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**STATE OF RHODE ISLAND
SPECIAL ADJUDICATION FOR ENFORCEMENT (SAFE)
Volume II: Evaluation of Driver Retraining Schools**

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FINAL REPORT**

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16. Abstract As a part of the administrative adjudication of traffic violations in the State of Rhode Island, two types of driver retraining programs were conducted for motorists who had charges sustained at hearings and were referred for retraining by the Hearing Commissioners. These were: 1) a General Education Session consisting of a single two-hour didactic presentation and, 2) the Defensive Driving Course developed by the National Safety Council. During the two years of operation, 84 sessions of the GES course were held. A total of 3,046 persons were assigned to attend, with 2,915 graduating. A total of 58 cycles of DDC were conducted with 1,827 persons assigned and 1,752 graduated. Evaluation of the courses showed that both produced measurable increases in knowledge among the students. On the other hand, examination of the subsequent driving records of those assigned to the courses and a group of drivers assigned at random to untreated control groups, failed to yield any evidence that the courses were effective in reducing traffic violations and accidents.					
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FOREWORD

The present document is one of two analytic studies which are a part of the final report of the Special Adjudication for Enforcement (SAFE) demonstration project conducted in the State of Rhode Island during the period from July 1, 1975 to June 30, 1977. Funding for the project came from the Office of Driver and Pedestrian Programs of the National Highway Traffic Safety Administration and from the State of Rhode Island.

Mr. John Krause and Mr. Frank Hance of NHTSA served as Contract Technical Managers for the Rhode Island SAFE. We appreciate the advice and encouragement they have provided. We are also indebted to Messrs. George Brandt and Robert Stone of NHTSA for their inputs to the project. We also wish to thank the NHTSA Region I Administrator, Mr. James Williamson, and Mr. Arthur Fletcher, Highway Safety Management Specialist, for their support.

The author of the present volume is a member of Dunlap and Associates, Inc., the subcontractor for project evaluation. Dr. David F. Preusser of Dunlap was responsible for establishing the experimental design employed in the study.

The SAFE demonstration was carried out by the Administrative Adjudication Division (AAD) of the Rhode Island Department of Transportation. The author is grateful for the support received from all of the staff of AAD, and especially from the late Victor S. Andreozzi, the first AAD Director; Mr. A. Charles Moretti, Director; former Commissioner Leo P. McGowan and Commissioners Joseph D. Accardi and Paul F. Casey; Mr. Nicholas F. Giuliani, Chief of the Data System Section; Mr. Samuel Lapatin, Chief of the Violation Section and Mr. Charles W. Shields, Chief of the Driver Retraining Section.

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I. INTRODUCTION

Driver improvement programs have been employed for a number of years in the attempt to modify the attitudes and behaviors of motorists who accumulate records of traffic accidents and violations. A recent study (NHTSA, 1975) suggests that the use of warning letters, educational sessions and group discussions or therapy have increased rapidly during the 1970's. Many of these programs, operated by driver licensing agencies, employ a driver record review process (e.g., a point system) to identify drivers for whom an intervention is required; others make the improvement program available as a resource to the agency adjudicating traffic violations.

In mid-1975, the majority of traffic offenses in the State of Rhode Island were decriminalized (i.e., became violations rather than misdemeanors) and an Administrative Adjudication Division (AAD) established to adjudicate these offenses. As a part of this system, two types of didactic presentations were employed in the attempt to ameliorate the driving records of motorists receiving traffic summonses in the state. These courses were: (1) a General Education Session (GES) consisting of a single two-hour presentation, and (2) the Defensive Driving Course (DDC) developed by the National Safety Council.

Both the GES and DDC programs were employed as sanctioning options in the adjudication of traffic violations. That is, Hearing Commissioners who sustained violations among motorists required to appear in person, could require attendance in one of the courses in addition to, or as an alternative to a monetary fine and/or license suspension.

Administration of the classes was carried out by the Driver Retraining Section of the Administrative Adjudication Division. The classes, therefore, were an integral part of the AAD system and were employed, as just noted, as an option in traffic violation adjudication. The philosophy of the classes was to provide attendees with knowledge regarding safe driving practice and thereby to attempt to reduce the likelihood of subsequent traffic accidents and violations. Generally, the GES class was intended for motorists who were beginning to accumulate traffic violation records, while the DDC course was intended for motorists with more extensive histories of violations.

Motorists entering either GES or DDC had a traffic violation adjudicated at an AAD hearing and were referred to the Driver Retraining Section by a Hearing Commissioner. The decision, as to whether the GES or DDC course was to be attended could have been made by the Hearing Commissioner at the time the violation was adjudicated, or if this was not done, by a Driver Improvement

Analyst upon receipt of the referral. In either case, a three-year violation history was available to the individual making the decision.

The present document is one of two analytic studies which are part of the final report of the Special Adjudication for Enforcement demonstration project conducted in Rhode Island during the July, 1975 to June, 1977 period. Specifically, the report presents an evaluation of the effectiveness of the GES and DDC courses as employed in the AAD system.

Existing evaluations of various driver improvement programs have provided a mixed picture of effectiveness. Kaestner (1968) in a review of seven experimental programs conducted in the 1960's, which ranged from individual driver interviews to group therapy, noted that all seven produced reduced violations while only two appeared to have had an effect on subsequent accidents. All seven of these efforts employed a violation or accident record review to identify eligible drivers.

Marsh (1971), in a large scale study of eight improvement techniques, found that five of these, including a warning letter, had an effect on subsequent traffic convictions. On the other hand, only one technique--a one hour Group Educational Meeting--was found to offer the possibility of reducing subsequent accidents. Drivers were selected for this program using a point system based on accidents and violations.

Brown and Marchi (1976) report that sequentially applied warning letters, a Group Education Meeting, individual hearings and probation violator hearings all were effective in reducing subsequent convictions among several thousand "negligent operators", as compared with randomly selected controls. Statistically significant accident reductions were also found, except in the case of the Group Education Meeting where the "effects are in the desired direction but not of sufficient magnitude or consistency to reach statistical significance...".

Harano and Peck (1971) in an evaluation of an 18 hour Uniform Driver Improvement School employed following conviction for a traffic offense where the drivers had one or more prior convictions, found an 11.8 percent accident reduction and a 6.2 percent violation reduction compared to an untreated control group. The authors also report a number of important interactions between recidivism and the characteristics of their subjects. For instance, they indicate that course impact on violation recidivism was most pronounced for persons with few prior violations while impact on accident recidivism was evident only for those who had higher prior conviction levels. They suggest the need for further research to clarify the latter finding and caution that it may be a chance result.

The Defensive Driving Course is employed extensively throughout the country among the general driving population. As reported by Planek et al. (1974) there are approximately 25,000 instructors in the 50 states who have presented the course to more than 3.5 million drivers. The authors note that several evaluations of DDC have been carried out, but have suffered from the absence of adequate comparison groups against which possible DDC effects could be measured.

In an attempt to overcome this situation, Planek et al. carried out a large scale survey of persons attending DDC. Basically, their evaluation design involved collection, on a voluntary basis, of data from a large group of drivers taking the DDC course, a one-year follow-up of these same drivers using the same data collection instrument, and the collection of the same data from other drivers enrolled in the DDC course at the time of the follow-up.

Based on this study, the authors conclude that, "exposure to DDC was associated with a reduction in self-reported accidents of 30 percent among study group respondents." They also note that males were more likely to show reductions than were females and that certain types of accidents (e.g., on freeways) were less likely to have been reduced.

The Planek et al. study suffers from the same type of deficiency that the authors sought to resolve--the absence of fully adequate comparison groups against which to assess the results attained. Critiques of the research can be found in O'Neill (1974) and Sorenson (1974).

Kaestner and Speight (1974) carried out a study of the effectiveness of DDC, probationary licenses and warning letters as alternatives to discretionary license suspension. They report that both the DDC group and one probationary license group had significantly fewer accident and violation recidivists than did an untreated, randomly selected control group. Motorists in this study were drawn from a pool of drivers eligible for license suspension because of conviction for a moving violation within a defined number of months after having undergone a driver improvement interview.

The present study setting differed from most of the previous work in that referral to retraining, if it occurred, was made at the time a traffic offense was adjudicated, rather than after a subsequent record screening process. The decision to refer or not was made by a Hearing Commissioner based on the facts of the violation being heard and on the motorist's prior violation history.

II. DESCRIPTION

During the first two years of operation of the Administrative Adjudication Division, over 6,000 persons were referred to the driver retraining activity after having a traffic violation sustained at an AAD hearing. This figure represents approximately 20 percent of all of the persons who had a traffic violation sustained at a hearing.

A. Description of Courses

The GES course was designed as a one session meeting of two hours duration which combined lecture, film and film strip presentations. The course was intended for drivers showing some recurring patterns of traffic violations, but not to the extent that would require attendance at the longer DDC course. An outline of the GES course is shown in Exhibit 1.

The Defensive Driving Course employed by AAD was the DDC course developed by the National Safety Council. The course in Rhode Island was presented in four two-hour sessions over a four week period.

B. Administration

Referral to driver retraining was one of the options available to the AAD Hearing Commissioners in sustained cases. When a Commissioner decided that a motorist would benefit from retraining he so indicated while the hearing was being conducted. The motorist was issued a temporary license to cover the period until class completion (the permanent license was retained by AAD), and was informed that he would be notified by mail regarding school attendance.

Each day, records from the hearing sites were returned to the AAD office where they were examined to identify persons referred to retraining. These cases were scheduled into the next available GES or DDC course with the decision regarding GES or DDC attendance being made either by the Commissioner at the time of the hearing or, if this was not done, by personnel from the Driver Retraining Section.

Persons attending the GES course were charged a two-dollar tuition while a ten-dollar tuition was charged to those attending DDC. Administration of tuition fees and attendance records, as well as the presentation of the classes was carried out by the Rhode Island Junior College. Instructors were provided by the college subject to the approval of the AAD staff. Class sizes generally were from 35 to 40 persons.

EXHIBIT 1
OUTLINE OF THE GES COURSE

- I Introduction and purpose of GES
 - II Magnitude of the traffic safety problem in the state and nation
 - III Relationship of driver attitudes and motor vehicle operation
 - IV Economic impact of traffic accidents
 - V Developing perceptual skills in driving
 - VI Factors affecting perceptual ability
 - VII Film and discussion of the Smith technique of driver training
 - VIII Film strip and discussion of perception of traffic hazards
 - IX Film, The Final Factor
 - X Conclusion
-

C. Activity Levels

During the two year period of the present study, a total of 82 sessions of the GES course were conducted, while 58 cycles of the DDC course were presented. A total of 3,046 persons were assigned to attend the GES program while 1,827 were assigned to the DDC classes.*

D. Evaluation Design

Evaluation of the effectiveness of the GES and DDC courses focused on two basic issues. The first of these was whether the classes brought about measurable changes in the knowledge of attendees regarding the traffic safety content covered by the courses. The second issue was whether the subsequent violation and accident records of those assigned to the courses were better than those of comparable drivers who were not assigned to attend.

1. Knowledge Testing

Knowledge testing was carried out by administering paper and pencil tests to course attendees. In the case of DDC, the instrument employed consisted of the true-false and multiple choice items from the standard DDC final examination. In the present case, these items were administered as a pre and post-test among those attending DDC.

For the GES classes, a brief multiple choice test was developed based on a review of course content. Administration was carried out on a pre or post class basis in alternate cycles of the school.

2. Subsequent Violations and Accidents

In order to address the issue of the possible impact of DDC and GES as remedial efforts following traffic violation adjudication, an evaluation design was adopted which employed randomly selected control groups for both courses. As noted earlier, drivers were entered into the schooling process based on the decision of a Hearing Commissioner as a part of the disposition of a traffic

* The difference between referral and assignment levels lies in (1) persons assigned to classes which began after June 30, 1977 and (2) persons assigned to control groups for evaluation purposes.

violation. For practical reasons, it was not possible to implement a random control group selection process at the point in time when the referral decision was made. Rather, the technique adopted was to hold back from class assignment a randomly selected proportion of those who were referred following a hearing. The process employed was as follows:

When persons were referred for retraining (DDC or GES) and the decision made regarding which course would be appropriate, preliminary class rosters were compiled by the Driver Retraining Section. When a GES roster had 55 entries, or a DDC roster had 45 entries, it was subjected to a random selection process which on average assigned 75 percent of the individuals to attend schooling and 25 percent to the course control group.

The random procedure consisted of a rotary card file containing 500 cards, of which, 375 contained the word "GO" while 125 said "NO GO". The sequence of cards in the file was random. The cards in the file were numbered in sequence from 1 to 500. When a preliminary roster was to be screened, a random number in the range from 1 to 500 was drawn from a table of random numbers. This determined the starting point in the card sequence. That is, the GO/NO GO decision regarding the first person on the list came from the card bearing the random number, the next card in order assigned the second name on the list, and so on. Thus, assignment to the school or control group was based on a random starting point into a random sequence of GO/NO GO cards.

Persons assigned to school were notified by mail as to the starting date. Persons assigned to the control group received the letter shown in Exhibit 2. Selection of the control groups began with the seventh DDC cycle and with the sixth GES cycle.

Hearing Commissioners were willing to cooperate with the random selection procedure on the grounds that there was no a priori knowledge that the courses were effective. However, they felt that a procedure should exist to insure that certain referred individuals attended school (i.e., by-passed the random selection process). Accordingly, a procedure to denote persons to by-pass the selection process was adopted.

On October 19, 1977, a driver history abstract for all persons assigned to the classes or the control groups was requested from the AAD data system. These abstracts provide listings, for each motorist, of all traffic offenses (except parking tickets) adjudicated in Rhode Island between early 1973 and approximately the end of September, 1977.



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DRIVER RETRAINING SECTION
345 Harris Avenue
Providence, R. I. 02909
(401) 277-2997

Exhibit 2

CONTROL GROUP LETTER

TO:

Your driving record has been referred to this section for review.

Please be advised that a pattern of negligence is only too easily established and inevitably will lead to loss of your driving privilege.

Another violation in the next 12 months will result in assignment to a driver retraining program.

Henceforth, your driving record will be subject to computer review on a periodic basis. Further action will depend upon your driving performance.

Div. of Administrative Adjudication
Driver Retraining Section

Charles W. Shields, Jr.
Chief, Driver Retraining

The abstracts also provided listings of all self reported traffic accidents for the years 1974, 1975 and 1976. (Because of existing data reduction methods in the state, no accident data were available to AAD for 1977.) The information on the abstracts provided the basis for examining subsequent violations and accidents for the school assigned and control groups.

III. ANALYSIS

Evaluation of the GES and DDC courses focused on two issues. The first of these was whether they brought about a measurable increase in the knowledge of attendees regarding the traffic safety issues which were part of the courses. The second issue was whether the subsequent accident and violation records of attendees were better than the records of comparable drivers who did not attend.

A. Knowledge Testing

1. GES

In order to test whether there was an increase in knowledge among persons attending GES, a six item multiple choice test was developed which was related to the major points in the course content. The test was deliberately kept as short as possible because of the compact schedule for GES. Also, because the course was a single session no attempt was made to administer the test on a pre-class and post-class basis to the same students. Instead, the test was administered either as a pre-test or post-test to alternate cycles of the school. The content of the GES test is shown in Exhibit 3.

a) Results

Use of the GES test began with the 22nd session of the school. During the period of data collection, useable results* were obtained from 677 students in 20 sessions who took the exam as a pre-test and from 628 in 18 sessions who took the exam as a post-test.* The mean number of test items answered correctly when the instrument was employed as a pre-test was 3.60 (S.D.=1.35), while the post-test mean was 4.75 (S.D.=1.46). The difference between means is statistically significant ($t=5.23, d.f.=1303, P<.01$). Thus, students who take the test after completing GES answer more items correctly than do students taking the test prior to school.

The percentage of students answering each test item correctly was as follows:

* The exams from several classes were not identifiable as pre or post tests and, therefore, were not included in the analysis.

Exhibit 3
GES KNOWLEDGE TEST

1. About how many people die each year in the United States as the result of a motor vehicle accident?
 - a) 10,000
 - b) 30,000
 - c) 50,000

2. About how many motor vehicle accidents of all kinds occur each year in Rhode Island?
 - a) 10,000
 - b) 30,000
 - c) 50,000
 - d) 70,000

3. The "Two Second Rule" in driving helps you to avoid:
 - a) Exceeding the speed limit
 - b) Tailgating another vehicle
 - c) Changing lanes too quickly
 - d) Passing red lights

4. When driving, it is usually best to:
 - a) Keep your eyes on the car in front of you
 - b) Keep your eyes on your speedometer
 - c) Keep your eyes moving
 - d) Keep your eyes on the center line

5. Traffic safety experts generally agree that it is best to keep your eyes focused on the roadway close in front of your vehicle, this is referred to as "aiming low in steering"?
 - a) True
 - b) False

6. Under the law, driving is considered:
 - a) A right of every citizen which the State of Rhode Island cannot restrict
 - b) A privilege which the State of Rhode Island can restrict
 - c) A right of every citizen which can be restricted only by the Courts
 - d) A privilege which cannot be restricted as long as licenses are renewed

<u>Questions</u>	<u>Percent Correct</u>	
	<u>Pre-Test</u>	<u>Post-Test</u>
1	62.2	79.6
2	34.9	58.6
3	38.4	75.8
4	71.9	90.4
5	78.4	86.1
6	75.2	81.4

All of the post-test percentages are significantly higher than the corresponding pre-test percentages.* That is, the better performance of the post-test group extended to all six test items.

2. DDC

The standard DDC course includes a 24 item final examination. In order to test for knowledge changes in the present context, the first 16 items of the examination were employed as a pre-test while the full examination was administered at the completion of the course.** (The items employed are shown in Exhibit 4). Student scores on the 16 item pre-test and the same 16 items in the post-test were then compared.

a) Results

Pre-test and post-test scores on the DDC examination were available for 768 students in 32 class cycles.*** The mean number of items answered correctly by these students on the pre-test was 10.74 (S.D.=2.35) while the post-test mean was 13.59 (S.D.=1.96). The difference between these means is significantly different (t , for correlated means = 33.4, d.f.=767, $P < .01$). Thus, students taking the first 16 items of the DDC examination answered more items correctly after having completed the course.

* The critical ratios for the differences between percentages were all significant at $P < .01$.

** The first 16 items of the DDC examinations are objective multiple choice items. The examination normally contained in the student workbook was removed so that students did not have access to the test answers.

*** Data from students who took the pre-test in one class cycle and the post-test in another class cycle are excluded.

Exhibit 4

DDC PRE AND POST-TEST

Part I. Multiple Choice. Circle the letter preceding the correct answer.

1. Approximately (a) 250, (b) 150, (c) 75, people die in traffic accidents in the United States every day.
2. The single most significant cause of fatalities, serious injuries and property damage is: (a) the one-car, or "mystery crash" (b) the two-car crash, (c) the rear-end collision.
3. The most effective way to deal with a tailgater is: (a) slam on your brakes to give him a scare, (b) speed up to increase the distance between your vehicles, (c) slow down to force him either to pass or slow down.
4. On a right-hand curve, centrifugal force will tend to pull your car to (a) the left, (b) the right.
5. While waiting to make a left turn, have your wheels pointing (a) straight ahead, (b) turned to the left.
6. Your maximum nighttime seeing distance with headlights on upper beam on an unlighted road is (a) 255 feet, (b) 366 feet, (c) 488 feet.
7. When approaching an intersection, look first to the (a) right, (b) left.
8. In negotiating curves, slow down (a) before you reach, (b) after you are in, the curve.

Part II. True-False. Circle T if statement is true; F if it is false.

1. The federal government has relatively little concern with traffic safety.
T F
2. Reaction distance is the number of feet your car travels between the time your foot hits the brake and the point at which you are able to bring your car to a halt.
T F
3. After the stop light turns green, you should count slowly to three before you go.
T F

Exhibit 4
(continued)

4. Mystery crashes are accidents over which the drivers involved had little or no control.
T F
5. If your right wheel drops off the pavement while you are traveling at high speed, brake and steer sharply to the left.
T F
6. If a tire blows, don't brake, but hold the wheel steady and coast to a spot that is safely off the road.
T F
7. If you see a car coming at you headon, signal him with your lights and horn and then swerve to the left to avoid a collision.
T F
8. The best rule to follow is to always give the pedestrian the right-of-way.
T F

During the first 10 cycles of the DDC, the examination was given only as a post-test. The mean number of items correct here was 14.0 (S.D.=2.0) which is higher than the post-test mean of 13.59 for those who took both the pre and post tests. We can, therefore, eliminate a testing effect as the reason for the better post-test performance among those who took the pre and post-tests.

The percentage of students answering each item correctly on the pre and post-test was as follows:

<u>Question</u>	<u>Percent Correct</u>	
	<u>Pre-Test</u>	<u>Post-Test</u>
Part I		
1	46.0	68.7
2	58.7	88.4
3	94.2	98.3
4	81.9	91.0
5	63.9	95.1
6	26.3	57.8
7	57.9	82.3
8	96.1	98.4
Part II		
1	87.2	95.1
2	53.0	71.2
3	59.9	88.3
4	40.5	62.8
5	69.3	84.5
6	83.1	95.6
7	66.3	83.2
8	90.5	98.7

These figures show that the percentage of correct responses was greater for all items on the post-test and that the magnitude of the improvement was generally large.* Thus, as with the GES test, the post-test score improvement extended to all items in the test.

* Because of the relatively large sample size, all of the post test percentages are significantly greater than the corresponding pre-test values at $P < .01$.

3. Subsequent Violations and Accidents

As noted earlier, one of the two major evaluation issues concerning the GES and DDC courses as employed in the AAD system, is whether the subsequent violation and accident records of those assigned to schooling is better than that of comparable drivers who were not assigned. This issue is explored in the following material.

1. GES

Selection of the GES control group began with the class roster for cycle six which was conducted on October 23, 1975 and concluded with cycle 80 held on May 11, 1977. During this time, 2,062 persons were assigned to the GES experimental group and 772 persons were assigned to the GES control group. An additional 423 persons were assigned to GES as part of the by-pass process noted earlier.

Excluded from these figures are a small number of cases where a correct driver abstract could not be obtained. Also excluded are persons who were assigned to both GES and DDC, as occasionally occurred by intentional assignment, and somewhat more frequently because of multiple input violations. In addition, drivers were included in the experimental or control groups only once. For example, a control group driver who had a subsequent violation and was again referred for driver retraining, did not enter the experimental or control group for the second event. Only the original referral is considered in the present study. Similarly, a driver in the GES experimental group who recidivated and was subsequently assigned to DDC, is considered only with regard to GES (i.e., did not become part of the DDC experimental or control groups).

a) Equivalence of Experimental and Control Groups

1) Subsequent Exposure Period

Depending on when drivers were assigned to the GES experimental and control groups, they may have had as many as 23 months or as few as four months of subsequent exposure in which possible traffic violations could have occurred and been recorded in the AAD data base. The median experimental group driver entered during GES cycle 48 held on July 29, 1976 and, therefore, had approximately 14 months of subsequent exposure.

By comparison, the median control group driver was assigned from the class roster for GES cycle 44 held on June 30, 1976. Thus, the control group

may have been assigned proportionately earlier than the experimental group.

As noted before, the random selection process was designed to assign 25 percent of those screened to the control group. The 772 persons actually assigned to the control group represent 27.2 percent of those included in the present study. The 772-2,062 division between the number of control and experimental subjects is not significantly different from the 708-2,126 split that would have resulted if the exact 25-75 percent division had occurred ($\chi^2=3.59, d.f.=1, P>.05$). However, the chi-squared test outcome approaches statistical significance.

Casting the number of experimental and control subjects entering on a class by class basis into cumulative frequency distributions, and testing the distributions using the Kolmogorov-Smirnov two-sample test, also showed that the distributions approach but do not reach statistically significant differences (Maximum $D=.053$ versus a D of $.057$ significant at $P=.05$).

During the first year of operation of the retraining program, there were 387 control drivers and 944 experimental drivers available for study. The control group figure represents 29 percent of those included in the study during year one. This actual division during year one is significantly different from the expected 333-998 split if a 25-75 percent assignment had been exactly achieved ($\chi^2=5.60, d.f.=1, P<.05$).

There are at least two possible factors which may have contributed to the differential exposure of the experimental and control groups. These include a chance outcome from the random selection process and differential removal from the study because of missing abstracts and multiple referrals. Whatever the case may be, the expectation is that there are more recidivism opportunities for the control group. As will be seen shortly, this is not of practical concern in the present case.

2) Prior Traffic Violations

Table 1 shows the distribution of the number of violations by drivers in the GES experimental and control groups prior to the violation which led to the hearing and retraining referral.

TABLE 1
 Number of Prior Traffic Violations among GES
 Experimental and Control Group Members

Number of Violations	Percent of Experimental Group (N=2062)	Percent of Control Group (N=772)
None	25.0%	25.1%
One	25.0	25.5
Two	25.0	27.1
Three	14.2	13.7
Four	7.7	6.7
Five more more	3.1	1.8

The distributions underlying the figures in the table are not significantly different ($\chi^2=5.42, d.f.=5, P>.30$). Thus, the GES experimental and control groups are equivalent in terms of prior violation record.

In the AAD system, summonses for certain traffic violations may be paid by mail if the driver has not had another violation in the previous 12 months. Persons who have summonses adjudicated at hearings are those who are ineligible to pay by mail (approximately 56 percent of all hearings), who committed an offense that cannot be paid by mail (42 percent), or who requested a hearing (two percent).

The figures in Table 1 show that 50 percent of the experimental group had no more than one other violation prior to the one leading to the input hearing, while the other 50 percent had two or more prior violations. A random sample of 700 driver abstracts, drawn from among those for all persons who attended an AAD hearing during the first year of operation, provided the following distribution of number of prior violations:

<u>Number of Violations</u>	<u>Percent of Sample</u>
None	42.9%
One	28.1
Two	14.1
Three	5.7
Four	4.4
Five or more	4.7

This distribution was found to be significantly different from that of the GES experimental group in Table 2 ($\chi^2=129.59, d.f.=6, P<.01$). A comparison of the figures indicate that those referred to GES retraining were more likely to have had a prior violation and tended to have more prior violations, than the total population adjudicated at hearings.

As noted earlier, several hundred persons bypassed the random selection process and were directly entered into a GES class. An analysis conducted after the first year of operation showed that the distribution of prior violations of the GES by-pass group was similar to the experimental group ($\chi^2=6.34, d.f.=5, P>.20$). It was also noted that the frequency of by-pass designations increased throughout the year and reached the point where almost as many persons were given this designation as were undergoing the random selection process. During the second year of operation the frequency of by-pass designations was reduced and essentially eliminated by mid year.

3) Prior Traffic Accidents

Because of problems and delays experienced in the development of the AAD data base, information on the accident experience of motorists appearing for hearings generally was not available to the Hearing Commissioners during the time period of the present study. Accident information, therefore, was not a factor in the decision regarding whether to refer an individual to driver retraining.

Analysis of the driving records employed herein (which contained accident records for 1974, 1975 and 1976) for the GES experimental and control

groups selected prior to January 1, 1977* showed that 30 percent of the experimental group had at least one accident in 1974, 1975 or 1976 prior to their selection date, while 29 percent of the control group did so. The proportions in both groups having, and not having prior accidents is not significantly different ($x^2=0.234, d.f.=1, P>.50$).

4) Sex and Age

Of the 2,062 persons in the GES experimental group, 223 (10.8 percent) were females, while 82 of 772 (10.6 percent) persons in the control group were females. These figures show that the random selection process assigned females on a proportionately correct basis between the two groups.

The mean age (at last birthday) of the GES experimental group was 23.44 years while the mean age of the control group was 24.22 years. The difference between means is not significantly different ($t=.521$).

b) Subsequent Violations

Within the present evaluation design, experimental control exists at the point the random assignment process was applied to each class. Accordingly, the appropriate class meeting date was used as the starting time for tabulating subsequent violations and accidents.

It is important to note that some experimental group members may not have completed the class to which they were assigned. For example, some persons requested to be rescheduled and completed a later session. Also, about nine percent of those scheduled to attend a retraining class had their licenses suspended for failure to comply. While over one-half of these persons subsequently attended and had the suspension lifted, there were some 190 persons assigned to attend GES or DDC who had not done so within the time frame of the present study.

The rationale for comparing the experimental group with the control group, without regard for whether the experimental group received treatment in

* Accident data were tabulated only for the individuals where a subsequent accident could be recorded (i.e., were assigned prior to 1977).

a timely manner, is that the control group is expected to have members who would behave in the same way had they been assigned to the attend group. That is, a valid comparison for those who completed treatment as assigned would require some form of adjustment to the control group to eliminate those persons who would not have promptly completed treatment had they been selected to attend. Such an adjustment would have to be made based on what is known about the experimental group. Assuming that such an adjustment could be perfectly done, it is suggested that subsequent statistical tests would yield the same outcome (except for reduced sample size) as would the tests which included the total experimental and control groups. That is, the correct decision regarding the null hypothesis would be made in either case. Comparison at the overall experimental and control group level has been employed in comparable situations, for example, by Preusser, Ulmer and Adams (1976) and by Peck (1976).

In order to determine the subsequent violation frequency of the GES experimental and control groups, the material in the relevant driver history abstracts was tallied. An individual was counted as a violation recidivist if he had a recorded violation committed on a date after the GES class date for which he was assigned to the experimental or control group.

The basic outcome was as follows:

	GES Experimental Group	GES Control Group
Number of Recidivists	702	239
Number of Non-Recidivists	1,360	533
$\chi^2=2.41, d.f.=1, P>.10$		

These figures translate to 34.0 violation recidivists per 100 drivers in the experimental group and 31.0 recidivists per 100 divers in the control group. As noted in the figures above, the recidivism rates of the two groups are not significantly different.

Because of the possibility of differential exposure and because the effects of treatment, if any, may be expected to be most pronounced shortly thereafter, the subsequent violation data were retabulated to only include events which occurred within six months of individuals' assignment dates. The results were as follows:

	GES Experimental Group	GES Control Group
Number of Recidivists Within Six Months	453	121
Number of Non-Recidivists Within Six Months	1,609	651
<hr/>		
$\chi^2=13.78, d.f.=1, P<.01$		

These figures translate to 22 recidivists per 100 experimental group members and to 15.7 recidivists per 100 drivers in the control group. As noted, the recidivism rates within six months are significantly different and contrary to a positive effect of the GES course.

1) Recidivating Event

Among the recidivists in the GES experimental group, speeding was the recidivating violation in 62 percent of the cases, another moving violation was the event in 22 percent of the cases, while other violations (e.g., equipment) accounted for 16 percent of the recidivism events. The comparable figures for the control group were: speeding - 66 percent, other moving violations - 21 percent, other violations - 14 percent. The distributions by type of subsequent violations do not differ significantly ($\chi^2=1.17, d.f.=2, P>.50$).

2) Recidivism and Prior Violations

Table 2 shows the distributions of the number of prior violations of the recidivists in the GES experimental and control groups. The distributions are not significantly different ($\chi^2=4.28, d.f.=5, >.30$).

TABLE 2
 Prior Violations of the GES Experimental
 and Control Group Recidivists

Number of Prior Violations	Experimental Group Recidivists (N=702)	Control Group Recidivists (N=239)
None	22.0%	23.5%
One	25.1	21.0
Two	25.0	30.0
Three	16.8	16.9
Four	7.8	6.2
Five or more	3.3	2.5

c) Subsequent Accidents

As noted earlier, accident data were available for the years 1974, 1975 and 1976. Therefore, it was not possible to check subsequent accident records for persons assigned in 1977. This had the effect of reducing the usable experimental group by 465 persons and the control group by 151 persons. Also, the subsequent exposure time regarding accidents was considerably less than for subsequent violations. For example, drivers assigned early in the program would have had less than 18 months of subsequent possible accident exposure, while those entering late in 1976 would have had virtually no exposure at all. In terms of subsequent accidents, the median driver had about seven months of exposure time.

Tabulation of the number of persons who had a subsequent traffic accident among the GES experimental and control group members yielded the following:*

* Data are based on accident reports filed as required by state law for personal injury and property damage.

	<u>Experimental Group</u>	<u>Control Group</u>
Subsequent Accident	160	65
No Subsequent Accident	1,437	556
	<hr/> x ² =0.10, d. f. =1, P>.70	

The subsequent accident rate for the experimental group was 11.1 persons having an accident per 100 drivers, and was 10.5 per 100 drivers in the control group. No significant difference exists between the two groups.

A total of 111 of the experimental group had their accident within the first six months of exposure while 43 of the control group did so. The "within six months" accident rates were 5.4 and 5.6 per 100 drivers respectively for the experimental and control groups. The accident experience within six months exposure is not significantly different between the two groups (x²=.041, d. f. =1, P>.50).

2. DDC

During the period of the present study, a total of 1,021 persons were assigned to the DDC experimental group and 373 persons were assigned to the control group. An additional 249 persons were assigned to DDC directly, bypassing the random selection process. As with GES, these figures exclude a small number of cases where a correct driver history was not obtained, the second entry of violation recidivists and persons assigned to both GES and DDC.

The random selection process began with class cycle 7, which had its first meeting on November 3, 1975, and continued until cycle 56 which first met on June 13, 1977. The drivers involved, therefore, may have had between three and one-half and 22 months of exposure as far as possible subsequent violations are concerned.

a) Equivalence of Experimental and Control Groups

1) Subsequent Exposure Period

The median DDC experimental group driver entered in cycle 34, which began on November 16, 1976, and therefore, had about 10.5 months of subsequent possible violation exposure. By

comparison, the median control driver entered in cycle 30 held on October 13, 1976. Thus, as with GES, the DDC control group may have had greater exposure.

The 373 persons in the control group represent 26.8% of those included. The actual division between control and experimental groups is not significantly different from the expected values of an exact 25-75 percent split ($\chi^2=1.17, d.f.=1, P>.20$).

However, when just the first year of operation is examined, the control members represent 32.5 percent (136 of 419) of those included in the study. The year one control-experimental split is significantly different from the expected values ($\chi^2=5.60, d.f.=1, P<.05$). This outcome is similar to that found for GES.

Analysis of the cumulative frequencies of entry into the experimental and control group on a class-by-class basis using the Kolmogorov-Smirnov two-sample test, also shows the distributions to differ significantly ($D=.104, N_1=1021, N_2=373, P<.01$). Thus, exposure of the two groups is statistically different, with the control group having the greater exposure.

2) Prior Traffic Violations

The distributions of prior traffic violations among the DDC experimental and control group drivers are indicated in Table 3. The figures underlying the distributions are not significantly different ($\chi^2=6.69, d.f.=6, P>.30$). Thus, as with GES, the prior driving violation histories of the DDC experimental and control groups are essentially equivalent. Comparing the data in Table 3 for DDC with that in Table 1 for GES, however, shows that the prior violation records of the individuals assigned to DDC were far more extensive than the GES group. For example, where 75 percent of the GES experimental group had no more than two prior violations, only about 28 percent of the DDC experimental group had as few prior violations. At the other extreme, 23 percent of the DDC group had five or more prior violations compared to three percent of the GES group. These figures confirm the expectation that DDC would be selected for those with the more extensive records.

TABLE 3
 Number of Prior Traffic Violations Among DDC Experimental
 and Control Group Members

Number of Violations*	Percent of Experimental Group (N=1,021)	Percent of Control Group (N=373)
Less than two	7.6%	8.7%
Two	20.6	25.5
Three	28.0	25.7
Four	20.3	20.9
Five	11.5	10.3
Six	5.8	3.8
Seven or more	6.0	5.1

* Excludes the input violation.

An analysis conducted after the first year of operation showed that the prior violation distribution of the DDC by-pass group did not differ significantly from the DDC experimental group ($\chi^2=3.26, d.f.=5, P>.50$). This finding was comparable to that for GES.

3) Prior Traffic Accidents

Among the DDC experimental group members selected prior to January 1, 1977, 36 percent had at least one accident in 1974, 1975 or 1976 prior to their selection date, while 38 percent of the control group did so. The accident - no accident distributions of the experimental and control groups are not significantly different ($\chi^2=.15, d.f.=1, P>.70$).

4) Sex and Age

Of the 1,021 persons in the experimental group, 80 (5.9 percent) were females, while 22 of 373 (also 5.9 percent) persons in the control group were females. Thus, as with GES, females were assigned in the same proportions to the DDC experimental and control groups.

The mean age (at last birthday) of the DDC experimental group was 24.13 years (SD=6.15) while the mean for the control group was 24.66 years (SD=6.75). The difference between means is not statistically significant ($t=1.34$).

b) Subsequent violations

It was noted earlier that the subsequent exposure of the DDC control group was somewhat greater than that of the experimental group. In the absence of other factors, the expectation, therefore, is that the overall recidivism rate of the control group would be greater than that of the experimental group.

Actual tabulation of violation recidivism for the DDC subjects yielded the following:

	<u>DDC Experimental Group</u>	<u>DDC Control Group</u>
Number of Recidivists	388	136
Number of Non-Recidivists	633	237
<hr/>		
$\chi^2 = .276, d.f. = 1, P > .50$		

These figures translate to 38.0 recidivists per 100 drivers in the experimental group and 36.5 recidivists per 100 drivers in the control group. No significant difference exists between these rates.

Tabulation of recidivism occurring within the first six months of exposure showed the following:

	<u>DDC Experimental Group</u>	<u>DDC Control Group</u>
Number of Recidivists Within Six Months	258	90
Number of Non-Recidivists Within Six Months	763	283
$x^2 = .190, d.f. = 1, P > .50$		

The figures show no significant difference between the groups. The recidivism rates are -- experimental group: 25.3 per 100 drivers; control group: 24.1 per 100 drivers.

1) Recidivating Event

The distributions of the types of violations involved in the recidivating events for the DDC experimental and control groups were as follows:

	<u>Experimental</u> (N=388)	<u>Control</u> (N=136)
Speeding	61.4%	58.1%
Other Moving Violations	23.8%	27.9%
Other Violations	14.8%	14.0%
$x^2 = .91, d.f. = 2, P > .50$		

The figures show the majority of recidivating events to have been speeding. There is no significant difference between the distributions of the two groups.

2) Recidivism and Prior Violations

Table 4 contains the distributions of prior violations for the DDC experimental and control group recidivists. The distributions in the table are significantly different ($x^2 = 10.70, d.f. = 4, P < .05$), suggesting that the DDC experimental group recidivists had somewhat poorer driving histories than the control group recidivists.

TABLE 4
 Prior Violations of the DDC Experimental and
 Control Group Recidivists

Number of Prior Violations	Experimental Group Recidivists (N=388)	Control Group Recidivists (N=136)
Less than Three	22.1%	25.2%
Three	22.9	32.4
Four	20.5	20.7
Five	16.6	12.9
Six or More	17.9	8.6

c) Subsequent Accidents

As with GES, no 1977 accident data were available for the DDC subjects. This had the effect of reducing the usable experimental group by 425 persons and the control group by 138 persons.

Tabulation of the number of drivers having a subsequent accident among the DDC experimental and control group members resulted in the following:

	<u>Experimental Group</u>	<u>Control Group</u>
Subsequent Accident	61	23
No Subsequent Accident	436	212

$$\chi^2 = .97, d.f. = 1, P > .30$$

The subsequent accident rate for the experimental group is 12.3 persons having an accident per 100 drivers and 9.8 per 100 drivers in the control group. As noted, the figures above are not significantly different.

In terms of persons having accidents within the first six exposure months, the rate for the experimental group was 9.3 per 100 drivers and 6.8 per 100 drivers for the control group. The 2 x 2 table experimental vs. control by accident vs. no accident within six months is not statistically significant ($\chi^2=1.23, d.f.=1, P>.20$).

IV. DISCUSSION

The results of the present study have shown that both the GES and DDC courses bring about measurable increases in knowledge among attending students. However, there is no evidence that the courses contributed to safer driving, as measured by subsequent traffic violation and accident rates.

The procedures employed in the study created experimental and control groups which were essentially equivalent in terms of age, sex and prior traffic accidents and violations. However, the control groups for both GES and DDC tended to be selected proportionately earlier and therefore, had somewhat greater subsequent exposure.

The exposure factor, plus the occurrence of license suspension among a few of the experimental group for failure to comply, would be expected to favor the recidivism rates of the experimental groups. As the study results indicate, this was not the case.

The failure to find a positive effect of the retraining schools on driving records is contrary to the general expectation from most prior studies, at least with regard to violations. Thus, it may be that the use of retraining courses as a sanction in traffic case adjudication creates different attitudes among the persons involved, than when the courses are applied as part of a subsequent record review. It may also be that the courses were not well suited to the needs of those assigned. That is, a lack of information regarding safe driving practices may not be a primary cause of the accumulation of accidents and violations among those involved.

In Rhode Island, there are over 500,000 licensed drivers. The total AAD data base contains approximately 295,500 violations committed by 199,200 persons (including out-of-state residents) during the period from early 1973 to mid 1977. Approximately 89 percent of the persons in the data base had only one or two violations, while the remaining 11 percent had three or more violations. The majority of the motorists included in the present study, therefore, were drawn from a small subset of traffic violators and from an even smaller subset of drivers in general. It is possible, therefore, that many in the study groups are atypical in their attitudes toward safe driving and may not be responsive to remediation through educational efforts.

It was seen in the previous analyses, that the subsequent violation and accident records of the control groups tended to be better than that of the experimental groups, although generally not statistically so. In the case of GES, however, the violation

recidivism within six months exposure was significantly less in the control group than in the experimental group. That is, the course appears to have had a negative effect on those assigned.

Such an outcome is contrary to the logical expectation of the benefits of educational offerings. It is not an unprecedented finding in the traffic safety field, however.

Pelz (1976), for example, conducted a study of the effect of driving workshops (non-directive discussions stimulated by trigger films and personal experiences) on the subsequent driving records of male high school students. The findings showed a significantly higher accident rate in the first subsequent exposure year and then a decline. Traffic violations also increased, but not significantly so. Pelz suggests that the initially poorer performance came from an "alienated" subgroup in his study, i.e., students with poor academic records who were older than their classmates.

Schuster (1974) examined the effects of various official actions on the subsequent driving records of problem drivers. This author found that manipulating the severity of official action led to more accidents among drivers who received less than the normal action when they had previously received a more severe action (e.g., a warning letter following probation) than among drivers receiving the normal or higher than normal action. Schuster also reports a tendency for drivers receiving more than the normal action to have higher subsequent violation rates.

The Pelz and Schuster studies suggest that personality factors and individuals' perceptions regarding an intervention can play a part in the level of subsequent driving events. Many others have examined the topic of maladjustment and driving behavior, c.f. Carlson and Klein (1970) and McGuire (1976).

That personality/adjustment factors may be operating in the present study, cannot be directly examined given the data available. The drivers in the GES and DDC groups tended to be young and were accumulating substantial records of accidents and violations. In this regard, they may contain individuals similar to the anti-social individuals with poor driving records identified in other studies. As Carlson and Klein conclude, "In several respects, the young traffic offender closely resembles the juvenile delinquent, for whom a wide variety of narrowly focused prophylactic, therapeutic, or rehabilitative programs have failed...If the parallel is a legitimate one, courses in driver education as they are currently constituted will be no more effective in reducing violations than police-sponsored basketball teams are effective in reducing delinquency, nor will fines, license revocations, and jail sentences prove any more effective than reformatory sentences in reducing recidivism". (Carlson and Klein (1970)).

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