

#### ABSTRACT

## A STUDY OF THE DRIVER RECORDS OF CALIFORNIA PUBLIC SECONDARY SCHOOL DRIVER INSTRUCTION TEACHERS

by Ed F. N. Lorenzen

The study sought to determine the quality of the official driver records of public secondary school driver instruction teachers in California for purposes of determining the advisability or necessity for more precise evaluation and surveillance of the driver record for initial or continued teacher certification and assignment. Three different survey instruments were used to gather data. Specific data obtained in the study included (a) driver record information by age, sex, and marital status, and (b) professional information concerning academic background, phase of instructional assignment, and membership in specific professional organizations. The driver record for the three year period immediately prior to the investigation was provided by the State Department of Motor Vehicles for 4,558 driver instruction teachers with full- or part-time teaching assignments during the 1966-67 school year in 334 California public secondary school districts. Mean numbers of accidents, convictions, and negligent operator point counts of the driver instruction teachers were statistically compared to normative data on the California general driving population as reported in the <u>1964 California Driver Record Study</u>. Driver instruction teachers had significantly lower mean numbers of accidents, convictions, and negligent operator point counts than did the general driving population. Female driver instruction teachers, however, had significantly higher means than did their counterparts in the general driving population. Judgment was suspended on the rejection of the null hypothesis of no difference between driver records of the two populations.

Significant differences were established at the 1 per cent level of confidence between mean numbers of accidents, convictions, and negligent operator point counts in terms of (a) age, (b) marital status, (c) highest academic degree held, (d) phase of instructional assignment, and (e) traffic density within the county of employment. Non-significant differences occurred in terms of (a) sex, (b) major field of academic specialization, and (c) professional affiliation. Physical education undergraduate majors were found to have significantly poorer driver records than did subjects with other specializations. A total of 41 driver instruction teachers could legally be classified as prima-facie negligent operators; 15 were convicted of a major traffic violation during the three year period immediately prior to the investigation, e.g. drunk driving, hit-and-run, and driving after their driver license had been suspended or revoked; 35 teachers had been convicted of these major violations and 21 had had their driver license suspended or revoked at some time previous to the three year period under investigation.

Conclusions of the study were: (1) there is ample evidence to warrant more precise and critical evaluation and surveillance of driver records for purposes of teacher certification and assignment; and (2) there is a positive relationship between driver record and academic background, phase of instructional assignment, age, sex, and marital status. Recommendations for improvement of the statewide driver instruction program were directed to (a) the California Driver Education Association, (b) the State Board of Education, (c) teacher preparation institutions, (d) public secondary school district administrators, and (e) the driver instruction teachers. Implications for future research were cited.

National implications of this study are in direct proportion to the degree that the 4,558 California public secondary school teachers are representative of the nationwide population of driver education and driver training teachers.

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## A STUDY OF THE DRIVER RECORDS OF CALIFORNIA PUBLIC SECONDARY SCHOOL DRIVER INSTRUCTION TEACHERS

By

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## A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

### DOCTOR OF PHILOSOPHY

College of Education

ED FAY NOLAN LORENZEN

#### ACKNOWLEDGMENTS

This research study was made possible by a graduate fellowship and research grant from the Automotive Safety Foundation. I owe a great debt of gratitude to that organization, and in particular to Dr. Charles H. Hartman for his personal interest and encouragement in the development of the study. Appreciation is also extended to Mr. Al Evans and the Triple "E" Corporation for also providing financial assistance during the early stages of the investigation.

The official driver record data reported in this research study were provided by the California State Department of Motor Vehicles. I am deeply indebted to Mr. Ronald Thunen and the members of his staff for the invaluable assistance in obtaining the data so vital to this study. I wish also to acknowledge the counsel given by Ronald Coppin and Raymond Peck and the use of data reported in the 1964 California Driver Record Study.

Sincere appreciation is also extended to the California State Department of Education and the many hundreds of California public secondary school administrators who participated in the

iii

questionnaire survey to provide essential identification and professional information concerning driver instruction teachers. Special acknowledgment is given to Dr. Carl Larson and Dr. John R. Eales of the State Department of Education.

My gratitude also extends to all of those who have counseled me toward completion of this research study. I count among my best supporters those who have constructively criticized. Grateful appreciation is extended to the members of my Doctoral Committee at Michigan State University -- Dr. Robert O. Nolan (Chairman), Dr. Dale Alam, Dr. Robert E. Gustafson, and Dr. William A. Mann -- for their hours of counsel and guidance throughout the course of the research study.

Finally, I would be greatly remiss if I did not acknowledge with loving appreciation the invaluable contribution made to this research study by my wife, Edine, through her unceasing patience and encouragement during the many months of my graduate work.

The completion of this investigation has provided me with a unique and inspiring experience which I shall never forget.

iv

## TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iii
LIST OF TABLES	viii
LIST OF FIGURES	xiii
LIST OF APPENDICES	xiv
Chapter	
I. THE PROBLEM	1
Background of the Problem	1 9 12 14 18 18
II. A REVIEW OF THE 1964 CALIFORNIA DRIVER RECORD STUDY	21
Purpose	21 22
Description	23
Negligent Operator Count by Sex	24
Marital Status	28
of Convictions and Accidents	46 47

Chapter

. 50 . 52 . 54 . 61 . 64
. 52 . 54 . 61 . 64
. 54 . 61 . 64
. 61 . 64
. 64
. 07
. 66
68
. 00
. (1
. 80
. 99
. 108
. 111
. 112
. 120
. 122
. 124
. 127
. 130
. 130
. 132
. 137
139
141
145

# BIBLIOGRAPHY . . . . . . . . 147 APPENDICES . . . . . . . . . . 151

Page

## LIST OF TABLES

Table		Page
1.	1964 California Driver Record Study: Percentage Distribution of Licensees by Total Number of Accidents and Convictions1964	25
2.	1964 California Driver Record Study: Percentage Distribution of Licensees by Negligent Operator Point Count and Sex	26
3.	1964 California Driver Record Study: Mean Number of Counts by Sex for Basic Driver Record Components	27
4.	1964 California Driver Record Study: Percentage Distribution of Male Licensees by Age and Total Number of Reported Accidents	30
5.	1964 California Driver Record Study: Percentage Distribution of Female Licensees by Age and Total Number of Reported Accidents	31
6.	1964 California Driver Record Study: Average (Mean) Number of Total Accidents by Age, Sex, and Marital Status	32
7.	1964 California Driver Record Study: Percentage Distribution of Male Licensees by Age and Total Convictions	35
8.	1964 California Driver Record Study: Percentage Distribution of Female Licensees by Age and Total Convictions	36
9.	1964 California Driver Record Study: Average (Mean) Number of Total Convictions by Age, Sex, and Marital Status	37

$\mathbf{P}$	а	g	е
	a	ĸ	C

10.	<u>1964 California Driver Record Study</u> : Average (Mean) Number of Double Count Convictions by Age, Sex, and Marital Status	39
11.	1964 California Driver Record Study: Percentage Distribution of Male Licensees by Age and Negligent Operator Point Count + Moving FTA's .	41
12.	1964 California Driver Record Study: Percentage Distribution of Female Licensees by Age and Negligent Operator Point Count + Moving FTA's .	42
13.	1964 California Driver Record Study: Average (Mean) Number of Negligent Operator Points + Moving FTA's by Age, Sex, and Marital Status	43
14.	1964 California Driver Record Study: Percentage Distribution of Convictions by TypeTotal Sample	45
15.	Driver Instruction Teachers: Percentage Distribution of Licensees by Total Number of AccidentsTotal Samples	71
16.	Driver Instruction Teachers: Percentage Distribution of Licensees by Total Number of ConvictionsTotal Samples	72
17.	Driver Instruction Teachers: Percentage Distribution of Male Licensees Between the Ages of 21-65 by Total Number of Accidents	76
18.	Driver Instruction Teachers: Percentage Distribution of Male Licensees Between the Ages of 21-65 by Total Number of Convictions	77
19.	Driver Instruction Teachers: Percentage Distribution of Male Licensees Between the Ages of 21-65 by Total Number of Negligent	70
	Operator Points + Moving FIA'S	10

Ń

20.	Driver Instruction Teachers: Percentage	
	of Recorded Accidents	80
21.	Driver Instruction Teachers: Percentage Distribution by Age and Total Number	09
	of Recorded Convictions	83
22.	Driver Instruction Teachers: Percentage Distribution by Age and Negligent Operator Point Counts + Moving FTA's	85
23.	Driver Instruction Teachers: Percentage Distribution by Sex and Total Number of Recorded Accidents	88
24.	Driver Instruction Teachers: Percentage Distribution of Female Licensees Between the Ages of 21-65 by Total Number of Accidents.	9 <b>0</b>
25.	Driver Instruction Teachers: Percentage Distribution by Sex and Total Number of Recorded Convictions	92
26.	Driver Instruction Teachers: Percentage Distribution of Female Licensees Between the Ages of 21-65 by Total Number of Convictions	9 <b>3</b>
27.	Driver Instruction Teachers: Percentage Distribution by Sex and Negligent Operator Point Counts + Moving FTA's	95
28.	Driver Instruction Teachers: Percentage Distribution by Age and Negligent Operator Point Counts + Moving FTA's (Males)	9 <b>6</b>
29.	Driver Instruction Teachers: Percentage Distribution by Age and Negligent Operator Point Counts + Moving FTA's (Females)	97

30.	Driver Instruction Teachers: Percentage Distribution by Sex and Major (Double-	
	count) Convictions	99
31.	Driver Instruction Teachers: Percentage Distribution by Marital Status and Total Number of Recorded Accidents	100
32.	Driver Instruction Teachers: Percentage Distribution by Marital Status and Total Number of Recorded Convictions	103
33.	Driver Instruction Teachers: Percentage Distribution by Marital Status and Major (Double-count) Convictions	104
34.	Driver Instruction Teachers: Percentage Distribution by Marital Status and Negligent Operator Point Counts + Moving FTA's	106
<b>35.</b> .	Driver Instruction Teachers: Percentage Distribution of Convictions by TypeTotal Sample	107
36.	Driver Instruction Teachers: Summary of Driver Record Variables by Sex and Critical Ratio Test Results	113
37.	Driver Instruction Teachers: Summary of Driver Record Variables by Marital Status and Critical Ratio Test Results	114
38.	Driver Instruction Teachers: Percentage Distribution of Negligent Operator Point Counts + Moving FTA's by Degree Earned	116
39.	Driver Instruction Teachers: Frequency and Percentage Distributions of Undergraduate Majors	117

40.	Driver Instruction Teachers: Percentage
	Distribution of Negligent Operator Point
	Counts + Moving FTA's by Undergraduate
	Majors
41.	Driver Instruction Teachers: Frequency and
	Percentage Distributions of Graduate
	<b>Majors</b>
42.	Driver Instruction Teachers: Percentage
	Distribution of Negligent Operator Point
	Counts + Moving FTA's by Graduate
	Majors
43.	Driver Instruction Teachers: Percentage
	Distribution of Negligent Operator Point
	Counts + Moving FTA's by Phase of
	Instructional Assignment
44.	Driver Instruction Teachers: Percentage
	Distribution of Negligent Operator Point
	Counts + Moving FTA's by Professional
	Affiliation
45.	Driver Instruction Teachers: Correlation
	Between Driver Record Variables and
	Traffic Density

## LIST OF FIGURES

Figure		Page
1.	Mean Numbers of Accidents, Convictions, and Negligent Operator Point Counts for Driver Instruction Teachers and the General Driving Population	. 73
2.	Driver Instruction Teachers: Average (Mean) Number of Total Accidents by Age	. 81
3.	Driver Instruction Teachers: Average (Mean) Number of Total Convictions by Age	. 82
4.	Driver Instruction Teachers: Average (Mean) Number of Negligent Operator Point Counts by Age	. 86
5.	Mean Numbers of Accidents by Sex for Driver Instruction Teachers and the General Driving Population	. 87
6.	Mean Numbers of Convictions by Sex for Driver Instruction Teachers and the General Driving Population (Between the Ages of 21-65)	. 91
7.	Mean Numbers of Negligent Operator Point Counts by Sex for Driver Instruction Teachers and the General Driving Population (Between the Ages of 21-65)	. 98
8.	Driver Instruction Teachers: Mean Numbers of Accidents, Convictions, and Negligent Operator Point Counts by Marital Status	. 101
9.	Mean Numbers of Negligent Operator Point Counts by Marital Status for Driver Instruction Teachers and the General Driving Population	. 102

## LIST OF APPENDICES

Appendix		Page
Α.	"DATA CONCERNING INSTRUCTION IN DRIVER EDUCATION AND DRIVER TRAINING IN THE CALIFORNIA PUBLIC HIGH SCHOOLS, 1966-67 SCHOOL YEAR"	151
В.	DRIVER INSTRUCTION CERTIFICATION SURVEY FORM WITH COVERING LETTERS OF TRANSMITTAL	154
C.	REQUEST FOR DRIVER RECORD INFORMATIONDEPARTMENT OF MOTOR VEHICLES FORM DL-254	160
D.	DATA CODING SHEET	162
Ε.	CALIFORNIA VEHICLE CODE SECTION 12810	164
F.	CALIFORNIA VEHICLE CODE VIOLATION CATEGORIES	166
G.	TRAFFIC DENSITY ESTIMATES BY COUNTY	171

### CHAPTER I

#### THE PROBLEM

The elements of the problem under investigation in this study included: (a) the background of the problem, (b) the need for the study, (c) the purpose of the study, (d) the definition of terms, (e) the research hypothesis and problem, and (f) an overview of the investigation.

#### Background of the Problem

Historically, education in the United States has placed great emphasis upon the necessity for formal instruction for all children in those activities that will enable them to effectively interact and contribute to the adult community. It has been recognized that the family can and does provide adequate educational experiences in many fundamental areas, but that there are other areas of social importance that do not lend themselves to adequate learning through imitation of older members of the family. The underlying theory for this investigation was that through early exposure to formal educational experiences, under the guidance and direction of competent, qualified

educators, the development of acceptable and successful behavior in adult society can be accomplished. In this light, driver and traffic safety education activities in our elementary and secondary school systems appear critical. Accidents--traffic collisions in particular-are the leading cause of death to teen-agers, and the National Safety Council claims that teen-agers are involved in a disproportionate number of fatal, injury, and property damage traffic collisions. <sup>1</sup> Safety educators, however, continue to claim marked success in the development of safe traffic behavior through systematic formal instruction culminating in completion of a course in driver education and driver training in the secondary school.

In a speech that was reprinted in the <u>Harvard Graduate</u> <u>School of Education Association Bulletin</u>, Lawrence A. Cremin made the statement, "... today, seven years after Sputnik, the most rapidly growing area of the secondary school curriculum is not physics, not chemistry, not mathematics, but driver education."<sup>2</sup> The comment tends to reflect a continuing controversy among educators as to the legitimacy of driver education within the secondary

<sup>&</sup>lt;sup>1</sup>National Safety Council, <u>Accident Facts--1967 Edition</u> (Chicago: The Council, 1967), p. 54.

<sup>&</sup>lt;sup>2</sup>Lawrence A. Cremin, "The Education of the Public," <u>Harvard Graduate School of Education Association Bulletin,</u> Volume IX, Fall 1964, #3, p. 4.

school curriculum. While educators argue the relative merits of the instructional offering, however, public and legislative demands have generated rapid expansion of traffic safety education activities within public secondary school systems throughout the country.

California has experienced phenomenal growth in its driver instruction program in recent years.<sup>3</sup> Enrollment data distributed by the California Department of Education indicate that between the years 1951-52 and 1966-67 enrollments in classroom driver education increased 179 per cent while enrollments in behind-the-wheel driver training increased 714 per cent. There have been compulsory classroom driver education courses in all California public secondary schools since 1949. Permissive behind-the-wheel driver training courses on an elective basis, with excess-cost reimbursement incentives, have been offered since 1953. During the 1966-67 school year in California more than 317,000 high school students received the mandatory driver education classroom course, while more than 233,000 students elected to complete the behind-the-wheel driver training course in addition to the mandatory classroom course. To accomplish such a massive instructional program--the largest in the

<sup>&</sup>lt;sup>3</sup>John R. Eales, "Driver Education and Driver Training: Its Growth and Financing in California Secondary Schools," <u>California</u> Schools, Volume XXXIII, #5, May, 1962.

United States--more than 6,000 driver instruction teachers were employed on a full- or part-time teaching assignment.

The availability and assignment of qualified driver instruction teachers are problems of increasing magnitude for secondary school administrators. Because of unique problems of scheduling and financing, coupled with continuing student population growth. administrators have been hard-pressed to initiate and maintain quality driver instruction programs that satisfy professional driver and traffic safety organizations and the general public as represented by the California Legislature. Compounding their problem, as pointed out by Hartman in his 1961 study, there are a number of glaring weaknesses in teacher certification regulations and practices, a widespread lack of agreement among teacher preparation institutions as to what constitutes an introductory college course in driver instruction, and a relative lack of specialized preparation and experience in driver and traffic safety education on the part of those conducting the college and university teacher preparation courses. 4 During the 1966-67 school year in California more than 95,000 high school students completing the classroom driver education course received

<sup>&</sup>lt;sup>4</sup>Charles H. Hartman, "Teacher Preparation Programs in Driver Education in Colleges and Universities of the United States" (unpublished Ed.D. dissertation, Michigan State University, 1961).

their instruction from teachers who had not had specific driver instruction preparatory courses in college. In the behind-the-wheel driver training phase of the program over 38,000 students completed the course under the tutelage of a teacher who had not had any specific traffic safety preparation.<sup>5</sup>

State and national professional driver and traffic safety education associations have repeatedly expressed their concern for the professional improvement of certification and teacher preparation standards. As early as 1949 the National Commission on Safety Education called the First National Conference on Driver Education to attempt to establish national standards for high school driver instruction programs. Subsequently, three additional national conferences were held for the purpose of setting guidelines for the conduct of state and local programs.<sup>6</sup> In every instance published reports of these national conferences have contained specific recommendations concerning the qualifications of teachers.

<sup>&</sup>lt;sup>5</sup>California State Department of Education, "Data Concerning Instruction in Driver Education and Driver Training in the California Public High Schools, 1966-67 School Year," October 1, 1967. (This entire report appears in Appendix A.)

<sup>&</sup>lt;sup>6</sup>First National Conference on High School Driver Education, Jackson's Mill, West Virginia, 1949. Subsequent national conferences were held in 1953 (Michigan State University, East Lansing, Michigan), in 1958 (Purdue University, Lafayette, Indiana), and in 1963 (National Education Association Education Center, Washington, D.C.).

There appears to be evidence of increasing concern with the driving record of the active or potential driver instruction teacher. In 1965 the National Education Association convened the National Conference on Teacher Preparation and Certification in Driver and Traffic Safety Education. The conference was attended by 150 leaders representing state and local school systems, colleges and universities, governmental agencies, and private support organizations. A widely distributed conference report contained the following position statement:

The primary factors insuring quality instruction in all subject areas of the school curriculum relate to the selection, preparation, and performance of the teacher. Successful driver and traffic safety education programs are taught by carefully chosen, well-prepared, competent teachers. There are no exceptions to this rule.

Since there appeared to be great disparity among the various states in

their official interpretation of what constitutes a "good" driving

record, the 1965 conference also recommended "a more precise

<sup>7</sup>National Commission on Safety Education, <u>Policies and</u> <u>Guidelines: Teacher Preparation and Certification--Driver and</u> <u>Traffic Safety Education</u> (Washington, D.C.: National Education Association, 1965), pp. 33-34.

- a. Beginning teachers should have a valid driver license without a conviction for a moving violation or without a chargeable accident on record for the two-year period immediately prior to employment.
- b. Conviction for a moving violation for which a driver license is suspended or revoked should call for automatic suspension of authorization to teach [driver instruction].
- c. Those whose authorization to teach has been suspended should be required to maintain a driving record free of convictions for moving violations or chargeable accidents for a period of two years before reinstatement.

California, even though long considered one of the leaders in

the field of driver and traffic safety education and adequately represented at all of the national conferences, curiously disregards all such driving record guidelines. The State Board of Education requires only cursory attention be given to the prior driving record of persons applying for certification to teach driver instruction in public secondary schools within the state and, once certification is awarded, the

<sup>8</sup><u>Ibid</u>., p. 35.

<sup>9</sup>National Commission on Safety Education, <u>Policies and</u> <u>Practices for Driver and Traffic Safety Education</u> (Washington, D.C.: National Education Association, 1964), p. 14. teacher's personal driving record is never again subjected to surveillance by the certification agency.<sup>10</sup> The State Board of Education has for years consistently refused to establish specific regulations and procedures that could be considered minimal standards of driving competency on the part of potential or active driver instruction teachers.

There have been an increasing number of challenges to the continuation or expansion of the public secondary school driver instruction programs in California. Special interest groups, the commercial driving school operators in particular, point an accusing finger at the effectiveness of public secondary school programs. They cite as evidence research studies that cast doubt on the effectiveness of secondary school driver instruction. One such study was conducted by the California Department of Motor Vehicles. It contained the following conclusion:

<sup>&</sup>lt;sup>10</sup>During the summer of 1967 the California Legislature passed what was purported to be a "quality control" bill. It contained the following provision: "Section 6. Section 18252.2 is added to the Education Code, to read: '... The Department of Motor Vehicles shall notify the school district and the Department immediately upon suspension or revocation of a driver instruction teacher's driver's license. The Department of Education and the Department of Motor Vehicles shall jointly determine the details regarding procedures for notification. ... ' Provisions of this bill, State of California Legislature, Senate, <u>An Act to Amend Sections of the Education and Vehicle Codes Relating to Driver Education and Training</u> (Carrell Act), S. B. #56, 1967, calling for this minimal surveillance of driving records, had not been implemented at the time of this investigation.

After considering all the facts available from this study, the authors can find no evidence that, on a statewide basis, behindthe-wheel driver training is effective in reducing the frequency of accidents . . . although it is entirely possible that some programs in certain individual school districts are effective, this finding raises serious questions about the general effectiveness of statewide driver training in reducing accidents.

A 1967 study conducted by the Washington State Department of Motor Vehicles, however, indicated a very positive effect of driver instruction on high school students' driving performance.<sup>12</sup>

#### The Need for the Study

During the 1966-67 school year over \$12 million was returned to California public secondary schools as reimbursement for the excess-costs of their behind-the-wheel programs alone. Driver instruction in the public schools is an extremely costly and administratively complex operation. There is a definite need for professional inquiry into every aspect of the educational program to justify continued moral and financial support by the general public.

<sup>&</sup>lt;sup>11</sup>Ronald S. Coppin, et al., The Teen-Aged Driver: An Evaluation of Age, Experience, Driving Exposure, and Driver Training as They Relate to Driving Record (Sacramento, California: California Department of Motor Vehicles, February, 1965).

<sup>&</sup>lt;sup>12</sup>Washington Department of Motor Vehicles, <u>An Evaluation</u> of Driver Training Based on Accident and Violation Rates, Report 004 (Olympia, Washington: The Department, 1967).

There have been a relatively small number of studies completed in recent years specifically relating to secondary school driver instruction programs. The continuing controversy among educators concerning the legitimacy of driver instruction in the secondary school curriculum, coupled with increasing frustrations on the part of school administrators, seem to compel repeated inquiry into all aspects of the driver and traffic safety educational program. Typically these studies have tended to attempt to show a cause and effect relationship between the driver instruction experience of high school students and their subsequent driving record. Experimental grouping of "trained" and "untrained" student drivers was the basis for many of these studies. <sup>13</sup> Other investigations have dealt with the various methodological approaches to the subject. The educational effect of using various types of instructional equipment and materials has also

<sup>&</sup>lt;sup>13</sup>For example, "Driver Education Reduces Accidents and Violations," American Automobile Association (Washington, D.C., 1964), 16 pp.; and "The High School Student and the Automobile," Allstate Insurance Companies, Safety Department (Skokie, Illinois, 1960), 21 pp. David Klein, co-author of <u>Accident Research:</u> <u>Methods and Approaches and Interviewing--Its Forms and Functions, rebuts findings of such studies, however, in his "A Reappraisal of the Violation and Accident Data on Teen-Aged Drivers." His findings state "there is no evidence whatever that driver education is directly responsible to any extent for reducing the accident or violation rates." <u>Traffic Quarterly, #4</u>, October 1966, and <u>CALDEA Calen-</u> dar, Volume XIV, #2, January 1967, p. 20.</u>

been studied.<sup>14</sup> Very little, however, has been done looking specifically at the driver instruction teacher.

State and national professional driver and traffic safety education associations are exerting increasing pressures on state certification agencies to apply stringent, objective standards of driving competency of driver instruction teachers. If existing standards are inadequate, the implementation of evaluatory and surveillance operations would necessarily involve major operational changes within the State Department of Education. It would involve close cooperation between teacher education, certification authorities, and the State Department of Motor Vehicles. Before such organizational and operational changes are made as the result of local, state, or national pressures, however, it would appear that an investigation is warranted to determine the effects of the existing minimal driver record standards. If, in the absence of any previous critical evaluation and surveillance of the driving record prior to or following certification to teach, the driving records of California driver instruction teachers are shown to be poorer than those of the general driving population, it would indicate the necessity of a critical re-evaluation of the State

<sup>&</sup>lt;sup>14</sup>For example, Robert O. Nolan, "A Comparative Study of the Teaching Effectiveness of the Multiple Car Off-Street Driving Range and the Aetna Drivotrainer" (unpublished Ed.D. dissertation, Michigan State University, 1965).

Board of Education's traditional apathetic policy. If, on the other hand, the driver instruction teachers' driving records are shown to be <u>better</u> than those of the general driving population, it would tend to negate the necessity of complex operational procedures to evaluate and survey the driving record of potential and active driver instruction teachers as encouraged by national guidelines, or at least give rise to questioning the rationale for more stringent control measures.

#### The Purpose of the Study

The purposes of basic descriptive research are:

- To secure evidence concerning an existing situation or current condition;
- 2. To identify standards or norms with which to compare present conditions, in order to plan the next step; and
- To determine how to take the next step (having determined where we are and where we wish to go).

In these terms this study was conducted to make a contribution toward meeting a basic need in educational administration within the State of California.

This investigation had as its primary purpose and objective to provide essential information concerning the quality of driver instruction teachers' personal driving records. It is hoped that it may shed light upon previously unknown phenomena and therefore prove of significance to education. By becoming aware of the existing condition of the driving records of active driver instruction teachers, educators will be in a better position to respond to the leadership and supervisory needs of teacher certification and preparation programs.

A secondary purpose of this investigation was to gather a relatively large array of data on certificated driver instruction teachers that could be used to provide normative data for other traffic safety research projects. For this reason a concerted attempt was made to obtain the largest possible sampling of the active public secondary school driver instruction teacher population in the State of California.

The specific problems of this investigation were as follows:

- Is there evidence to warrant more precise and critical evaluation of the driving record for purposes of initial and continued certification of driver instruction teachers in the State of California?
- 2. Is there evidence to show that the driving records of California public secondary school driver instruction teachers are different from those of the general driving population?
- 3. What is the relationship between the driving records of driver instruction teachers and their academic background,

phase of instructional assignment, and professional affiliation?

4. Is there evidence to imply that driver instruction teachers' driving records in combination with their academic fields of specialization, membership in professional organizations, or phase of instructional assignment could be used by secondary school administrators to predict driving record for purposes of assignment within driver instruction programs?

#### Definition of Terms

Several distinct terms are incorporated in this report. These terms are defined as follows:

"Driver instruction teacher" is defined as any California teacher who was teaching driver education and/or driver training in a public secondary school during the 1966-67 school year on a full- or part-time basis.

"DIT" refers to data derived from the survey of 334 of the 361 California public secondary school districts.

"DMV" refers to normative data on the California general driving population as reported in the California Department of Motor Vehicles' 1964 California Driver Record Study.

"Driving record" refers to the number of accidents and convictions that appear in the subject's official driver record file maintained by the Department of Motor Vehicles. Except for certain notations concerning conviction for major offenses, the driver record file contains only recorded accidents and conviction incidents occurring during the immediate previous three year period.

"Accidents" refer to the total number of accidents involving the subjects that have been reported to the Department of Motor Vehicles. This includes all fatal and injury accidents, all accidents investigated by or reported to the California Highway Patrol either by individuals or local enforcement agencies, and all property damage accidents reported in compliance with California's Financial Responsibility Law (those in excess of \$100 damage). Since responsibility or culpability cannot be determined from a review of the driver record file, appearance of an accident involvement does not necessarily imply the subject was responsible for the accident.

"Conviction" refers to traffic citation conviction through court adjudication. All recorded convictions were counted regardless of type. Multiple citations relating to a single incident, however, were counted as a single conviction.

"Negligent operator point count" refers to the total number of "points" that could be assessed against the subject because of

accident and conviction incidence. The <u>Vehicle Code</u> defines a "negligent operator" as anyone who accrues at least 4 points in 12 months, 6 points in 24 months, or 8 points in 36 months. Points are assessed only for the violation of regulations involving the safe operation of the motor vehicle. <sup>15</sup> A complete listing of the negligent operator point counts according to types of violations appears as Appendix E.

"Major conviction" refers to a conviction which counts double, or 2-points, in negligent operator point counts. They include drunk driving, hit-and-run, reckless driving, and driving with a suspended or revoked driver license. Refer to Appendix E.

"Age" represents the midpoint of each subject's three year driver record interval. Thus, a subject whose midpoint age was 27 would, in actuality, vary from 25.5 to 28.5 years of age. This procedure was consistent with the continuous nature of age and resulted in the driver record being equally divided on each side of a given age point.

"FTA" refers to a traffic citation for which the subject has failed to appear in court in accordance with a signed promise. Once the subject appears in court and the violation is adjudicated, it usually

<sup>&</sup>lt;sup>15</sup>California State Department of Motor Vehicles, <u>Vehicle</u> Code (Sacramento, California: The Department, 1965).

becomes a regular conviction. FTA's were considered as convictions since this procedure was followed in a Department of Motor Vehicles' previous study.

"Traffic density" is a rate mathematically derived by dividing the total number of motor vehicles registered within each of the 58 California counties by the number of linear miles of roadway within each county. Refer to Appendix G.

"Phase of instructional assignment" represents the school district's official assignment of the driver instruction teacher. The terms driver education, driver training, and driver instruction are defined by the <u>California Administrative Code</u>, <u>Title V</u><sup>16</sup> and the <u>California Education Code</u>.<sup>17</sup> "Driver education" refers to the mandatory classroom instruction, while the behind-the-wheel practice driving in dual-control automobiles is designated as "driver training." The term "driver instruction" is used when referring to both classroom and behind-the-wheel courses.

"Academic background" includes each subject's undergraduate and graduate major field of preparation and the highest academic degree earned.

<sup>&</sup>lt;sup>16</sup>California State Department of Education, <u>Administrative</u> Code, Title V (Sacramento, California: The Department, 1966).

<sup>&</sup>lt;sup>17</sup>California State Department of Education, <u>Education Code</u> (Sacramento, California: The Department, 1966).
"Professional affiliation" refers to official professional membership in either the California Driver Education Association or the American Driver and Traffic Safety Education Association.

### **Research Hypothesis and Problem**

One research hypothesis and one research problem were advanced for purposes of this investigation. They were:

- <u>Research Hypothesis</u>: The driving records of California public secondary school driver instruction teachers are superior to those of the general driving population. That is to say, the mean numbers of accidents, convictions, and negligent operator point counts for driver instruction teachers are less than those of the general driving population.
- 2. <u>Research Problem</u>: What relationship exists between the driver instruction teachers' driving records and their academic background, phase of instructional assignment, and professional affiliation?

The research hypothesis and problem will be restated in testable form in Chapter III.

### Overview of the Study

Chapter I has dealt with identification of the problems to which this investigation addressed itself. Background information

was supplied to establish the general need for the study. Specific terms that were to be used in the report of the investigation were defined, and the research hypothesis and problem were stated.

Chapter II will deal exclusively with a resume of certain portions of the <u>1964 California Driver Record Study</u>.<sup>18</sup> That study established normative data providing a comprehensive profile of the typical California motorist. It is to that normative data that comparison was made of the driving records of California public secondary school driver instruction teachers. It is felt, therefore, that an entire chapter should be devoted to a review of that study. One might prefer, however, merely to scan Chapter II paying particular attention to the chapter summary. Following reading of Chapter IV, where the statistical comparison of data is presented, a return to the details of Chapter II may prove of more value and interest.

The design of this investigation is described in Chapter III. The procedures, methods, techniques, and instruments of the investigation are cited. What was to be done in the study, how it was to be accomplished, and what devices or instruments were used to obtain the data necessary to the solving of the problems under investigation will be presented.

<sup>18</sup>Ronald S. Coppin, <u>et al.</u>, <u>The 1964 California Driver</u> <u>Record Study</u> (Sacramento, California: California Department of Motor Vehicles, 1964-67).

Chapter IV contains the findings that deal exclusively with the statistical comparison of driving records from the normative data supplied by the <u>1964 California Driver Record Study</u> and data obtained in this investigation on California public secondary school driver instruction teachers. This statistical comparison was made in terms of driver record components, i.e., accidents, convictions, and negligent operator point counts, by age, sex, and marital status.

Chapter V is devoted to the analysis of data describing the relationship between the stated driver record variables and (a) academic background, (b) phase of instructional assignment, and (c) professional affiliation. A comprehensive profile of the typical driver instruction teacher's driving record will be presented in Chapter V.

Conclusions reached, discussion of investigation findings, specific recommendations resulting from the analysis and interpretation of data, and the implications for future research studies are presented in Chapter VI.

## CHAPTER II

# A REVIEW OF THE <u>1964 CALIFORNIA</u> DRIVER RECORD STUDY

The review of the <u>1964 California Driver Record Study</u><sup>1</sup> will be presented through: (a) the statement of purpose, (b) the sample that was used, (c) resumes of Parts 1, 2, 5, and 7 of the total investigation, and (d) the summary of significant findings.

### Purpose

In September of 1963 the California Department of Motor Vehicles began data collection for an extensive study meant to provide a profile of the California driving population in terms of a number of variables, e.g., traffic accidents, convictions, negligent operator point count, age, sex, and marital status. One of the primary purposes of that study, the <u>1964 California Driver Record Study</u>, was to provide basic descriptive data on the characteristics and composition of the California driving population in order to establish normative

<sup>&</sup>lt;sup>1</sup>Ronald S. Coppin, <u>et al.</u>, <u>The 1964 California Driver</u> <u>Record Study</u> (Sacramento, California: California Department of Motor Vehicles, 1964-67).

data for use in comparative studies. That 1964 study will, therefore, be reviewed in some detail in this chapter. Data derived from the investigation of California public secondary school driver instruction teachers could then be compared statistically with the norms established by the 1964 Department of Motor Vehicles' study.

#### Sample

In the California Department of Motor Vehicles' study a two per cent random sample of the 11 million plus California licensed drivers was obtained. A total of 225, 393 driving records were derived from the random sampling procedure. This random sampling was achieved in the following manner: A terminal digit filing system is used in the central statewide driver record files. In this system all records with the same last two numerical digits are placed together. All driver license numbers ending in 00 are filed before those ending in 01, and so on through 99. Within any given terminal digit the licenses are arranged alphabetically and, within the alphabetic prefix, by the first part of the permanent driver license number. The method used in California for issuing driver licenses has resulted in the earliest prefixes and lowest numbers representing the oldest licenses, and any given terminal digit, therefore, actually contains the entire chronological spectrum of licensees. In other words, any

given terminal digit represents and contains 1/100 of the entire 11 million plus driver record file population in which one out of every 100 drivers is assigned to that digit. With this in mind the investigators for the <u>1964 California Driver Record Study</u> selected two terminal digits for their random sample. This resulted in the one driver in every 50, or two per cent sample, of the entire driver record file population.

Since the data collected for the 1964 study were so extensive, it was decided that a series of separate reports on relatively homogeneous aspects of the driver record data was to be presented rather than a single, comprehensive report. In this chapter briefs of the individual reports that have been issued by the California Department of Motor Vehicles considered to be relevant to this investigation will be presented. Each report will be presented in terms of the specific driver record variables under consideration, the methodology used, and selected findings and conclusions of the particular aspect of the study.

# Part 1--An Introduction and Methodological Description<sup>2</sup>

The investigators present basic methodological information. They emphasize that the sample had been selected randomly and is

<sup>2</sup>Ibid., Part 1, December 1964.

representative of the population from which it was drawn. The methods and procedures of sampling were detailed. Data extracted from each sample subject's driver record file were coded onto code sheets in accordance with carefully delineated procedures. All coded data were then keypunched onto IBM cards and later converted to magnetic tape and edited and tabulated on an IBM 7090 computer. Analysis of the computer output indicated a usable sample of 223, 683 driver records from the original 225, 393 obtained in the random sampling procedure. Depending upon the nature of the variables to be considered, each of the subsequent reports utilized various proportions of this total usable sample.

# Part 2--Accidents, Traffic Citations, and Negligent Operator Count by Sex<sup>3</sup>

In this report the various components of the driving record-accidents, traffic citation convictions, and negligent operator counts-were considered. The data were analyzed to provide answers to the following questions:

- 1. How many California drivers are conviction and accident free?
- 2. How many accidents and traffic citation convictions has the average California driver?

 $\frac{3}{1 \text{ bid}}$ , Part 2, March 1965.

- 3. What proportion of the California driving population can legally be classified as negligent operators?
- 4. How do men and women compare with regard to accidents and convictions?

In Table 1 the investigators show the proportion of licensed

drivers with three-year accident free records to be 82.8 per cent,

while 60 per cent had not been convicted of a traffic violation during

TABLE 1 1964 California Driver Record Study: Percentage
Distribution of Licensees by Total Number of Accidents
and Convictions1964
(Three-year prior record)

Number of Accidents		1964 N = 148,006
All drivers		. 100.0%
No accidents		. 82.8
1		. 14.4
2		. 2.3
3		. 0.4
4		. 0.1
5 or more	•••	·
All drivers		100 0%
All drivers	• •	. 100.0% 60.0
All drivers	•••	. 100.0% . 60.0 22.0
All drivers	• • • •	. 100.0% . 60.0 . 22.0 9.0
All drivers	· ·	. 100.0% . 60.0 . 22.0 . 9.0 . 4.1
All drivers	· · · · · · · · · · · · · · · · · · ·	. 100.0% . 60.0 . 22.0 . 9.0 . 4.1 . 2.0
All drivers	· · · · · · · · · · · · · · · · · · ·	. 100.0% . 60.0 . 22.0 . 9.0 . 4.1 . 2.0 . 1.2
All drivers	· · · · · · · · · · · · · · · · · · ·	. 100.0% . 60.0 . 22.0 . 9.0 . 4.1 . 2.0 . 1.2 . 0.7
All drivers       . <td< td=""><td><ul> <li>.</li> <li>.&lt;</li></ul></td><td>. 100.0% . 60.0 . 22.0 . 9.0 . 4.1 . 2.0 . 1.2 . 0.7 . 0.4</td></td<>	<ul> <li>.</li> <li>.&lt;</li></ul>	. 100.0% . 60.0 . 22.0 . 9.0 . 4.1 . 2.0 . 1.2 . 0.7 . 0.4
All drivers	<ul> <li>.</li> <li>.&lt;</li></ul>	. 100.0% . 60.0 . 22.0 . 9.0 . 4.1 . 2.0 . 1.2 . 0.7 . 0.4 . 0.2

the same period of time. Less than one driver in 100 had more than five convictions or more than two accidents during the period under investigation. A total of 148,006 licensed drivers were included in this sample.

Table 2 provides a percentage distribution of the licensees by negligent operator point count and sex. It indicates the marked difference between males and females in recorded incidents.

TABLE 2. -- <u>1964 California Driver Record Study</u>: Percentage Distribution of Licensees by Negligent Operator Point Count and Sex (Three-year prior record)

Number of Points	Total N = 148,006	Males n = 86,726	Females n = 61,280
All drivers	100.00%	100.00%	100.00%
0	55.86	46.18	69.55
1	22.67	24.58	19.98
2	10.49	13.21	6.65
3	5.17	7.16	2.35
4	2.56	3.76	0.85
5	1.39	2.14	0.33
6	0.85	1.34	0.15
7	0.43	0.69	0.07
8	0.26	0.42	0.03
9	0.14	0.22	0.02
10 or more	0.18	0.30	0.02
Mean number of points	0.90	1.20	0.47

Table 3 illustrates the differences in the mean number of accidents, convictions, and negligent operator point counts. An examination of this table reveals that males have over twice the incidence as do females. This finding held fairly stable throughout the study on most of the driver record variables. Attention was drawn, however, to the assumption that females drive much less and under different circumstances than do males. Exposure was not controlled in this study and, therefore, one might anticipate rather dramatic changes in the driver record differences if adequate exposure data could have been collected.

(Th	ree-year prior	record)	
Driving Booord	Mean	Number of Co	ounts
Component	Total N = 148,006	Male n = 86,726	Female n = 61,280
Total Accidents	0.204	0.260	0.126
Total Convictions	0.801	1.103	0.374
Major Convictions	0.017	0.026	0.004
Negligent Operator Count	0.898	1,197	0.474

TABLE 3. -- 1964 California Driver Record Study: Mean Number of Counts by Sex for Basic Driver Record Components (Three-year prior record)

It is interesting to note that the largest discrepancy among male and female subjects occurred when the major violation variable was considered. The male rate is over six times the female rate. The smallest difference in any of the variables included in this report indicated that male accident involvement is twice that of females. All differences in other variables fell between these two extremes. The report also gave evidence that 0.94 per cent of the males and 0.07 per cent of the females can be legally classified as prima-facie negligent operators at any given time. In terms of proportional rate, males are 13.5 times more prevalent in the 36 month negligent operator population than are females.

Negligent operator points are assessed for convictions of violations involving the safe operation of the motor vehicle. A listing of the various sections of the <u>California Vehicle Code</u> carrying one and two point counts is presented in Appendix E.

# Part 5--Driver Record by Age, Sex, and Marital Status

The framework of Part 5 is oriented around the relationship existing between the driver record and three descriptive subject variables--age, sex, and marital status. The investigators present information in a basically descriptive form without the employment of complex mathematical curve-fitting procedures. They warn that specific shapes of the trends and relationships of this particular sample

<sup>&</sup>lt;sup>4</sup>Ibid., Part 5, June 1965.

should be generalized cautiously in terms of the overall population of drivers. The sample for this investigation included 86,717 males and 61,273 females. The method and rationale for determining the midpoint age of the subjects was explained, as was the procedure for categorizing the marital status for all drivers included in the study.

Some of the more pertinent trends presented in this report

were as follows:

- 1. Accidents and citations tended to decrease with age, except at extremely old ages where there was a tendency for accidents to increase slightly. The decrease in accident and conviction frequency with age was much sharper for males than for females.
- 2. Married female drivers had driving records that were superior to those of the single female driver in all age groups. On most driver record variables the single females had almost twice the accident and conviction frequency of their married counterparts. A similar observation was made in respect to male drivers with a few exceptions noted in the younger age categories where married male drivers had a poorer driving record.
- 3. In general, single and married males had over twice as many driver record incidents than did female drivers. Driving record differences with respect to sex and marital status in the conviction variable comparison were greater than were the differences in the accident variable comparison. Males had approximately three times as many convictions as did their female counterparts, and slightly over twice as many reported accident incidents.

Tables 4 and 5 illustrate the percentage distribution of male

and female licensees by age and the total number of reported acci-

dents, while Table 6 provides the average number of total accidents

by age, sex, and marital status.

Percentage Distribution of Male Licensees by	Reported Accidents
<b>ABLE 4 1964 California Driver Record Study:</b>	Age and Total Number of

(Three-year record)

	L of C			A	ccidents			
Age	number	0	1	2	3	4	വ	6 or more
All ages	86, 717	78.66%	17.49%	3.20%	0.53%	0.10%	0.01%	0.01%
Under 21	4,207	64.56	26.31	7.30	1.47	0.31	0.05	1
21-25	8, 392	73.59	20.83	4.61	0.77	0.19	0.01	1
26-30	9, 336	76.35	19.15	3.79	0.57	0.10	0.03	0.01
31-35	10,200	79.30	16.82	3.11	0.59	0.13	0.04	0.01
36-40	10,573	79.26	17.17	2.96	0.52	0.09	1	1
41-45	10, 127	80.76	16.12	2.55	0.47	0.08	0.01	0.01
46-50	9,041	80.27	16.57	2.74	0.34	0.07	0.01	1
51-55	7,466	80.94	16.10	2.50	0.38	0.07	1	0.01
56-60	5,949	80.80	16.44	2.40	0.34	1	1	0.02
61-65	4,608	81.21	15.58	2.65	0.52	0.04	1	1 1
66-70	3,419	83.39	14.36	1.96	0.20	0.06	1	0.03
71-75	2,027	84.11	13.96	1.83	0.10	1	1	!
76 and over	1, 372	83.17	14.14	2.48	0.07	0.07	0.07	1

ABLE 5 <u>1964 California Driver Record Study</u> : Percentage Distribution of Female Lic by Age and Total Number of Reported Accidents
--

(Three-year record)

	6 or more	I	1	1	1	1	1	1	1	1	1	1	1	1	1	
	വ	1	1	!	!	!	1	1	!	1	!	1	!	t I	1	
	4	0.01%	i T	0.02	0.02	1	1	0.01	1	1	1	1	1	1	0.22	
ccidents	с	0.12%	0.31	0.12	0.12	0.16	0.14	0.09	0.10	0.08	0.05	0.11	0.05	0.21	1	
A	5	1.06%	2.06	1.40	0.91	1.08	0.92	1.01	0.94	0.99	0.89	1.11	0.99	0.63	0.88	
	1	10.08%	15.80	10.54	9.60	9.28	9.96	9.82	10.37	8.57	10.45	9.20	9.06	11.66	11.50	
	ο	88.73%	81.83	87.92	89.35	89.48	88.98	89.07	88.59	90.36	88.61	89.58	89.90	87.50	87.40	
	1 otal number	61, 273	2, 867	5,910	6,574	7,534	8,612	8, 113	6,671	5, 253	3, 807	2,706	1, 822	952	452	
	Age	All ages	Under 21	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76 and over	

 TABLE 6. - 1964 California Driver Record Study:
 Average (Mean) Number of Total Accidents by

 Age, Sex and Marital Status

(Based on three-year record of 147, 990 licensees)

		Total			Males			Females	
Age	Total	Married	Single	Total	Married	Single	Total	Married	Single
All ages	0.204	0.185	0.275	0.260	0.241	0.324	0.126	0.108	0.197
Under 21	0.363	0.280	0.392	0.468	0.526	0.460	0.209	0.180	0.233
17*	0.600	0.250	0.727	0.737	0.333	0.875	0.250	1	0.333
18	0.417	0.319	0.434	0.532	0.667	0.524	0.213	0.187	0.224
19	0.371	0.303	0.394	0.476	0.599	0.460	0.219	0.200	0.235
20	0.324	0.256	0.359	0.419	0.458	0.410	0.198	0.165	0.237
21-25	0.256	0.216	0.305	0.332	0.333	0.331	0.138	0.116	0.215
21	0.290	0.239	0.333	0.396	0.403	0.393	0.149	0.143	0.160
22	0.275	0.212	0.348	0.355	0.322	0.376	0.163	0.135	0.250
23	0.234	0.206	0.277	0.308	0.326	0.293	0.129	0.106	0.219
24	0.236	0.217	0.272	0.311	0.332	0.285	0.126	0.105	0.224
25	0.229	0.211	0.272	0.301	0.315	0.277	0.123	0.099	0.255

Continued
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i.
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<b>TABLE</b>
1

0.21	.0 6	198	0.299	0.290	0.278	0.323	0.118	0.105	0.219
0.221 0.197 0.3	197 0.:	0	291	0.298	0.289	0.317	0.113	0.100	0.198
0.223    0.200   0.	200 0.	0.	296	0.288	0.281	0.305	0.124	0.103	0.263
0.221    0.193   0.	193 0.	0.	333	0.310	0.284	0.381	0.094	0.085	0.167
0.218 0.201 0.	201 0.	0.	285	0.279	0.273	0.295	0.132	0.116	0.255
0.214 0.199 0.	199 <b>0</b> .	o.	290	0.277	0.265	0.321	0.129	0.119	0.207
0.198 0.186 0.	186 0.	0.	263	0.256	0.252	0.271	0.119	0.105	0.243
0.193 0.182 0.	182 0.	0	269	0.250	0.242	0.305	0.122	0.110	0.219
0.182 0.173 0.	173 0.	0	253	0.231	0.225	0.274	0.122	0.106	0.231
0.188 0.182 0.	182 0.	0	229	0.234	0.229	0.273	0.126	0.114	0.190
0.177 0.174 0.	174 0.	0.	197	0.226	0.224	0.245	0.108	0.099	0.160
0.185 0.184 0.	184 0.	<u>.</u>	190	0.224	0.225	0.215	0.124	0.105	0.173
0.186 0.183 0.	183 0.	0.	197	0.226	0.220	0.269	0.118	0.097	0.154
0.165 0.164 0.	164 0.	0	169	0.193	0.186	0.233	0.112	0.095	0.132
0.165 0.153 0.	153 0.	<u>.</u>	196	0.179	0.171	0.220	0.136	0.086	0.181
0.185 0.189 0.	189 0.	<u>.</u>	178	0.200	0.199	0.201	0.142	0.117	0.154

\*The means for 17 year olds on all three-year data are based on a very small number of subjects which, when applied to three-year data, required that a subject receive his license prior to his and are therefore unstable. This reduction resulted from the method of defining age herein, 16th birthday in order to be classified as a 17 year old. Tables 7 and 8 report the percentage distribution of male and female subjects by age and total convictions. Table 9 indicates the average number of total convictions by age, sex, and marital status. An examination of Table 10 gives evidence of the age, sex, and marital status comparison in terms of the average number of convictions for major violations, e.g., drunk driving, hit-and-run, reckless driving, and driving after a license had been suspended or revoked. Tables 11, 12, and 13 show the average number of negligent operator point counts by age, sex, and marital status.

Throughout all sections of the study the authors consistently used the term "driving record" rather than "driving performance." They indicated the latter term would incorrectly imply that exposure to accidents and convictions had been held statistically constant and the comparative performance of the various groups evaluated on the basis of accident and conviction rates. Given knowledge that traffic exposure is definitely correlated with accident and conviction frequency, and also with age, sex, and marital status, it would be safe to assume that the driver record differences reflected in the data would shrink if corrected for differences in exposure. They also point out that regardless of the effects of other uncontrolled variables, the tabulated accident and conviction frequencies represent the absolute frequency of accident and conviction occurrence relative to any given age, sex, or marital status stratification.

 TABLE 7. -- 1964 California Driver Record Study:
 Percentage Distribution of Male Licensees by

 Age and Total
 Convictions

(Three-year record)

	T 2421				Tot	al conv	ictions				
Age	1 ota 1 number	0		5	ę	4	2 2	9	2	8	9 or more
All ages	86, 717	49.87%	24.44%	11.84%	5.94%	3.13%	1.82%	1.15%	0.68%	0.39%	0.74%
ider 21	4,207	23.06	21.61	15.33	12.38	8.32	6.13	4.52	3.23	1.83	3.59
-25	8, 392	33.27	22.53	15.55	10.19	6.23	4.33	3.01	1.85	1.07	1.97
-30	9,336	42.09	23.86	14.34	8.17	4.27	2.83	1.67	1.08	0.58	1.11
-35	10,200	47.43	24.48	13.06	6.73	3.57	1.88	1.11	0.63	0.30	0.81
-40	10,573	50.29	25.57	11.62	5.75	3.30	1.57	0.80	0.38	0.31	0.41
-45	10, 127	52.02	26.25	11.78	4.98	2.28	1.07	0.66	0.32	0.25	0.39
-50	9,041	54.43	25.73	11.10	4.51	2.07	0.94	0.59	0.22	0.12	0.29
-55	7,466	56.83	25.78	10.14	3.72	1.69	0.84	0.52	0.23	0.05	0.20
-60	5,949	58.97	24.61	9.62	3.97	1.58	0.59	0.29	0.12	0.12	0.13
-65	4,608	61.28	23.72	9.61	3.32	0.89	0.61	0.24	0.20	0.02	0.11
-70	3,419	66.47	23.05	7.02	2.05	0.91	0.26	0.18	0.03	1	0.03
-75	2,027	68.67	21.56	6.36	2.22	0.59	0.25	0.30	0.05	1	1 1
and over	1, 372	71.35	19.90	5.83	1.68	0.51	0.36	0.07	0, 15	0.15	1

<sup>b</sup> ercentage Distribution of Female Licensees	onvictions
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Driver	β
California	
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(Three-year record)

Total –					Ĥ F	otal con	wiction	s N			
number 0 1	0 1	1		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ę	4	വ	Q	7	ω	9 or more
61,273 74.23% 18.30% 5	74.23% 18.30% 5	18.30% 5	വ	. 00%	1.57%	0.49%	0.20%	0.10%	0.05%	0.03%	0. 03%
2,867 60.76 24.24 8	60.76 24.24 8	24.24 8	ω	3.86	3.56	1.19	0.66	0.35	0.14	0.07	0.17
5,910 69.96 19.42 6	69.96 19.42 6	19.42 6	θ	. 33	2.62	0.83	0.30	0.22	0.15	0.07	0.10
6,574 74.26 18.10 4	74.26 18.10 4	18.10 4	4	. 72	1.87	0.67	0.18	0.09	0.06	0.02	0.03
7,534 75.58 17.72 4	75.58 17.72 4	17.72 4	4	. 66	1.27	0.40	0.23	0.08	0.01	0.05	1
8,612 74.42 18.39 4	74.42 18.39 4	18.39 4	4	. 85	1.53	0.42	0.22	0.08	0.03	0.03	0.03
8,113 75.19 18.09 4	75.19 18.09 4	18.09 4	4	. 81	1.16	0.48	0.17	0.06	0.01	0.01	0.02
6,671 75.52 17.86 4	75.52 17.86 4	17.86 4	4	. 63	1.23	0.43	0.18	0.10	0.01	0.01	0.03
5,253 76.34 17.74 4.	76.34 17.74 4.	17.74 4.	4.	26	1.24	0.30	0.06	0.02	0.04	1	1
3,807 76.95 16.84 4.	76.95 16.84 4.	16.84 4.	4.	60	1.10	0.24	0.11	0.08	0.08	1	I I
2,706 76.09 17.44 4.	76.09 17.44 4.	17.44 4.	4	77	1.40	0.26	0.04	1	1	1	1
1,822 76.02 18.06 4.1	76.02 18.06 4.	18.06 4.	4	50	0.99	0.22	0.16	0.05	1	1	1
952 78.78 16.70 3.0	78.78 16.70 3.0	16.70 3.0	з. С	38	0.63	0.21	1 1	!	1	1	!
452 79.43 15.71 2.	79.43 15.71 2.	15.71 2.	<u>ہ</u>	43	1.77	0.66	1	1	1	1	1

ge (Mean) Number of Total Convictions by	Status
Avera	Marita
TABLE 91964 California Driver Record Study:	Age, Sex and

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Q V		Total			Males			Females	
Dgc	Total	Married	Single	Total	Married	Single	Total	Married	Single
All ages	0.801	0.692	1.200	1.103	0.965	1.581	0.374	0.318	0.597
Jnder 21	1.790	1.344	1.947	2.558	3.155	2.471	0.663	0.606	0.712
17	2.333	1.750	2.545	3.091	2.000	3.500	0.250	1.000	1 1 1
18	1.841	1.406	1.913	2.512	3.397	2.455	0.651	0.651	0.651
19	1.835	1.364	1.993	2.624	3.437	2.523	0.686	0.637	0.728
20	1.719	1.314	1.924	2.522	2.960	2.423	0.651	0.572	0.744
1-25	1.326	1.106	1.650	1.915	1.947	1.888	0.489	0.389	0.839
21	1.677	1.354	1.946	2.507	2.849	2.365	0.561	0.474	0.739
22	1.433	1.108	1.813	2.109	2.104	2.113	0.500	0.416	0.761
23	1.306	1.096	1.618	1.855	1.926	1.794	0.524	0.410	0.964
24	1.189	1.093	1.377	1.660	1.808	1.479	0.500	0.392	1.000
25	1.072	0.985	1.283	1.550	1.633	1.415	0.366	0.283	0.813

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0.773	0.802 0.623	0.747	0.837	0.867	0.679	0.652	0.697	0.590	0.493	0.445	0.430	0.390	0.308	0.305
0.328	0.333 0.335	0.330	0.338	0.305	0.307	0.332	0.298	0.299	0.273	0.268	0.264	0.262	0.224	0.247
0.381	0.395 0.372	0.377	0.395	0.366	0.346	0.368	0.348	0.346	0.319	0.318	0.324	0.321	0.268	0.285
1.520	1.492 1.455	1.586	1.546	1.542	1.366	1.216	1.214	1.081	0.903	0.840	0.843	0.640	0.542	0.539
1.387	1.581 1.465	1.389	1.294	1.249	1.124	0.988	0.881	0.810	0.736	0.678	0.604	0.474	0.452	0.401
1.424	1.551 1.462	1.443	1.359	1.312	1.170	1.018	0.917	0.839	0.755	0.698	0.635	0.497	0.467	0.431
1.347	1.342 1.277	1.397	1.376	1.359	1.167	0.984	0.965	0.825	0.669	0.607	0.587	0.482	0.400	0.421
0.897	0.975 0.949	0.902	0.854	0.820	0.756	0.690	0.625	0.600	0.558	0.537	0.502	0.420	0.404	0.382
0.993	1.068 1.029	1.004	0.958	0.912	0.820	0.726	0.664	0.630	0.575	0.550	0.520	0.436	0.403	0.395
6-30	26 27	28	29	30	1-35	6-40	1-45	6-50	1-55	6-60	1-65	6-70	1-75	6 and over

		Single	0.008	0.001	1 1 1	0.004	1	   	0.003	:	0.003	1	0.014	0.005	
	Females	Married	0.004	0.001	1	1 1	0.001	1 † 1	0.001	0.003	0.001	1	0.004	0.001	
sees		Total	0.004	1 1 1	1 1 1	0.004	1	1	0.003	0.001	0.002	   	0.006	0.003	
aan IIcen		Single	0.046	0. 035	   	0.023	0.049	0.031	0.042	0.046	0.051	0.049	0.034	0.020	
ru ol 141,	Males	Married	0.022	0.049	0.333	0.047	0.048	0.047	0.044	0.060	0.046	0.052	0.036	0.038	
year reco		Total	0.027	0.037	0.091	0.026	0.047	0.033	0.043	0.051	0.049	0.051	0.035	0.030	
-aajun u		Single	0.031	0.025	8 1 1	0.017	0.033	0.021	0.033	0.034	0.040	0.039	0.030	0.017	
(Dased 0	Total	Married	0.015	0.015	0.250	0.013	0.014	0.015	0.020	0.024	0.019	0.023	0.020	0.021	
		Total	0.019	0.022	0.067	0.018	0.029	0.019	0.021	0.031	0.029	0.030	0.023	0.019	
		D RG	All ages	Under 21	17	18	19	20	21-25	21	22	23	24	25	

 TABLE 10. - 1964 California Driver Record Study:
 Average (Mean) Number of Double Count Convictions by Age, Sex and Marital Status

(Based on three-year record of 147.990 licensees)

26-30	0. 025	0.019	0.045	0.040	0.033	0.056	0.004	0,004	0.010
26	0.028	0.022	0.046	0.045	0.038	0.058	0.003	0.004	   
27	0.024	0.017	0.048	0.039	0.029	0.059	0.003	0.003	0.006
28	0.026	0.019	0.051	0.041	0.033	0.060	0.005	0.004	0.019
29	0.023	0.018	0.043	0.035	0.031	0.047	0.006	0.004	0.026
30	0.024	0.020	0.038	0.038	0.034	0.052	0.004	0.005	1 1 1
31-35	0.018	0.014	0.041	0.029	0.023	0.054	0.004	0.002	0. 008
36-40	0.017	0.015	0.038	0.027	0.023	0.051	0.006	0.005	0.015
41-45	0.018	0.014	0.045	0.027	0.023	0.066	0.006	0.005	0.019
46-50	0.019	0.015	0.045	0.028	0.023	0.077	0.007	0.004	0.015
51-55	0.015	0.012	0.028	0.020	0.017	0.049	0.005	0.003	0.012
56-60	0.015	0.014	0.019	0.022	0.020	0.039	0.004	0.003	0.005
61-65	0.009	0.007	0.018	0.013	0.009	0.035	0.003	0.001	0.006
66-70	0.007	0.005	0.012	0.010	0.008	0.024	0.003	0.001	0.004
71-75	0.005	0.006	0.004	0.007	0.006	0.009	1 1 1	0.002	1 1 1
76 and over	0.002	0.001	0.003	0.002	0.001	0.007	1 1	1 1	1 1 1

TABLE 10. -- Continued

A double count conviction is one which counts double in determining a subject's negligent operator point count. There are four such sections in California: Drunk driving, hit and run, reckless driving, and driving under suspension or revocation. Note:

(Three-year record)

	F T				Points	+ Movi	ng FTA	ß			
Age	number	0		5	с	4	ß	9	7	ω	9 or more
All ages	86, 717	46.09%	24.59%	13.21%	7.18%	3.78%	2.14%	1.34%	0.70%	0.43%	0.54%
Under 21	4,207	21.91	20.54	17.07	13.19	8.68	6.37	4.92	2.85	1.88	2.59
21-25	8, 392	32.52	21.88	15.34	11.39	6.82	4.52	3.09	1.78	1.11	1.55
26-30	9,336	39.33	24.18	14.51	8.88	5.39	3.14	1.95	1.12	0.58	0.92
31-35	10,200	44.30	24.94	14.03	7.75	4.10	2.01	1.30	0.65	0.47	0.45
36-40	10,573	46.45	25.82	13.32	6.95	3.39	2.01	1.04	0.44	0.31	0.27
41-45	10, 127	48.20	26.26	12.96	6.38	2.98	1.45	0.83	0.46	0.25	0.23
46-50	9,041	49.92	25.76	12.95	5.70	2.79	1.38	0.80	0.38	0.14	0.18
51-55	7,466	51.72	26.41	12.05	5.08	2.37	1.18	0.71	0.20	0.09	0.19
56-60	5,949	53.38	25.05	11.72	5.55	2.30	0.97	0.49	0.27	0.12	0.15
61-65	4,608	55.35	23.96	11.68	5.10	2.17	0.98	0.39	0.13	0.15	0.09
66-70	3,419	60.08	24.13	9.33	3.77	1.55	0.58	0.32	0.12	0.09	0.03
71-75	2,027	63.24	20.87	9.82	3.55	1.53	0.39	0.35	0.05	0.15	0.05
76 and over	1, 372	64.58	20.48	8.97	4.08	0.73	0.80	0.07	0.07	0.07	0.15
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1964 California Driver Record Study: Percentage Distribution of Female Licensees	by Age and Negligent Operator Point Count + Moving FTA's
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TABL	

(Three-year record)

	Total			Γ	Points -	+ Movin	g FTA'	S			
Age	number	0	1	2	ß	4	5	9	7	8	9 or more
All ages	61, 273	69.50%	19.99%	6.65%	2.36%	0.85%	0.34%	0.16%	0. 07%	0.03%	0.05%
Under 21	2,867	55.57	24.80	11.30	4.43	2.09	0.91	0.35	0.24	0.07	0.24
21-25	5,910	65.99	20.49	8.14	2.94	1.42	0.49	0.17	0.12	0.07	0.17
26-30	6,574	70.55	19.44	6.16	2.37	0.67	0.47	0.14	0.09	0.09	0.02
31-35	7,534	71.11	19.51	6.01	2.15	0.73	0.23	0.17	0.05	0.03	0.01
36-40	8,612	69.89	20.05	6.22	2.30	0.92	0.33	0.16	0.05	0.03	0.05
41-45	8, 113	69.97	20.34	6.29	2.10	0.76	0.31	0.17	0.04	1	0.02
46-50	6,671	70.48	19.65	6.24	2.28	0.73	0.33	0.18	0.06	0.01	0.04
51-55	5,253	71.63	19.41	6.11	1.81	0.65	0.27	0.04	0.06	1	0.02
56-60	3, 807	71.04	19.57	6.30	2.05	0.66	0.13	0.16	0.03	0.03	0.03
61-65	2,706	71.36	18.29	7.06	2.40	0.63	0.15	0.07	1	!	0.04
66-70	1, 822	71.20	19.27	6.64	2.03	0.44	0.16	0.11	0.05	0.05	0.05
71-75	952	71.31	20.17	6.20	1.89	0.32	0.11	1	1	1	1 1
76 and over	452	72.57	19.25	3.98	3.32	0.44	0.22	0.22	1	1	1

lifornia Driver Record Study: Average (Mean) Number of Negligent Opera-	r Points + Moving FTA's by Age, Sex and Marital Status
964 Califorr	tor Poi
13.	
TABLE	

(Based on three-year record of 147, 990 licensees)

		Total			Males			Females	
Age	Total	Married	Single	Total	Married	Single	Total	Married	Single
All ages	0.904	0.788	1.328	1.205	1.066	1.685	0.477	0.406	0.762
Under 21	1.829	1.372	1.990	2.526	2.996	2.458	0.806	0.710	0.888
17 18	2.400 1 883	2.000	2.545 1 962	3.091	2.333	3.375	0.500	1.000	0.333 0.899
19	1.885	1.398	2.048	2.607	3.234	2.530	0.834	0.754	0.901
20	1.746	1.345	1.949	2.470	2.847	2.386	0.784	0.668	0.919
21-25	1.369	1.133	1.718	1.926	1.923	1.928	0.580	0.460	0.998
21	1.689	1.363	1.959	2.459	2.724	2.348	0.653	0.562	0.840
22	1.466	1.117	1.873	2.079	1.997	2.130	0.619	0.505	0.971
23	1.351	1.113	1.704	1.878	1.898	1.860	0.600	0.465	1.121
24	1.245	1.122	1.486	1.699	1.798	1.578	0.580	0.458	1.145
25	1.140	1.042	1.378	1.605	1.685	1.476	0.453	0.345	1.026
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26-30	1.075	0.960	1.499	1.507	1.441	1.676	0.462	0.402	0.910
26	1.148	1.025	1.510	1.636	1.611	1.685	0.467	0.405	0.880
27	1.109	1.013	1.409	1.537	1.524	1.566	0.460	0.404	0.832
28	1.093	0.961	1.601	1.555	1.457	1.818	0.433	0.380	0.853
29	1.043	0.924	1.519	1.430	1.345	1.670	0.500	0.430	1.039
30	0.988	0.890	1.464	1.381	1.306	1.654	0.452	0.390	0.953
31-35	0.896	0.820	1.312	1.234	1.172	1.497	0.438	0.389	0.854
36-40	0.825	0.778	1.159	1.117	1.077	1.379	0.467	0.419	0.842
41-45	0.775	0.726	1.150	1.032	0.990	1.378	0.454	0.390	0.903
46-50	0.755	0.718	1.001	0.974	0.937	1.279	0.458	0.402	0.747
51-55	0.698	0.674	0.831	0.894	0.871	1.079	0.418	0.358	0.643
56-60	0.696	0.679	0.770	0.865	0.844	1.011	0.432	0.364	0.603
61-65	0.676	0.653	0.761	0.815	0.777	1.065	0.441	0.365	0.574
66-70	0.589	0.566	0.657	0.670	0.639	0.854	0.438	0.350	0.542
71-75	0.559	0.550	0.582	0.633	0.614	0.731	0.400	0.308	0.485
76 and over	0.563	0.544	0.602	0.612	0.572	0.761	0.414	0.351	0.446

TABLE 13. -- Continued

A moving FTA is a citation for a moving traffic violation on which the subject has failed to appear in court as scheduled. Negligent operator point totals were determined by allocat-ing the designated number of points to each "countable" traffic violation and one point for each accident. Note:

964 California Driver Record Study: Percentage Distribution of Convictions by	TvpeTotal Sample*
TABLE 14 1964 California	

Type--Total Sample\* (Three-year record)

	Equipment	6 100.00%	93.44	3.91	1.39	0.64	0.27	0.35	15.03	11.4
	Major	100.00	98.80	1.04	0.12	0.02	0.00	0. 02	1.91	1.5
tion	Speed	100.00%	83.05	12.11	3.05	1.06	0.41	0.32	32.36	24.6
pe of convic	Turning, stopping, and signalling	100.00%	93.32	6.03	0.57	0.06	0.01	0.01	9.78	7.4
Ty	Right of way	100.00%	96.12	3.66	0.20	0.01	0, 00	0.01	5.48	4.2
	Driving, overtaking, and passing	100.00%	93.98	5.42	0.52	0.05	0.01	0.02	8.88	6.8
	Signs, signals, and markings	100.00%	83.74	13.17	2.42	0.52	0.11	0.04	26.57	20.2
	Number of convictions	All counts	0		2	S	4	5 or more	Percent of total convictions	Mean number of convictions per 100 drivers

\*N = 144, 726

# Part 7--The Relationship Between Types of Convictions and Accidents<sup>5</sup>

This report attempts to answer questions concerning the nature of the conviction-accident relationship as it applies to various violation categories. Prior to this report, convictions had been dealt with as one collective unit. Convictions were grouped into seven categories in this report, i.e., (1) signs, signals, and markings; (2) driving, overtaking, and passing; (3) right-of-way; (4) turning, stopping, and signalling; (5) speed; (6) major violations; and (7) equipment. With a few exceptions convictions falling into each of these categories are considered to be violations involving the safe operation of the vehicle. A complete listing of the various <u>California Vehicle Code</u> violations that were grouped into the seven categories used in the <u>1964 California</u> <u>Driver Record Study</u> and replicated in the current investigation is presented in Appendix F.

Part 7 of the study is of interest to the extent that it provides a breakdown of the types of convictions recorded for the general driving population. The report is primarily concerned with the magnitude and shape of the relationship between each of the traffic conviction categories and accident involvement. For purposes of comparison with data collected on the driving records of California public

<sup>&</sup>lt;sup>5</sup>Ibid., Part 7, March 1966.

secondary school driver instruction teachers, however, only that aspect of the report dealing with the percentage distribution of convictions by type was considered relevant. Table 14 illustrates the types of convictions that were recorded for the sample of 144, 726 licensed drivers during the three year period under investigation.

#### Summary

In this chapter a brief review has been presented of those portions of the <u>1964 California Driver Record Study</u> considered to be relevant to this investigation concerning the driving records of California public secondary school driver instruction teachers. One of the stated objectives of the Department of Motor Vehicles' study was to establish normative data describing the typical California general driving population in terms of selected driver record components. Specifically, the following descriptive data on the California general driving population were presented and illustrated with appropriate tables in this chapter:

- 1. Percentage distribution of licensees by total number of accidents and convictions.
- 2. Percentage distribution of licensees by negligent operator point counts and sex.
- 3. Mean number of accidents and convictions by age, sex, and marital status.

- 4. Mean number of negligent operator point counts by age, sex, and marital status.
- 5. Percentage distribution of convictions by type.

An analysis of data presented reveals the following profile

of the California general driving population:

- 1. Six out of every 10 licensees had no convictions on their official record for the three year period immediately prior to the investigation. The average motorist had .80 convictions (males had 1.10 convictions while females had .37).
- 2. Better than 8 of every 10 licensees were not involved in an accident during the three year period. The average motorist had .20 accidents (males had .26 while females had .13).
- 3. Slightly over half of the licensees (55.86%) had "0" negligent operator point counts on their three year record. Less than one driver in 100 had more than 5 convictions or more than two accidents during the three year period under investigation.
- 4. Less than 1 per cent of the total driving population can be considered as negligent operators at any given time. Of the males, .94 per cent were considered prima-facie negligent operators while only .07 per cent of the females were so classified. The average licensee had .9 negligent operator points on his record (males had 1.20 while females had .47).

No attempt has been made to critically evaluate or provide a

comprehensive analysis of the entire <u>1964 California Driver Record</u> <u>Study</u>. Only those portions considered to be relevant to make a statistical comparison with the driver records of the driver instruction teachers were reviewed.

In the next chapter a listing will be made of the procedures, methods, techniques, and instruments that were used to enable the statistical comparison of the two samples of the California licensed driver population. A concerted effort was made to follow the carefully delineated procedures that were the basis for the Department of Motor Vehicles' 1964 study.

## CHAPTER III

### DESIGN

What was to be done in the study, how it was accomplished, and what devices or instruments were used to obtain the data necessary for the solving of the problems under investigation will be presented in this chapter through statements concerning (a) the sample, (b) the instrumentation, (c) the procedures used to obtain data, (d) the statistical hypotheses, (e) the statistical methods of treatment and analysis employed, and (f) the summary.

For purposes of this investigation the assumption was made that the official driver record file for each of the subjects contained all accident and conviction involvements and, by the very fact that they appear on the official legal record, are an indication of the subject's "success" in driving a motor vehicle during the previous three year period.

#### Sample

This comparative analysis aspect of investigation was concerned with two samples drawn from the licensed driver population of

the State of California. The normative data derived from the <u>1964</u> <u>California Driver Record Study</u><sup>1</sup> were used for comparative purposes with the data obtained in this investigation. As described earlier in Chapter II, the sample of the 1964 Department of Motor Vehicles' study contained a two per cent randomly selected group of licensed drivers from the 11 million-plus total population of licensed California drivers. The actual sample of 225,393 subjects represented the entire spectrum of the general driving population in terms of age, sex, and marital status.

The sample that was drawn for purposes of this investigation contained only California public secondary school teachers of driver instruction who were also licensed drivers. The group contained only those teachers who actually had driver instruction "teaching" assignments during the 1966-67 school year as opposed to administrative or supervisory-type positions. A total of 4,584 driver instruction teachers were identified and drawn from the 361 public secondary school districts within the State of California. Of the 361 school districts surveyed to obtain the sample, 334 (92.5%) responded in time for data to be included in the study. This represented a sampling of 56 of the 58 California counties. The 4,584 driver instruction teachers

<sup>&</sup>lt;sup>1</sup>Ronald S. Coppin, <u>et al.</u>, <u>The 1964 California Driver</u> <u>Record Study</u> (Sacramento, California: California Department of Motor Vehicles, 1964-67).

comprised 75.3 per cent of the 6,091 full- or part-time driver instruction teachers claimed by the State Department of Education to be active during the 1966-67 school year.<sup>2</sup> The total was later reduced to a useable sample of 4,558 subjects. A concerted attempt was made to draw as large a sampling of the total population of driver instruction teachers as was possible within the time limitations of the investigation. It was felt the sample that was obtained truly represents the total population of California public secondary school driver instruction teachers.

#### Instrumentation

Three separate instruments were used to obtain data relative to the problems under investigation:

1. A <u>survey-questionnaire</u> instrument was used to obtain data necessary to identify those public secondary school teachers with driver instruction assignments during the 1966-67 school year. The original questionnaire format was reviewed by selected State Department of Education personnel, college driver instruction professors, secondary school administrators, and high school driver instruction teachers. The

<sup>&</sup>lt;sup>2</sup>California State Department of Education, "Data Concerning Instruction in Driver Education and Driver Training in the California Public High Schools."

questionnaire was designed to obtain data in two general areas: (1) to obtain that information necessary to make positive identification of the subject with the official driver record file maintained by the California Department of Motor Vehicles, i.e., full name, date of birth, and driver license number, and (2) to obtain information from the school district personnel file relative to the subjects' academic background, phase of instructional assignment, and certification authority for assignment as driver instruction teachers. The questionnaire and covering letters of transmittal appear in Appendix B.

- 2. The Department of Motor Vehicles' "<u>Request for Driver</u> <u>Record Information</u>," Form DL-254, was used to obtain the official report of recorded accident and conviction incidents for each of the 4,584 subjects included in the sample. The current status of the driving privilege plus indications of atypical administrative actions, if any, were obtained through use of this instrument. This "Request for Driver Record Information" form appears in Appendix C.
- Official <u>membership rosters</u> for the 1966-67 school year were obtained from the California Driver Education Association and the American Driver and Traffic Safety Education
Association. Data from these records were used to determine professional affiliation of the sample subjects.

### Procedures

In order to obtain a high rate of return of the completed survey-questionnaire forms, arrangements were made to have the forms mailed directly to the individual public secondary school district administrative officials by the State Department of Education. The forms were included in a routine mailing of the Department's annual request for information concerning district involvement in driver instruction activities. Results of that annual survey are used to compile the Bureau of Elementary and Secondary Education's annual report of "Data Concerning Instruction in Driver Education and Driver Training in the California Public High Schools," and return of information generally approaches 100 per cent. Because of time limitations arbitrarily imposed on this investigation, however, surveyquestionnaire data from only 334 of the 361 public secondary school districts were received in time to be included in the study.

A list of the 361 public secondary school districts in California was compiled on the basis of information taken from the <u>Directory</u> of Administrative and Supervisory Personnel in California Public

<u>Schools</u><sup>3</sup> and the <u>California School Directory</u>.<sup>4</sup> Administrative code numbers assigned to individual school districts appearing in those two directories were used for school district identification purposes. Individual counties were arranged alphabetically and numbered consecutively from 01 through 58. School districts within each county were also numbered consecutively. The code number used, therefore, identified the school district within a particular county, e.g., Alameda County was coded 01 and the first school district in Alameda County, Alameda City Unified, was coded 010. Therefore, the code 01-010 was placed on the survey-questionnaire instrument to identify data concerning driver instruction teachers within the Alameda City Unified School District in Alameda County.

Following the return of the survey-questionnaire form by the 334 public secondary school districts to the State Department of Education, individual subject identification data (full name, date of birth, and driver license number) were transcribed onto the Department of Motor Vehicles' "Request for Driver Record Information" Form DL-254. Each subject was given a code identification number which

<sup>&</sup>lt;sup>3</sup>California State Department of Education, <u>Directory of</u> <u>Administrative and Supervisory Personnel in California Public Schools</u> (Sacramento, California: State Printing Office, 1966).

<sup>&</sup>lt;sup>4</sup>California Association of Secondary School Administrators, <u>California School Directory</u> (Burlingame, California: The Association, 1966).

was placed on the original survey-questionnaire instrument as well as on the DL-254 form to ensure the positive matching of the driver record search results with the subject within the particular school district. The DL-254 form was then forwarded to the Department of Motor Vehicles for the official search of the subjects' driver record files. This search resulted in the positive identification of all but 15 of the original 4,584 subjects. Certain clerical transcription errors that appeared on the districts' completed survey-questionnaire forms were corrected from data in the official driver record file. In addition to the 15 that were not positively identified because of insufficient or inaccurate information on the survey-questionnaire instrument, 8 subjects were identified as not possessing a driver license, while 3 subjects did not hold a valid California driver license, but did hold an out-of-state driver license. These 26 subjects were removed from the total sample of 4, 584, reducing the useable sample to 4, 558 driver instruction teachers with valid California drivers licenses.

Official 1966-67 membership rosters from the California Driver Education Association and the American Driver and Traffic Safety Education Association were matched by full name and school district of the 4,558 subjects. A total of 504 of the sample subjects appeared on the official membership rosters. This information was

transcribed onto the survey-questionnaire instrument representing the subjects' reporting school districts.

Following return of the completed DL-254 forms from the Department of Motor Vehicles containing the official driving record of each of the 4,558 subjects, the driver record components were coded and transcribed onto the appropriate survey-questionnaire instrument representing the individual subject's reporting school district.

At this point all descriptive data concerning the individual subjects were transcribed from the survey-questionnaire instrument onto an intermediary code sheet. Information so transcribed included data identifying the subject by school district, his driver record, and information concerning his academic background, phase of instructional assignment, and professional affiliation. The coding sheet format appears in Appendix D. The coding and transcription operations were done by a specially-trained clerical staff. A cross-checking procedure was used to reduce possibility of error. Later editing by a CDC-3600 computer further reduced the probability of clerical errors.

Data from the coding sheets were keypunched onto IBM cards and verified for accuracy. After initial frequency distributions were tabulated with data processing machines, data were transferred onto

magnetic tape and processed through a CDC-3600 computer. Data were statistically treated and interpreted to make a comparison between the 1964 California Driver Record Study normative data on the general driving population and the data derived in this investigation on the public secondary school driver instruction teacher population. The statistical treatment involved testing for the significance of observed differences between mean numbers of recorded accidents, convictions, and negligent operator point counts by age, sex, and marital status. The critical ratio or t-test method of determining significant differences between means of the two populations was used to determine whether any observed differences were true differences or merely due to chance fluctuations in sampling. A stringent region of hypothesis rejection was desired, leading to the decision-rule to reject the null hypothesis if t > 2.58 or at the 1 per cent confidence level. Any observed difference that large would occur due to sampling differences less than once in every 100 such comparisons and it would not be reasonable to attribute the difference to chance, but rather that a real difference could be assumed to exist between the two samples and, by inference, between the two populations from which they were drawn.

The t-test statistic was deemed appropriate for the significance test even though both groups' frequency distributions of recorded

accidents and convictions were positively skewed. Since both groups' distributions were skewed in the same direction in approximately identical proportions, it was felt the statistical results of the critical ratio test should not be distorted. The question of the form of the original distributions becomes irrelevant because of the large sample sizes involved. The central limit theorum was applied:

As both  $N_1$  and  $N_2$  grow infinitely large, the sampling distribution of the difference between the means approaches a normal distribution, regardless of the form of the original distributions.<sup>5</sup>

The t-test was also considered to be most conservative since the assumption of equal variances between the two sample groups was not made. The following formula was used:

$$t = \sqrt{\frac{\frac{\overline{X}_{1} - \overline{X}_{2}}{\frac{1}{N_{1}} + \frac{s_{2}^{2}}{N_{2}}}}$$

Possible non-normality in the two populations and the concomitant violation of specific theoretical assumptions in the use of the t-test statistic, led to the decision for the rigorous 1 per cent confidence level rejection interval. Cockrin, in a review of studies dealing

<sup>&</sup>lt;sup>5</sup>William L. Hays, <u>Statistics for Psychologists</u> (New York: Holt, Rinehart, and Winston, Inc., 1963), p. 316.

with theoretical assumptions for tests of significance of differences, concludes "... the consensus from these investigations is that no serious error is introduced by non-normality in the significance level of the ... two-tailed t-test."<sup>6</sup>

It was recognized that major dissimilarities were present in the two sample groups and would likely influence the statistical comparison. For example, the Department of Motor Vehicles' sample was a randomly selected group (223, 683) containing a cross-section of the entire California driving population of over 11 million licensed drivers. The driver instruction teacher sample, however, represented a unique group (4,558) in terms of age distribution, sex ratios, and occupational status. The driver instruction teacher sample group did not contain any subject under the age of 21, and only a single subject over the age of 65. This group was composed of approximately 96 per cent males and only 4 per cent females. Since age and sex have long been isolated as major factors in any discussion of differences in accident and conviction incidence, this dissimilarity in the two sample groups had to be taken into account. In most instances the two groups were statistically equated in order to enable a

<sup>&</sup>lt;sup>6</sup>W. G. Cockrin, "Some Consequences When the Assumptions for Analysis of Variances Are Not Satisfied," <u>Biometrics</u>, III (1947), pp. 22-38.

legitimate comparison in driver record components. The specific details of this operation are described in Chapter IV.

Data obtained in this investigation were additionally analyzed to provide a characteristic profile of the California public secondary school driver instruction teacher in terms of his driving record and academic background, phase of instructional assignment, and professional affiliation. The chi square statistic was used in this withingroup analysis as a test for independence of the variables as well as a test of hypothesized expected frequencies. A one-way analysis of variance technique was used to test for significant differences among means.

## Statistical Hypotheses

The statistical hypothesis for that part of this investigation concerning the comparison of driving records of California public secondary school driver instruction teachers and the general driving population was stated as follows:

> <u>Null hypothesis</u>: There is no significant difference in the driver record mean numbers of accidents, convictions, and negligent operator point counts for the driver instruction teacher sample when compared with those of the general driving population sample.

Symbolically:  $H_0: \mu_1 = \mu_2$ 

Legend:  $\mu_1 = \text{Driver record variables} - \frac{1}{\text{driver instruction teacher}}$ 

$$\mu_2$$
 = Driver record variables--  
general driving population

<u>Alternate hypothesis</u>: The mean numbers of accidents, convictions, and negligent operator point counts for the driver instruction teacher sample will be significantly lower than those of the general driving population sample.

Symbolically:  $H_{\Lambda}: \mu_1 < \mu_2$ 

Legend:	$\mu_1 =$	Driver record variables
	' I	driver instruction teacher
		population

 $\mu_2$  = Driver record variables-general driving population

To test for significancy of differences in the means of the driver record variables when considering academic background, phase of instructional assignment, and professional affiliation, a one-way analysis of variance technique was applied for each variable. The driver record variable was represented by the mean number of negligent operator point counts. The statistical hypothesis for each of these analyses was: <u>Null hypothesis</u>: There is no significant difference in driver record mean number of negligent operator point counts between:

- those who have earned bachelors, masters, or doctoral degrees;
- undergraduate and graduate major fields of preparation;
- those assigned to classroom teaching only, behind-the-wheel teaching only, or combinations of the two;
- those who are professional members of CALDEA and/or ADTSEA and those who are non-members.

Symbolically:  $H_0: \mu_1 = \mu_2 = \mu_3 \dots = \mu_k$  $H_A: \text{ not } H_0$ 

Legend:  $\mu$  = the mean number of negligent operator point counts for each variable.

The formula that was used to test for significancy of differences in the computed variances was:

$$F = \frac{MS \text{ between}}{MS \text{ within}}$$

To test the strength of the relationship between traffic density and the driver record (as represented by the mean number of negligent operator point counts) a coefficient of correlation (product-moment correlation) was computed. The test of significance of the correlation was a test of the null hypothesis, i.e., the obtained correlation in this sample is not different from a correlation of zero. Any difference can be ascribed easily to a chance variation about population correlation of zero. The significance test formula that was used was:

$$t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

#### Summary

In this chapter there have been presented the procedures, methods, techniques, and instruments that were used in the investigation. Specifically cited were the two sample groups drawn from the 11 million-plus licensed driver population in the State of California. Normative data on the typical general driving population were drawn from the <u>1964 California Driver Record Study</u>, which used a random sample containing 225, 393 subjects representing 2 per cent of the total licensed driver population. Data from a sample of 4,584 subjects representing 75.3 per cent of the public secondary school driver instruction teacher population were used for driver record comparative purposes.

A survey-questionnaire instrument was used to identify the driver instruction teachers; their driver record files were searched by the Department of Motor Vehicles; their professional affiliation was determined by an examination of official membership rosters of the professional driver and traffic safety education associations; and all personal and driver record data were coded and transcribed by a specially-trained clerical staff onto IBM cards and magnetic tape before being edited and processed through a CDC-3600 computer.

The research hypothesis and problem were restated in testable form and presented in the null form. The statistical comparison of the two sample groups was accomplished by means of ttests to determine the ratio of variability between mean differences. A one-way analysis of variance technique was applied to test for the presence of statistical relationship between the driver record and academic background, phase of instructional assignment, and professional affiliation. A product-moment coefficient of correlation was computed to test the strength of the relationship between traffic density and the driver record variables.

In the next chapter the findings of the statistical comparison of the driving records of public secondary school driver instruction teachers and those of the general driving population will be presented.

### CHAPTER IV

# ANALYSIS OF DATA AND FINDINGS: THE COMPARISON OF DRIVER RECORDS OF DRIVER INSTRUCTION TEACHERS AND THE GENERAL DRIVING POPULATION

Previous chapters contained the methodology and research tools that were used in this investigation and a summary of a previous investigation that provided normative data on the driver records of the California general driving population. This chapter will contain the analysis of data from the official driver record files of 4, 558 California public secondary school driver instruction teachers. Data for this sample group were statistically compared to the normative data on the general driving population to provide the basis for possible support or rejection of the research hypothesis, i.e. the driver records of driver instruction teachers are superior to those of the general driving population. The findings will be presented under the following five headings: (a) general observations; (b) driver record by age; (c) driver record by sex; (d) driver record by marital status; and (e) summary.

Throughout the remainder of this report the term "DIT" will be used to represent data specific to the driver instruction teacher sample group, while the term "DMV" will designate data specific to the general driving population sample group as reported in the <u>1964 California Driver Record Study</u>.<sup>1</sup>

To delineate a driver record profile of the California public secondary school driver instruction teacher population, the official driver record components, i.e. reported accidents, convictions, and the resulting negligent operator point counts, were tallied and summarized. Only those driver record entries for the three year period immediately prior to the date of the investigation, June 1, 1967, were included in the study. Data were analyzed and interpreted to provide answers to the following general questions:

- 1. How many California driver instruction teachers have clear driver records, i.e. accident and conviction free for a three year period, and how do they compare proportionally to the general driving population?
- 2. What are the mean numbers of accidents, convictions, and negligent operator point counts appearing on the driver records of driver instruction teachers and how do they compare to those of the general driving population?
- 3. What proportion of driver instruction teachers can legally be classified as prima-facie negligent operators and how does it compare to that of the general driving population?

<sup>&</sup>lt;sup>1</sup>Ronald S. Coppin, et al., <u>The 1964 California Driver</u> <u>Record Study</u> (Sacramento, California: California Department of Motor Vehicles, 1964-1967).

- 4. How do the driver records of male and female driver instruction teachers compare to those of the general driving population?
- 5. How do the driver records of married and unmarried driver instruction teachers compare to those of the general driving population?
- 6. What types of traffic violations result in convictions for driver instruction teachers and how do they compare proportionally to those of the general driving population?

### **General Observations**

In analyzing the data obtained from the official search of the official driver record files maintained by the Department of Motor Vehicles for each of the 4,558 subjects included in the DIT sample group, the following observations not specific to age, sex, or marital status were made:

1. Less than half of the driver instruction teachers had an accident and conviction free driver record file during the three year period immediately prior to the investigation. The DIT group showed 49.9 per cent without a recorded accident or conviction, while 52.7 per cent had a "0" negligent operator point count. The DMV group had been reported to have 55.8 per cent with a "0" negligent operator point count. When the two groups were equated in terms of age and sex ratios, however, this percentage

with "0" negligent operator point counts dropped to 46.0 in the DMV group and 52.6 in the DIT group. Justification for equating the two groups will be explained later in the chapter.

- 2. A total of 41 driver instruction teachers could legally be classified as prima-facie negligent operators having an excessive number of points assessed against their driver record within a limited period of time. This total represents 0.89 per cent of the total sample and compares to the 0.94 per cent in the prima-facie negligent operator classification at any given time within the male general driving population. A total of 10 of the prima-facie negligent operator driver instruction teachers were found to be employed by a single secondary school district.
- 3. A total of 15 driver instruction teachers had been convicted during the three year period under investigation of a major traffic violation, e.g. drunk driving, hit-and-run, and driving after their driver license had been suspended or revoked. Four of the driver instruction teachers had multiple major convictions on their record, while one subject had been convicted of a major violation on five separate occasions. An additional 35 had been convicted

of one or more of these major violations at some time previous to the three year period under investigation.

- 4. A total of 22 driver instruction teachers had previously had their driver license officially suspended or revoked by the Department of Motor Vehicles because of illegal driving behavior or the accumulation of an excessive number of negligent operator points.
- 5. A total of 21 driver instruction teachers' files indicated the Department of Motor Vehicles had established a "special" file, indicating in general that some action had been taken or was contemplated by the Department for medical or driver behavior purposes.
- 6. A total of 9 driver instruction teachers had official "holds" placed on their file because of their failure to appear in traffic court to answer a traffic citation after having given their written promise to appear. One subject had an uncleared FTA on his driver record since 1959, indicating his driver license had not legally been renewed since that time. He was assigned behind-the-wheel instructional duties within his school district.
- 7. Eight driver instruction teachers were found to be nondrivers. An additional three held only an out-of-state

driver license in violation of regulations requiring possession of a valid California driver license.

# Driver Record by Age

The average (mean) age of the driver instruction teachers in the sample was 36.4 years. Over 50 per cent of the male teachers were under 35 years of age, while slightly over 50 per cent of the female teachers were under the age of 30. Tables 15 and 16

TAB	LE 15.	Driv	rer	Instru	lction	Tea	chers:	$\mathbf{P}$	ercentag	ge	Distribut	ion
	of Lic	ensees	by	Total	Numb	er o	f Accid	den	tsTota	al S	Samples	
			(	Three	-year	pri	or rec	core	d)			

Number of	Driver Instru	ction Teachers	General	Population
Accidents	Frequency	Percentage	Frequency	Percentage
Total Sample	4,558	100.0%	148,006	100.0%
0	3,780	82.9	122,549	82.8
1	686	15.0	21,313	14.4
2	83	1.8	3,404	2.3
3	7	0.2	592	0.4
4	2	0.1	148	0.1
5 or more				
Mean Number of Accidents <sup>a</sup>		19		20
Standard Deviation		45		50

 $a_t = 1.48$  (not significant)

show that 82.9 per cent of the driver instruction teachers did not have an accident recorded on their official driver record for the three year period immediately prior to the investigation, while 58.3 per cent did not have a recorded conviction for a traffic violation.

Number of	Driver Instruc	tion Teachers	General P	opulation
Convictions	Frequency	Percentage	Frequency	Percentage
Total Sample	4,558	100.0%	148,006	100.0%
0	2,656	58.3	88, 804	60.0
1	1,212	26.6	32,561	22.0
2	441	9.7	13, 321	9.0
3	136	3.0	6,068	4.1
4	66	1.4	2,960	2.0
5	21	0.5	1,776	1.2
6	20	0.4	1,036	0.7
7	2	0.1	592	0.4
8	3	0.1	296	0.2
9 or more	1		592	0.4
Mean Number of Convictions <sup>a</sup>		67		80
Standard Deviation	1.	03	1.	36

TABLE 16. -- Driver Instruction Teachers: Percentage Distribution of Licensees by Total Number of Convictions--Total Samples (Three-year prior record)

<sup>a</sup>t = 7.67 (significant beyond the 1 per cent level of confidence)

Tables 15 and 16 also provide a proportional comparison of the driver record components for the DIT and DMV sample groups. Data for the general driving population were previously reported in Table 1 on page 25.

The two groups appear remarkably alike when considering the proportions of subjects involved in accidents. The DMV group shows 82.8 per cent to be accident free, while the DIT group shows 82.9 per cent. The similarity was also evident, but to a lesser degree, in the comparison of conviction incidence--60.0 per cent conviction free in the DMV group to 58.3 per cent in the DIT group. Figure 1 graphically illustrates the proportional similarity of the mean numbers of accidents and convictions for the two sample groups.



FIG. 1. -- Mean Numbers of Accidents, Convictions, and Negligent Operator Point Counts for Driver Instruction Teachers and the General Driving Population.

When the critical ratio, or t-test, was applied, the difference between the means proved non-significant in terms of accident involvement. There was a highly significant difference between the two groups, however, in terms of mean numbers of convictions. This finding was significant beyond the 1 per cent level of confidence, indicating the difference was unlikely to be the result of chance factors alone and it would be found in 99 of every 100 such comparisons.

While this investigation was essentially conducted to provide descriptive data on the California public secondary school driver instruction teacher population, it was not considered within the scope of the study to investigate possible causal-relationship factors for any of the phenomena that might be revealed. However, in the interest of accounting for the apparent substantial difference in the mean number of convictions for each of the two sample groups, both groups were reexamined in terms of age and sex ratios. The DMV group was made up of more than 148,000 subjects ranging in age from 16 to over 76. There were approximately 87,000 male subjects representing 58.6 per cent of the total sample. The DIT group, on the other hand, was composed of 4,558 subjects ranging in age from 22 to 68, with only a single subject over the age of 65. Males comprised over 95 per cent of the sample. It was

obvious the two groups had differing age and sex ratios and any statistical comparison that failed to take such differences into account could produce distorted results. The 1964 California Driver Record Study, as well as numerous other driver record studies, reported that male drivers had substantially higher rates of accident and conviction involvements than did their female counterparts. Younger (under 21) and older (over 65) drivers were also involved in a disproportionate number of accidents and convictions. Since the DIT sample group contained over 95 per cent males (who normally have higher accident and conviction rates than do females) and did not contain any subjects in the very young or very old age groups (who also have higher accident and conviction incidence rates), the statistical comparison of group means would be relatively meaningless if compared to the more normally distributed DMV sample group in terms of age and sex.

In an attempt to equate the two sample groups to enable a more realistic and meaningful comparison of data, all data on subjects under the age of 21 and over the age of 65 and all female subjects were removed from both samples. This age and sex adjustment resulted in a final sampling of 75, 691 male licensed drivers between the ages of 21 and 65 in the DMV group and 4, 368 males in the same age categories in the DIT group.

Tables 17, 18, and 19 show the percentage distributions by accidents, convictions, and negligent operator point counts for both sample groups after the age and sex data adjustments were made. By removing all females and younger and older subjects

TABLE 17 Driver Instruction Teachers: Percentage Distribution
of Male Licensees Between the Ages of 21-65
by Total Number of Accidents
(Three-year prior record)

Number of	Driver Instruc	tion Teachers	General F	opulation
Accidents	Frequency	Percentage	Frequency	Percentage
Total Sample	4,368	100.0%	75,691	100.0%
0	3,624	83.0	59,796	79.0
1	<b>6</b> 59	15.1	13,092	17.3
2	76	1.7	2,329	3.1
3	7	0.2	388	0.5
4	2	0.1	71	0.1
5 or more			15	0.0+
Mean Number of Accidents <sup>a</sup>		19		26
Standard Deviation	. '	45		55

 $a_{t} = 9.92$  (significant beyond the 1 per cent level of confidence)

TABLE 18 Driver Instruction Teachers: Percentage Distri	bution
of Male Licensees Between the Ages of 21-65	
by Total Number of Convictions	
(Three-year prior record)	

Number of	Driver Instruc	tion Teachers	General F	opulation
Convictions	Frequency	Percentage	Frequency	Percentage
Total Sample	4,368	100.0%	75,691	100.0%
0	2,535	58.0	37,632	49.7
1	1,166	26.3	18,787	24.8
2	<b>42</b> 9	9.8	9,173	12.1
3	128	2.9	4,492	5.9
4	65	1.5	2,314	3.1
5	20	0.5	1,301	1.7
6	20	0.5	794	1.0
7	1	0,0+	449	0.6
8	3	0.1	259	0.3
9 or more	1	0.0+	490	0.6
Mean Number of Convictions		67	1.	07
Standard Deviation	1.	03	1.	57

 $a_{t} = 24.11$  (significant beyond the 1 per cent level of confidence)

			·····	
Number of	Driver Instruc	tion Teachers	General P	opulation
Points	Frequency	Percentage	Frequency	Percentage
TotalSample	4,368	100.0%	75,691	100.0%
0	2,298	52.6	34,823	46.0
1	1,254	28.7	18,931	25.0
2	497	11.4	10,096	13.3
3	190	4.4	5,414	7.2
4	68	1.6	2,819	3.7
5	37	0.8	1,549	2.0
6	17	0.4	936	1.2
7	3	0.1	481	0.6
8	3	0.1	287	0.4
9 or more	1	0.0+	355	0.5
Mean Number of Points		79	1.	18
Standard Deviation	1.	10	1.	59

TABLE 19. -- Driver Instruction Teachers: Percentage Distribution of Male Licensees Between the Ages of 21-65 by Total Number of Negligent Operator Points + Moving FTA's (Three-year prior record)

 $a_t = 22.13$  (significant beyond the 1 per cent level of confidence)

from the DMV sample group, the mean number of accidents rose from .20 to .26; the mean number of convictions rose from .80 to 1.07; and the mean number of negligent operator point counts rose from .90 to 1.18. When the DIT sample group was adjusted for age and sex, however, the means remained relatively unchanged. To measure the significance of variability between these equated sample groups, the t-test statistic was again applied. The DIT group had significantly lower mean numbers of accidents, convictions, and negligent operator point counts than did the DMV group. These findings were significant beyond the 1 per cent level of confidence.

<u>Total accidents</u>. -- Table 20 shows the percentage distribution of mean numbers of accidents for the various age groups within the DIT sample. While over 82 per cent of the DIT sample subjects did not have a recorded accident on their record during the three year period prior to the investigation, 2 out of every 100 driver instruction teachers had been involved in from two to four reported accidents during the period. Comparison of data in Table 20 with accident involvement data for the general driving population, reported in Table 6 on pages 32-33, reveals a general consistency in pattern or trend between the two sample groups. A curious departure within the 55-65 ages within the DIT group, however, is noticeable. Figure 2 graphically illustrates these mean

ners: Percentage Distribution by Age and Total Number of	Recorded Accidents
Instruction Teachers:	Reco
ABLE 20 Driver	

(Three-year prior record)

0.04%0.09 1 1 1 0.12 1 1 1 1 1 1 1 4 0.15%1 1 1 0.99 0.19 0.48 0.21 0.12 1 1 1 1 1 1 1 က Total Accidents<sup>b</sup> 1.83%0.99 1.48 1.55 2.38 4.26 2.53 1.57 1 2.82 1 1 2 15.05%16.34 15.2416.17 12.15 15.06 14.60 23.40 16.11 8.91 1 1 -82.93% 83.46 81.90 81.13 80.86 81.98 86.62 83.85 90.10 72.34 100.00 111 0 7.79% Number Cum. % of Total 28.76 52.50 85.06 92.12 96.73 98.95 99.98 70.21 100.00 1 111 100.00% Number 14.85 7.79 23.74 7.06 20.97 17.71 4.61 2.221.03 0.02 % of Total | | | Number 4,558 1,082 926 210 Total 355 807 677 322 101 47 1 All Ages Age<sup>a</sup> Under 21 31-35 56-60 26-30 36-40 41-45 46-50 51-55 61-65 21-25 66-70

<sup>a</sup>Mean Age = 36.37 (Standard Deviation = 8.71) <sup>b</sup>Mean Number = 0.19 (Standard Deviation = 0.45)

differences by age. The <u>1964 California Driver Record Study</u> had indicated that accident involvement tended to decrease with age



except at the extremely old ages. A marked erratic, or inconsistent, fluctuation in mean numbers of accident involvements is discernable from Figure 2 in the 55-65 age group. It should be remembered, however, that this age grouping represents only 3 per cent of the total DIT sample. Total convictions. -- Figure 3 provides graphic illustration

of the mean conviction differences between the various ages.



Table 21 shows the percentage distribution of age groups in terms of recorded convictions. Over 58 per cent of the driver instruction teachers did not have a recorded conviction on their three year driver record, while approximately 85 per cent had only one or no recorded convictions. Table 21

Age and Total Number of	
Distribution by	tione
Percentage	nded Convic
Driver Instruction Teachers:	Reco
TABLE 21.	

Recorded Convictions (Three-year prior record)

All Ages Number 0   All Ages 4, 558 58.27% 26.   Under 21      21-25 355 43.66 28.   26-30 956 50.52 28.   31-35 1,082 59.33 27	2 0 600 3							
All Ages   4, 558   58.27%   26.     Under 21         21-25   355   43.66   28.   28.     21-25   355   43.66   28.   28.     31-35   1,082   59.33   27.	0 6000	3	4	5	9	7	ω	6
Under 21        21-25   355   43.66   28.     26-30   956   50.52   28.     31-35   1,082   59.33   27.	2.00% Z	. 98%	1.45%	0.46%	0.44%	0.04%	0.07%	0.02%
21-25 355 43.66 28.   26-30 956 50.52 28.   31-35 1,082 59.33 27.	1 1 1	     	1	1	1	1	   	1 9 1
26-30     956     50.52     28.       31-35     1,082     59.33     27	17.18 6	.20	2.54	1.13	0.56	0.28	0.28	1 1 1
31-35 1,082 59.33 27.	12.55 3	. 56	2.30	0.94	1.05	1 1 1	0.11	1 1 1
	8.69 2	. 50	1.29	0.19	0.37	0.09	   	1 1 1
36-40 807 63.20 24.	8.06 2	. 73 (	0.99	0.25	0.37	1	0.12	0.12
41-45 677 61.74 25.	8.42 2	. 81	1.03	0.15	0.15	   	   	1 1 1
46-50 322 64.60 26	5.90 2	. 17 (	0.62	1	1	   	1 1 1	1 1 1
51-55 210 64.76 24.	8.57 1	. 43 (	0.48	0.48	1	   	1	
56-60 101 73.27 17.	4.95 0	. 99	1,98	0.99	1 1 1	1 1 1	1	1 1 1
61-65 47 61.70 27.	4.26 2	. 13	2, 13	2.13	1	   	1 1 1	1 1 1
66-70 1 100.00 -			   			1	-	1

<sup>a</sup>Mean Number = 0.67 (Standard Deviation = 1.03)

reveals, however, that the remaining 15 per cent of the driver instruction teachers had been convicted of traffic violations on from two to nine separate occasions. For purposes of comparing differences in mean numbers of total convictions between the DIT (0.67) and DMV (0.80) sample groups, Table 9 on pages 37-38 should be reviewed. The same general pattern for the various age groups is apparent, but again the marked fluctuation within the DIT 55-65 age grouping appears. This fluctuation can readily be seen in Figure 3.

Negligent operator point counts. -- Table 22 shows the mean number of negligent operator point counts to be 0.78 for the DIT group. This can be compared to the 0.90 mean for the DMV group as previously reported in Table 13 on pages 43-44. It should be recalled that negligent operator point counts are determined by assigning a designated number of points (either 1 or 2) for each "countable" conviction of a moving violation and a single point for each culpable accident involvement. The negligent operator point count is frequently considered to be the best overall indication of the licensees' driving success. Figure 4 shows in graphic form the differences in mean numbers of negligent operator point counts for the DIT group by age. It closely resembles the trend illustrated

Operator	
Negligent	
and	
Age	
by	
e Distribution	
Percentag	ate i Aferica
Teachers:	
Instruction	
Driver	
TABLE 22.	

•

Point Counts + Moving FTA's (Three-year prior record)

	6	0.02%	   	1 8 1	1 1 1	1 1 1	0.12	1 1 1	1 1 1	1 1 1	8 8 8	1 1 1	   
	8	0.07%	1	1	0.21	0.09	1 1 1	1	1	1	1 1 1	1 1 1	
	7	0°.09%	+   	0.56		   	0.25	1	1 1 1	   	   	1 1 1	
TA' s <sup>a</sup>	9	0.39%	1	0.28	1.04	0.28	0.12	1 1 1	1 1 1	0.95	1	2.13	1
ints + I	2	0.81%	1 1 1	1.41	1.46	0.92	0.12	0.44	1	0.47	2.97		
ator Po	4	1.56%		3.38	2.09	1.48	1.12	1.18	0.62	0.95	0,99	2.13	;
ent Oper	ю	4.34%	   	8.45	5.13	3.88	3.84	4.43	2.17	2.86	1.98	2.13	1
Neglige	5	11.41%	1	14.09	15.69	9.61	10.66	10.49	8,39	10.48	4.95	10.63	1 1 1
	1	28.57%	   	31.55	28.77	31.15	24.66	27.92	28.88	27.62	21.78	36.17	-
	0	52.74%	1	40.28	45.61	52.59	59,11	55.54	59,94	56.67	67.33	46.81	100.00
Total	Number	4,558	1 1 1	355	956	1,082	807	677	322	210	101	47	1
	р Д Д	All Ages	Under 21	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70

<sup>a</sup>Mean Number = 0.78 (Standard Deviation = 1.10)

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FIG. 4. -- Driver Instruction Teachers: Average (Mean) Number of Negligent Operator Point Counts by Age.

## Driver Record by Sex

The driver instruction teacher sample was composed of 95.8 per cent males and 4.2 per cent females. Even though less than 5 per cent of the total sample were females, it should be remembered that the 4,558 subjects included in the DIT sample represent over 75 per cent of the total public secondary school driver instruction teacher population in California. The 190 female subjects, therefore, can be considered highly representative for statistical purposes.

<u>Total accidents.</u> -- Table 23 shows the percentage distribution of total accident involvement by sex for the DIT group. A review of Tables 4-5-6 on pages 30-33 can provide a comparison by sex with the DMV group in terms of accident involvement. This comparison is further illustrated in Figure 5. Figure 5 illustrates



FIG. 5. -- Mean Numbers of Accidents by Sex for Driver Instruction Teachers and the General Driving Population.

U U U	Total	% of		Tota	l Accide	nts		Mean	Standard
200	Number	Number	0	1	2	3	4	Number <sup>a</sup>	Deviation
Total Sample	4, 558	100.00%	82.93%	15.05%	1.82%	0.15%	0.04%	0.19	0.45
Male	4,368	95.83	82.97	15.09	1.74	0.16	0.05	0.19	0.45
Female	190	4.17	82.11	14.21	3,68	:	:	0.22	0.49

<sup>a</sup>t = .25 (not significant)

the proportional comparison by sex both within and between the two sample groups.

When the two sample groups were equated in terms of age and sex ratios the DIT group had a significantly lower mean number of accidents than did the DMV group. However, both Table 23 and Figure 5 reveal a radical departure from this finding when the female subjects' data were analyzed. It shows the 190 female driver instruction teachers had a 0.22 mean number of recorded accident involvements compared to the 0.19 mean for the male driver instruction teachers. The DIT female subjects had significantly poorer driver records than did their counterparts in the general driving population. Table 24 shows the DIT females' 0.22 mean to be approximately double the 0.12 mean for females within the DMV sample. It should be remembered that the 1964 California Driver Record Study had concluded that males in the general driving population had well over twice the mean number of accidents than did the females and over three times the mean number of convictions. The 0.22 mean number of accidents for the DIT group females was not significantly different from the 0.19 mean for the DIT group males. The finding of no significant difference, however, is of interest. The California Department of Motor Vehicles' researchers dealt at some length in their study with the concept of relative traffic
TABLE 24 Driver Instruction Teachers: Percentage Distribution
of Female Licensees Between the Ages of 21-65 by
Total Number of Accidents
(Three-year prior record)

Number of	Driver Instruc	tion Teachers	General P	opulation
Accidents	Frequency	Percentage	Frequency	Percentage
Total Sample	190	100.0%	55,181	100.0%
0	156	82.1	49,157	89.1
1	27	14.2	5,395	9.8
2	7	3.7	562	0.1
3			62	0.0+
4 or more			5	0.0+
Mean Number of Accidents	. :	22		12
Standard Deviation	. '	19		37

<sup>a</sup>t = -2.81 (significant beyond the 1 per cent level of confidence)

exposure between male and female drivers. Exposure in traffic has not been accurately or realistically measured for traffic research purposes, so this intangible element was not considered in the comparison of the DIT and DMV samples. Since the males and females within the DIT sample group, unlike the general driving population, represent a single occupational group with relatively identical available traffic exposure hours, this element could very well have been of even less significance or relevance within the DIT group than within the normally distributed DMV group.

<u>Total convictions</u>. -- Table 25 shows the percentage distribution of total convictions by sex for the DIT group. Male subjects had a mean of 0.67 while the female subjects had a mean of 0.58. A review of Tables 7-8-9 on pages 35-38 provides a comparison of mean numbers of convictions between the DIT and DMV groups. Figure 6 illustrates the proportional differences for the two sample groups by sex after the age and sex adjustments previously indicated had been made.





TABLE 25. -- Driver Instruction Teachers: Percentage Distribution by Sex and Total Number of Recorded Convictions

	Total				T ota!	I Convic	tions					Mean	Standard
Sex	Number	0	1	2	3	4	5	9	2	80	6	Number <sup>a</sup>	Deviation
Total Sample	4, 558	58.27%	26.59%	9.68%	2.98%	1.45%	0.46%	0.44%	0.04%	0, 07%	0, 02%	0,67	1.03
Male	4,368	58.04	26.69	9.82	2.93	1.49	0.46	0.46	0.02	0.07	0.02	0.67	1.03
Pemale	190	63.68	24.21	6.32	4.21	0.53	0.53	1	0.53	1	1	0.58	1.01

(Three-year prior record)

at = .39 (not significant)

Table 26 indicates the comparison of conviction incidence

between female subjects within the DIT and DMV sample groups.

Number of	Driver Instruc	tion Teachers	General F	opulation
Convictions	Frequency	Percentage	Frequency	Percentage
Total Sample	190	100.0%	55,181	100.0%
0	121	63.7	41,248	74.8
1	46	24.2	9,959	18.0
2	12	6.3	2,681	4.9
3	8	4.2	829	1.5
4	1	0.5	257	0.5
5 or more	2	1.1	207	0.3
Mean Number of Convictions		58		36
Standard Deviation	1.	01		77

TABLE 26. -- Driver Instruction Teachers: Percentage Distribution of Female Licensees Between the Ages of 21-65 by Total Number of Convictions (Three-year prior record)

<sup>a</sup>t = -2.45 (significant beyond the 5 per cent level of confidence)

The DIT female subjects had a significantly higher mean number of convictions (0.58) than did the females within the DMV group (0.36). This difference was significant at the 5 per cent level of confidence.

While the females within the DIT sample had a higher mean number of accidents than did males within the same sample, female driver instruction teachers had a lower mean number of convictions (0.58) than did the male driver instruction teachers (0.67). These apparent differences, however, were not significant.

Negligent operator point counts. -- The most meaningful comparison of driver records by sex within the DIT sample group can be made by a review of Tables 27-28-29 giving the percentage distribution of negligent operator point counts. The tables indicate a 0.04 difference in the mean numbers of negligent operator point counts for males (0.79) and females (0.75). These means can be compared to those of the DMV sample group by referring to Tables 11-12-13 on pages 41-44. Figure 7 graphically illustrates this comparison. The DIT group as a whole, it should be remembered, was previously found to have a significantly lower mean number of negligent operator point counts at the 1 per cent level of confidence.

Tables 28 and 29 present separate percentage distributions of negligent operator point counts by age and sex for the DIT group. The critical ratio test was applied to determine the significance of the mean differences between females (0.75) and males (0.79). The difference was not significant. This finding was

TABLE 27. -- Driver Instruction Teachers: Percentage Distribution by Sex and Negligent Operator Point Counts + Moving FTA's

Standard	Deviation	1.10	1.10	1.12
Mean	Number	0.78	0.79	0.75
	6	0.02%	0.02	1
	30	0.07%	0.07	1
	7	0, 09%	0.07	0.53
FTA's	9	0.39%	0.39	0.53
Points +	5	0.81%	0.85	1
erator ]	4	1.56%	1.56	1.58
gent Op	3	4.34%	4.35	4.21
Negli	2	11.41%	11.38	12.11
	1	28.57%	28.71	25.26
	0	52.74%	52.61	55.79
Total	Number	4,558	4, 368	190
	V.IC	Total Sample	Male	Female

(Three-year prior record)

<sup>a</sup>t = .14 (not significant)

TABLE 28. -- Driver Instruction Teachers: Percentage Distribution by Age and Negligent Operator Point Counts + Moving FTA's (Males)

(Three-year prior record)

e an l	Total	% of Total	Cum. %			Neglig	ent Ope	rator P	oints +	FTA's <sup>b</sup>			
2 1	Number	Number	Number	0	1	3	3	4	5	9	2	æ	თ
All Ages	4, 368	100.00%		52.61%	28.71%	11.38%	4.35%	1.56%	0.85%	0.39%	0.07%	0.07%	0.01%
Under 21	;	;	;	!	!	:		!	:	!	!	!	ļ
21-25	293	6.71	6.71%	37.88	32.08	14.68	9.56	3.75	1.71	ł	0.34	ľ	:
26-30	919	21.04	27.75	45.70	28.73	15.78	5.01	1.96	1.52	1.09	!	0. 22	!
31-35	1,064	24.36	52.11	52.26	31.48	9.59	3.85	1.50	0.94	0.28		0.09	!
36-40	789	18.06	70.17	58.93	24.71	10.65	3.93	1.14	0.13	0.13	0.25	!	0.13
41-45	658	15.07	85.24	55.77	27.96	10.18	4.41	1.22	0.46	!	!		:
46-50	304	6.96	92.20	60.53	28.95	7.89	1.97	0.66	!	!	:	:	!
51-55	197	4.51	96.71	54.82	28.43	11.17	3. 05	1.01	0.51	1.01	!		1
56-60	26	2.22	98.93	65.98	22.68	5.16	2.06	1.03	3.09	;	!	i	:
61-65	46	1.05	99.98	47.83	34.79	10.87	2.17	2.17	;	2.17	!		!
66-70	1	0.02	100.00	100.00	:			:		!			:

<sup>a</sup>Mean Age = 36.49 (Standard Deviation = 8.59)

 $^{b}Mean Number = 0.79$  (Standard Deviation = 1.10)

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TABLE 29. -- Driver Instruction Teachers: Percentage Distribution by Age and Negligent Operator Point Counts + Moving FTA's (Females)

(Three-year prior record)

A de a	Total	% of Totol	Cum. %			Neglige	ent Oper	ator Po	ints + F	TA' s <sup>b</sup>			
Uğu	Number	Number	Number	0	1	2	3	4	5	9	7	8	<b>6</b>
All Ages	190	100.00%	:	55.79%	25.26%	12.11%	4.20%	1.58%	-	0.53%	0.53%	:	-
Under 21	;	!	;	;	!	;	!	!	:	;	!	!	1
21-25	62	32.63	32.63%	51.61	29.03	11.29	3.23	1.61	1	1.61	1.61	1.	:
26-30	37	19.48	52.11	43.24	29.73	13.51	8.11	5.41	!			1	1
31-35	18	9.47	61.58	72.22	11.11	11.11	5.56	!	!	!		!	;
36-40	18	9.47	71.05	66.67	22.22	11.11	;	:	;	:	:	;	!
41-45	19	10.00	81.05	47.37	26.32	21.05	5.26	:	ł	:	,	;	
46-50	18	9.47	90.52	50.00	27.78	16.67	5.56	   	:	:	:	!	:
51-55	13	6.84	97.36	84.62	15.38		!	;	:	!		ł	:
56-60	4	2.11	99.47	100.00	!	!	1	!	ļ	!	!	1	
61-65	1	0.53	100.00	!	100.00		1		!	{	;		1
66-70	:	:	100.00	:	:	:	!	;	:	!	:	!	;

<sup>a</sup>Mean Age = 33.64 (Standard Deviation = 10.83)

 $^{b}Mean Number = 0.75$  (Standard Deviation = 1.12)

consistent with the t-test results of the comparison of mean differences by sex in accidents and convictions.



FIG. 7.-- Mean Numbers of Negligent Operator Point Counts by Sex for Driver Instruction Teachers and the General Driving Population (Between the Ages of 21-65).

Table 30 shows that 15 driver instruction teachers (all males) were convicted of major traffic violations during the three year period under investigation.

## TABLE 30. -- Driver Instruction Teachers: Percentage Distribution by Sex and Major (Double-Count) Convictions (Three-year prior record)

Sov	Total	Total M	ajor Conv	victions	Mean	Standard
Dex	Number	0	1	2	Number	Deviation
Total Sample	4,558	99 <b>.67</b> %	0.29%	0.04%		0.07
Male	4,368	99 <b>.6</b> 5	13 0.30	2		0.07
Female	190	100.00				

### Driver Record by Marital Status

Over 85 per cent of the sampled driver instruction teachers were married.

<u>Total accidents</u>. -- Married subjects had a 0.17 mean number of accidents during the three year period under investigation, while unmarried driver instruction teachers had a mean approximately twice as high (0.32). Table 31 shows the percentage distribution of reported accidents for the DIT group by marital status. It reveals general agreement with the accident involvement pattern within the general driving population as reported in Table 6 on pages 32-33. A comparison of the data reveals that married subjects in both sample

lers: Percentage Distribution by Marital Status and Total	r of Recorded Accidents	
ABLE 31 Driver Instruction Teacher	Number	

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Standard	Deviation	0.45	0.43	0.58	0.41
Mean	Number	0.19	0.17	0.32	0.21
	4	0.04%	0.03	0.16	;
nts	3	0.15%	0.10	0.48	;
al Accide	2	1.82%	1.53	3.71	;
Tota	1	15.05%	13.80	22.74	20.83
	0	82.93%	84.54	72.90	79.17
% of Total	Number	100.00%	85.87	13.60	0.53
Total	Number	4,558	3, 914	620	24
Marital	Status	Total Sample	Married	Single	Undefined Status

 $a_t = 5.00$  (significant beyond the 1 per cent level of confidence)

groups had a very similar mean number of accidents--0.17 for those in the DIT group to 0.18 for those in the DMV group. The unmarried driver instruction teacher, however, had a higher mean number of accidents (0.32) than did his counterpart in the general driving population (0.27). Figure 8 illustrates the differences within the DIT group in terms of accident involvement, total convictions, and negligent operator point counts by marital status.



FIG. 8. -- Driver Instruction Teachers: Mean Numbers of Accidents, Convictions, and Negligent Operator Point Counts by Marital Status.

Figure 9 illustrates the negligent operator point count differences by marital status between the DIT and DMV sample groups.



FIG. 9. -- Mean Numbers of Negligent Operator Point Counts by Marital Status for Driver Instruction Teachers and the General Driving Population.

<u>Total convictions</u>. -- Table 32 shows the percentage distribution of driver instruction teachers by marital status and total number of recorded convictions. It indicates that 60.9 per cent of the married subjects were conviction free during the three year period under investigation, while only 41.7 per cent of the unmarried driver instruction teachers did not have a recorded conviction on their driver record. When compared to data on the DMV group TABLE 32. -- Driver Instruction Teachers: Percentage Distribution by Marital Status and Total Number of Recorded Convictions

Marital	Total				Tota	l Convic	tions					Mean	Standard
Status	Number	0	1	2	3	4	5	9	7	8	6	Number"	Deviation
Total Sample	4, 558	58.27%	26.59%	9.68%	2.98%	1.45%	0.46%	0.44%	0.04%	0.07%	0. 02%	0.67	1.03
Married	3, 914	60.96	26.03	8.87	2.35	1.10	0.33	0.33	-	0.03		0.59	0. 93
Single	62 0	41.77	29.03	15.16	7.10	3.71	1.29	1.13	0.32	0.32	0.16	1.15	1.43
Undefined Status	24	45.83	54.17			1	1	1	1	1	8 8 9	0.54	0.51

(Three-year prior record)

 $a_{t} = 6.48$  (significant beyond the 1 per cent level of confidence)

previously reported in Table 9 on pages 37-38, both married and single subjects in the DIT group had a lower mean number of convictions than did their counterparts in the DMV sample group.

Table 33 shows the percentage distribution of driver instruction teachers by marital status and conviction of the major (double point) traffic violations. Marital status does not appear to be a determining or predictive factor in the appearance of major convictions on the DIT group driver records. Refer to Table 10 on pages 39-40 to make a comparison of data with the DMV sample group.

TABLE 33. -- Driver Instruction Teachers: Percentage Distribution by Marital Status and Major (Double-Count) Convictions (Three-year prior record)

Marital	Total	Majo	or Convic	tions	Mean	Standard
Status	Number	0	1	2	Number	Deviation
Total Sample	4,558	99 <b>.67</b> %	0.29%	0.04%		0.07
Married	3,914	99 <b>.69</b>	11 0.28	1 0.03		0.06
Single	620	99.52	2 0.32	1 0.16	0.01	0.10
Undefined Status	24	100.00				

<u>Negligent operator point counts</u>. -- Table 34 presents the percentage distribution of driver instruction teachers by marital status and negligent operator point counts. FTA's on moving violations were considered as convictions for purposes of this study, while FTA's for non-moving violations were not included in either the total convictions or negligent operator point count calculations. This was consistent with the procedures used in the <u>1964 California</u> <u>Driver Record Study</u>. The unmarried subjects in the DIT group had over twice the mean number of negligent operator point counts as did the married driver instruction teachers. This pattern exceeds that of the DMV group as reported in Table 13 on pages 43-44.

Table 35 provides the breakdown of total convictions involving driver instruction teachers according to the type of violation: (a) signs, signals, and pavement markings; (b) driving, overtaking, and passing; (c) right-of-way; (d) turning, stopping, and signalling; (e) speed; (f) major violations; and (g) equipment. It shows that violation of speed regulations accounts for over 40 per cent of the total convictions, while violations of traffic control signs, signals, and pavement markings account for an additional 24 per cent. Comparative data on the DMV sample group were previously reported in Table 14 on page 45. Generally, the types of convictions within the DIT group follow the same pattern as was apparent within the DMV

 TABLE 34. -- Driver Instruction Teachers:
 Percentage Distribution by Marital Status and Negligent Operator Point Counts

 + Moving FTA's

(Three-year prior record)

Standa rd	Deviation	1.10	1.00	1.48	0.69
Mean	Number	0.78	0.69	1.35	0.71
	6	0. 02%		0.16	8
	8	0.07%	0.03	0. 32	8 8 9
	7	0.09%	0. 05	0.32	8
FTA' s	9	0.39%	0.31	0.97	1 1 1
oints +	5	0.81%	0.51	2.74	
rator P	4	1.56%	1.18	4.03	8 5 1
ent Ope	3	4.34%	3.70	8.55	8
Neglig	2	11.41%	10.07	19.84	12.50
	1	28.57%	28.51	28.23	45.83
	0	52.74%	55.65	34.84	41.67
Total	Number	4, 558	3,914	620	24
Marital	Status	Total Sample	Married	Single	Undefined Status

 $a_{t} = 9.63$  (significant beyond the 1 per cent level of confidence)

(Three-year prior record)

	Equipment	100.00%	94.58	4.19	0.77	0.29	0.11	0.06	11.24	7.42	338
	Major	100.00%	99.67	0.29	0.04	1	1	1 1 1	0.57	0.37	17
tion	Speed	100.00%	79.60	16.02	3.20	0.83	0.24	0.11	40,09	26.44	1,205
pe of Convic	Turning, Stopping, and Signalling	100.00%	94.71	4.98	0.22	0.07	0.02	   	8.65	5.70	260
$Ty_{J}$	Right of Way	100.00%	97.04	2.92	0.04	1	1	1 1 1	4.56	3.01	137
	Driving, Overtaking, and Passing	100.00%	93.15	6.38	0.39	0.07		1 1 1	11.18	7.37	336
	Signs, Signals, and Markings	100.00%	86.62	11.39	1.80	0.13	0.07	1	23.72	15.64	713
	Number of Convictions	All Counts	0	1	2	S	4	5 or more	Percent of Total Convictions	Mean Number of Convictions Per 100 Drivers	Total Number <sub>b</sub> of Convictions <sup>b</sup>

107

<sup>a</sup>N = 4, 558 <sup>b</sup>Total = 3, 006 sample. Violation of speed regulations and traffic control signs, signals, and pavement markings account for 64.8 per cent of the total convictions for driver instruction teachers and 58.9 per cent of the total convictions within the general driving population.

#### Summary

The research hypothesis for the comparison of driver records of the driver instruction teachers and the general driving population was, "The driving records of California public secondary school driver instruction teachers are superior to those of the general driving population. That is to say, the mean numbers of accidents, convictions, and negligent operator point counts for driver instruction teachers are less than those of the general driving population." A significant difference appeared to exist between the two populations. The results of the tests of significant differences suggest that it would be safe to assert that driver instruction teachers do in fact have lower mean numbers of accidents, convictions, and negligent operator point counts than does the general driving population. These statistical results are non-committal as to reasons for these differences, if such exist. This study has shown an association between the two populations, but the degree to which this finding enhances educational knowledge is debatable.

When the criterion of strength of association was applied to the t-test results, it became obvious that the difference in sample sizes had probably negated possibility of predicting anything of educational value from the comparison of driver records of the two populations. Detection of trivial associations was a real problem. For this reason judgment was suspended on the rejection of the null hypothesis of no difference between the driver records of the two populations.

This chapter has presented the findings relating to the comparison of driver records of 4,558 California public secondary school driver instruction teachers with those of the general driving population as represented by normative data provided in the <u>1964</u> California Driver Record Study.

These findings, in terms of age, sex, and marital status, showed the driver instruction teacher sample group had significantly lower mean numbers of accidents, convictions, and negligent operator point counts than did the general driving population. These findings were significant at the 1 per cent level of confidence. Female driver instruction teachers, however, were found to have significantly higher means in each of the driver record components when compared to the female general driving population. The younger, unmarried driver instruction teacher had a significantly poorer

driver record. This finding was consistent with age and marital status data reported in the <u>1964 California Driver Record Study</u>.

The next chapter will be devoted to the analysis of data describing the relationship between the driver records of the driver instruction teachers and their (a) academic background; (b) phase of instructional assignment; and (c) professional affiliation.

### CHAPTER V

# ANALYSIS OF DATA AND FINDINGS: THE RELATIONSHIP BETWEEN DRIVER RECORD VARIABLES AND ACADEMIC BACKGROUND, PHASE OF INSTRUCTIONAL ASSIGNMENT, AND PROFESSIONAL AFFILIATION

In Chapter IV study findings were presented from the statistical comparison between the driver records of California public secondary school driver instruction teachers and those of the California general driving population. An additional objective of this investigation, however, was to provide a profile of driver instruction teachers in terms of an intragroup comparison of relationships between driver record and various specialized major fields of academic preparation, specific instructional assignments, and membership in the professional driver and traffic safety education organizations. These intragroup findings will be presented in this chapter under the following five headings: (a) driver record by academic background, (b) driver record by phase of instructional assignment, (c) driver record by professional affiliation, (d) driver record by traffic density, and (e) summary.

The negligent operator point count is considered by many to be the single most appropriate indication of the overall driver record of an individual since it is a compilation of only those "countable" convictions and accident involvements. It weighs, to a certain extent, these offenses in terms of seriousness. For purposes of determining the relationship of the driver record with the academic and professional variables, therefore, the overall driver record was represented in this portion of the investigation by the mean number of negligent operator point counts that appear on each subject's driver record for the three year period immediately prior to the date of the driver record search. Tables 36 and 37 provide a summary of the driver instruction teachers! driver records by sex and marital status. The critical ratio test indicated the observed differences in mean numbers of accidents, convictions, and negligent operator point counts between male and female driver instruction teachers were not significant. The t-test did, however, reveal significant differences between means when the marital status of the driver instruction teachers was considered.

### Driver Record by Academic Background

Academic background was divided into three separate categories: (a) highest academic degree earned, (b) undergraduate major field of specialization, and (c) graduate major field of specialization.

¢ V	Total	Acci	idents	Convi	ictions	Negligent Point	: Operator Counts
4	Number	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standa <i>r</i> d Deviation
Total Sample	4, 558	.19	. 45	. 67	1.03	. 78	1.10
Male	4,368	.19	. 45	. 67	1.03	62.	1.10
female	190	. 22	.49	. 58	1.01	. 75	1.12
Critical ttio Test Results		t = (not sig	. 25 nificant)	t = , (not sign	. 39 iificant)	t = (not sig	. 1 <b>4</b> nificant)

TABLE 36. -- Driver Instruction Teachers: Summary of Driver Record Variables by Sex and Critical Ratio Test Results (Three-year prior record)

(Three-year prior record)	AccidentsConvictionsNegligent OperatorPoint Counts	umber Mean Standard Mean Standard Mean Deviation Deviation	4, 558         . 19         . 45         . 67         1.03         . 78         1.10	3, 914 . 17 . 43 . 59 . 93 . 69 1. 00	620         .32         .58         1.15         1.43         1.35         1.48	24     .21     .41     .54     .51     .71     .69	t = 5.00 t = 6.48 t = 9.63 (highly significant) (highly significant)
	Total	Number	4, 558	3, 914	620	24	
	Marital	Status	Total Sample	Married	Single	Undefined Status	Critical Ratio Test Decultea

TABLE 37. -- Driver Instruction Teachers: Summary of Driver Record Variables by Marital Status and Critical Ratio Test Results

<sup>a</sup>Significant beyond the 1 per cent level of confidence

Graduate majors were considered only if the subject had earned a Master's or a Doctor's degree. Thirty-one different fields of specialization were reported. These 31 areas were later reduced to seven broader fields of specialization for purposes of this investigation.

Highest academic degree earned. -- Data from the 334 California public secondary school districts that responded to the survey-questionnaire indicated 53.5 per cent of the driver instruction teacher sample group held a Bachelor's degree, although 79 of the subjects did not hold any academic degree. Over 43 per cent of the total sample held advanced degrees, either the Master's or the Doctor's degree. Table 38 shows the percentage distribution of negligent operator point counts for each of the academic degree categories. Those subjects who had earned only the Bachelor's degree had a higher mean number of negligent operator point counts than did those who had earned the advanced degrees. When these differences in means were subjected to a one-way analysis of variance they proved to be significant beyond the 1 per cent level of confidence. A value as large or larger than the obtained F-ratio (7.37) would occur due to chance factors fewer than once in every 100 such comparisons. It could be assumed that real differences

hers: Percentage Distribut	Driver Instruction Teachers: Percentage Distribut
by Degree Earr	by Degree Ear
	Driver Instruction Teac

Degree	Total	% of			Neglig	ent Ope.	rator Po	oints +	FTA's				Mean	Standard
Earned	Number	Total	0	1	2	3	4	5	9	7	80	6	Number	Deviation
Total Sample	4, 558	100.0%	52.7%	28.6%	11.4%	4.3%	1.6%	0.8%	0.4%	0.1%	0.1%	0. 0+%	0.78	1.10
chelor's	2,438	53.5	51.4	28.2	11.8	4.6	2.1	1.1	0.5	0.2	0.1	1	0.85	1.18
aster's	1, 983	43.5	53.7	29.2	11.1	4.2	1.0	0,5	0.2	1	0.0+	0, 0+	0.73	1.01
octorate	2	0.0+	50.0	50.0	1	1	1	1	1	1	-	1	0.50	0.71
ndefined	135	3.0	64.4	25.2	8.9	1.5	1	1	1	1			0.47	0.72

(Three-year prior record)

 $^{a}F$ -ratio = 7, 37 (significant beyond the 1 per cent level of confidence)

exist between driver records in relation to the level of academic degree earned.

Undergraduate major field of specialization. -- A total of 110 subjects could not be identified by academic field of specialization. Table 39 shows the distribution of driver instruction teachers according to their reported undergraduate major fields of specialization:

Undergraduate Major	Total Numbers	% of Total
Language Arts	230	5.0%
Math/Science	372	8.2
Social Science	1,091	23.9
Fine Arts	146	3.2
Physical Education	1,686	37.0
Industrial Arts	<b>4</b> 9 <b>6</b>	10.9
Others	427	9 <b>.4</b>
Undefined	110	2.4
Totals	4,558	100.0

TABLE 39. -- Driver Instruction Teachers: Frequency and Percentage Distributions of Undergraduate Majors

Table 40 shows that driver instruction teachers with undergraduate physical education and social science fields of specialization had the 

 TABLE 40. -- Driver Instruction Teachers:
 Percentage Distribution of Negligent Operator Point Counts + Moving FTA's

 by Undergraduate Majors

(Three-year prior record)

Undergraduate	Total	% of			Neglig	ent Ope	rator Pe	oints + 1	FTA' s				Mean	Standard
Field	Number	Total	0	1	2	3	4	5	9	7	8	6	Number <sup>a</sup>	Deviation
Total Sample	4,558	100.0%	52.7%	28.6%	11.4%	4.3%	1.6%	0.8%	0.4%	0.1%	0.1%	0.04%	0.78	1.10
Language Arts	230	5.0	57.4	27.4	8.3	3.9	2.2	0.4	1	0.4			0.70	1.07
Math/Science	372	8.2	55.6	28.2	10.8	3.2	1.3	0.5	ł	0.3	1		0.69	1.00
Social Science	1,091	23.9	52.1	28.0	12.6	4.3	1.6	1.1	0.3		0.1		0.80	1.10
Fine Arts	146	3.2	54.8	28.8	11.6	3.4	0.7	1	0.7				0.69	0.97
Physical Education	1, 686	37.0	48.9	30.0	11.9	5.2	1.9	1.0	0.8	0.1	0.1	1	0. 89 <sup>b</sup>	1.20
Industrial Arts	496	10.9	56.0	28.2	10.5	3.2	1.2	0.6	0.2		ł		0.68	0.97
Education/ Others	427	9.4	57.8	26.5	9.4	4.7	1.2	0.2	-		•	0.2	0.67	1.02
Undefined	110	2.4	60.9	25.4	11.8	0.9		0.9				ł	0.56	0.85

<sup>a</sup>F-ratio = .46 (not significant)

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 $b_{t} = 3.62$  (significant beyond the 1 per cent level of confidence)

highest mean numbers of negligent operator point counts, while those with majors in industrial arts, math, science, and fine arts had the lowest. When the analysis of variance technique was applied, however, these observed differences were found to be not significant. Physical education majors, with the highest mean (0.89 as compared to the 0.78 mean for the total sample), had a significantly higher mean than did all other categories. The obtained t-score of 3.62 was significant beyond the 1 per cent confidence level. Physical education majors comprised the largest single group within the total sample (37% of the total).

<u>Graduate major field of specialization</u>. -- Table 41 shows the distribution of driver instruction teachers by academic major

Graduate Major	Total Numbers	% of Total
Language Arts	70	3.6%
Math/Science	112	5.8
Social Science	267	13.9
Fine Arts	60	3.1
Physical Education	414	21.5
Industrial Arts	130	6.8
Education & Others	871	45.3
Totals	1,924	100.0

TABLE 41. -- Driver Instruction Teachers: Frequency and Percentage Distributions of Graduate Majors

field of specialization for those who held Master's and Doctor's degrees. Those teachers with the advanced degrees in the fields of mathematics and science had the lowest mean numbers of negligent operator point counts (0.64), while physical education and fine arts majors had the highest (0.79 and 0.78 respectively). The analysis of variance F-ratio of .41 was not significant, indicating the observed mean differences were not sufficiently large to ignore the possibility of chance factors being responsible for the differences. Table 42 gives the frequency and percentage distributions of each of the graduate fields of specialization by mean number of negligent operator point counts.

## Driver Record by Phase of Instructional Assignment

Of the 4,558 public secondary school driver instruction teachers included in the investigation, 55.5 per cent (2,529) were reported by the school districts to be assigned only in the behindthe-wheel driver training phase of the instructional program. In most instances this assignment involved instruction after the regular school hours and on Saturdays. Approximately 21 per cent (949) of the teachers had been assigned only within the classroom driver education phase of the program, while 20 per cent (905) of the teachers were assigned to both behind-the-wheel and classroom

<sup>2</sup> ercentage Distribution of Negligent Operator Point Counts + Moving FTA's	by Graduate Majors
TABLE 42 Driver Instruction Teachers:	

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(Three-year prior record)

Graduate	Total	% of	,		Neglig	ent Open	rator Po	oints +	FTA's				Mean	Standa rd
Field	Number	Total	0	1	2	3	4	5	9	2	8	6	Number <sup>a</sup>	Deviation
Total Sample	4,558	100.0%	52.7%	28.6%	11.4%	4.3%	1.6%	0.8%	0.4%	0.1%	0.1%	0. 0+%	0.78	1.10
Language Arts	70	1.5	54.3	27.1	12.9	4.3	1.4	1	1	1	1	1	0.71	0. 95
Math/Science	112	2.5	58.9	25.0	9.8	5.4	0.9	1	1		1		0.64	0, 93
Social Science	267	5.9	56.2	25.1	10.9	6.4	1.1	0.4	1	ł		ł	0.72	1.01
Fine Arts	60	1.3	48.3	33.3	13.3	3.3		1.7	1	}	ł	1	0.78	0. 99
Physical Education	414	9.1	51.2	29.2	13.5	3.4	1.2	0.5	1.0				0.79	1.08
Industrial Arts	130	2.8	52.3	30.0	14.6	1.5	0.8	0.8	1	1	1 1 4	1	0.71	0, 92
Education/ Others	871	19.1	53.7	30.3	9.4	4.6	0.9	0.7	0.1		0.1	0.1	0.73	1.05
Undefined	2,634	57.8	52.1	28.2	11.6	4.3	2.0	1.0	0.5	0.2	0.1	!	0.82	1.15
a F - rat	tio = . 41 (	not signifi	cant)											

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phases of the instructional program. A total of 175 subjects (3.8%) could not be identified with a specific instructional assignment from the data supplied by the school districts.

Table 43 shows the percentage distribution of negligent operator point counts for each of the three instructional assignments, i.e. classroom only, behind-the-wheel only, or a combination classroom/behind-the-wheel assignment. Teachers assigned only classroom driver education instructional duties had the highest mean number of negligent operator point counts (0.85), followed closely by the teachers who taught both in the classroom and behind-the-wheel (0.83). Teachers who were assigned to the phase of the instructional program involving behind-the-wheel driver training only had the lowest mean number of negligent operator point counts (0.74). When the analysis of variance technique was applied to determine whether these observed differences were significant, the obtained F-ratio of 3.83 indicated there were significant differences among the means.

## Driver Record by Professional Affiliation

Of the total sample of 4,558 public secondary school driver instruction teachers only 504 (11.1%) were members of a local, state, or national driver and traffic safety education organization. When the driver instruction teachers' names were matched with the TABLE 43. -- Driver Instruction Teachers: Percentage Distribution of Negligent Operator Point Counts + Moving FTA's by Phase of Instructional Assignment

(Three-year prior record)

ī	Total	% of			Neglig	ent Ope	rator P	oints +	FTA's				Mean	Standa rd
rnase	Number	Total	0	1	7	3	4	5	9	7	80	6	Number <sup>a</sup>	Deviation
Total Sample	4, 558	100.0%	52.7%	28.6%	11.4%	4.3%	1.6%	0.8%	0.4%	0.1%	0.1%	0. 0+%	0.78	1.10
Classroom Only	949	20.8	50.6	28.0	13.2	4.7	1.9	1.0	0.3	0.2			0. 85	1.14
Behind- he-Wheel Only	2,529	55.5	54.3	28.6	10.4	4.1	1.5	0.6	0.4	0.1	0.1	0.0+	0.74	1.07
Both lassroom/ Behind - he-Wheel	905	19.9	51.2	28.5	12.3	5.0	1.4	1.2	0.3		0.1		0. 83	1. 12
Jndefined	175	3.8	50.3	30.9	12.6	2.9	0.6	1.1	1.7			-	0. 83	1.18

 $^{a}F$ -ratio = 3.83 (significant beyond the 1 per cent level of confidence)

official 1966-67 membership roster of the California Driver Education Association (CALDEA), 492 were found to be members; when the names were matched with membership information from the American Driver and Traffic Safety Education Association (ADTSEA), 132 were found to be members. When these sub-groups' (members and non-members) driver records were compared there was no significant difference in mean numbers of negligent operator point counts. The obtained t-score of 1.22 indicated the differences could well have been due to chance factors. Table 44 provides the driver record comparison between the professionally affiliated (504) and non-affiliated (4,054) sub-groups.

### Driver Record by Traffic Density

California is a large state with extreme variations in traffic density. In particular, there are three extremely large metropolitan areas, i.e. the Bay Area in Northern California (San Francisco), the Los Angeles/Orange County Area, and the San Diego Area in Southern California. Traffic is more highly congested in these areas when compared to outlying areas within the state. The Department of Motor Vehicles established a measure of this congestion, or traffic density, by mathematically dividing the total number of registered vehicles within a given county by the number of linear miles of

Percentage Distribution of Negligent Operator Point Counts + Moving FTA's by	Professional Affiliation
<b>TABLE 44 Driver Instruction Teachers:</b>	

record)
prior
e-year
(Thre

Standard	Deviation	1.10	1.11	1.03
Mean	Number	0.78	0.79	0.73
	6	0. 0+%	0.0+	
	8	0.1%	0.1	0.2
	7	0.1%	0.1	1
FTA' s	9	0.4%	0.4	:
oints +	5	0.8%	0.8	1.2
rator P	4	1.6%	1.6	1.0
ent Ope	3	4.3%	4.5	3.2
Neglig	2	11.4%	11.6	10.1
	1	28.6%	28.2	31.6
	0	52.7%	52.7	52.8
% of	Total	100.0%	88.9	11.1
Total	Number	4,558	4, 054	504
Professional	Affiliation	Total Sample	Non-Members	CALDEA <sup>a</sup> and/or ADTSEA Member

<sup>a</sup>California Driver Education Association (State)--492

<sup>b</sup>American Driver and Traffic Safety Education Association (National)--132

<sup>c</sup>t = 1.22 (not significant)
roadway within that county. Each county would then have a determined degree of traffic density for comparative purposes. An attempt to establish traffic congestion rates in this manner has obvious shortcomings, but for purposes of this investigation and in the absence of better density measuring devices, the Department of Motor Vehicles' traffic density code chart was used to determine the relationship between traffic density and the overall driver record of the driver instruction teachers. Examination of the traffic density chart in Appendix G shows the Bay Area (San Francisco) to be the most highly congested area within the state. The traffic density code of the county in which the employing school district was located was used to determine the product-moment correlation between driver record and traffic density. Table 45 shows the correlation coefficients for the total sample by accidents, convictions, and negligent

Variable	Correlation Coefficient
Total Accidents	+. 088
Total Convictions	+.102
Negligent Operator Point Counts	+.118

TABLE 45 Driver Instruct	ion Teachers:
Correlation Between Driver Re	ecord Variables
and Traffic Densi	ty

operator point counts. While each of the obtained correlation coefficients was significantly different from zero at the 1 per cent level of confidence, they indicate only a very slight relationship between traffic density and driver record and would be of little or no predictive value.

#### Summary

This chapter has dealt with the relationships existing between the driver records of California public school driver instruction teachers and their academic background, phase of instructional assignment, professional affiliation, and traffic density in the county of their employment. The following were the major findings from these aspects of the total investigation:

1. Driver record academic background. -- Over 43 per cent of the driver instruction teachers held Master's or Doctor's degrees. The difference in mean numbers of negligent operator point counts between those teachers who held only the Bachelor's degree and those who held either the Master's or Doctor's degree was significant at the 1 per cent level of confidence. Physical education majors had significantly poorer driver records when compared to teachers with other undergraduate academic fields of specialization.

- 2. Driver record by phase of instructional assignment. -- Over half of the teachers were assigned only within the behindthe-wheel driver training phase of the instructional program. Those teachers who were assigned only within the classroom driver education phase of the program had the highest mean number of negligent operator point counts. Analysis of variance techniques indicated the differences among means according to phase of instructional assignment were significant at the 1 per cent level of confidence.
- 3. Driver record by professional affiliation. -- Only 11 per cent of the 4,558 driver instruction teachers were members of local, state, or national driver and traffic safety education associations. When the driver records of the two sub-groups (members and non-members) were compared, no significant difference was found in the mean number of negligent operator point counts.
- 4. Driver record by traffic density. -- Traffic density was determined by dividing the total number of vehicles registered within a given county by the total number of linear miles of roadway within that county. Product-moment correlation coefficients of less than +. 12 were found when mean numbers of accidents, convictions, and negligent

operator point counts were compared to traffic density figures of the county within which the driver instruction teachers were employed. While each of the obtained correlation coefficients was significant at the 1 per cent level of confidence, they were far too low to be of any predictive value.

The specific conclusions and discussion of the findings of the total investigation will be presented in Chapter VI. Specific recommendations for improvement of the statewide driver instruction program and suggestions for future research based on the findings of this study will be presented in the final chapter.

#### CHAPTER VI

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In Chapters IV and V the analysis of data and the findings of the investigation were presented. This chapter will contain statements of (a) summary of study purposes and procedures, (b) summary of findings, (c) conclusions, (d) discussion, (e) recommendations, and (f) implications for future research.

### Summary of Study Purpose and Procedures

California has experienced phenomenal growth in its public secondary school driver instruction program in recent years. This rapid expansion has precipitated problems of increasing magnitude to educational authorities, essentially in the areas of program financing, scheduling, teacher preparation and certification, and assignment. Increased criticism of existing program procedures and results are apparent. State and national professional driver and traffic safety education organizations have repeatedly expressed their concern for improvement of teacher qualification, certification and

preparation standards. Specific proposals for driver record standards have been advanced through widely distributed national guidelines and recommendations, but the California State Board of Education has not adopted many of these proposals. The primary purpose of this investigation was to collect descriptive data to determine if there was sufficient evidence to warrant a more precise and critical evaluation and surveillance of the driver records of active or potential public secondary school driver instruction teachers for purposes of initial or continued certification and assignment in this specialized area of the curriculum. A questionnaire survey of 334 public secondary school districts in California yielded positive identification of 4,558 driver instruction teachers who had teaching assignments during the 1966-67 school year. The State Department of Motor Vehicles provided the official driver record for each of the sample subjects covering the three year period immediately prior to the investigation, June 1, 1964, to June 1, 1967. Driver record data were punched onto IBM cards along with specific data relating to the academic background, phase of instructional assignment, and professional affiliation for each of the subjects. Data were transferred to magnetic tape and processed through a CDC-3600 computer. The study was divided into two specific parts: (1) To compare the driver records of driver instruction teachers to those of the general driving

population from normative data reported in the <u>1964 California</u> <u>Driver Record Study</u><sup>1</sup>; and (2) To study the relationship between the driver instruction teachers' driver records and their academic background, phase of instructional assignment, and professional affiliation. A t-test to determine the ratio of variability between mean differences was used to test the research hypothesis "The driving records of California public secondary school driver instruction teachers are superior to those of the general driving population." A one-way analysis of variance technique was used to provide a possible answer to the research problem "What relationship exists between the driver instruction teachers' driving records and their academic background, phase of instructional assignment, and professional affiliation?"

#### Summary of Findings

The summary of findings is presented in terms of specific answers to the questions that were originally posed at the start of the investigation:

1. "How many California driver instruction teachers have clear driver records and how do they compare proportionally to the general driving population?"

<sup>&</sup>lt;sup>1</sup>Ronald S. Coppin, <u>et al.</u>, <u>The 1964 California Driver</u> <u>Record Study</u> (Sacramento, California: California Department of Motor Vehicles, 1964-67).

Less than half (49.9%) of the driver instruction teachers had clear driver records for the entire three year period prior to the investigation. Over 52 per cent had a "0" negligent operator point count. This compares to the 56 per cent of the general driving population with a "0" negligent operator point count. Over 82 per cent of the driver instruction teachers did not have a recorded accident on their official three year driver record, while over 58 per cent did not have a recorded conviction during the same period. The general driving population were reported to have 82 per cent without a recorded accident and 60 per cent without a recorded conviction.

2. "What are the mean numbers of accidents, convictions, and negligent operator point counts appearing on the driver instruction teachers! driver records and how do they compare to those of the general driving population?"

Driver instruction teachers had a mean accident involvement of 0.19 for the three year period under investigation; the general driving population had a mean of 0.20 for a comparable three year period. Driver instruction teachers had a mean conviction incidence of 0.67; the general driving population's mean was 0.80. The mean number of negligent operator point counts for driver instruction teachers was 0.78, while the mean for the general driving population was 0.90 for the three year period. When the two sample groups were equated in terms of sex and age ratios, however, the general driving population's mean number of accidents increased to 0.26; their mean number of convictions increased to 1.07; and their mean number of negligent operator points increased to 1.18 for a three year period. These differences in means between the two samples proved to be significant at the 1 per cent level of confidence. Driver instruction teachers appeared to have superior driver records when compared to the general driving population.

3. "What proportion of driver instruction teachers can legally be classified as prima-facie negligent operators and how does it compare to that of the general driving population?"

A total of 41 driver instruction teachers had accumulated a sufficient number of negligent operator points within a short period of time to be legally classified as prima-facie negligent operators. This number comprises 0.89 per cent of the total sample. The <u>1964</u> <u>California Driver Record Study</u> had reported 0.94 per cent of the male general driving population could be legally considered to be prima-facie negligent operators at any given time. A total of 21 driver instruction teachers had had their driver license suspended or revoked at some time previous to the three year period immediately prior to the investigation. A total of 15 driver instruction teachers had been convicted of the most serious traffic violations, e.g. drunk driving, hit-and-run, and driving after their driver license had been suspended or revoked, during the three year period under investigation, while an additional 35 teachers were found to have been convicted of these major violations at some time previous to the three year period immediately prior to the investigation.

4. "How do the driving records of male and female driver instruction teachers compare to those of the general driving population?"

Male driver instruction teachers had a significantly lower mean number of accidents (0.19), convictions (0.67), and negligent operator point counts (0.79) than did their counterparts in the general driving population with mean numbers of accidents (0.26), convictions (1.07), and negligent operator point counts (1.18). Female driver instruction teachers had significantly higher mean numbers of accidents (0.22), convictions (0.58), and negligent operator point counts (0.75) than did their counterparts in the general driving population with mean numbers of accidents (0.12), convictions (0.36), and negligent operator point counts (0.46). The female driver instruction teachers' means were not significantly different from those of male driver instruction teachers even though the 1964 California Driver Record Study had reported males to have twice as high mean numbers of accidents and over three times as high mean numbers of convictions as did females within the general driving population.

5. "How do the driving records of married and unmarried driver instruction teachers compare to those of the general driving population?"

Unmarried driver instruction teachers were involved in a disproportionate number of accidents and convictions. Unmarried driver instruction teachers, comprising less than 14 per cent of the total sample, had mean numbers of accidents (0.32), convictions (1.15), and negligent operator point counts (1.35); married driver instruction teachers' means were accidents (0.17), convictions (0.59), and negligent operator point counts (0.69). These mean differences proved highly significant. The comparison to the general driving population can best be made by reference to the mean numbers of negligent operator point counts between the two samples. Married driver instruction teachers had a mean of 0.69, while the subjects in the general driving population had a mean of 0.79. Unmarried driver instruction teachers had a mean of 1.35, while the unmarried subjects in the general driving population had a mean of 1.33.

6. "What types of traffic violations resulted in convictions for driver instruction teachers and how do they compare with those of the general driving population?"

Approximately 65 per cent of all convictions of driver instruction teachers resulted from violation of regulations pertaining to speed and observance of traffic control signs, signals, and pavement markings. These two general categories of traffic violations accounted for 59 per cent of the convictions within the general driving population.

7. "What relationship exists between the driver instruction teachers' driver records and their academic background, phase of instructional assignment, and professional affiliation?"

Differences in mean numbers of accidents, convictions, and negligent operator point counts were significant at the 1 per cent level of confidence when considering the highest degree held, the undergraduate and graduate major fields of specialization, age, marital status, and phase of instructional assignment. Teachers with undergraduate majors in physical education had significantly higher means in all of the driver record components. Non-significant differences in mean numbers of accidents, convictions, and negligent operator point counts were observed when considering sex and professional affiliation with driver and traffic safety education organizations. Traffic density was significantly correlated to the driver records, but the obtained correlation coefficients were so low that only a slight relationship exists.

#### Conclusions

Based on sample data and evidence of this study, the following conclusions were drawn:

1. Judgment was suspended on the rejection of the null hypothesis of no difference in driver records of the public secondary school driver instruction teachers and those of the general

driving population. A significant difference appeared to exist between the two populations, suggesting it would be safe to assert that driver instruction teachers had superior driver records than did the general driving population. Because of the probability that the observed differences between the two populations, while significant at the 1 per cent level of confidence, were in fact trivial, the suspension of judgment decision was made.

2. There appears to be ample evidence to warrant more precise and critical evaluation and surveillance of driver records for purposes of initial and continued certification and the actual assignment of teaching personnel to driver instructional duties. This conclusion is based on the study finding of 41 driver instruction teachers who could legally be classified as prima-facie negligent operators; 15 driver instruction teachers who had been convicted of the most serious of traffic violations, e.g. drunk driving, hit-and-run, and driving after their driver license has been suspended or revoked; 35 driver instruction teachers who had previously been convicted of these major traffic violations; and 21 who had previously had their driver license suspended or revoked at some time before the three year period under

investigation in this study. One school district had 10 primafacie negligent operators assigned driver instructional duties within the district during the 1966-67 school year.

3. There is evidence of a relationship between the driver record and academic background, phase of instructional assignment, age, sex, and marital status that needs to be considered and understood by public secondary school administrators responsible for the assignment of teachers to driver instructional duties as well as for State Department of Education certification and advisory authorities.

#### Discussion

Traditionally, public education in the United States has supported the theory that youngsters exposed to structured educational experiences in the public school system under the tutelage of trained, competent teachers can be effectively prepared for successful interaction within the adult society. The magnitude of the traffic accident problem, since it affects school-aged youngsters more than any other single age group, makes traffic safety education of primary concern to parents, educators, and legislators.

While evidence of this study tended to support a hypothesis that driver instruction teachers in California's public secondary

school system have superior driver records than does the general driving public, it is extremely disconcerting to discover that a substantial number of certificated teachers with obviously inadequate driver records continue to be assigned within driver instruction programs. A good profession guides its policies and practices by a strong sense of social responsibility. A good profession also is one whose preparatory training is validly related to the ultimate functions of the members of the profession. A substantial number of driver instruction teachers, and indirectly secondary school administrators, State Department of Education authorities, and teacher preparation institutions, are preaching practices which are impassively repudiated by personal driving example. Appraisal of local and state level administrative practices relating to driver instruction teacher preparation, certification, and assignment would lead many observers to be outraged at the apparent discrepancy between principles and practices.

Current criticism is not an indictment against all California driver instruction teachers or public secondary school driver instruction programs. The overwhelming majority undoubtedly evidence sincere dedication to the principles of their profession in both spirit and practice. Current criticism is, however, an indictment against those driver instruction teachers, public secondary school

administrators, State Department of Education licensing and certification authorities, legislators, and teacher preparation institution personnel who continue to be insensitive to the social responsibility requirements relating to personal driving performance of those teachers entrusted with the traffic safety education of our youth.

#### Recommendations

Based on the evidence of this study, the following recommendations are made:

 The <u>California Driver Education Association</u> and the <u>Ameri-</u> <u>can Driver and Traffic Safety Education Association</u> should develop a vigorous program to increase professional membership from the current 11 per cent of the active driver instruction teachers in California. At the present time CALDEA and ADTSEA in no way represent the total body of driver instruction teachers within California and, therefore, the current preoccupation with and emphasis upon attempts to influence legislation should be abandoned in favor of (a) strengthening the internal quality of their own organizational priorities; (b) establishment and enforcement of a code of ethics that reflects unsatisfactory driver records as being evidence of "unprofessional conduct" on the part of driver instruction teachers; (c) encouraging teacher preparation programs of greater uniformity with proper emphasis upon specific content to be mastered and individual excellence in driving performance; and (d) ultimately demanding higher standards of driver instruction teacher certification policies and procedures and surveillance of driver records by the State Department of Education.

2. The State Board of Education should establish a realistic program of supervision and surveillance of driver records of driver instruction teachers. Such surveillance should not be restricted to periods of initial or renewal certification periods, but should be continuous in nature. Stringent, but realistic, standards of driver record quality should be developed jointly by the State Department of Education, the teacher preparation institutions, and the representative organization of driver instruction teachers. The evidence of this study shows that suspension or revocation of the driver license by the State Department of Motor Vehicles should not be considered an adequate standard of driver record quality for educational purposes. Certification to teach driver instruction in the public secondary schools should be withheld or withdrawn immediately when the

driver record falls below established minimum standards. Adequate supervision of public secondary school driver instruction programs should be provided in order to ensure the proper assignment of teaching personnel to driver instructional duties. The State Board of Education should recognize that such standards are necessary to protect the educational commitment to the public through the certification and assignment of driver instruction teachers with a demonstrated proficiency not only in preparation but in performance as well.

3. <u>Teacher preparation institutions</u> should recognize the fallacy in their traditional primary emphasis upon the "how" to teach aspects of driver instruction to the detriment of the "what" to teach. Candidates for admission to teacher preparation programs should be carefully screened for prior abnormal driving behavior and admitted to the program only upon evidence of a satisfactory driver record. Emphasis within the instructional program should be placed upon the development of personal driving proficiency, and the successful completion of the teacher preparation program should require high standards in this regard.

- 4. <u>Secondary school administrators</u> should periodically survey the official driver records of those teachers assigned driver instructional duties and remove them from such assignments immediately upon discovery or notification by the State Department of Education or the State Department of Motor Vehicles of sub-standard driver records. Assignment of teachers to driver instructional duties should be based fundamentally upon their adequacy of teaching ability, driver instructional preparation, and demonstrated driving proficiency.
- 5. Driver instruction teachers should strive constantly to maintain and improve the integrity of their profession. Basic to this integrity is a personal effort toward developing and maintaining an extremely high level of driving proficiency and performance. Driver instruction teachers should encourage a thorough, critical evaluation--both prospective and retrospective--of the total driver instruction program within their own school district and within the state. Essential to such active encouragement, however, is individual membership in and support of the local and state level driver and traffic safety education organization.

#### Implications for Future Research

This study has provided a substantial amount of data obtained specifically to provide a profile of the California public secondary school driver instruction teacher. However, a number of additional research questions or problems have been raised.

- The finding of this investigation that a substantial number of 1. driver instruction teachers have poor personal driver records suggests a causal-relationship study to investigate the relationship existing between the driver record and the presence or absence of relevant psychological factors. "Are psychological traits, such as aggressiveness and competitiveness, present to a greater degree in driver instruction teachers with an academic specialization in specific major fields?" "Are they reflected in the driver instruction teacher's personal driving performance and in the quality of instruction within the secondary school driver instruction program?" "What is the effect of teaching by a driver instruction teacher with a poor personal driver record upon the quality or potential of the high school student of driver education or driver training?"
- 2. The finding of this investigation that fewer than half of the active driver instruction teachers had an accident and

conviction free record for a three year period suggests an investigation into the quality of driver instruction teacher preparation programs in reference to the development of driving proficiency. Hartman<sup>2</sup> raised serious questions in his 1961 study concerning the quality of teacher preparation programs in traffic safety education. "What is the relationship between the driver instruction teacher's personal driver record and the quality and extent of college level preparatory course work?" The State Department of Education reports annually that the preponderance of public secondary teachers of driver instruction in California have not had specific preparation in driver and traffic safety education courses on the college level prior to their assignment to teach in this specialized field. "Is specific college or university-level preparatory course work essential to the effective teaching of driver education or driver training?"

Based on evidence of this study each of these suggested research investigations could contribute to the body of knowledge in the field of driver and traffic safety education.

<sup>&</sup>lt;sup>2</sup>Charles H. Hartman, "Teacher Preparation Programs in Driver Education in Colleges and Universities of the United States" (Ed.D. dissertation, Michigan State University, 1961).

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## APPENDIX A

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# "DATA CONCERNING INSTRUCTION IN DRIVER EDUCATION AND DRIVER TRAINING IN CALIFORNIA PUBLIC HIGH SCHOOLS, 1966-67 SCHOOL YEAR"

Max Rafferty Superintendent of Public Instruction and Director of Education

## CALIFORNIA STATE DEPARTMENT OF EDUCATION Division of Instruction--Bureau of Elementary and Secondary Education Sacramento, California 95814

October 1, 1967

## DATA CONCERNING INSTRUCTION IN DRIVER EDUCATION AND DRIVER TRAINING IN THE CALIFORNIA PUBLIC HIGH SCHOOLS 1966-67 SCHOOL YEAR

## Prepared By John R. Eales Consultant in Secondary Education

I.	Tea	cher Data (Driver Education and Driver Training)	
	1.	Total number of teachers involved in driver education and driver training	6,091
	2.	Teachers who taught (one or more periods) both driver education and driver training	1,335
	3.	Teachers who taught (one or more periods) classroom driver education only	1,550
	4.	Teachers who taught (one or more periods) driver training only	3,206
	5.	Teachers who taught driver instruction on a full-time basis	1,050
	6.	Teachers holding special credential only	161
II.	Dri	ver Education	
	1.	Number of schools offering driver education	707
	2.	Number of students receiving this instruction	317,247
	3.	Number of students taught by teachers having two or more units of college credit in driver education	221,528

4. Subjects and grades in which driver education is offered:

		Grade	Level		
	9	10	11	12	Total
Driver Education	41	308	8		357
Health and Safety	3	33			36
Social Science	113	65			178
State Requirements	67	64	3		134
Miscellaneous course titles	2				2
Total	226	470	11		707

5. Number of class hours offered:

Hours	Number of Schools
30	286
31-40	177
41-50	161
51-70	43
71-85	12
86 and over	28
Total	707

6. Departmental status:

	Organization	Number of Schools
	Separate Driver Instruction Department	207
	Separate Driver Education Department	30
	Separate Driver Training Department	106
	Total	343
	7. Number of schools using television	18
III.	Driver Training	
	1. Number of schools offering driver training	ng 695

- 2. Number of students receiving this instruction 233, 161
- Number of students taught by teachers having two or more units of college credit in driver education 194,780
- 4. Number of automobiles used in driver training program:

On loan	1,535
Owned by district	82
Rented	26
Total	1,643

5. Type of shift used in driver training cars:

Automatic shift	1,510
Stick shift	133
Total	1,643

6. Subjects and grades in which driver training is offered:

	Grad	e Level		
9	10	11	12	Total
1	64	4		<b>6</b> 9
1	57	2		60
1	219	49	5	274
1	46	26	15	88
1	25	4	2	32
6	463	192	34	695
	9 1 1 1 1 1 6	Grad   9 10   1 64   1 57   1 219   1 46   1 25   6 463	$\begin{tabular}{c c c c c c c c c c c c c c c c c c c $	$\begin{tabular}{ c c c c c c } \hline Grade Level \\ \hline 9 & 10 & 11 & 12 \\ \hline 1 & 64 & 4 & & \\ 1 & 57 & 2 & & \\ \hline 1 & 219 & 49 & 5 & \\ 1 & 46 & 26 & 15 & \\ \hline 1 & 25 & 4 & 2 & \\ \hline 6 & 463 & 192 & 34 & \\ \hline \end{tabular}$

Of the 421 schools offering driver training inside of school hours, 357 offered additional instruction outside of school hours.

Of the 695 schools offering driver training, 543 were giving some instruction in the summer.

7. Class hours behind the wheel: (Not using simulator-car program)

6 hours	414
7 hours and over	58
Total	472

 Class hours as observer: (Not using simulator-car program)

6 hours	132
12 hours	249
18 hours	73
Miscellaneous	18
Total	472

 Schools using simulator-car program: (Minimum of 24 hours in simulator, behind-the-wheel, and observation)

Number of schools 223

Students trained in simulator-car program 102, 921

APPENDIX B

DRIVER INSTRUCTION CERTIFICATION SURVEY FORM WITH COVERING LETTERS OF TRANSMITTAL DRIVER INSTRUCTION CERTIFICATION SURVEY TAIS REPORT SOULD BE TIFED. PLARE REFER TO ACCOMPANITIO INSTRUCTION SEET.

IRTVER LICENSE HDATE NUMBER D E	8	E DENTIAL NUMBER
		6. 10 10

#### INSTRUCTIONS FOR COMPLETING DRIVER INSTRUCTION CERTIFICATION SURVEY

(THIS FORM SHOULD BE TYPED)

COLUMNS A-B-C :	Type last name in capital letters. Give entire first and middle names - no initials or "nicknames." Write "None" if there is no middle name.
COLUMN E : COLUMN F :	e.g. 0 194986 - List <u>California</u> license number only. e.g. 23 LD 15688 - The teacher might hold several teaching credentials, but only the <u>one authorizing assignment in Driver Education and Driver</u> Training thould be listed here.
COLUMN G :	Use the following key to indicate specific Driver Instruction credentials held:
	<pre>1 = Special Secondary in Public Safety &amp; Accident Prevention 2 = Standard Designated Subjects (Public Safety &amp; Accident Prevention) 3 = Provisional or partial-fulfillment type credential for either 1 or 2 above 4 = Views of these listed</pre>
00115.3	4 = None of these listed.
<u>CCLUMA</u> H :	Use the following key to indicate other california credentials held:1 = General Secondary5 = Standard or General (Provisional)2 = General Elementary6 = Standard or General Administrative/3 = Standard (Secondary)Supervision/Fupil Personnel
	4 = Standard (Elementary) 7 = None
COLUMNS I-J :	Use the following key to identify undergraduate and graduate MAJORS :
	A = Anthropology K = Health Education U = Political Science
	$B = Art \qquad L = History \qquad V = Psychology$
	C = Biology M = Home Economics W = Safety Education
	J = Business Education N = Industrial Arts X = Social Science/Studies
	K = Chemistry $O = Journalism$ $I = Sociology$
	r = Drama $P = Mathematics$ $Z = Speech$
	U = LCOTOMICS $V = MUSIC$ AA = 20010FY
	$n = ng_{113n}$ $R = rn1030pny$ BB = Administration
	J = Geography   T = Physics   DD = Secondary EducationEE = Other
COLUMNIS K-L :	Use the above key to identify undergraduate and graduate MINORS :
CCLUMA: N :	Use the following key to identify the highest degree attained;
	1 = A.A. (Associate of Arts) 4 = M.A. (Master of Arts)
	2 = A.B. (Bachelor of Arts) 5 = M.S. (Master of Science)
	3 = B.S. (Bachelor of Science) 5 = Doctorate
CCLUME N :	Indicate total number of years of driver instruction experience, either
	full-time or part-time.
COLINE: C :	Use the following key to indicate what phases of Driver Instruction the
	teacher is currently assigned:
	1 = Driver Education (classroom only)
	2 = Driver Training (behind-the-wheel only)
	3 = Both classroom and behind-the-wheel
<u>CCLUMII F</u> :	Use the following key to indicate the times of Driver Instruction assignment:
	1 = Before/After School Hours, including Saturdays and Holidays
	2 = During Summer Sessions only
	3 = During regular school hours
	4 = Both during regular school hours and before/after school hours
<u>CC1173</u> :	Indicate the total number of periods of Driver Instruction assigned:
<u>ochami</u> H :	Use the following key to indicate whether the teacher was assigned Driver
	Instruction duties <u>last</u> year (1965-66) :
	l = Yes
	2 = No

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MAX RAFFERTY importationdont of Public Instruction and Director of Education

EVERETT T. CALVERT Chief Deputy Superintendent

EUGENE GONZALES Assistant Superintendent (807 State Bidg, Los Angeles 90012)



STATE OF CALIFORNIA DEPARTMENT OF EDUCATION 721 CAPITOL MALL SACRAMENTO, CALIFORNIA 85814

March 22, 1967

RONALD W. COX Assoc:ate Superintendent: Chief, Division of Public School Administration FRANCIS W. DOYLE

Deputy Superintendent: Chief, Division of Special Schools and Services PAUL F. LAWRENCE Associate Superintendent: Chief, Division of Higher Education

Division of higher Education WILSON C: RILES Director of Compensatory Education DONALD E: KITCH Acting Chief, Division of Instruction

TO: County Superintendents of Schools and High School Principals

SUBJECT: Driver Instruction Certification Survey

The Bureau of Teacher Education and Certification is cooperating with the California Department of Motor Vehicles and the California State College System in conducting a survey of all certificated teachers involved in driver instruction programs in California secondary schools.

The purpose of this survey is to verify existing Bureau information and to determine the status of teachers currently engaged in driver education and driver training assignments with a view toward development and implementation of standards and procedures necessitated by recent Federal and State legislation.

We hope, therefore, that you will complete all the items on the questionnaire to the best of your ability. When completed return it with the driver education and driver training questionnaire so that both reports will reach the Bureau of Secondary Education by May 12.

Your cooperation will be appreciated very much.

Sincerely yours,

Carl A. Larson, Chief Bureau of Teacher Education and Certification

CAL:sr

MAX BATT tendent of Points Inger

EVERETT T. CALVERT Chiel Deputy Super

EUGENE GONZALES (807 State Bidg. Las Angeles 90012)



STATE OF CALIFORNIA DEPARTMENT OF EDUCATION 721 CAPITOL MALL, BACRAMENTO, CALIFORNIA 85814

April 10, 1967

PAUL F. LAWRENCE Associate Superintendent; Chief, Division of Higher Education WILSON C. RILES Director of Compensatory Education DONALD E. EITCH Acting Chief, Division of Instruction

RONALD W. COX

Associate Superintendent; Chiel, Division of Public School Administration FRANCIS W. DOYLE

Deputy Superintendent; Chiel, Division of Special Schools and Service

TO: County Superintendents of Schools

Max Rafferty, Superintendent of Public Instruction FROM: and Director of Education

SUBJECT: Annual Study of the Status of Driver Education and Driver Training and Driver Instruction Certification Survey

As you know, each year the Bureau of Elementary and Secondary Education has found it necessary to gather data concerning the driver education and driver training programs. In addition, this year the Bureau of Teacher Education and Certification is requesting information on the training and certification of teachers of driver instruction. This is done in order to meet requests for information directed to us by members of the California Legislature and by other interested state and national groups.

Under separate cover, we are sending three copies of the driver education and training questionnaire and three copies of the certification study for each high school in your county, which was reported by your office last year as having driver education, with extra copies for new schools. This will permit each school to retain one copy of each questionnaire, your office to retain one, and the original of each to be sent to:

> Bureau of Elementary and Secondary Education State Department of Education 721 Capitol Mall - Room 464 Sacramento, California 95814

If a local administrator wishes to submit a district driver education and training report rather than a school-by-school report, this is quite acceptable. In such a case, be sure that the number of schools included in the district report is indicated plainly. Please call this to the attention of the superintendent in each district maintaining a high school in your county.

Additional copies of the questionnaires will be sent to you upon request. Sufficient copies of each letter to principals are being sent under separate cover so that one may be available for each high school.

Please have the reports and surveys in the Bureau of Elementary and Secondary Education in Sacramento by May 12, 1967.

Enclosures

MAX BAFFERTT specialendent of Public Instruction and Director of Education

EVERETT T. CALVERT Chief Deputy Superintendent

EUGENE GONZALES Assistant Superintendent (807 State Bidg. Los Angeles 90012)



STATE OF CALIFORNIA DEPARTMENT OF EDUCATION 721 CAPITOL MALL, SACRAMENTO, CALIFORNIA \$5114

April 10, 1967

RONALD W. COX Associate Superintendent: Chief, Division of Public School Administration FRANCIS W. DOYLE Deputy Superintendent: Chief, Division of Special Schools and Services PAUL F. LAWRENCE Associate Superintendent: Chief, Division of Higher Education WILSON C. RILES Director of Compensatory Education DONALD E. KITCH Acting Chief, Division of Instruction

TO: Principals of High Schools Offering Driver Education Only, or Driver Education and Driver Training

- FROM: Glen D. Smith, Acting Chief, Bureau of Elementary and Secondary Education by John R. Eales, Consultant in Secondary Education
- SUBJECT: Annual Study of the Status of Driver Education and Driver Training

Each year the Bureau of Elementary and Secondary Education gathers data concerning the driver education and driver training programs to meet requests for information directed to us by members of the California Legislature, and by other interested state and national groups. We shall appreciate your providing the information requested on the enclosed questionnaire. Of the three copies which you have received, keep one for your own record and <u>return the</u> the original and one copy to the office of the county or city superintendent of schools from which you received them.

Governor Reagan and Superintendent Rafferty have approved participation in the nationwide study of driver education made by the Insurance Institute for Highway Safety, and the Bureau of Secondary Education has been assigned the responsibility for gathering the desired information. In order that we may meet our deadlines, your replies should be returned to the county or city superintendent whence the questionnaire came in order that he may transmit them to Sacramento no later than May 12, 1967.

Enclosure

APPENDIX C

REQUEST FOR DRIVER RECORD INFORMATION--

DEPARTMENT OF MOTOR VEHICLES FORM DL-254
REQUEST INFORMATION CONCERNING:	Lić. No	Citation Date	Information Requested	FOR DDL USE
			STATUS & RECORD	
emon		Court Date		Sdx
First Middle Address	Last			E
Birth Date				
DDL RECORDS INFORMATION LLC				
Try Positive Lic	. 4			
<b>J</b> .				
Name First Middl	Lat			
Address				
Birth Date Sex	Married Single	ROM: ☐ Ed F. N Driver I Californ	. Lorenzen, Director nstruction Certificati ia State College	on Study
Restrictions None	Corrective Lenses	6101 E.	7th Street	
Other		Long Be	ach, California 9080	
DL-254		Request Date: Jun	e 1, 1967	
				A 087

161

DATA CODING SHEET

APPENDIX D

## SUBJECT AND DISTRICT IDENTIFICATION DATA

1.	Subject Identification Number
2.	County - School District -
	Density Area Code
3.	Sex
4.	Marital Status
5.	Birthdate (D)
6.	Age (as of 6/1/67)
7.	Driver License Number (E)
	INSTRUCTIONAL ASSIGNMENT DATA
	INSTRUCTIONAL ASSIGNMENT DATA
8.	Specific Driver Instruction Credential Held (G)
9.	Other Credential Held (H)
10.	Undergraduate Major (I)
11.	Graduate Major (J)
12.	Undergraduate Minor (K)
13.	Graduate Minor (L)
14.	Highest Degree Held (M)
15.	Phase of Instructional Assignment (O)
16.	CALDEA Membership (d)
	DRIVER RECORD DATA
17	Total Convictions (S)
1Q	Total Accidents (T)
10.	Signs Signals & Payement Markings (II)
20	Driving Overtaking & Passing (V)
20. 91	Bight_of_Way (W)
21. 99	Turning Stopping & Signalling $(X)$
22. 93	Speed (V)
2J. 91	Major Violations (7)
24. 25	Fauinment Violations (a)
20. 26	Other Violations (b)
20.	Violations not in CVC (c)
21. 28	Total $FTA_{1,\alpha}(f)$
20. 29	File Established (a)
20.	Prior Negligent Operator Status/Suspension/Revocation (h)
31	Insufficient/Inaccurate Information Supplied (i)
32	No Driver License (i)
33	Out-of-State Driver License (k)
34	Negligent Operator Point Count (36-months)
35	Prior Conviction of Major Offense
36	Moving FTA's
07	ADTSEA Mombarghin
<u>.</u>	

APPENDIX E

CALIFORNIA VEHICLE CODE--SECTION 12810

Section Violation		Section	Violation	
Two Points		21712	unlawful riding	
		21750	cutting in	
14601	driv susp., rev.	21751	passing clear - 100 ft.	
20001	H & R - death, inj.	21752	pass, on grade - rr	
20002	H & R - prop. damage	21753	yield if overtaken	
20007	H & R - unattend. veh.	21754	improper pass.	
23101 fel. dr. driv inj.		21755	improper pass. on rt.	
23102 drunk driving		21756	wrong pass. str. car	
23103	reck. dr prop. dam.	21757	wrong pass, str. car	
23104	reck, dr inj.	21758	slow pass, on grade	
23105	narcotics	21759	wrong pass, animals	
23106	other than narcotics	21800a	vield - at intersect.	
23108	dangerous drugs	21800b	vield - to car at right	
	8	21801	vield - when turning	
	One Point	21802	vield - thru highway	
		21803	vield - vield sign	
2800	Officent a nime!	21804	viold - allow drivoway	
2801	Fireman's signal	21805b	vield - horseback rider	
13360	violation of restr	218065	vield - omergency yeb	
14603	violation of restr.	210004	wield to nod (onswitch)	
1005	violation of restr.	21051	yield - to ped. (crawik)	
10457	violation of restr.	21951	yield - otr. stopped ven.	
14010	misuse of license	21952	yield - to ped. (sdwik)	
214513	yield - green	219546	care if ped. vields	
21402a	vield - yellow	22100a	rt, turn - rt, lane	
21453a	limit lane - stop	b	left turn - left lane	
b	rt, turn on red	22101	turns - obey markers	
C	1-way turn on red	22102	U turns: business	
21454a	yield - green arrow	22103	U turns: residence	
21457a	flashing red - stop	22104	U turns: fire stat.	
b	flashing yellow	22105	U turns: curve, grade	
21459-21460	over double line	22106	starting or backing	
21461-21462	obey control device	22107	unsafe turn - signal	
21650	wrong side of road	22108	give signal, 100 ft.	
21651	wrong side - div. hwy.	22109	stop signal	
21652	wrong entrance - hwy.	22110	signal device req.	
21653	wrong side - 1 way	22111	hand signals	
21654	wrong lane (not pass.)	22349-22363	speed laws	
21655	wrong lane - tr., tr.	22400	too slow	
21656	too slow; pull over	22405	bridges, etc.	
21657	off - center lane	22406	speed - trucks, trl.	
21658a	straddling - marked	22407	trucks, trl desc. grd.	
b	slow traffic lane	22408	speed - towing	
21659	vield - middle lane	22411	speed - lift carriers	
21660	straddling - unmarked	22412	speed - school bus	
21661	vield to ascending	22450	ston sim	
21662	wrong side - mt driv	22451	stop - train signal	
21700	obstructed view	22452-22453	stop - rr crossing	
21702	special hours	22454	etop - nase school bus	
21703	following too close	22455	stop - rr: trucks hus	
21704	too close - tr trail	22500 (b)	double parking	
21705	too close - caravan	22517	opening dre on traf	
21706	too close - fire yeh	22100	opening ure. on trai.	
21707	inter - fire a rea	22252	ushioular crossing	
21709	driv over finchere	23233	Venicular crossing	
21700	the second second	24008	lower'ed ven.	
21705	thru safety zone	24409	lights	
21/10	coasting on grade	26300	Drakes	
21/11 (acc)	towed ven. swerving	26457	stopping sp loads	

## California Vehicle Code--Section 12810 NEGLIGENT OPERATOR POINT COUNTS

.

APPENDIX F

CALIFORNIA VEHICLE CODE--VIOLATION CATEGORIES

## California Vehicle Code VIOLATION CATEGORIES

Traffic Signs, Signals, Markings

- 21451a Green or Go, shall proceed but shall yield to vehicles lawfully within intersection. No U-turn unless permitted by sign.
- 21453a Red or Stop, vehicles stop a limit line or X-walk.
- 21453b After stopping, may turn right (unless sign posted) but shall yield to vehicles lawfully within intersection.
- 21453c After stopping, may turn left (unless sign posted) from oneway to one-way street, but shall yield to vehicles on cross street.
- 21454 Green Arrow, make only restricted movement indicated, yield to vehicles lawfully within intersection. No U-turn unless permitted by sign.
- 21457a Flashing Red, failing to stop for.
- 21457b Flashing Yellow, proceed only with caution.
- 21460a Double solid lines, driving to left of, except driveway, intersection, or U-turn.
- 21460b Solid-broken lines, driving to left when solid line placed on right.
- 21461 Traffic control sign, failure to obey regulatory provisions.
- 21462 Traffic control signals, all traffic to obey.
- 22450a Stop sign, failure to stop at limit line or crosswalk.
- 22450b Stop sign, failure to stop where indicated within intersection.
- 22450c Stop sign, failure to stop at posted RR crossing.
- 22451a Railroad crossing, failure to stop for signal device.
- 22451b Railroad crossing, failure to stop for human flagman.
- 22452b Railroad crossing, certain vehicles must stop.
- 22454 Passing school bus, stop when red lights flashing.
- Driving, Overtaking and Passing
- 21650 Right half of roadway, failure to drive on.
- 21651 Divided highways, driving to left, over, or across dividing section.
- 21652 Service road, entering or leaving adjacent highway from other than lawful opening.
- 21653 One-way street, driving against traffic.
- 21654 Slower vehicle in left lane(s).
- 21655b Slow vehicles (22406-22414) using left lane(s), or passing in lane other than adjacent to right lane.
- 21656 Slow vehicle, failure to use signposted turnout.
- 21657 Off-center lanes, failure to obey signs designating.
- 21658a Laned roadways (2 or more lanes in direction of travel), straddling or changing when unsafe.
- 21658b Failure to obey directions of traffic device on a divided roadway.

- 21659 3-lane highway, driving in far left lane, or using center lane when unsafe.
- 21660 Meeting vehicles, failure to pass to right, and/or yield half of roadway.
- 21661 Descending narrow grade, yield to ascending vehicle.
- 21662 Mountain driving, keep to right, sound horn when required.
- 21700 Obstructing driver's view, or control, by passengers or load.
- 21702a Driving hours--Persons, not to exceed 10 hours.
- 21702b Driving hours--Property, not to exceed 12 hours.
- 21703 Following too closely, not reasonable and prudent.
- 21704a Distance between trucks, 500 feet on 2-lane highway.
- 21705 Caravan, maintain at least 100 feet distance between vehicles.
- 21706 Fire department or police vehicles, following within 300 feet.
- 21707 Fire area, operating vehicle within the block or 300 feet.
- 21708 Fire hoses, driving over unprotected.
- 21709 Safety zone, driving through.
- 21710 Coasting, in neutral or downgrade.
- 21711 Towed vehicle, whipping, swerving, or failing to track properly.
- 21712 Unlawful riding on portion not intended for passengers or load.
- 21715 Passenger vehicle, towing more than one other vehicle.
- 21750 Overtaking vehicle, failure to pass safely to left.
- 21751 Overtaking vehicle, passing without sufficient clearance.
- 21752a Driving left of center, when view limited by curve or hill crest.
- 21752b Driving left of center, when view limited by approaching bridge, viaduct or tunnel.
- 21752c Driving left of center, traversing intersection or RR crossing.
- 21753 Overtaken vehicle, not moving to right on audible signal, or increasing speed.
- 21754 Passing on right when unlawful.
- 21755 Passing on right, when unsafe, or on shoulder.
- 21756a Passing streetcar when receiving or discharging passengers.
- 21756b Passing streetcar at unsafe speed.
- 21756c Passing trolley coach at unsafe speed.
- 21757 Passing streetcar on left.
- 21758 Passing too slowly on grade (10 mph faster, complete pass 1/4 mile).
- 21759 Passing animals, stop or reduce speed as necessary.

Right-of-Way

- 21800a Uncontrolled intersection, yield to first vehicle within.
- 21800b Uncontrolled intersection, yield to vehicle on right.
- 21801a Left turns, yield until reasonably safe.
- 21801b Failure to yield, turning vehicle having yielded (lane by lane).
- 21802a Entering through highway, yield until reasonably safe.
- 21802b Failure to yield, by vehicle presenting a hazard.

- 21802c Proceeding from stop sign or flashing red (within intersection), yield until reasonably safe.
- 21802d Failure to yield, by vehicle not a hazard.
- 21803a Yield signs, yield until reasonably safe.
- 21803b Failure to yield, by vehicle not a hazard.
- 21804a Private property, drive or alley, yield to approaching vehicles.
- 21804b Left turn into private property, drive or alley, yield until reasonably safe.
- 21804c Failure to yield, turning vehicle having yielded.
- 21805b Equestrian crossings, failure to yield by driver.
- 21806a Emergency vehicles, other driver failing to yield.
- 21950 Crosswalks, failure to yield to pedestrians within.
- 21951 Crosswalks, overtaking and passing vehicle stopped for pedestrian within.
- 21952 Sidewalk, failure to yield to pedestrian on.

Turning, Stopping, Signalling

- 22100a Right turn at intersection, improper position.
- 22100b Left turn at intersection, improper position.
- 22101b Required turn, failure to obey official sign.
- 22101c Prohibited turn, failure to obey official sign.
- 22102 U-turn in business district, other than at intersection, or opening in divided highway.
- 22103 U-turn in residence district, vehicle approaching within 200 feet.
- 22104 U-turn at fire station, in front of or using entrance.
- 22105 U-turn at curve or grade, vision obstructed within 200 feet.
- 22106 Starting or backing when unsafe.
- 22107 Unsafe turn, and/or without signalling.
- 22108 Turning without signalling last 100 feet.
- 22109 Stopping suddenly without signalling.
- 22111 Hand signals, improperly given.
- 22112 School bus signals, misuse by bus driver.
- 22500a Parking unlawfully, within intersection.
- 22500b Parking unlawfully, on crosswalk.
- 22500c Parking unlawfully, adjacent to safety zone.
- 22500d Parking unlawfully, within 15 feet of fire station driveway.
- 22500e Parking unlawfully, blocking any driveway.
- 22500f Parking unlawfully, on a sidewalk.
- 22500g Parking unlawfully, blocking excavation.
- 22500h Parking unlawfully, double parking.
- 22500i Parking unlawfully, in posted bus loading zone.
- 22500j Parking unlawfully, in tube or tunnel.
- 22500k Parking upon any bridge, unless posted to permit.

- 22502 Park parallel on right, and/or within 18" if curbed.
- 22504a Stopping or parking, on roadway outside city limits.
- 22505 Parking on state highway where sign posted.
- 22510 Parking in snow areas, when sign posted.
- Fire hydrant, parking unattended vehicle within 15 feet.
- 22515 Unattended vehicle, motor running and/or brakes not set.
- 22517 Vehicle doors, opening to traffic when unsafe, leaving open.
- 22520 Stopping or parking, on freeway having full control of access and no crossings at grade.

Speeding					
22349	Maximum speed limit, 65 miles per hour.				
22350	Unsafe speed for prevailing conditions.				
22356	Maximum speed 70 mph, when sign posted.				
22400a	Minimum speed, impeding normal flow of traffic.				
22400b	Minimum speed, below signposted limit.				
22405a	Unsafe speed (signposted for condition of bridge, structure, tube or tunnel).				
22406	Truck or tractor exceeding 50 mph.				
22407	Truck speed on downgrade, exceeding posted limit.				
22408	Passenger car or bus towing any vehicle, exceeding 50 mph.				
22409	Solid tire vehicle, speed restricted by weight.				
22410	Metal tire, vehicle exceeding 6 mph.				
22412	School bus, exceeding 45 mph with passengers.				
22414	Labor bus or truck, exceeding 45 mph with passengers.				
23109a	Speed contest, engage in, aid, or abet.				
23109b	Speed contest, blocking or obstructing highway.				
Major					
14601a	Driving privilege suspended or revoked, driving when.				
20001	Hit-run, injury or death, immediate report of fatal.				
20002a	Hit-run property damage.				
20002Ъ	Hit-run property damage, by runaway vehicle.				
20007a	Hit-run, unattended vehicle damaged.				
23101,					
P.C. 367e	Intoxicated driver, causing injury to other than self.				
23102a,					
P.C. 367d	Under influence of alcohol (or combined with drug), driv-				
	ing on highway.				
23103	Reckless driving, no injury.				
23104	Reckless driving, causing injury.				
23105	Narcotics, driving under influence, or by addict.				
23106	Other drugs, driving under influence.				
23108	Dangerous drugs, driving under influence causing injury.				

P.C. 192.3 Manslaughter.

APPENDIX G

TRAFFIC DENSITY ESTIMATES BY COUNTY

.

Code	County	Traffic Density	Code	County	Traffic Density
01	Alameda	213	30 31	Orange Placer	168 029
02	Amador	010	32	Plumag	003
04	Butte	026	33	Riverside	036
01	Calaveras	008	34	Sacramento	122
06	Colusa	011	35	San Benito	017
07	Contra Costa	120	36	San Bernardino	030
08	Del Norte	018	37	San Diego	095
09	El Dorado	015	38	San Francisco	417
10	Fresno	038	39	San Joaquin	064
11	Glenn	012	40	San Luis Obispo	028
12	Humboldt	031	41	San Mateo	163
13	Imperial	014	42	Santa Barbara	067
14	Inyo	004	43	Santa Clara	148
15	Kern	031	44	Santa Cruz	070
16	Kings	026	45	Shasta	014
17	Lake	014	46	Sierra	002
18	Lassen	003	47	Siskiyou	005
19	Los Angeles	200	48	Solano	064
20	Madera	011	49	Sonoma	053
21	Marin	098	50	Stanislaus	052
22	Mariposa	004	51	Sutter	026
23	Mendocino	021	52	Tehama	009
24	Merced	025	53	Trinity	003
25	Modoc	002	54	Tulare	023
26	Mono	002	55	Tuolumne	007
27	Monterey	048	56	Ventura	083
28	Napa	053	57	Yolo	041
<b>2</b> 9	Nevada	012	58	Yuba	030

Traffic Density Estimates by County\*

\*Number of vehicles registered ÷ total number of linear miles of roads and highways for each county to nearest whole number.

