driving should be reduced so that courts will convict more drunk drivers than they do now.

5.4% Strongly agree

12.6% Agree

14.9% Don't know

45.9% Disagree

21.3% Strongly disagree

(5) I feel that all Michigan drivers should be given a written test when renewing their driver's license.

8.8% Strongly agree

43.1% Agree

10.3% Don't know

32.5% Disagree

5.3% Strongly disagree

SCORE _____

Comments: _____

GEMCO UNIT # _____

Appendix C
Interview Forms

R.A.R. INTERVIEW QUESTIONNAIRE

Test/Date	<input type="text"/>	<input type="text"/>	1969
Interview/Date	<input type="text"/>	<input type="text"/>	1969
Non/Response	<input type="text"/>	<input type="text"/>	<input type="text"/>
Interviewer	<hr/>		
F-1	<input type="text"/>	<input type="text"/>	<input type="text"/>
E-1	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

1. Are you

- A. married
- B. single
- C. divorced
- D. other _____

2. Mark the last year of school you attended.

- A. 1-9 grade
- B. 10-12 grade
- C. 1-4 college
- D. 4-up college

3. What type and year of car do you drive most of the time?

- A. sports car
- B. sedan
- C. station wagon
- D. convertible
- E. foreign car (non-sports)
- D. other _____
- E. year _____

4. Estimate the average number of miles you drive per week.

5. How many years have you been driving?

6. Did you take and pass a driver education course?

- A. yes
- B. no

7. Do you feel you learned any new information about driving in Michigan from the Re-Exam at license renewal?

- A. yes
- B. no

8. Have you sought information about highway safety practices that would help improve your driving since you renewed your license?

- A. yes
- B. no

9. What source gave you the most knowledge about driving?

- A. experience
- B. driver education course
- C. public information programs
- D. other drivers
- E. other _____

10. Which source gave you the least knowledge about driving?

- A. experience
- B. driver education course
- C. public information program
- D. other drivers

11. Do you think that the Michigan Department of State gives you enough information about new changes in driving laws and driver responsibility?

- A. good job
- B. fair job
- C. adequate job
- D. poor job
- E. no opinion

12. Do you have automobile liability insurance?

- A. yes
 - B. no
- If A is not checked, then ask the next question.

13. Did you pay the \$35.00 uninsured motorist fee?

- A. yes
- B. no

14. Under Michigan law the police can administer chemical tests to discover the amount of alcohol in the blood. This comes under the

- A. "Drunk-driving" law
- B. "Implied Consent" law
- C. "Alcohol-consent" law
- D. Don't know

15. If an accident occurs (\$200 or more property damage/personal injury), all drivers must file an accident report with the Department of State

- A. whenever one driver has no liability insurance
- B. whenever all drivers have no liability insurance
- C. whenever an accident occurs even if all parties are insured
- D. don't know

16. More fatal accidents occur at speeds

- A. below 45 mph.
- B. between 45-55 mph.
- C. over 55 mph.
- D. don't know

17. Recent records of traffic deaths in Michigan show that

- A. county roads are safer than city streets
- B. fatal accidents increase during snowstorms
- C. more people are getting killed in one car, run-off-the-road type accidents.
- D. don't know

18. If you deflate the tires on your car while on ice and snow, traction will

- A. increase
- B. decrease
- C. remain about the same
- D. don't know

19. If an uninsured motorist causes an accident and a claim is paid out of the Accident Claims Fund,

- A. he will have to pay back the entire amount
- B. he will not have to pay back the amount if he paid the \$35.00 uninsured motorist fee
- C. he will have to pay back as much as he can afford
- D. don't know

20. When driving at high speeds (usually over 40 mph.) on pavement wet from a heavy rain the front wheels leave contact with the pavement. This is called

- A. water-planing
- B. hydro-planing
- C. surface-planing
- D. don't know

21. Of all the adult pedestrians killed last year in traffic accidents, approximately what per-cent were legally "under the influence of alcohol."

- A. 20%
- B. 30%
- C. 40%
- D. 50%
- E. don't know

22. "Driving under the influence" results in

- A. a more serious penalty than "driving while impaired"
- B. a less serious penalty than "driving while impaired"
- C. the same penalty as "driving while impaired"
- D. don't know

23. If you cancel your liability insurance policy, you should pay \$35.00 uninsured motorist fee.

- A. right away
- B. the next time you buy license plates
- C. either A or B is legally acceptable
- D. don't know

APPENDIX D

Description of the Gemco Testing Machine

Four ITEM Testing Machines, manufactured by Gemco, Inc. in Tulsa, Oklahoma, were utilized in this project. These machines consist of an 80 slide carousel projector which projects the test question onto a small screen in front of the testee. The testee can give one of four possible responses to each question by depressing a control button on his console. The machine can be programmed to provide the correct response to the question when the button is depressed. Simultaneously, a paper tape indicating the cumulative number of questions missed is updated.

In this project, five sixteen-item machine tests were sequentially placed into the carousel. (Alternatively, the machine can be programmed to select questions randomly). In addition, the machine was programmed to provide immediate feedback by providing the correct answer after each question.

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