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TRAFFIC LAW SANCTIONS

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FINAL REPORT

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16. Abstract

Surveys of the driver population were conducted in Colorado, Maryland, and North Carolina for the purpose of determining driver perceptions on several different subjects, including (1) the chances of being caught by the police for specific unsafe driving actions, (2) the chances of being found guilty by the courts if a challenge were made, (3) the fine for a first violation of an offense, (4) the perceived severity of the fine, and (5) other related topics of interest of a deterrence nature. Questions on these topics were asked on seven different offenses which had been identified in previous NHTSA research as being the primary unsafe driving actions associated with accident causation. The seven offenses were speeding 10 miles per hour over the posted speed limit, speeding 20 miles per hour over the posted speed limit, driving while intoxicated, running a traffic light or stop sign, following a moving car too closely, turning in front of oncoming traffic, and crossing the center line of the roadway.

Through an independent data collection effort, it was also possible to obtain the citation history of all survey respondents and whether they had appeared in court for a particular violation. The number of citations for each type of offense was obtained for a three-year period prior to the survey. A total of over 2,600 drivers participated in the survey. The Final Report provides details on the survey responses as related to citation histories.

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METRIC CONVERSION FACTORS

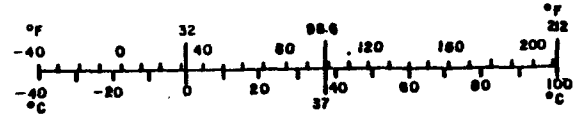
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.96	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



ACKNOWLEDGMENT

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The surveys of drivers were conducted under a subcontract to Opinion Research Corporation located in Princeton, New Jersey. Mr. Ben Phillips, Vice President, was responsible for the survey personnel at each of the jurisdictions. We are also particularly grateful for the services of Ms. Cheryl Rogers on the Public Management Services, Inc. staff for her assistance in setting up the surveys and in collecting data at the jurisdictions.

There has also been excellent support from the National Highway Traffic Safety Administration's Contract Technical Managers: James F. Frank, Ph.D.; Theodore E. Anderson; and Michael J. Goodman, Ph.D. Dr. Goodman was the CTM for much of the contract period and took an active involvement in the project.

J. Thomas McEwen, Ph.D.
Principal Investigator

John P. McGuire
Principal Investigator

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

The origin and development of traffic sanctions as part of traffic law have been from the general penal law. With the appearance and increasing presence of automobiles on streets and roads and later on highways in the first three decades of this century, the need to regulate their movement became obvious. This led to the formulation of various "rules of the road" laws, backed up with penalties modeled after those that were expressed in the current criminal laws. To date, investigations of traffic offense sanctions have been limited to a small number of studies on the effect of particular traffic countermeasures and additional studies of the impact of traffic sanctions on offender behavior.

It is remarkable that so little is known about the operation and impact of traffic sanctions in a nation where more people drive than vote and where the traffic court is the most important contact with criminal justice for most adult citizens. If traffic law enforcement and administration are viewed as a business, they are big business indeed, occupying a substantial percentage of total police time and consuming as an industry between one and two percent of gross national product. Traffic accidents account for two out of every hundred deaths in the United States and huge economic losses. If sanction policy can have a cost-effective impact on accidents, it is important to determine how this can best be done. If not, it is important to impart fairness and economy into the sanction system and direct resources that would otherwise be used in sanctions to other need areas in a transportation and highway safety policy.

For some time now there has been a tendency to decriminalize or detraditionalize traffic law. As it turns out, the break has been developing between serious and non-serious traffic crime in terms of the maximum imposed penalty. If one wishes to preserve the option of sending a traffic offender to jail, the offender must be processed through a court. Thus, sanction policy becomes a key issue in traffic sanction regulation organization. In general, if jail is removed as a possible penalty, those committing traffic offenses that may result in a license suspension or revocation or some lesser sanction can be disposed of by means of a due process hearing in an administrative setting. Retention of the possibility of jail results in adherence to the traditional system or creation of a system in which most offenses will be treated administratively and some small number become a residual category in the criminal courts.

What are the sanctions for traffic offenses? Criminal law, including traffic law, usually defines the upper limit of a sanction rather than the mode or the minimum sanctions. Thus, a review of specified sanctions leads to a determination of the maximum announced sanction, i.e., the "bark" (as opposed to the "bite") stated in the law. In practice, examination of the sanctions imposed on offenders suggests that for those offenses with the greater maximum sanctions, greater disparity will be observed in their imposition.

As indicated above, one of the distinctive characteristics of traffic offense sanctions is the extremely large number of citizens on whom they are imposed. This stems from the fact that traffic offenses, even serious ones, are massive acts. Nearly ninety-five

percent of all arrests/ citations are for traffic offenses and almost all of those are for minor offenses. The forty-seven million traffic arrests/citations in fiscal year 1974, for example, represent more than one arrest/citation for every five persons in the United States. Fortunately, the processing of this number of offenders through the adjudication-sanction system is performed in a manner that requires minimum interaction between the offenders and the adjudication officials. In at least thirty-three jurisdictions, however, the statutes provide for jail sentences as a possible penalty for violation of traffic laws (McGuire and Peck, 1977; Appendix A). It is not difficult to imagine the societal response that would result should there be a sudden escalation of the penalties imposed on traffic offenders so that a significant proportion were being incarcerated. Because of the very large number of citizens that will be affected by any changes in traffic offense sanctioning policy, it is imperative that such changes be precisely evaluated in terms of their ultimate impact.

A prior sanctions study that included a thorough review of the research literature in the area, indicated that little data exist regarding how the driving public regards traffic sanctions (McGuire and Peck, 1977). A California study questioned over 4,000 California drivers regarding their perception of various factors of the traffic enforcement-adjudication-licensing system but did not cover the sanctioning area in depth (Finkelstein and McGuire, 1971). Similarly, while there have been a small number of studies regarding the effects of sanctions on traffic offenders themselves (Blumenthal and Ross, 1973a, b), there have been even fewer investigations of the general effects (including deterrence) of these sanctions, i.e., the effect on the total population (Ross,

1974, 1975). As a result of this lack of scientifically valid information, current attempts at sanction policy formulation and/or adjustment are based largely on pragmatic responses to obvious system failure or are generally developed by relying on unproven hypotheses.

The research described in this report was conducted in order to assess variations in (1) the perceived severity and impact of traffic offense sanctions, and (2) the actual behavior of sanctioned offenders (in terms of recidivism) resulting from the differences in traffic offense sanction policy found in purposefully selected jurisdictions. The underlying assumption in the research design developed by the National Highway Traffic Safety Administration is as follows:

> Three jurisdictions are chosen in which the relative traffic offender sanction policies can be rated in terms of severity as low, intermediate, and high. Since it is assumed that severe sanctions are more likely to deter traffic violations than mild sanctions, the violation rate and recidivism rate should be lowest in the jurisdiction with the highest penalties, provided other influencing factors such as enforcement level are the same, To the extent that other factors are not the same, their influence on violation and recidivism rates must be accounted for when comparing the three jurisdictions with different sanction policies.

In three jurisdictions selected on the basis of statutory sanction level, data were collected on perceived severity of sanctions, actual sanctions, violation rate and recidivism rate in each jurisdiction. To account for possible differences, data were also collected on traffic law enforcement in each of the jurisdictions.

The data were analyzed to determine whether the greatest degree of traffic law compliance (in terms of lower violation rates and lower recidivism rates) occurs in the jurisdiction having the most severe traffic offender penalties. To the extent that such a difference in sanction effect can be detected, conclusions can be drawn regarding the deterrence effects of the sanctions.

The remainder of this report is organized in the following manner. Chapter 2 gives the background on the survey development, site selection, and data collection efforts. Chapter 3 is a discussion of deterrence theory as it relates to traffic safety. This chapter provides a foundation for both the survey and other research efforts which may be of value. Chapter 4 is a summary of the survey results from the three states. Chapters 5, 6, and 7 present the detailed analysis from each of the three jurisdictions. Chapter 5 is devoted to the Colorado results; Chapter 6 to the Maryland results; and Chapter 7 to the North Carolina results. These three chapters have been prepared to serve as stand-alone chapters on the survey results. The chapters basically have the same format and much of the wording is similar because of similar results.

CHAPTER TWO

SURVEY DEVELOPMENT, SITE SELECTION AND DATA COLLECTION

In this chapter, a description is given of (1) the development of the survey, (2) the selection of three jurisdictions in which to conduct the study, and (3) the collection of the data in the three locations.

SURVEY DEVELOPMENT

The development of the survey plan for the study, including the sampling procedures, the processes required by security and privacy considerations and the interview subject areas is described in this section.

Survey Plan

One of the principal information gathering activities of the study was a personal interview survey of motorists at a driver license renewal station. This survey setting was chosen because (1) potential subjects represent a random sample of all licensed drivers in the local jurisdiction, and (2) the environment was thought to be conducive to cooperative responses on the part of the subjects.

It was planned that approximately 1,000 subjects would be interviewed in each of the three jurisdictions examined in the study. The driving population was considered to consist of three categories of sanction experience:

1. Drivers who have had no traffic violations in the preceding three years.

2. Drivers who have had one, two, or three minor violations in the preceding three years.
3. Drivers who have had more than three minor violations or one or more serious violations in the preceding three years.

A stratified sampling plan was prepared that should have resulted in approximately equal numbers of drivers from each category being asked to participate in the interview. The stratified sampling plan was chosen because comparable group sizes would improve the confidence associated with conclusions drawn from the response of the three groups. Had the stratified sampling plan not been used, the three categories would represent approximately 70 percent, 20 percent, and 9 percent* respectively, of the general driving population.

The selection procedure for sampling was based on having the ability, a priori, to identify the group of the driver through such schemes as:

- the coding on renewal reminder cards that drivers in some states are asked to bring with them to renewal, or
- on-line access to driver records at renewal stations.

Using estimates of the fraction of the driver population in each group, a sampling scheme was devised. Knowing to which group each potential respondent belongs and using the sampling plan, a decision was made to approach an individual driver for participation in the survey. A random start was used for each group following any interruption in routine sampling. At the end of the first day of interviewing at each location, the sampling scheme was adjusted to account for the refusals experienced and the group membership experienced among those renewing their licenses. From these data the number of days required to obtain approximately 1,000 interviews

*Based on North Carolina renewal applicants described in "The North Carolina Test Waiver Law: An Evaluation of Its Impact," by P.F. Waller, R.G. Hall and S.S. Padgett. University of North Carolina Highway Safety Research Center, April 1977.

in that location was estimated. To estimate possible biases in sampling, the sex, approximate age and (potential) survey group was recorded for those refusing to be interviewed.

The survey plan described above was approved by the Office of Management and Budget along with the survey instrument.

Security and Privacy Considerations

To make certain determinations required in the study, it was necessary to examine both the interview responses and driving record of the subjects. For example, to compare perceived sanction impact (as obtained from the interview responses) and actual recidivism data (as obtained from driving records), it was clearly necessary to have both data sources on the same subject. To minimize extra paperwork, collecting data on individual subjects from both sources was approached in a manner that allowed bringing together the interview response and the driver record in as short a time as possible and then removing all identifiers so that from that point on, only anonymous data had to be handled. The principal reason for this approach was to avoid creation of an indexed System of Records as described in the Privacy Act of 1974 (P.L. 93-579). Having to create a System of Records would have resulted in diversion of efforts from the study to the publication of notices regarding the system and answering inquiries from individuals regarding whether their name is among the records. The plan used to handle this situation was approved by the Privacy Act Coordinator of NHTSA.

Questionnaire Development

The survey instrument or questionnaire used for conduct of the interviews was developed to allow measurement and comparison

of the perceived severity and the perceived impact of traffic offense sanctions. Basic to the investigation was the broader question of perceived risk of detection and the perception of subsequent events. The conscious decision to commit a traffic offense and/or a lax attitude toward commission of offenses is based on assessment of certain risks, the most important conceivably being the risk of detection. Figure 1 illustrates the events that can occur subsequent to commission of a traffic offense. A certain probability, dependent on a number of factors, is associated with the transition of a driver through the various stages shown. Irrespective of the actual probabilities, those perceived by a potential offender are the ones that influence his actions. It was the investigators' position that the perceived severity and impact of sanctions should be assessed in terms of the perceived risks of detection and conviction, for it is the aggregate of these risks that influences the subsequent behavior of traffic offenders. Thus, the questionnaire was developed, tested and revised so that the risks described could be assessed.

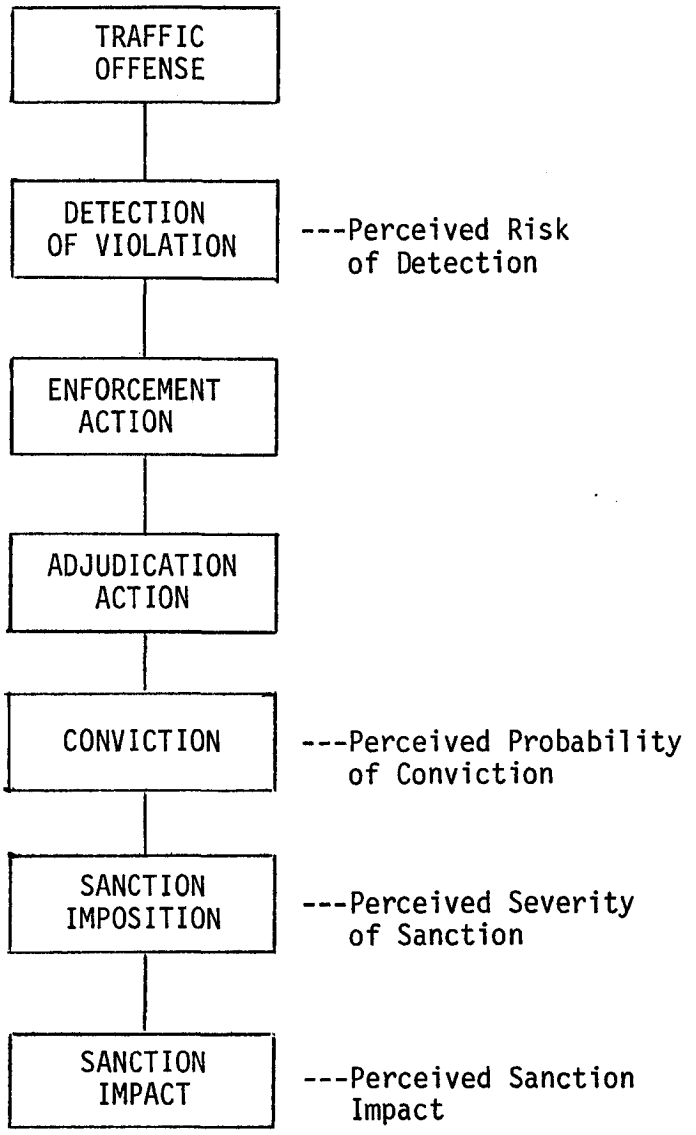
In the interview, the stage was set by identifying the sponsor as the United States Department of Transportation, and the reason for the survey as finding out how the public feels about various safety problems and monetary fines that can occur when people drive a car. At this point the respondent was informed of the type of data to be collected and what was to be done with it (in accordance with the Privacy Act requirements).

The issues covered in the interview questions are as follows:

- A general question on whether the respondent believed his State did a good, fair or poor job of holding down traffic accidents through:

FIGURE 1

ILLUSTRATION OF THE SEQUENCE OF
ENFORCEMENT-ADJUDICATION-SANCTIONING
ACTIVITIES AND ASSOCIATED INTERVIEW MEASURES



- The motor vehicle inspection system
- Setting high standards for people obtaining a driver's license
- Designing and maintaining highways in a way that makes them safe to drive on
- Enforcing the laws that require motorists to follow safe driving practices.

- Questions testing attitudes toward (a) the likelihood of detection, and (b) the likelihood of a court conviction in the event of a detected violation in each of the following categories separately:

  - Speeding--10 and 20 MPH over the speed limit
  - Driving while intoxicated
  - Moving violations. Several specific examples are covered, such as running a traffic light or stop sign, following a moving car too closely, turning left into oncoming traffic, driving on the wrong side in a curve, etc.

- For the same violations listed above, the interviewer tested the driver's knowledge or awareness of what the penalty for a (first) violation was. Measuring the extent to which drivers were aware of sanctions can have analytical value in its own right and was a desirable prelude, in the interviewing, to obtaining the ratings of severity.

- For the same list of individual violations as above, questions were asked to obtain the respondent's evaluations as to how severe they considered the penalty to be. To get everybody on the same track--those who do and those who do not know what the penalty is--the true sanction was briefly described. The respondent was asked to rate the severity of the true sanction. The ratings of severity were based on a scale, with five numerical scale points and word assists at each end of the scale, as follows:

  "Not at all severe".....".Extremely severe."

- In addition to traditional sanctions such as fine, jail, and license suspension, the interviewer tested the awareness of such "penalties" as assignment to court traffic school or a DMV education program or an increase in insurance premiums following a traffic violation conviction.

- Similarly, the respondents were asked questions regarding the ultimate impact of sanctions on both violators and non-violators in terms of:
  - Prevention (of future violations)
  - Education (regarding driving skill).
- Finally, the questionnaire contained a few background questions to assist in analysis of responses, such as the number of years a period had been driving, how many miles driven per year, income level and level of education. (Additional demographic variables such as age, sex and zip code were available from the driver records that were merged with the questionnaire responses.)

A copy of the questionnaire used in the survey is presented in Appendix A.

SITE SELECTION

The principal determinant of site selection for the study was to be the traffic offender sanction (penalty) level in a given state. To the extent feasible, these levels were to be at different points in the sanction spectrum. The successful conduct of the study, however, required screening on a number of other factors.

Comparisons were made among all states regarding penalty ranges for "rules of the road" type violations and, for those states having them, traffic offense penalty schedules for violations not requiring an appearance before a magistrate. Information was gathered regarding the extent to which state driver records contained the desired penalty information and how much reliance would have to be placed on court records. Because the survey plan called for a stratified sample of drivers at license renewal, if possible, it was necessary to determine in which

states all renewal applicants must appear in person and in which states it would be practical to learn about a driver's violation record while he/she was being processed for renewal.

After analysis of gathered data, sixteen states were chosen as candidates with varying potential and from these, six were chosen for site visits.

- Colorado and Delaware -- having relatively low penalties
- California and Oklahoma -- having intermediate penalties
- Virginia and Washington -- having relatively high penalties.

Discussions to explore the prospects of conducting the study were held with driver licensing operational and research officials in each state. As might be expected, a variety of responses were received, including:

- interest and willingness to explore the matter further;
- interest, but a stance of not wanting to burden the public with the survey;
- Interest, but practical limitations on the ability to meet some technical requirements imposed by the study approach (two states); and
- genuine disinterest.

As a result of the responses, it was necessary to locate additional candidates for the intermediate and high penalty states. During the period when the screening took place, Maryland had changed its licensing policy to one that required all renewal applicants to appear in person. This change allowed consideration of Maryland as a high penalty candidate. North Carolina did not have on-line access to driver records at the renewal station but

its procedure of coding violation information on the renewal notices allowed consideration of that state as an intermediate penalty candidate. These states were visited and agreed to participate in the study along with Colorado.

Following agreement by the three licensing agencies, specific local sites for the survey were selected. This was done on the basis of the volume of license renewals at a station and the number of traffic law enforcement agencies in the county (and their willingness to both provide enforcement data and assist in speed data collection).

The three sites selected are described in Table 1.

Table 1

Summary of Sites Selected

State	Jurisdiction	License Renewal Stations	Enforcement Agencies
Colorado	Denver City and County	Denver Headquarters	Denver P.D.
Maryland	Anne Arundel County	Glen Burnie Headquarters	Anne Arundel Co. P.D. & Maryland State Police
North Carolina	Wake County	East Raleigh Station; West Raleigh Station	Raleigh P.D., North Carolina Highway Patrol

Table 2 gives traffic offender penalty data. Admittedly, the spread of penalties among the three states is not very large. It was felt that the speeding 10 MPH over the limit violation would be cited more often than the others. The states were accordingly designated as having low, medium, and high penalties relative to each other.

Table 2

Penalty Data for Selected Sites

Offense	Colorado	North Carolina	Maryland
Speeding 10 MPH over limit	$25	$32	$40
20 MPH over limit	Court Appearance	Court Appearance	$50
Driving While Intoxicated	Court Appearance	Court Appearance	Court Appearance
Running traffic light or stop sign	$10 - 24	$27	$20
Following Too Closely	$ 5 - 24	$27	$30
Turning left or pulling out yield violations	$ 8 - 18	$27	$30
Crossing center line	$10 - 24	$27	$30

DATA COLLECTION

Four sources of data were used in this study:

- In-person structured interviews
- Driver records of interview respondents
- Speeding violation data in the jurisdictions of the interviews
- Traffic violation enforcement (citation/arrest) data in the jurisdictions of the interviews.

The activities required to gather these data are described here.

Interview Data

The mechanics of conducting the interviews were established to conform with the driver license renewal procedures in each

locale and were constrained by the need to (1) determine to which driver (violation history) group each renewal applicant belonged, (2) apply the group sampling criteria, and (3) ask the potential respondent to be interviewed. The screening, the requesting to be interviewed and the actual interviewing were conducted by personnel from Opinion Research Corporation of Princeton, New Jersey under contract to Public Management Services.

In general, once a potential respondent's group membership was known, the screener increased the group count on the sampling record form. Persons eligible for interview according to the sampling scheme were asked if they would not mind being interviewed. If they agreed, they were directed to an interviewer who asked questions according to the format previously described and shown in Appendix A. When no interviewers were free to accept a new respondent, the screening and sampling procedure continued as usual with the exception that eligible potential respondents were not asked and the sample cycle for that group was repeated.

As described in the survey plan, the group ratios for the sampling scheme were developed on the basis of limited knowledge about the driver population of the state and modified as a result of the first day's interviewing experience (both acceptances and refusals by group). Although it was anticipated that approximately equal groups would develop using this scheme, in all three jurisdictions the size of Group 3 (the high violation group) was smaller than the others. There were a number of conditions that caused this outcome. The factor most influencing this result was the practical requirement for reasonable sampling ratios. If the sampling ratios among the three groups were set very high (e.g., only every 15th Group 1 and every tenth Group 2 for each

Group 3), there could be significant periods in which project resources were expended for idle interviewers who could not conduct any interviews until the next appropriate member of each group could be approached for the survey. Other factors included daily variations in both volume and refusal rate that made the initial sampling rates difficult to live with. In order to increase the number of Group 3 respondents, some interviews were conducted with persons who had been assigned by the court to attend driver improvement clinics. These interviews significantly increased the number of respondents in this important subpopulation.

In addition, it was found during the analysis that it was beneficial to divide Group 3 into three subgroups, making a total of five rather than three groups. The five groups were defined as follows:

Group 1--No minor and no major violations for the three-year period;
Group 2--One to three minor violations but no major violations;
Group 3--Four or more minor violations and no major violations;
Group 4--One major violation and possibly some minor violations;
Group 5--Two or more major violations and possibly some minor violations.

By group, the number of surveys conducted on which it was possible to gather complete three-year histories of citation and court data are shown in Table 3. All interviews were conducted in November and early December 1979.

Once the interviews were completed in a jurisdiction, the questionnaire forms were assigned an arbitrary number which was coded on both the front and last page. The last page, containing the data elements needed for requesting the driver record, was removed from each form and the entire group sent to the licensing

Table 3

Sample Sizes at the Sites

	Colorado	Maryland	North Carolina
Group 1	405	412	366
Group 2	372	313	382
Group 3	39	94	35
Group 4	41	68	68
Group 5	12	17	15
Total	869	904	866

agency. Three-year driver (violation) records were printed for each interview respondent.

Once the driver records (and the numbered request forms) were received from the licensing agency, the driver record was numbered and all identifying information on the record and request form was removed and destroyed. A combined (anonymous) file of interview responses and violation history was then available for analysis.

Speeding Violation Data

To account for variations in violation rate in each jurisdiction, the effort focused on speeding violations. This violation was chosen because it is by far the most common violation and, as a practical matter, it is the easiest to measure in sufficient volume.* In essence, the reliance on speeding data

*The study initially called for observation measurement of the incidence of all violations (except DWI) covered in the interview. The difficulties in establishing objective violation observation criteria, the inefficiency of collecting such observation data and the fact that such data were to be collected in another NHTSA study related to enforcement led PMS to recommend the change to speeding data.

assumes that the relative incidence of speeding violations observed in a jurisdiction is a measure of the incidence of other rules-of-the-road violations as well. Thus, any conclusions drawn about relative violation rates are based on the speeding data and the assumption described.

To obtain a degree of uniformity in the speed data from the three jurisdictions, four types of roadway segments were defined and one segment of each type was selected in each jurisdiction. The roadway segments were defined as follows:

- a two-lane unimpeded rural road with occasional access and cross traffic,
- a residential/commercial area arterial street,
- a multi-lane expressway, and
- a freeway.

For each roadway type, the selections made across jurisdictions were chosen to have comparable average daily traffic volumes, number of lanes, roadway geometry and speed limit. In addition, segments were selected in which the traffic was generally in free-flow conditions, with speed unaffected by the density or closeness of vehicles, by the curvature of the roadway, by sight distance limitations, by traffic slowing for turns, exits or entrances, etc. Furthermore, the posted speed limit in each candidate roadway segment was reviewed to be certain that it was reasonable for the circumstances.

At each roadway segment selected, recording instruments were deployed that necessitated the placement of two electronic cables across the traffic lanes.* The instruments counted all vehicles

* The cables are quite thin and were placed in such a way that, by the time an on-coming driver saw them, any reaction he might have in response, would not impact the measured speed.

passing the location and in addition indicated the number of vehicles falling into various speed bands, i.e., below 35 MPH, 35-45 MPH, 45-55 MPH, 55-57.5 MPH, 57.5-60 MPH, 60-62.5 MPH, 62.5-65 MPH, 65-69 MPH, 70-75 MPH, and over 75 MPH. Data were recorded four times a day for seven days at each location. The collection times were approximately:

- 6:30 A.M.--covering the overnight period from 7:00 PM the previous evening,
- 10:00 AM--covering the morning commute traffic,
- 3:00 PM--covering the mid-day traffic, and
- 7:00 PM--covering the evening commute.

In this way both weekday and weekend driving situations were covered. The speed data were collected during the interview period.

During the data collection period, every effort was made to avoid public announcement of the measurement and to ensure that normal enforcement took place. The collected data will be analyzed to describe a measure of the extent of speeding violations in each jurisdiction.

Enforcement Data

To account for different enforcement levels in the three interview locations, enforcement data were gathered from those agencies having jurisdiction for traffic law enforcement. Two types of data were collected:

- Number of arrests/citations by offense type during the calendar month in which the interviews took place and
- Amount of manpower in terms of officer patrol hours devoted to traffic patrol during the same month.

All agencies involved routinely produced most of the data requested and willingly furnished it to the study. These data were used in analyzing the violation data and in comparing jurisdictions.

CHAPTER THREE

DETERRENCE THEORY AND TRAFFIC SAFETY

INTRODUCTION

Deterrence can be defined as the action or means by which one is prevented or discouraged from a particular behavior because of the fear of possible consequences. The behavior in question is proscribed by the law along with the punishment that follows apprehension and conviction. Deterrence is often mentioned in the literature as an objective of criminal and traffic law sanctions. More often, the literature discusses what the deterrence effect is, under what circumstances it occurs, and what population groups are influenced by it.

From the theoretical viewpoint, Zimring and Hawkins (1973) describe the deterrence effect by stating that:

> The imposition of punishment is a demonstration to society as a whole that the legal system is serious in its attempt to prohibit criminal behavior: punishment is the "convincer." The unpunished criminal is a direct challenge to the authority behind the law. From this point of view the significance of the individual sentence and the execution of it, lies in the support that these actions give to the law (p. 87).

This description must be viewed in terms of the seriousness of the offense. With minor criminal matters, the penalties are less than certain, are generally not too severe, and hardly serve as a "convincer." A substantial segment of the population may not view traffic offenses as serious and are unconcerned when caught violating a traffic law. A principal reason for this lack of stigmatization of traffic offenses is the lack of correspondence

between the law and contemporary mores. The fact that conviction for violations of many traffic ordinances need not involve criminal intent on the part of the violator further complicates the problem.

In the legal field, offenses are sometimes classified either as mala in se when they are jointly proscribed by law and by public mores or as mala prohibita when they are proscribed by law but not by public mores (Gibbs, 1966). With this distinction, Ross (1969) states that many traffic offenses are mala prohibita. The classification also indicates why many traffic offenses are often referred to as "Folk Crimes"--a class which also includes some gambling, tax evasion, and drug offenses. These offenses are often condoned by the general public even though they are widespread and socially costly.

It has been pointed out by Silberman (1976) that the distinction between mala in se and mala prohibita is a "legalistic one which does not take into account variability with respect to norms, acts or situations." The lack of agreement in any population group regarding what the mores are or what is proscribed leads to the consideration of a continuum which permits the examination of deterrent effects as a function of the degree of legality and the degree of morality involved. In this context, Zimring and Hawkins put traffic offenses into the following perspective:

> Where there is general moral condemnation of the behavior being penalized, it is relatively easy to enforce harsh penalties. As a corollary to this, where there is general sympathy for and identification with offenders (as in the case of drunk driving in the United States), it will be more difficult to achieve effective enforcement of those penalties. Indeed in this context the level of law enforcement must be seen as a dependent variable, because such factors as sympathy with offenders may influence the kind of enforcement that a harsher penal policy will

> receive. Somewhat ironically, where there is widespread moral condemnation of a forbidden behavior, the enforcement of harsh penalties is likely to be both easiest and least necessary. On the other hand, where the behavior is not strongly condemned but widely tolerated, the enforcement of stringent penal provisions will be both most difficult and most necessary in order to educate the community and to reduce a high rate of crime (pp. 66-67).

The lack of social stigma associated with traffic offenses influences the relationship between the properties of legal punishment and crime rate (Erickson, Gibbs and Jensen, 1977). It has been suggested that for improved conformity to traffic laws, it is necessary to increase social stigma while placing less emphasis on penalties (Grasmick and Appleton, 1977; Middleton, 1977). One survey in Australia has shown that, irrespective of the high potential for severe accidents that certain offenses such as drunk driving may possess, only the accidents themselves produce any social stigma (Misner and Ward, 1975).

Finally, the proposal that substantial increases in enforcement be applied to increase social stigma and thereby reduce the offense rate leads to a more costly traffic control system than is presently in force. One of the beneficial aspects of the deterrence approach is that, if it indeed works, better cost effective methods than intense enforcement can be developed. In the following sections, we examine the research approaches to deterrence theory and its applicability to the study of traffic offender penalties.

RESEARCH APPROACHES TO DETERRENCE

Criminologists and sociologists have for some time sought adequate measures of deterrence. The most often described research approaches have been based on the assumption that deterrence is accurately measured by comparing crime rate data among various jurisdictions as a function of the observed certainty and severity of punishment found there. Tittle (1969), in describing such an approach, used reported crime rates from various states as the indication (dependent variable) of deterrent effect. For measures of the independent variable, he used data related to admissions to state prisons (certainty) and mean length of time (severity). The difficulty in controlling for other influencing variables across jurisdictions was cited as a limitation of this approach. Chiricos and Waldo (1970), taking a similar approach and reviewing the work of other researchers, concluded that "these sources of data were inappropriate for the testing of deterrence hypotheses." They recommended expanding the operational definition of "punishment" to include "arrest and adjudication inasmuch as they may be as effective as incarceration in deterring some types of offenders" (p. 215).

Given the limitations described, it is agreed by most researchers that the certainty of punishment has more impact than its severity. In particular, Teevan found only a weak negative relationship between perceptions of certainty of punishment and deviant behavior. Severity alone, however, was unimportant in deterring deviance. The author believed that certainty and severity working together could enhance the deterrent effect. While finding that certainty was more important than severity, Geerken and Gove (1977) claimed that the extent to which deterrence varies inversely as a function of the certainty of punishment is

highly dependent on the type of crime involved. This occurs because as the type of crime changes, there is a variation in the accuracy of the assumptions that a person acts rationally and accurately perceives the costs and benefits associated with potential acts. In particular, the deterrence effect more "correctly" describes what happens for property crimes than for person crimes. Furthermore, Geerken and Gove took the position that arrest (clearance) rates are a better measure of the risk of punishment than are imprisonment rates because prison rates do not include juveniles (while clearance rates do) and because plea-bargained cases are not included in prison rates. These authors also discuss the impact on deterrence of "overload"--the notion that there are not sufficient enforcement and adjudication resources to respond as required to increased crime rates, and "incapacity"--the notion that crime rates decrease because so many criminals have been placed in confinement. If one were to demand that all traffic violations be eliminated, an overload condition would exist. On the other hand, one can be certain that only a miniscule proportion of traffic offenders are confined and, therefore, potential offenders are not incapacitated.

The search for a more realistic as well as more accurate deterrence model led to consideration of <u>perceptions</u> of the certainty of punishment rather than the <u>objective</u> certainty of punishment. This distinction is important because it recognizes that the information upon which individuals act is often less than perfect. Henshel and Carey (1975) asserted that prior investigations of sanctions and deterrence had neglected an essential point--public knowledge of sanctions. They claim that general deterrence can be considered "a state of mind" in that for an individual, deterrence does not exist if there is no

awareness of specified levels of certainty, severity and swiftness. They cite studies such as that by the California Assembly (1968) which showed a dismal state of ignorance on the part of the public with respect to sanctions. In a rather important comment, the authors noted that some investigators claimed that there is an inefficacy of punishment because only convicts are really knowledgeable of sanctions. This could only be demonstrated, Henshel and Casey insist, if the public is incapable of knowing what penalties there are.

In 1976, Erickson and Gibbs called for a reexamination of their own work as well as the whole area of deterrence theory and urged employing perception of punishment as the independent variable. It was recognized that measures of public perceptions by surveys would be costly but necessary. They also recommended that close attention be paid to the time periods from which examined data are obtained. They believed that many studies had not allowed for an appropriate time lag between punishment and changes in crime rates.

In a subsequent paper, Erickson, Gibbs and Jensen (1977) have established a deterrence hypothesis that includes the perceptions discussed above. Two premises are set forth:

- The greater the objective certainty of punishment, the greater the perceived certainty of punishment.
- The greater the perceived certainty of punishment, the less the crime rate.

In another study seeking to examine informal sanctions from peers and family regarding marijuana use, Anderson, Chiricos and Waldo (1977) found that severe punishment is a "mere effective deterrent among those perceiving a high probability of arrest."

Zimring and Hawkins have concisely described the need for threatened audiences to be informed:

> Four conditions must be fulfilled if threats are to be effective as a means of crime control. First, unless members of an audience know that a behavior is prohibited, the prohibition cannot affect their conduct. Second, unless it is known that those who commit the prohibited behavior may be punished, the threat of punishment will not affect the rate of that behavior. Third, unless differences in the level of threatened punishment are perceived, increases in penalty can have no marginal deterrent effect. Fourth, if variations in rates of detection are to serve as marginal deterrents, knowledge of those variations must be transmitted in some fashion to potential offenders.

Zimring and Hawkins support their viewpoint by referencing the results of several studies. The studies clearly indicated that the general public has little knowledge about the legal minimum and maximum penalties for a variety of crimes.

As an example, the California Assembly (1968) conducted a survey asking:

- How knowledgeable are the people in California about criminal penalties?
- What is the public's perception of the "crime problem" and what do they think should be done to lessen the crime rate?
- What is the relationship between knowledge of penalties and criminal behavior?

The principal finding from the survey was, as suggested above, that the general population had the least amount of knowledge about criminal penalties, while those who engaged in crime had the greatest knowledge of penalties. Further, among the general population there was a tendency to underestimate penalties. It also appeared that penalties became of interest to a person only

after engaging in criminal behavior. Delinquent and non-delinquent boys expressed similar feelings about the general chances of being apprehended and convicted but the delinquent boys perceived their personal chances of arrest to be significantly lower than the personal chances estimated by non-delinquents (Claster, 1967).

A similar position was taken by Zimring and Hawkins:

> On the basis of the available information, the following tentative hypotheses may be advanced. Unless he is sophisticated, a person who is more likely to commit crimes at some future time does not have much more general knowledge about penalties than the rest of the population. At the same time, the more likely a person is to commit a crime, the more likely he is to know the penalty for that particular crime as opposed to other crimes. Lastly, prison inmates know more about the penalties provided by the criminal law than the general public (p. 146).

Another part of effective deterrence is that persons may not fear the imposition of a punishment unless they perceive that the punishment is meant to apply to them. Otherwise, they develop a feeling of immunity. For example, if a certain type of behavior is prohibited by law but has not been prosecuted and appears to be tolerated by the legal authorities, then the public may conclude that enforcement and punishment of a violation is not seriously intended.

There is also an educative effect associated with deterrence. Three educative aspects associated with deterrence are:

- the association of forbidden behavior and bad consequences may lead individuals to view the behavior itself as bad;
- punishment by a legal system communicates to the individual that the legal system views the threatened behavior as wrong, and this information will also affect the moral attitudes of the individuals; and

- threat and punishment may aid moral education by serving as an attention-getting mechanism.

These aspects are indeed distinct from such deterrent effects as fear of the certainty and fear of the unpleasantness of punishment.

There is also the question of what happens when penalties are escalated. Such a change has an effect on the entire criminal justice system. Zimring and Hawkins provide the following example:

> The social forces causing the change in punishment policy may at the same time give rise to other developments which may have an influence on subsequent rates of criminality. Let us assume that a sharp rise in the burglary rate, or the development of special awareness of the harm done by burglary, produces an upward shift in the punishment level for that crime. It is not unlikely that the same conditions will also lead both to an increase in the police resources invested in the detection and apprehensions of burglars, and to more attention to anti-burglary precautions on the part of the individual citizens. These latter developments, rather than the upward penalty shift, may well be responsible for any subsequent fall in the burglary rate (p. 277).

Associated with this line of thought is the general agreement that many special anti-crime efforts have only a short-term effect. For example, a saturation of police officers into an area may only temporarily alleviate the crime problem. Similarly, in the traffic field, there is general agreement that a citation or a conviction has an effect on driving behavior which decreases over time. Thus, for example, if a person has received a citation for speeding two years ago, the effect of that citation may only be for a few months, after which the person drives in the previous manner.

IMPLICATIONS FOR THE CURRENT STUDY

Having described the development of the current posture of researchers and theorists regarding deterrence, we can now indicate how this information should influence the conduct of an investigation of traffic offender penalties as reported in this study and how the findings might be interpreted.

The previous discussion suggests that it is important to assess the extent of public knowledge. As already suggested, this does not mean the public must be educated but that its state of information must be measured. Regarding survey research in deterrence assessment, Zimring and Hawkins list three obstacles to drawing straightforward categorical conclusions from the results of public surveys regarding the public's knowledge of changes in penalties and techniques of enforcement and apprehension.

> In the first place, even if it is found that public knowledge of the specific levels of a criminal penalty is extremely limited, this does not necessarily mean that the sanction for the crime is not achieving a deterrent effect among the population. As long as the public feels that unpleasant consequences are attached to apprehension for forbidden behavior, a deterrent effect is possible. Public ignorance of the level of penalties may produce a pattern of responses from that public which includes both overestimates and underestimates. And as we have already noted some scholars have suggested that an uncertain sanction, the behavioral equivalent of an unknown one, may be a better deterrent than a specifically defined punishment.
>
> In the second place, general lack of knowledge regarding penalty levels does not mean that subgroups of the population associated with particular types of criminal behavior may not have considerable knowledge of the penalties for that behavior. This is of some importance because serious criminal activity is normally confined to a group of persons smaller than the total population.

> In any particular form of criminal activity such factors as the degrees of socialization, lack of motivation, failure to recognize opportunities, and lack of skill or ability will preclude participation by a substantial proportion of the population. It would therefore seem that the utility of severe threats designed to prevent specific serious crimes must be in large measure determined by the effect of such threats on this limited group of potential criminals.
>
> In the third place, the finding that a substantial proportion of the population in a particular jurisdiction was ignorant of, or significantly underestimated the maximum or average penalty for a particular offense would not negate a marginal deterrent effect attributable to the particular penalty. This is because individual underestimates might vary in proportion to the actual severity of the sentence.

Zimring and Hawkins then discuss two theories on the communication and perception of legal changes to citizens. The "classical" theory assumes an immediate, direct, and literal relationship between the provisions of a legal change and citizen perception. If, for example, a new, more severe law on DWI is passed on a Tuesday, it is assumed that overnight all citizens affected by this change would perceive that (1) the new law has been passed; (2) the nature of the change and the fact that the new law is more severe; and (3) the extent of the change in the sanction. While there may be some validity to this theory in major changes and in major offenses, the more likely theory is the "diffusion" theory which argues that the communications and changes in perception occur over a longer period of time and that the communication is not uniform over the entire population. More specifically, violators of a particular statute are generally more aware of changes in the law than the general population.

The implication of these theories is that it is important to survey distinct subpopulations whose responses to perceptions about sanctions are likely to differ from the general population.

Along this line of thought, Thomas, Cage, and Foster (1976) described research in which they asked nine thousand subjects to rate a "fair sentence" for seventeen different offenses by adult, first offenders who were convicted. The offenses were rank-ordered according to the mean sentence assigned by the respondents. What was important from our perspective was the finding that when the respondents were divided into six dichotomous subgroups according to sex, race, age, income, occupation, and education, there was very little difference between the overall ranking and that by the subgroups. In all cases, person crimes were regarded as very serious while victimless crimes were viewed as relatively minor offenses. The total respondent group and the subgroups also had a high degree of agreement with regard to the length of sentences to be assigned to the set of possible offenses. It should be noted that these nine thousand respondents were not divided into offender and non-offender subgroups in order to learn of any differences between them on that basis.

In a recent paper, Parker and Grasmick (1979) discussed an improvement in previously described deterrence models which accounts for the manner in which individuals obtain information. Previous models sought to link (1) objective properties of legal punishment, (2) perceptions of legal punishment, (3) deterrence, and (4) crime rate. The authors note that researchers have failed to show that item (1) is related to item (2) in the link and have not described "any processes or mechanisms in communities which could produce such a relationship." They propose inserting in the model between items (1) and (2) another variable (Ex) which is a measure of the information about crimes and arrests to which people are exposed. Such a model is clearly

justified in view of the results of other research described here that indicates the impact of "communication" among offenders.

A study of perceived sanctions employing surveys has been reported by Waldo and Chiricos (1972). It was found that non-users of marijuana had perceived a higher likelihood of receiving the maximum penalty than did users. Similarly, non-users had higher perceptions of the probability of arrest than did users. The authors concluded that the effects of the law in deterring crime are probably not as great as and certainly less uniform than many have heretofore assumed.

From the research perspective, Erickson and Gibbs (1979) have described the difficulties in collecting and utilizing data on perceived severity of penalties. They note that severity is seldom an objective property and that there is no well-defined relationship between differences in actual penalties and differences in perceived severity. When working with aggregate data, one is more or less forced to work with averages in order to judge perceived severity. The variability in judgment with respect to perceived severity makes it difficult to know how severe a penalty is needed to produce deterrence. Furthermore, it is difficult, from both practical and legal viewpoints, to individualize penalties on the basis of the offender's status or station. An approach to such individualization for traffic offenders is the "day fine" used in Scandanavia. It was described by Zimring and Hawkins and also by McGuire and Peck (1977). In concept, an individual is fined a dollar value related in some way to his daily earnings from employment. As far as is known, it has not been tested extensively in this country.

Any research into the area of traffic offender penalties should be conducted in recognition of the evaluation of deterrence research that has taken place. In particular, the inclusion of perception variables and factors that involve differences between offenders and non-offenders with regard to attitudes, information and deterrability should be addressed.

CHAPTER FOUR

SUMMARY OF SURVEY RESPONSES

INTRODUCTION

The purpose of this chapter is to summarize the results from the three jurisdictions where the survey was conducted and, at the same time, make some comparisons between jurisdictions. The survey covered a wide variety of subjects including perceptions on detection, perceptions on court conviction, opinions on sanction severity, opinions on sanction effectiveness, opinions on the effectiveness of warnings, and opinions on other sanctioning alternatives including appearances before a judge, court traffic schools, and insurance premium effects.

In conducting the analysis, it was found to be beneficial to divide the respondents into groups according to their actual violation history over the three-year period prior to the survey. Accordingly, the following definitions for driver groups were developed:

Group 1--No minor and no major violations for the three year period;

Group 2--One to three minor violations but no major violations;

Group 3--Four or more minor violations and no major violations;

Group 4--One major violation and possibly some minor violations;

Group 5--Two or more major violations and possibly some minor violations.

Minor and major definitions were defined according to the number of points which would be placed on the driver's record for the violation. Generally, minor violations are those for which

1, 2, or 3 points are assessed and major violations are those for which 4 or more points are assessed. Major violations always included driving while intoxicated, reckless driving, and speeding more than 30 miles per hour over the posted speed limit as well as several other violations that could be considered as very serious violations in all three jurisdictions. Minor violations included other less unsafe driving actions such as speeding 10 miles per hour over the posted speed limit, failure to observe a red light or stop sign, failure to yield right of way and improper turns.

Group Violation History

The groups as defined therefore cover the extremes of the driving population. Group 1 would ordinarily be considered "safe" drivers since their driving records are clean over the three-year period while at the other extreme Group 5 drivers had have had more contact with the traffic system and have been involved in more serious violations. The following table provides the sample sizes and the average number of violations for each group. The averages are in line with the group definitions. For example, Group 2 was defined as drivers with one to three minor violations and the table shows averages for Group 2 of from 1.27 to 1.51 minor violations. Similarly, Group 3 was defined as drivers with at least four minor violations and no major violations and the table shows averages of from 4.35 to 4.82 for this group. Group 4 was defined as drivers with 1 major violation and possibly some minor violations. The averages in the table therefore indicate that Group 4 drivers in Colorado had 1.46 minor violations along with their major violation; Group 4 drivers in Maryland had 1.72 minor violations; and Group 4 drivers

Table 4

Average Violation Rate for Respondents

		Colorado	Maryland	North Carolina
Group 1	N	405	412	366
Group 2	N	372	313	382
Violations		1.51	1.37	1.41
Group 3	N	39	94	35
Violations		4.36	4.82	4.69
Group 4	N	41	68	68
Violations		2.46	2.72	2.21
Group 5	N	12	17	15
Violations		3.33	4.24	4.07

in North Carolina had 1.21 minor violations. With Group 5 a further analysis showed that in Colorado, this group averaged 2.08 major violations and 1.25 minor violations; in Maryland, Group 5 averaged 2.35 major violations and 1.89 minor violations; and in North Carolina, Group 5 averaged 2.33 major violations and 1.74 minor violations.

These groups were formed because it was believed important to determine whether the perceptions of drivers were dependent on the number of citations received over a period of time. With many of the comparisons, Group 1 serves as a comparison or control group since they have had no contact with traffic law enforcement or adjudication for the three-year period. The other groups represent more frequent contact. It should also be noted that the sample sizes for Group 5 are small in each jurisdiction. Initially, the analysis of the surveys combined the last two groups to reflect all drivers with major violations. It was determined, however, that drivers with two or more major violations

generally had very different responses than drivers with one major violation. Therefore, although the group is small, it represents a viable and important segment of the driving population.

Population Variables

Five descriptors of the survey population were available from the interview data: sex, annual income, education level, number of years of driving experience, and annual mileage. In analyzing these data it was found that:

- Regarding respondent sex, overall 65 percent of the North Carolina respondents were males while 69 percent were males in both Colorado and Maryland. In all jurisdictions, Group 1 (ranging between 40 and 45 percent female) had more females than the other groups. Among the Group 5 multiple major offense violators, the Colorado and North Carolina samples contained no female members; there were 12% females in Group 5 for Maryland.
- Regarding respondent family income, the following percentages of total respondents from each jurisdiction had the incomes indicated:

	$10,000	$10,000-$15,000	$15,000-$20,000	$20,000-$30,000	$30,000
Colorado	17%	21%	20%	21%	21%
North Carolina	18%	20%	18%	22%	22%
Maryland	14%	19%	20%	24%	23%

Overall the income distributions appear comparable across the jurisdictions. The Maryland sample has a slightly larger proportion in the higher income brackets and the lowest proportion in the under $10,000 bracket. The within-group incomes for Groups 1 and 2 are very much like the overall population except that for the non-violators of Group 1, 26 percent of the North Carolina sample

and 27 percent of the Maryland sample were in the $20-$30,000 range while only 22 percent of the Colorado sample were so situated. Examination of the relatively smaller groups (3, 4, and 5) indicates more than 30 percent of certain groups are in the middle ranges ($10-$20,000).

- Regarding education level, the Maryland sample, both overall and in each group, had the highest proportion of respondents who had not completed high school (22% vs. 11% in Colorado and 16% in North Carolina). Over all jurisdictions, the percentage of respondents completing high school, or completing high school and attending some college was about the same (52% in Colorado; 54% in North Carolina and 60% in Maryland). Also, overall the Maryland sample had the lowest percentage of college graduates including school attendees and graduates (19% vs. 38% in Colorado and 32% in North Carolina). In general, the education level of the Maryland sample was lower than that of the other two samples.
- Regarding the number of years of driving experience, the Colorado sample has a smaller proportion of drivers with less than five years' experience than the samples from other jurisdictions. It was also found that both overall and by groups, the Colorado sample had a higher proportion of drivers with more than ten years' driving experience than either of the other jurisdictions.
- Regarding estimated annual mileage, the proportion of the North Carolina sample claiming they drove in excess of 20,000 miles per year was higher than that for the other jurisdictions.

PERCEPTIONS OF VIOLATION DETECTION

Each participant in the survey was asked the following question in regard to the perceived risk of violation detection by

law enforcement:

4. Following are a number of traffic violations. For every 100 drivers who commit these acts, how many, in your opinion, will be caught by the police in the (Denver, Anne Arundel, Raleigh) area? You may assume no accidents are involved.

   a. Speeding 10 miles per hour over the posted speed limit
   b. Speeding 20 miles per hour over the posted speed limit
   c. Driving while intoxicated (drunk driving)
   d. Running a traffic light or stop sign
   e. Following a moving car too closely
   f. Turning left in front of oncoming traffic or pulling out into traffic (like at an intersection or on a freeway)
   g. Crossing the center line of the road.

Analysis of the responses revealed the following primary findings:

1. The Colorado responses were usually lower on average than the Maryland or North Carolina responses.
2. Respondents greatly overestimated the chances of being detected for each type of violation. Respondents also gave extreme variations in their answers.
3. The distribution of the averages across the groups is different in each jurisdiction.
4. There is no evidence that sanction severity is related to the recidivism rate as measured by the citation histories or by the recorded speed data.

Each result is discussed in the following sections:

1. The Colorado responses were usually lower on average than the Maryland or North Carolina responses.

The responses from the Colorado survey participants were usually lower for each group and each type of violation. Consider, for example, the first offense of driving 10 miles per hour over the posted speed limit. The averages by group for the three states were as follows:

Table 5

Average Detection Responses for Driving 10 MPH Over the Limit

	Colorado	Maryland	North Carolina
Group 1	17.4	27.8	26.8
Group 2	22.4	28.7	25.2
Group 3	24.8	28.5	30.6
Group 4	24.3	30.0	26.5
Group 5	9.9	26.7	48.0

The Group 1 respondents from Colorado stated that about 17 out of every 100 drivers would be caught while Group 1 respondents from the other two jurisdictions stated about 28 out of every 100 drivers would be caught. This same pattern holds true for the other groups. With the remaining types of violations, the Colorado averages were almost always lower with the exceptions being that Group 2 or Group 3 averages from one of the other states might occasionally be higher.

2. Respondents greatly overestimated the chances of being detected for each type of violation. Respondents also gave extreme variations in their answers.

With all the types of violations, the responses in each state ranged from zero percent to 100 percent. In Colorado, there were 26 persons who answered Question 4a on speeding with a zero percent response; in Maryland, there were 27 responses of zero percent; and in North Carolina, there were 9 responses of zero percent. At

the other extreme, there were 6 responses of 100 percent in Colorado; 10 responses of 100 percent in Maryland; and 7 responses of 100 percent in North Carolina. The response of 100 percent is, of course, completely unrealistic and was a surprising answer to the question. On the other hand, responses which are low, such as 0 to 5 percent, are certainly valid in many respects.

It was not possible to make estimates of what the true detection rate was for each of the three jurisdictions. However, there have been estimates made by other researchers for detection rates. In a recent study, Joscelyn and Jones (1980) estimated that the detection rate for speeding is about one violator in ten thousand.

In another study on the general deterrence of driving while intoxicated, Summers and Harris (January 1978) estimated an arrest rate for DWI of 4.4 arrests for every 10,000 DWI driver-trips. The responents in our survey generally stated that between 24 percent and 53 percent of DWI offenders would be arrested. It is interesting to note that the Group 5 respondents in North Carolina have the average of 53.3 percent in this offense category.

The conclusion is that the general perceptions of drivers is a much higher chance of being detected by the police than is actually the case. If respondents had known the true probabilities, we would have gotten many more responses of very low probabilities.

3. The distribution of the averages across the groups is different in each jurisdiction.

The distributions given in the above table on speeding 10 MPH over the posted limit are representative of the reason for

this conclusion. The Maryland results, for example, show a flat distribution with very small differences among the averages. Group 4 has the largest average at 30.0 percent and Group 5 the lowest average of 26.7 percent. In Maryland, with the other types of violations, this same pattern was generally the case. The only exception was with the offense of Driving While Intoxicated in which Groups 1, 2, and 3 were around 33 percent while Groups 4 and 5 were about 40 percent. Even this difference is not great and probably reflects the fact that respondents from Groups 4 and 5 had been arrested for DWI.

In the Colorado results, it was usually the case that the averages increased from Group 1 to Group 2 to Group 3 and then decreased with Group 4 and again with Group 5. This pattern can be seen in the above table on speeding 10 MPH over the speed limit in which Group 1 has an average of 17.4 percent, increasing to 24.8 percent for Group 3, and then decreasing to 9.9 percent with Group 5. With DWI in the Colorado survey, Group 1 had an average of 27.0 percent, increasing to 38.4 percent for Group 3, and then decreasing to 24.8 percent for Group 5. It was surprising to see a low average for Group 5, given that many of these respondents had been arrested for a DWI offense.

Finally, in the North Carolina results, it was found that the first four groups tended to have similar averages while Group 5 had higher averages. With the speeding 10 MPH over the speed limit, the averages for the first four groups varied from 25 to 31 percent while Group 5 had an average of 48.0 percent. This same pattern held generally true for the other types of violations in North Carolina.

In summary, the results from the three surveys were not consistent in regard to the distribution of the averages of the groups.

4. There is no evidence that sanction severity is related to the recidivism rate as measured by the citation histories or by the recorded speed data.

In Chapter 2, it was explained that Colorado had the lowest average fines for the offenses under consideration as compared to the other two states. This would lead to the conclusion that Colorado respondents would have the highest recidivism rate. However, Table 4, presented earlier in this chapter, shows that this is not the case for any of the subgroups of respondents. Consider Group 3 which was defined as those respondents with four or more minor violations. In Colorado, the Group 3 respondents had an average of 4.36 citations over the three-year period as compared to 4.82 citations in Maryland for this group and 4.69 citations in North Carolina. Colorado had the lowest citation rate for this group although the differences are very small.

Another comparison can be made by combining Groups 4 and 5 to form a group representing respondents with one or more major violations over the three-year period. From the data in Table 4, it can be calculated that these combined groups in Colorado averaged 2.67 citations over the three-year period as compared to 3.02 citations in Maryland and 2.54 citations in North Carolina. Once again, the averages in the three states are close and Colorado does not have the highest average.

One question in this analysis is whether the level of enforcement was approximately the same in each of the jurisdictions. To answer this question, data were gathered on the volume of moving violations which were issued during November 1979, which was the

primary month during which the surveys were conducted. During that month, the Denver Police Department issued 5,386 citations for moving traffic violations. Since Denver, Colorado is also a county, this volume represents the total number of moving traffic violations, In North Carolina, data were gathered from both the Raleigh Police Department and the North Carolina Highway Patrol. During November 1979, the Raleigh Police Department issued 1,233 citations for moving violations and the Highway Patrol issued 1,199 citations for moving violations in Wake County. This gives a total of 2,432 citations. In Maryland, the Anne Arundel County Police Department issued 1,363 citations and the Maryland State Police issued 2,843 citations for moving violations in Anne Arundel County. The combined total for Anne Arundel County was therefore 4,206 citations for moving violations.

These figures cannot be used directly since there are major differences in population among the three jurisdictions. It was therefore necessary to adjust the level of citations to develop the rates of citations issued per driving population. When this is done, it is estimated that the rate of citations issued per 1,000 drivers is 14.6 in Denver, 13.7 in Anne Arundel County, and 10.5 in Wake County. Thus, even though Denver had the largest number of citations its rate of citations is not much greater than either Anne Arundel or Wake County. The fact that these are rates per 1,000 driving population means that all of the rates are small and it is therefore believed that the differences in perceptions between Colorado and the other two states cannot be accounted for by differences in the citation rates.

Finally, the speed data which were collected are presented in detail in the individual chapters on each jurisdiction. Suffice it to say at this point that Colorado appears to have a smaller percentage of drivers exceeding the speed limit by 10 miles per hour. Unfortunately, there was considerable variation among sites within a jurisdiction so that no clear evidence of actual speed violation rates emerges. It is safe to say, however, that sanction severity does not appear to be related to the actual violation rates for speeding.

PERCEPTIONS OF COURT CONVICTIONS

To determine the perceptions on court convictions, each participant in the survey was asked the following question:

> 5. In this County, once a person has been caught by police and given a ticket for most of these violations, he can usually pay or mail in the fine or he can challenge the ticket in court. For every 100 drivers who are ticketed and arrested, and choose to take it to court, how many, in your opinion, will be found guilty of committing the violation? Again, you may assume that no accidents are involved.

The seven violations were then listed as in Question 4. Analysis of the responses revealed the following primary findings:

1. As compared to their estimates on detection, respondents made more accurate estimates on the chances of being found guilty in court. This result is complicated by fine reductions and/or suspensions.
2. Using the five groups, no significant differences were found in the perceptions of the Colorado and North Carolina respondents. In Maryland, Groups 3, 4, and 5 had higher averages than Groups 1 and 2.

3. Other differences were found in average perceptions by dividing the groups into Court Appearance versus No Court Appearance.

Each of these results is discussed in the following sections.

1. As compared to their estimates on detection, respondents made more accurate estimates on the changes of being found guilty in court. This result is complicated by fine reductions and/or suspensions.

As an example of the types of responses which were received for this question, the following are the averages for the offense of Driving While Intoxicated:

Table 6

Average Court Conviction Responses for DWI

	Colorado	Maryland	North Carolina
Group 1	67.6	58.8	70.7
Group 2	72.9	63.3	73.0
Group 3	69.8	72.6	77.3
Group 4	73.4	72.0	70.8
Group 5	69.3	70.3	76.3

Most of these values are close to the 70.0 percent used by Summers and Harris (1978) in their study and the 70.0 percent figure is based on other research conducted by NHTSA.

As with the questions on detection, the respondents gave a wide range of answers to the questions on court convictions. With the DWI offense, the range was from zero percent to 100 percent. In Colorado, 7 persons responded with zero percent and 188 persons with 100 percent; in Maryland, there were 7 responses of zero percent and 173 responses of 100 percent; and in North Carolina, there were 4 responses of zero percent and 182 responses of 100 percent.

2. Using the five groups, no significant differences were found in the perceptions of the Colorado and North Carolina respondents. In Maryland, Groups 3, 4, and 5 had higher averages than Groups 1 and 2.

The distribution of the averages presented in the above table for the DWI offense is typical of the results obtained with this question. It can be seen, for example, that the averages in Colorado and North Carolina have a relatively small range. In Colorado, the range of averages is from 67.7 percent for Group 1 to 73.4 percent for Group 4. In North Carolina, the range is from 70.7 percent to 77.3 percent. Also, there is no pattern with the groups.

This can be contrasted with the averages from Maryland in which Groups 3, 4, and 5 have significantly higher averages than Groups 1 and 2. With most of the other offenses in the Maryland survey, Groups 3, 4, and 5 had much higher averages than Groups 1 and 2. With Question 5d on running a traffic light or stop sign, Groups 1 and 2 had averages of 41.1 and 44.5 percent, while Groups 3, 4, and 5 had averages of 58.3 percent, 59.3 percent, and 58.9 percent.

3. Other differences were found in average perceptions by dividing the groups in Court Appearance versus no Court Appearance.

During the data collection process for determining the number of citations for the prior three years, it was also possible to record whether the respondent had appeared in court on a citation. Most of the respondents in Groups 4 and 5 had at least one court appearance because of their major violations. In addition, many of the respondents in Groups 2 and 3 also had made court appearances. Better insight into the responses can

be made by comparing respondents with court appearances with respondents without court appearances.

Consider, for example, the following results from Groups 2 and 3 in Maryland on the question of perceptions of court convictions:

Table 7

Average Court Conviction Responses in Maryland
Court Appearance versus No Court Appearance

Question	Group 2		Group 3	
	No Court Appearance	Court Appearance	No Court Appearance	Court Appearance
5a	44.6	46.0	47.6	50.2
5b	58.4	54.7	59.9	64.3
5c	64.8	60.2	67.8	74.3
5d	51.7	44.5	50.2	61.3
5e	32.4	33.0	28.3	37.7
5f	37.2	36.9	44.5	46.5
5g	32.1	31.2	37.0	40.0

With Group 3, it can be seen that the respondents with court appearances always have higher averages than those respondents without a court appearance. With Group 2, the results are mixed but with most offenses those respondents without a court appearance have higher average perceptions of court conviction. It would therefore appear that with Group 3, the court appearances made an impression with the respondents which had the effect of increasing their perceptions on court convictions in all offenses while with Group 2, this impression did not occur. Groups 4 and 5 also had court appearances and their averages were similar to the averages from the Group 3 Court Appearance group. The end result is that, as indicated in the previous

result, Groups 3, 4, and 5 had higher average perceptions of court convictions than Groups 1 and 2 in Maryland.

This same pattern did not emerge in the other two states. In North Carolina, the respondents with court appearances many times had lower average perceptions on court convictions than respondents without court appearances. In Colorado, the results were mixed and no overall conclusions could be made.

Estimates of First Offense Penalties

As part of the survey, the respondents were asked to estimate the fine for a first offense of each of the violations under study. Their responses can be compared to the actual sanction in the jurisdiction. Table 8 lists the standard fines and the sample average estimates of those fines for each jurisdiction. In the following discussion, a summary is given of the similarities and differences which were obtained.

The average fines from all jurisdictions underestimate the standard for the 10 MPH speeding violation. The differences between estimated and standard fines for this offense is small for Colorado and North Carolina but substantial for Maryland. In fact, all Maryland offender groups underestimated this penalty by about the same amount. Since there is no standard fine in Colorado and North Carolina for the more serious 20 MPH speeding violation we can only note that the estimates in these states are nearly double those of the 10 MPH speeding violation. The Maryland 20 MPH speeding estimate is also much higher than the 10 MPH speeding estimate and only underestimates the standard by seven dollars. All jurisdiction-wide estimates for DWI are higher than the standard--ranging from only slightly so in North

Table 8

Comparison of Standard Fines and Average Estimates

	Colorado		North Carolina		Maryland	
	Actual	Survey	Actual	Survey	Actual	Survey
a. Speeding 10 MPH Over the Limit	$25	$21.3	$32	$29.6	$40	$23.4
b. Speeding 20 MPH Over the Limit	CA*	$41.2	CA*	$53.6	$50	$43.0
c. Driving While Intoxicated	$75-125 + 1 yr. Susp.**	$142.0	$127 + 1 yr. Susp.**	$129.0	$125+ 30-day Susp.**	$167.0
d. Running a Traffic Light/ Stop Sign	$10-24	$24.5	$27	$30.2	$20	$28.4
e. Following Too Closely	$ 5-24	$18.7	$27	$26.1	$30	$20.7
f. Turning Into Traffic	$ 8-18	$24.1	$27	$30.7	$30	$27.6
g. Crossing Center Line	$10-24	$21.0	$27	$28.3	$30	$24.5

* Court Appearance

** License Suspension

Carolina to considerably so in Maryland. On the average, drivers in all jurisdictions overestimated the traffic signal offense fine and underestimated the following too closely fine. The Maryland sample showed the greatest difference between their estimate and standard fines for these two offenses. For all jurisdictions the differences between estimated and standard fines were comparatively small for the turning across lanes and crossing center lines offenses. The trends can be seen in the table.

Generally, for all violations, the Maryland sample tended to estimate fines that differed from the standard to a greater extent than did the average estimates offered in the other jurisdictions. In Maryland, the DWI and the Traffic Signal offenses had standard fines which must be considered much less severe than the standard fine for the other offenses. The Maryland sample average overestimated the fine for these two offenses and underestimated the fine for the other five offenses (which had the more severe standard fines). The Maryland survey sample tended to be least aware of the penalties imposed for the offenses discussed.

Estimates of Sanction Severity

In the interview, the drivers were asked to rate the severity of their estimated fine and then rate the severity of the standard fine on the same five-point scale. Here we describe any significant points on which the three jurisdictions differ with regard to these severity estimates:

- For 10 MPH speeding offense, the severity ratings given the estimated fines (Question 7) did not differ much among the jurisdictions or across groups.

In contrast, the severity ratings given the standard fine for this offense by the Maryland sample (except Group 5) were consistently higher (and often much higher) than for the other jurisdictions in which the standard fine was much lower.

- For the DWI violation, the severity ratings did not differ much across all jurisdictions although the ratings offered by the major violation groups (4 and 5) were higher than for the non-violator and minor violator groups. This closeness of rating occurred despite the difference in average dollar estimates shown for DWI in Table 8. It is understandable then that when Maryland drivers were informed of the considerably lower standard DWI fine, they tended to revise their severity estimate downward. In contrast, the average rating estimate given by the drivers from the other jurisdictions were revised slightly upward (generally only 0.1 points on the five-point scale).
- For the other violations, the only notable responses were obtained from Group 5 from North Carolina. In several instances the average revised severity rating of Question 8 compared to the severity rating given in Question 7 was in a direction opposite to what would have been predicted on the basis of the average fine estimate given in Question 6. It may be that the small number of respondents in this group resulted in these inconsistencies.

Opinions on Sanction Effectiveness

Question 9 dealt with special effects, that is deterrent (or preventive) vs. educational effect with respect to the sanctioned individual. Overall, the respondents from Colorado and North Carolina expressed a preference for the preventive or deterrent effect over the educational effect. The preference was strong in North Carolina and was given by all groups as well as the total sample. In Colorado, Group 5 disagreed strongly and Group 4 disagreed slightly with the overall average. In

Maryland, the average responses were close--with the total sample and Groups 1, 3, and 4 favoring educational effects while Groups 2 and 5 favored the preventive effect.

General effects, that is, those occurring in drivers who were not sanctioned but are aware of sanctions, were discussed in Question 10. Although the differences were small, the overall responses from North Carolina and Maryland favored the educative effect. By a larger margin, the Colorado respondents preferred the preventive effect (46% vs. 36%). With the exception of the Colorado Group 4 and the Maryland Group 5, the individual group preferences were in agreement with that of the total sample from the jurisdiction.

Opinions Regarding the Effectiveness of Warnings

Regarding the relative effectiveness (on a driver's future behavior) of a police warning and a traffic citation, in both North Carolina and Maryland, the highest preference (38% each) was given to the response "some effect but not as much as a ticket" with a close second place (34% and 35%, respectively) being achieved by the response "has the same effect as getting a ticket." Thus for these two jurisdictions, over two-thirds of the respondents did not feel that there would be any greater effect achieved from the warning, not to mention the loss in revenue that occurs when no citation is issued. In Colorado, 34 percent felt the warning had a greater effect (compared to 26 percent in North Carolina and 24 percent in Maryland). Sixty-four percent of the Colorado sample felt that the warning was not more effective than the citation.

The following table on the Maryland data also illustrate another point in regard to warning tickets:

Table 9

Effect of Warning Tickets
(Maryland)

	Same Effect As a Ticket	Greater Effect	Not as Great as a Ticket	No Effect
Group 1	35.4%	29.1%	33.0%	2.4%
Group 2	33.7%	22.4%	39.4%	4.5%
Group 3	20.2%	14.9%	52.1%	12.8%
Group 4	33.8%	19.1%	36.8%	10.3%
Group 5	35.3%	11.8%	47.1%	5.9%

These figures show that the responses for Groups 3 and 4 are more negative in regard to warning tickets than the other groups. In other words, those groups which would have been most affected have more negative views on the effects of warning tickets.

Opinions on Effects of Other Sanctioning Activities

Several questions in the interview dealt with the effectiveness of other sanctioning activities. Regarding comparisons across jurisdictions:

- The respondents from all jurisdictions felt (by from 64% to 68%) that appearance before a judge had a greater influence than paying the fine to a clerk.
- Eighty-eight percent or more of all respondents were aware of court traffic schools and licensing agency education programs and 81 percent or more thought their driving would be positively influenced by them. By jurisdiction, the responses were as follows:

Table 10

Awareness and Effect of Court Traffic Schools

		Colorado	Maryland	North Carolina
Aware of School	Yes	88.5%	89.9%	87.8%
	No	12.5%	10.1%	12.2%
Positive Effect	Yes	81.3%	87.8%	84.7%
	No	18.7%	12.2%	15.3%

- Ninety-three percent or more of all respondents were aware that insurance premiums may be increased as a result of traffic violation convictions. Of those who were so aware, seventy-three percent or more said their driving is influenced by insurance company practices.
- Sixty-four percent or more of drivers who were not aware of insurance company practices claimed that their (future) driving would be influenced by their (newly acquired) knowledge of what insurance companies do.

RESEARCH RECOMMENDATIONS

This study represents the first major effort by NHTSA to look at deterrence theory as related to the actions of drivers. As such, it is only the beginning of what could prove to be a very beneficial viewpoint with the eventual aim of understanding driver actions to a greater extent than now possible. During the course of analyzing the survey results and reviewing the literature on deterrence theory, several potential areas of additional research were uncovered. These areas are summarized in the following series of recommendations.

1. Research should be encouraged from the deterrence model viewpoint on the relationship of the perceptions of drivers and traffic safety programs.

The survey results encourage the strategies employed by some law enforcement agencies for increasing the perceptions of the driving community on the amount of enforcement with only a minimal increase in the actual amount of enforcement. The survey indicates that drivers already have a higher perception of being caught by the police in an unsafe driving action than is actually the case. It therefore implies that their driving habits are affected by these perceptions and that programs for increasing these perceptions could be beneficial.

It should also be noted that NHTSA has supported several pro-rams which include a public information and education (PI&E) component. These components clearly can be classified as attempts to increase the perceptions of the community on various enforcement programs.

2. The relationship of traffic court practices and perceptions should be studied in greater detail.

The results of the survey on the perceptions of drivers who had made court appearances are mixed. In Maryland, the perceptions of those with court appearances were higher in regard to the chances of being found guilty in court as compared to drivers who had not made court appearances. In North Carolina, the reverse situation was true and in Colorado, no clear differences emerged.

These results indicate that further research into this relationship would be beneficial. It would be important to determine if there are actions which could be made by the

courts to increase the perceptions of being found guilty for a particular offense. These could have benefit from both a specific and general deterrence viewpoint.

3. More research is needed from the deterrence viewpoint on changes in traffic laws.

One of the problems with this survey was that the differences in fines was not as great as expected between "high" and "low" sanctioning states. However, the states which were selected had about as great a difference as actually exists. As an alternative procedure, it may be of benefit to study states which enact major changes in their traffic laws. For example, some states are currently considering changes in their DWI laws which would result in more convictions and stiffer penalties in this area.

Changes in traffic law offer several opportunities for testing deterrence theory. One area of interest would be the communication process which was discussed in Chapter 2. The diffusion theory of communication of these changes could be a beneficial study in states which make changes. Further, deterrence theory says that such changes will cause an increase in enforcement activity as well as changes in traffic court actions.

4. More research is needed on the perceptions and opinions of the repeat offender.

This survey showed that there were many instances in which the opinions of the repeat offender differed from those who had clean records. The perceptions of the repeat offender need to be studied in greater detail. In Chapter 2, the ideas of

Zimring and Hawkins were discussed in some detail in regard to the importance of relating deterrence theory to specific subpopulations. In other words, deterrence works most effectively when it is able to relate to those members of the population who are most likely to violate the law. In the current survey, it was not possible to interview as large a number of repeat offenders as desired. A separate survey effort of repeat offenders could provide very beneficial results.

5. There are several other areas of analysis which could be performed with the data base from this survey.

Within the cost constraints of this contract, it was not possible to explore the survey data in as much detail as desired. For example, one area of concern is why there were such extreme responses from the survey participants. As noted in the results, the responses on each detection and court conviction question ranged from zero percent to 100 percent. Further insight into the data may be possible by analyzing the extreme groups in greater detail.

It may also be possible to do some deterrence theory modeling with the data collected from this survey. The modeling would attempt to relate in a more formal fashion the violation histories of the respondents to their perceptions.

6. The deterrent effects of increases in insurance premiums should be studied in more detail.

It was clear from the survey results that a large percentage of drivers are aware of the impact of violations on their insurance rates. Insurance premiums may be a greater

deterrent than the fines associated with violations. Whether this is the case would require a separate study in cooperation with insurance companies.

7. Warning ticket programs should be analyzed in greater detail--particularly as they relate to the repeat offender.

The results of the survey question whether warning ticket programs are really effective. Of particular note is that the repeat offenders, as represented by Groups 3 and 4, had more negative reactions to warning ticket programs. Since these groups may be most affected, it would be of benefit to study in greater detail how warning tickets impact both the general population of drivers and, in particular, the repeat offender.

CHAPTER FIVE
ANALYSIS OF COLORADO SURVEY

CHARACTERISTICS OF RESPONDENTS

In Colorado, the interviews were conducted at the Department of Revenue, Driver Licensing Headquarters in Denver. A total of 874 of license renewal applicants were interviewed. Following the interviews, three-year driver records were obtained for 860 of the respondents. The set of 860 combined driver record and interview responses was analyzed.

As planned, the drivers were purposefully selected to produce proportionately greater numbers of those with histories of violations than would have occurred without any such effort. Even with this special effort, we were unable to obtain as many interviews as desired from drivers who had a serious traffic violation history. For the following analysis the drivers were grouped in accordance with the number and type of violation convictions received during the three-year period prior to the survey. The definitions of driver groups (and their sizes in the sample) were as follows:

Group 1--No minor and no major violations (405)

Group 2--One to three minor violations but no major violations (372)

Group 3--Four or more minor violations and no major violations (39)

Group 4--One major violation and possibly some minor violations (41)

Group 5--Two or more major violations and possibly some minor violations (12)

The major and minor violations used to define the groups are listed in Table 11. In general, minor violations are those for which four or fewer "points" will be placed on the driver record by the Department of Revenue. Major violations are those having five or more points associated with them.

Table 11

Classification of Traffic Offenses in Colorado

Major Offenses
• Alluding an Officer • Driving While Impaired by Alcohol • Driving While Intoxicated (DWI) or Under the Influence of Drugs • Failure to Stop for School Signal • Leaving the Scene of an Accident • Reckless Driving • Speed Contest • Speeding 20 Miles Over the Posted Speed Limit
Minor Offenses
• Careless Driving or Following Too Close • Driving on Wrong Side of Road • Driving Through a Safety Zone • Failure to Dim or Turn on Lights • Failure to Observe a Traffic Sign or Signal • Failure to Signal or Improper Signal • Failure to Yield Right of Way • Failure to Yield to an Emergency Vehicle • Improper Passing • Improper Turn • Operating an Unsafe Vehicle • Speeding 1 to 9 Miles Over the Posted Speed Limit • Speeding 10 to 19 Miles Over the Posted Speed Limit

General Characteristics

The drivers were asked several questions to provide a general description of the respondent population. Table 12 relates their driving experience by groups. Group 4 and 5 drivers are relatively over-represented among drivers having less than five years of driving experience. Groups 3 and 4 are relatively over-represented among drivers with less than ten years of driving experience. Overall, those having more serious violations are less experienced than the general driver population. An indication of violation (and accident) exposure is given in Table 13, which lists the estimated miles driven annually by each respondent group. Nearly half of the conviction-free drivers of Group 1 estimate that they drive less than 10,000 miles per year. Less than one-third of the moderate violation drivers (group 2) drive less than 10,000 miles per year. In general, as expected, those driver groups representing higher violation rates had more driving exposure. In fact, 41 percent of the Group 3 drivers--those with substantial minor violation rates--drive over 20,000 miles per year.

The sex distribution of each driver group is as follows:

Sex of Respondents

	Group 1	Group 2	Group 3	Group 4	Group 5
Male	242 59.8%	276 74.2%	36 92.3%	36 87.8%	12 100.0%
Female	163 40.1%	96 25.8%	3 7.7%	5 12.2%	0 0.0%

These statistics are consistent with other findings that male drivers receive more traffic convictions than females. The high/serious violation groups are almost entirely males. Data related to the highest education level reported by the respondents are presented in Table 14. The non-violation group (1) and the minor violation groups (2 and 3) reported about the same education level,

Table 12

Years of Driving Experience
(Colorado)

Group	Less Than 5 Years	5 to 9 Years	10-19 Years	20 Years or More
Group 1	12 (3.0%)	49 (12.1%)	136 (33.7%)	207 (51.2%)
Group 2	24 (6.5%)	59 (15.9%)	146 (39.2%)	143 (38.4%)
Group 3	2 (5.1%)	17 (43.6%)	14 (35.9%)	6 (15.4%)
Group 4	7 (17.1%)	7 (17.1%)	12 (29.3%)	15 (36.6%)
Group 5	2 (16.7%)	1 (8.3%)	7 (58.3%)	2 (16.7%)

Table 13

Miles Driven Per Year
(Colorado)

	Under 10,000 Miles	10,000-15,000 Miles	15,000-19,000 Miles	20,000 or More Miles
Group 1	182 (45.0%)	112 (27.7%)	48 (11.9%)	60 (14.9%)
Group 2	112 (30.1%)	98 (26.3%)	51 (13.7%)	108 (29.0%)
Group 3	6 (15.4%)	7 (17.9%)	10 (25.6%)	16 (41.0%)
Group 4	8 (19.5%)	15 (36.6%)	5 (12.2%)	13 (31.7%)
Group 5	2 (16.7%)	6 (50.0%)	0 -	4 (33.3%)

Table 14

Education of Respondents
(Colorado)

	Did not Complete Grade Sch.	Completed Grade School	Attended High School	Completed High School	Attended College	Completed College	Attended Graduate School	Completed Graduate School
Group 1	1 (0.2%)	8 (2.0%)	29 (7.2%)	90 (22.2%)	106 (26.2%)	77 (19.0%)	39 (9.6%)	55 (13.6%)
Group 2	4 (1.1%)	7 (1.9%)	26 (7.0%)	70 (18.9%)	131 (35.3%)	57 (15.4%)	36 (9.7%)	40 (10.8%)
Group 3	0 (0.0%)	1 (2.6%)	3 (7.7%)	10 (25.6%)	11 (28.2%)	10 (25.6%)	3 (7.7%)	1 (2.6%)
Group 4	3 (7.3%)	1 (2.4%)	5 (12.2%)	7 (17.1%)	13 (31.7%)	10 (24.4%)	0 (0.0%)	2 (4.9%)
Group 5	0 (0.0%)	0 (0.0%)	2 (16.7%)	3 (25.0%)	6 (50.0%)	0 (0.0%)	1 (8.3%)	0 (0.0%)

with 42, 36 and 36 percent, respectively, completing college. For the major (serious) violation groups (4 and 5), the number stating that they had completed college represented 29 and 8 percent, respectively. (The combined major violation groups indicate that 25 percent had completed college.)

Violation History of Respondents

As further background on the groups, it is of interest to know the volume and types of violations which Groups 2, 3, 4, and 5 acquired over the three-year period under study. The overall totals and averages for the groups are as follows:

	Sample Size	Total Number of Citations	Average Number of Citations
Group 2	372	562	1.51
Group 3	39	170	4.36
Group 4	41	101	2.46
Group 5	12	40	3.33
Total	464	873	

The average numbers of citations are, of course, consistent with the definitions of the groups. For example, Group 3 was defined as those respondents who had at least four minor violations and the Group 3 average is 4.36 citations. Similarly, Group 4 was defined as those respondents who had one major violation. The Group 4 average of 2.46 means that respondents from this group averaged one major violation and 1.46 minor violations for the three-year period. The average for Group 5 respondents was 3.33 violations. Further analysis showed that this group averaged 1.25 minor violations and 2.08 major violations.

Table 15 shows the number of violations by type and group. As expected, the categories for speeding violations account for a significant portion of the total. In Group 2, speeding violations

Table 15

Violation History of Respondents
by Offense Type
(Colorado)

		Speeding Less Than 10 MPH*	Speeding Greater Than 10 MPH**	Running Red Light/Stop Sign	DWI	Other Offense
Group 2	N	40	193	66	-	168
	Citations	49	242	72	-	199
Group 3	N	19	30	15	-	29
	Citations	24	72	20	-	52
Group 4	N	8	18	8	27	25
	Citations	9	20	8	27	37
Group 5	N	2	9	2	12	8
	Citations	3	10	2	15	10
Total	N	69	250	91	39	230
	Citations	85	344	102	42	298

* This category is based on receiving 3 points on the driver's record.
** This category is based on receiving 4 or 6 points on the driver's record.

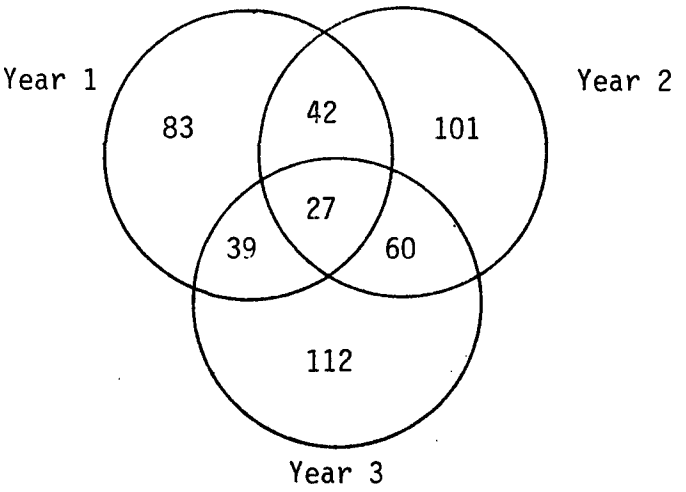
Table 16

Violation History by Year
(Colorado)

		Year 1 December 1976- November 1977	Year 2 December 1977- November 1978	Year 3 December 1978 November 1979
Group 2	N	146	159	172
	Citations	173	184	205
Group 3	N	28	36	31
	Citations	47	70	53
Group 4	N	14	25	25
	Citations	18	46	37
Group 5	N	3	10	10
	Citations	4	21	15
Total	N	191	230	238
	Citations	242	321	310

accounted for about 53 percent of the total. Other offenses, such as following too closely, turning into traffic, and careless driving, accounted for about 37 percent of the Group 2 total. Group 3 follows roughly the same pattern as Group 2. Groups 4 and 5 have a different pattern because major violations are included. The DWI category accounts for 38 percent and 35 percent, respectively, of the violations in these two groups.

The number of offenses over the three years is also of interest, as shown in Table 16. The years are defined in twelve month increments prior to the survey. Year 1 is December 1976-November 1977; Year 2 is December 1977-November 1978; and Year 3 is December 1978-November 1979. As seen in the table, there is a good representation of citations for each year. Of course, some respondents received citations in only one of the three years while others received citations in all three years. These combinations can be illustrated in a Venn diagram with three overlapping circles for the years:



The 27 respondents in the middle are the respondents who had at least one violation in each of the three years. Similarly, there were 83 respondents who had a violation only in Year 1; 101 respondents only in Year 2; and 112 respondents only in Year 3. Later in this chapter, an analysis is presented with these respondents to show how perceptions change over time.

SURVEY RESPONSES

In the following sections, an analysis is provided on the results of the survey given to the 869 respondents. For each question the averages are given for each group and results are provided to highlight statistically significant group differences. The analysis also includes the responses on sanctions, sanction severity and several other subjects of interest.

Responses to Questions on Violation Detection and Conviction

In the interview, the license applicants were asked two questions aimed at assessing the perceived risk of violation detection by law enforcement and the perceived risk of conviction following a court appearance on a citation. Question 4 was phrased as follows:

> 4. Following are a number of traffic violations. For every 100 drivers who commit these acts, how many, in your opinion, will be caught by the police in the Denver area? You may assume no accidents are involved.
>
> a. Speeding 10 miles per hour over the posted speed limit
> b. Speeding 20 miles per hour over the posted speed limit
> c. Driving while intoxicated (drunk driving)
> d. Running a traffic light or stop sign
> e. Following a moving car too closely

f. Turning left in front of oncoming traffic or pulling out into traffic (like at an intersection or on a freeway)
g. Crossing the center line of the road

Question 5, which follows, was asked about the same list of seven violations:

5. In the Denver area, once a person has been caught by police and given a ticket for most of these violations, he can usually pay or mail in the fine or he can challenge the ticket in court. For every 100 drivers who are ticketed or arrested, and choose to take it to court, how many, in your opinion, will be found guilty of committing the violation? Again, you may assume that no accidents are involved.

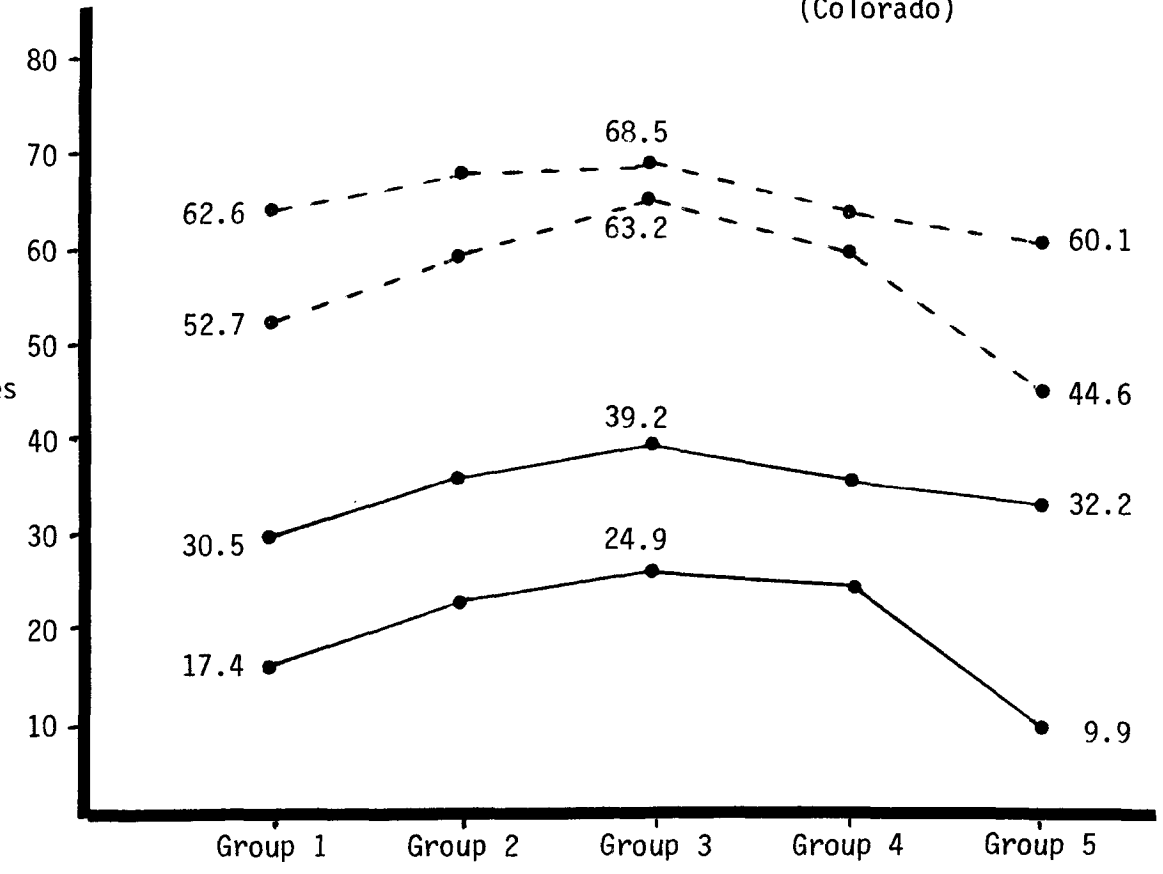
The responses to these two questions are analyzed together.

Analysis of Questions on Speeding

For the two violations, Speeding 10 and 20 Miles Per Hour Over the Posted Speed Limit, Figure 2 shows a graph of change, by group, of the group mean value of the respondents' estimate of the number of chances in 100 of detection/conviction. For example, the graph regarding Question 4a (detection of a 10 MPH speed violation) indicates that the average of the responses from the non-violator (Group 1) license applicants was that 17.4 drivers out of 100 such speeders would be detected or caught. With the exception of the multiple major offenders (Group 5) the average estimates of the other driver groups were slightly higher than the non-violator group. For Question 4b (20 MPH over the limit) the average detection estimates for all violator groups were higher than that for Group 1. For Group 1 through 4, the responses indicate the chances of detection at 20 MPH over the limit are from 1.5 times to nearly twice those at 10 MPH over the limit. For Group 5, the chances are more than three times as high. The data on the corresponding graphs in Figure 2 include the F-ratio calculated to determine if

Figure 2

Responses to Questions on Speeding
(Colorado)



5b--Speeding 20 MPH Over Limit (Conviction) (F=1.26; n.s.)

5a--Speeding 10 MPH Over Limit (Conviction) (F=2.35; n.s.)

4b--Speeding 20 MPH Over Limit (Detection) (F=3.08; .05)

4a--Speeding 10 MPH Over Limit (Detection) (F=4.26; .01)

Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4a	868	20.13	0% (26) to 100% (6)
4b	869	33.67	0% (8) to 100% (7)
5a	868	55.83	0% (28) to 100% (69)
5b	868	64.86	0% (13) to 100% (121)

the averages were significantly different. The F-ratios indicate that for both Questions 4a and 4b there is a significant difference between the groups' responses.

The curves of group-average estimates regarding chances of conviction in court (Questions 5a and 5b) indicate that Groups 2, 3, and 4 estimate a higher chance of conviction than (the non-violator) Group 1, while the Group 5 average estimate is lower than that of Group 1. The F-test ratio, however, indicates that for each of these offenses, the averages are not significantly different. The much higher average estimates of chances of conviction (Question 5) compared to chances of detection (Question 4) indicate the respondents' realization that the chances of being caught are relatively low (in reality, probably lower than expressed here) but once a citation has been issued, the chances of a court conviction are much higher. In addition, the curves regarding conviction suggest that to the respondents the nature of the violation (in this case, 10 MPH vs. 20 MPH over the limit) had less impact on the chances of conviction than on the chances of detection (Questions 4a and 4b). That is, the curves for 5a and 5b are closer to each other both relatively and absolutely than the curves for 4a and 4b.

The overall statistics at the bottom of Figure 2 indicate the range of responses to each question, including the number of respondents choosing the maximum and minimum answers. In terms of detection, 26 respondents did not think <u>any</u> 10 MPH speeding violators would be caught while eight respondents felt the same way about a 20 MPH violation (Questions 4a and 4b). Similarly, for Questions 5a and 5b, 28 and 13 respondents, respectively, felt that no cited drivers who went to court would be convicted. At the other end of the scale, six and seven respondents, respectively, felt that <u>all</u> violators at 10 and 20 MPH over the limit would be caught. Likewise, 69 and 121 respondents, respectively, felt that <u>all</u> violators

cited for more than 10 and 20 MPH over the limit would be convicted in court. In this case more total conviction estimates were obtained from the respondents with violation histories than from those who were violation-free. These data regarding choices of the maximum and minimum number of chances are included to indicate the range of driver perceptions that exist. Some of these extreme perceptions, e.g., zero chance of detection for a 10 MPH violation and 100 percent chance of conviction for a 20 MPH violation, are not unreasonable in certain enforcement and adjudication environments. On the other hand, the 100 percent detection estimates and the zero court conviction rate estimates are basically unrealistic.

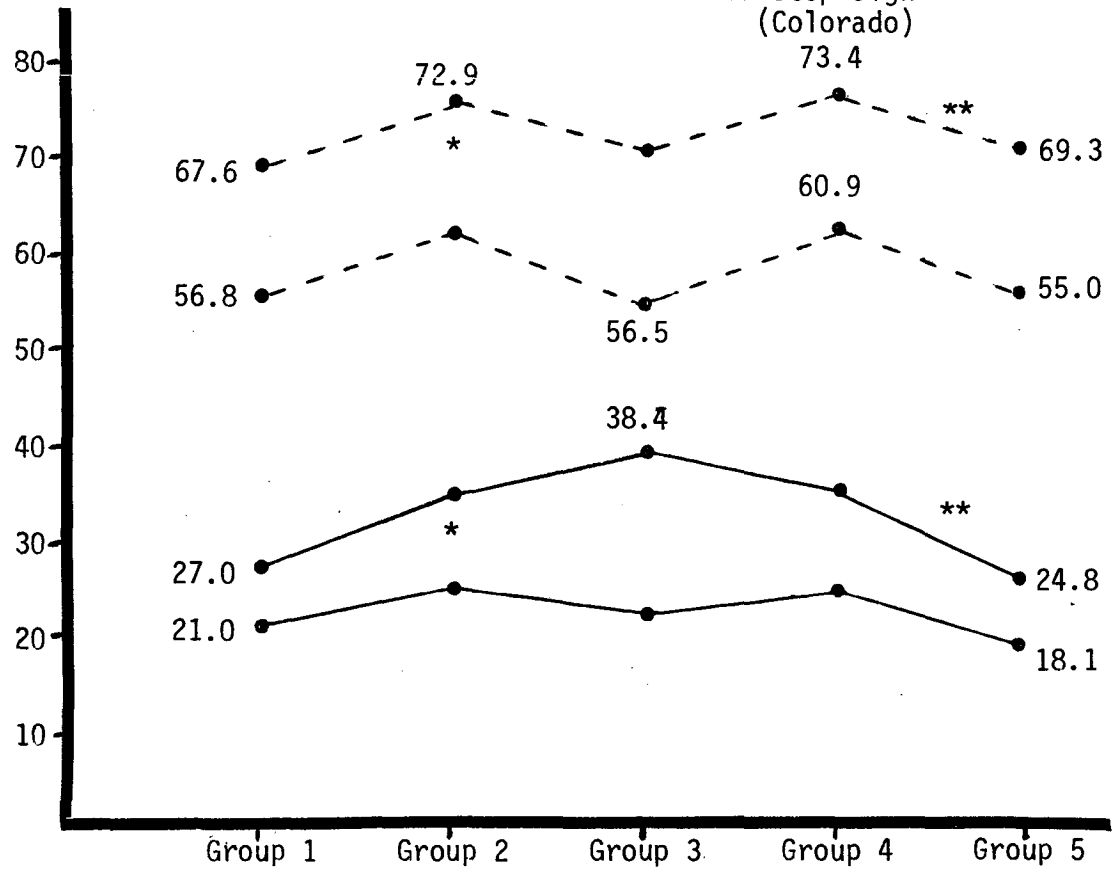
Analysis of Questions on Driving While Intoxicated and Running a Traffic Light or Stop Sign

Questions 4c and 5c relate to Driving While Intoxicated (DWI) and Questions 4d and 5d relate to Running a Traffic Light or Stop Sign. Graphs showing group-average estimates of chances of detection and conviction for these offenses are shown in Figure 3. For the DWI offense (Question 4c), the data show that Groups 2, 3, and 4 estimate higher chances of detection than Groups 1 and 5. Perhaps a more useful comparison can be made between the average detection rates of 30.75% for combined Groups 1, 2 and 3 (DWI non-violators) and that of 32.66% for combined Groups 4 and 5 (DWI offenders). The closeness of these averages suggests that there is little difference in perceived DWI detection rates between those who have experienced and those who have not experienced such detection.

The average estimates regarding DWI conviction rate (Question 5c) range (across groups) from 67.6 percent to 73.4 percent. These averages were not statistically significantly different. Also, these DWI average estimates were higher than those for the two

Figure 3

Responses to Questions on DWI and Running Traffic Light Or Stop Sign (Colorado)



5c--Driving While Intoxicated (Conviction) (F=1.54; n.s.)

5d--Running Traffic Light or Stop Sign (Conviction) (F=1.34; n.s.)

4c--Driving While Intoxicated (Detection) (F=5.20; .01)

4d--Running Traffic Light or Stop Sign (Detection) (F=2.62; .05)

*Mean for Groups 1, 2, and 3 (Questions 4c and 5c)
**Mean for Groups 4 and 5 (Questions 4c and 5c)

Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4c	869	30.87	0% (5) to 100% (4)
4d	869	33.67	0% (13) to 100% (2)
5c	869	70.30	0% (7) to 100% (188)
5d	869	59.13	0% (14) to 100% (94)

speeding offenses (5a, b) and the traffic signal/stop sign offense (5d), suggesting the drivers' perceptions on the relative conviction rates for DWI and other offenses.* The rate of selection of extreme (zero and 100) values is shown at the bottom of the figure. Once again, the value of 100 percent is an unrealistic response for detection of DWI, as is zero percent for conviction of DWI. The small number of such responses suggests that almost all respondents (> 99%) share this view. The 100 percent DWI conviction rate was expressed by 188 (or 22 percent) of the respondents. By groups, this breaks down to:

Group 1: 18 percent
Group 2: 24 percent
Group 3: 26 percent
Group 4: 32 percent
Group 5: 17 percent

Because in some jurisdictions conviction rates about 85-90 percent are not uncommon, this high rate of 100 percent estimates cannot be considered too unrealistic.

The detection rate estimates for the Running Traffic Light/ Stop Sign offense are shown in the bottom curve of Figure 3 (Question 4d). The corresponding conviction rate estimates are shown in the curve labeled "Question 5d." For both of these curves, Groups 1, 3 and 5 had estimates that were lower, relatively, than those of Groups 2 and 4. Although the F-test indicates significant differences among the average detection rates, no practical significance can be attributed to the results. With the exception of those respondents estimating that all cited drivers would be convicted, the number of extreme responses is relatively small. The 94 respondents (11 percent) indicating a 100 percent conviction rate should be considered unrealistically high for this offense.

*Comparing the averages of DWI offenders (Group 4 and 5) with non-DWI offenders (Groups 1, 2 and 3) shows little difference in conviction rate estimates (72% vs. 70%, respectively).

Analysis With Median Values

In the previous analysis, the differences in averages among the five groups have been examined using an F-test. While this approach is a standard and acceptable procedure, there are alternatives which do not use the sample mean as a basis. One alternative is to calculate the median for each group and see how the medians change across the groups. In this section, a brief presentation is made with medians as a basis. The interest in calculating medians arose because of the distribution of the responses and the extreme values of the data. It has been pointed out that the responses ranged from 10 to 100 percent on all questions. Extreme values can have the effect of making the sample means unrepresentative of the sample. Indeed, this section will show that this situation does occasionally occur. However, the overall conclusions on the trends of the responses remain the same whether the sample averages or sample medians serve as the basis.

Table 17 lists the sample median for each group in response to Questions 4a-4d and 5a-5d. These medians can be compared with

Table 17

Median Values for Questions 4 and 5

Question	Group 1	Group 2	Group 3	Group 4	Group 5
4a	10	10	15	20	5
4b	20	30	35	30	20
4c	20	25	30	30	15
4d	10	20	10	15	10
5a	50	70	75	70	50
5b	75	80	80	75	70
5c	80	90	80	80	80
5d	60	70	50	75	50

corresponding (sample mean) data points in Figures 2 and 3. For each of the eight offense types considered, the median data would not suggest any different interpretation than given for the sample mean data. The medians are lower than the sample means because in almost every offense type the number of very high percentages was greater than the number of low percentages.

Analysis of Questions on Following Too Closely, Turning Into Traffic, and Crossing the Center Line

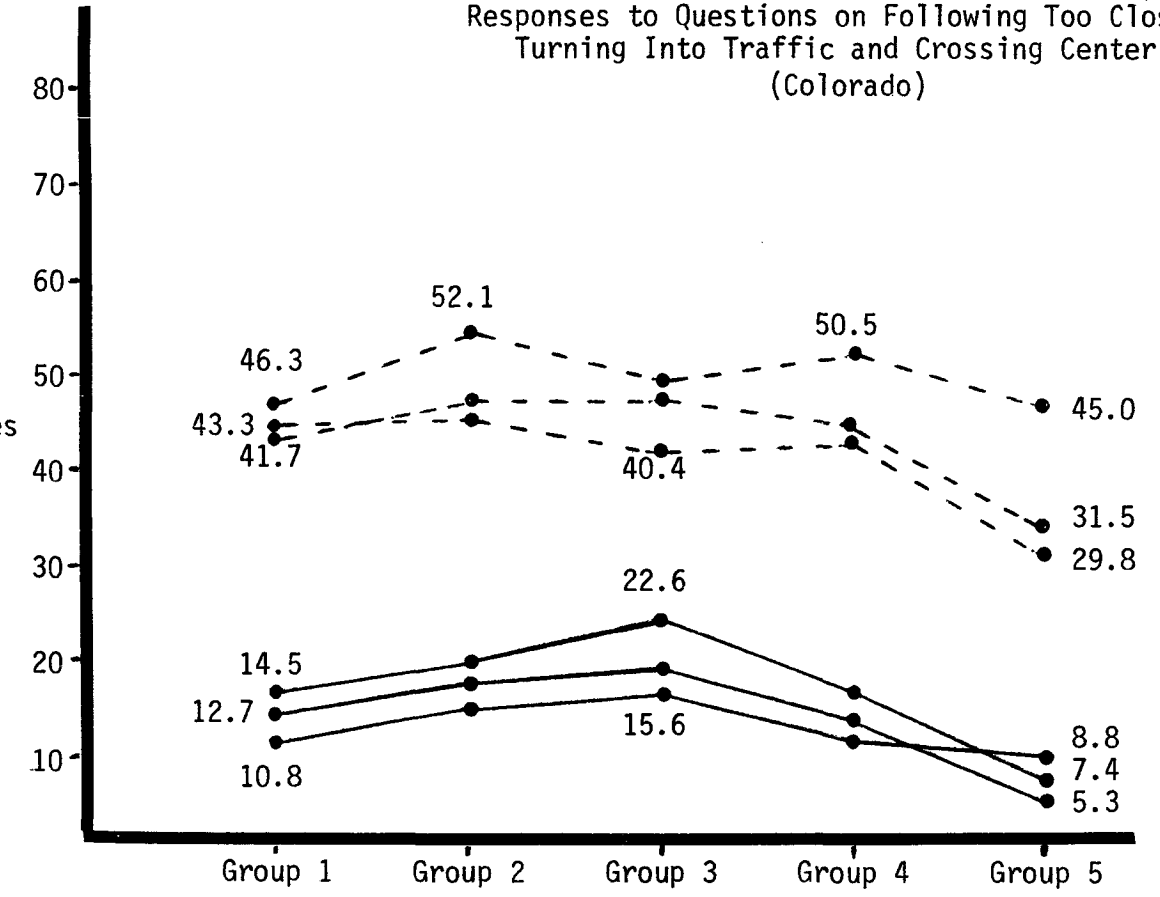
The curves depicting group average estimates of detection and court conviction rates for these three offenses are shown in Figure 4. With the exception of Group 5, the detection estimates for Following Too Closely are the lowest given for any of the offenses examined. Although the Group 2 and 3 responses are higher than the others, the F-test indicates no significant difference among the averages and all five values are really quite low. Moreover, 125 respondents (14 percent) indicated that zero following too closely violators in 100 would be detected and only three respondents (0.3 percent) suggested that all would be detected. The pessimism exhibited regarding detection of this offense (which was spread among all respondent groups) is understandable. The offense is both frequent in occurrence and difficult to enforce.

Other than the 31.5 percent rate given by Group 5, the estimated conviction rate for following too closely falls in a narrow range from 42 to 47 percent. What is noteworthy is the relatively low court conviction rate values for this offense compared to those analyzed up to this point.

The detection rate curves for the Turning Into Traffic Offense and the Crossing the Center Line Offense are very much like that for Following Too Closely. The only differences are overall slightly higher estimates for all groups except Group 5 and lower numbers of

Figure 4

Responses to Questions on Following Too Closely Turning Into Traffic and Crossing Center (Colorado)



5f--Turning Into Traffic (F=1.60; n.s.)

5e--Following Too Closely (F=1.80; n.s.)

5g--Crossing Center Line (F=1.06; n.s.)

4e--Following Too Closely (F=2.21; n.s.)

4f--Turning Into Traffic (F=3.02; .05)

4g--Crossing Center Line (F=2.43; .05)

Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4e	864	12.35	0% (125) to 100% (3)
4f	867	16.08	0% (56) to 100% (3)
4g	868	14.03	0% (90) to 100% (3)
5e	867	44.13	0% (61) to 100% (51)
5f	868	49.02	0% (30) to 100% (57)
5g	867	44.04	0% (51) to 100% (51)

respondents indicating that zero violators would be detected. The estimates of conviction rate for these two offenses are relatively close to those for Following Too Closely and lower than those for the four previously analyzed offenses. The range of estimates is quite narrow (except for Group 5, Question 5g) and the F-statistic confirms that there are no significant differences between the group averages.

Comparison With Violation History

Court Appearances and Perceptions

The analysis so far has concentrated on comparisons of different groups of violators. It has been shown that in regard to detection there are some significant differences among the groups. With regard to court actions, however, the differences have not been as great. As another analysis, it may be of benefit to consider respondents with court appearances versus respondents without court appearances. In such an analysis, Group 1 respondents do not have any violations or court appearances but can still serve as a comparison group. At the other extreme, virtually all Group 4 and Group 5 respondents have had court appearances since their violations were major in nature. Therefore, the averages previously presented for these two groups are reflective of both their detection and adjudication experiences. With Groups 2 and 3, there are also many mandatory appearances as well as persons who decided to challenge the citation in court. In Group 2 there were 32 respondents with a court appearance and in Group 3 there were also 32 respondents with a court appearance. Finally, with all the groups, the court experience can be expected to affect only their perceptions of court actions rather than their perceptions of detections by the police.

Table 18

Court Appearances and Court Conviction Perceptions
(Colorado)

Question	Group 1	Group 2		Group 3		Group 4	Group 5
		No Court Appearance	Court Appearance	No Court Appearance	Court Appearance		
5a	52.7	58.3	61.3	62.9	63.3	58.0	44.6
5b	62.6	67.1	69.8	60.0	70.4	62.9	60.8
5c	67.6	72.9	73.3	80.0	67.6	73.4	69.3
5d	56.8	61.3	67.8	72.4	53.0	60.9	55.0
5e	41.7	46.7	49.0	43.9	47.9	43.9	31.5
5f	46.3	51.9	54.3	43.6	33.9	50.5	45.8
5g	43.3	45.7	49.1	34.3	41.7	42.0	29.8

With this background, Table 18 shows the response averages for Question 5 with Groups 2 and 3 split into Court/No Court Appearance categories. The averages under the "Court Appearance" columns were calculated from those respondents with at least one court appearance on a citation during the three-year period while the "No Court Appearance" columns are based on respondents who decided to pay the fine and not challenge the citation in court. The table shows some clear trends. For example, with Group 2 respondents, the averages of the Court Appearance subgroup is greater than the No Court Appearance subgroup for every offense type. Similarly, with Group 3 respondents, the averages of the Court Appearance subgroup is greater than the No Court Appearance for five of the seven offenses. While the differences are not great with Groups 2 and 3, the pattern is consistent except as noted with two of the Group 3 offense categories. It is also noted that Groups 4 and 5 have averages which are generally lower than the averages for the Court Appearance subgroups of Groups 2 and 3.

In summary, it appears that persons with occasional court appearances, as with Groups 2 and 3, will respond with perceptions of higher chances of being found guilty than their counterparts with no court appearances. Further, persons with more experience with the courts, as in Groups 4 and 5, generally respond by stating lower chances of being found guilty.

Time of Citations and Perceptions

There was also interest in determining whether time had an effect on the responses on the chances of detection. It was hypothesized that persons who had recently received a citation would have higher responses than persons whose citations occurred at an earlier time. One way of analyzing this effect is to consider "single year" offenders. These are defined as respondents who had

received a citation during one of the three years but not the other two. From the Venn diagram presented earlier, it is possible to make the following definitions:

Group A: Respondents who received citations in Year 1 (December 1976-November 1977) but not during Years 2 or 3 (N=112)

Group B: Respondents who received citations in Year 2 (December 1977-November 1978) but not during Years 1 or 3 (N=101)

Group C: Respondents who received citations in Year 3 (December 1978-November 1979) but not during Years 1 or 2 (N=83).

These groups can be compared with Group 1 for Question 4 on detection as shown in the following figures:

Table 19

Relationship of Perceptions to Time

Question	Group A	Group B	Group C	Group 1
4a	22.8*	25.3*	20.5	17.4
4b	36.8*	37.3*	35.2	30.4
4c	35.5*	32.2*	33.3*	27.0
4d	26.0*	25.9*	27.2*	21.0
4e	14.5*	13.8*	14.7*	10.8
4f	16.6	19.1*	17.3	14.5
4g	15.4	16.6*	14.9	12.7

*The asterisk means that the average is significantly higher than the Group 1 average.

These figures show that the groups are always higher than the Group 1 averages. The indication is that citations raise the level of perceptions of being caught and that the higher level of perceptions is persistent over time. However, there is not the expected linear trend over time. That is, it was expected that the Group C average would be higher than Group B (due to their more recent citation

experience) and that Group B would, in turn, be higher than Group A. This pattern does not materialize with any of the offenses. It could be that such temporal effects are of a shorter duration than one year but it was not possible to test for shorter durations with the data collected.

ANALYSIS OF ESTIMATED FINES AND SANCTION SEVERITY

Analysis of Estimated Fines

The intent of Question 6 was to determine the extent of the respondents' knowledge regarding the fines imposed for the seven selected traffic offenses in the Denver area. The question was phrased as follows:

> 6. For each of the same violations we've been talking about, I'd like to get your idea of what the fine in the Denver area would be if the person had a clear driving record. If you're not sure, just give me your best guess. You may assume that no accident is involved.

Note that the question asks for the respondent's estimate for the first offense (clear driving record) and with no accident involvment. The correct answers to the question are as follows:

Offense	Fine
6a -- Speeding 10 MPH Over Limit	$25.00
6b -- Speeding 20 MPH Over Limit	Court Appearance
6c -- Driving While Intoxicated	$75.00 plus a likely 12-month license suspension -$125.00
6d -- Running a Traffic Light or Stop Sign	$ 10 - 24
6e -- Following Too Close	$ 5 - 24
6f -- Turning In Front of Traffic	$ 8 - 18
6g -- Crossing the Center Line	$ 10 - 24

For most offenses the range of fines is indicated because of the jurisdictional arrangement in the Denver area. Technically, the focus of the study was the City and County of Denver. As it happens, there was no practical way to limit the interviews to residents of Denver. The headquarters licensing station was located in central Denver but many Colorado citizens from adjoining areas might also review their license there. It turns out that 80 percent of the respondents were residents of Denver. (Those from Groups 4 and 5 were more evenly split among Denver/non-Denver residents.) Nevertheless, subjects may have had traffic violation experiences (detection/conviction) either in Denver or outside Denver or both. Depending on the locale, the fine paid could have been different. Only the Denver Police Department has traffic law enforcement jurisdiction within the City and County. Citations issued by that agency are adjudicated in the County Court. The higher valued fines listed above are those that are imposed (in the case of paying the fine to a clerk). Outside Denver, the Colorado State Patrol is responsible for enforcement on many highways and many of the respondents experienced such enforcement. For the violations a, d, e, f, and g, it is possible to take a citation issued by the State Patrol directly to the Department of Revenue and pay a fine that corresponds to the lower value shown above. Because of these distinct practices, the range of fines shown is considered the "correct" value.

The fine shown for DWI represents the range estimated by Denver County Court personnel as "what is normally imposed." Beyond the fine, the report of conviction to the Department of Revenue results in the posting of 12 points on the driver record and the high likelihood of a 12-month license suspension. Finally, it was not possible to obtain a typical fine that might be imposed following the court appearance and conviction for speeding 20 MPH above the limit.

Figures 5 and 6 show the analyses to responses to Question 6. For Speeding 10 MPH Over the Limit (Question 6a), the estimated fines are almost the same for all groups--ranging from $20 to $23--and are only slightly below the actual value of $25. For Speeding 20 MPH Over the Limit (Question 6b) the groups that included most speeders (but not those convicted of this offense), namely Groups 2 and 3, estimated the fine higher than Group 1 ($43 vs. $36). Groups 4 and 5 include both DWI offenders and drivers convicted of speeding more than 20 MPH. The average of the Group 4 estimates is $74 while that for Group 5 is $34. The following is a list of the median fine estimate for each group for each of the selected violations:

Table 20

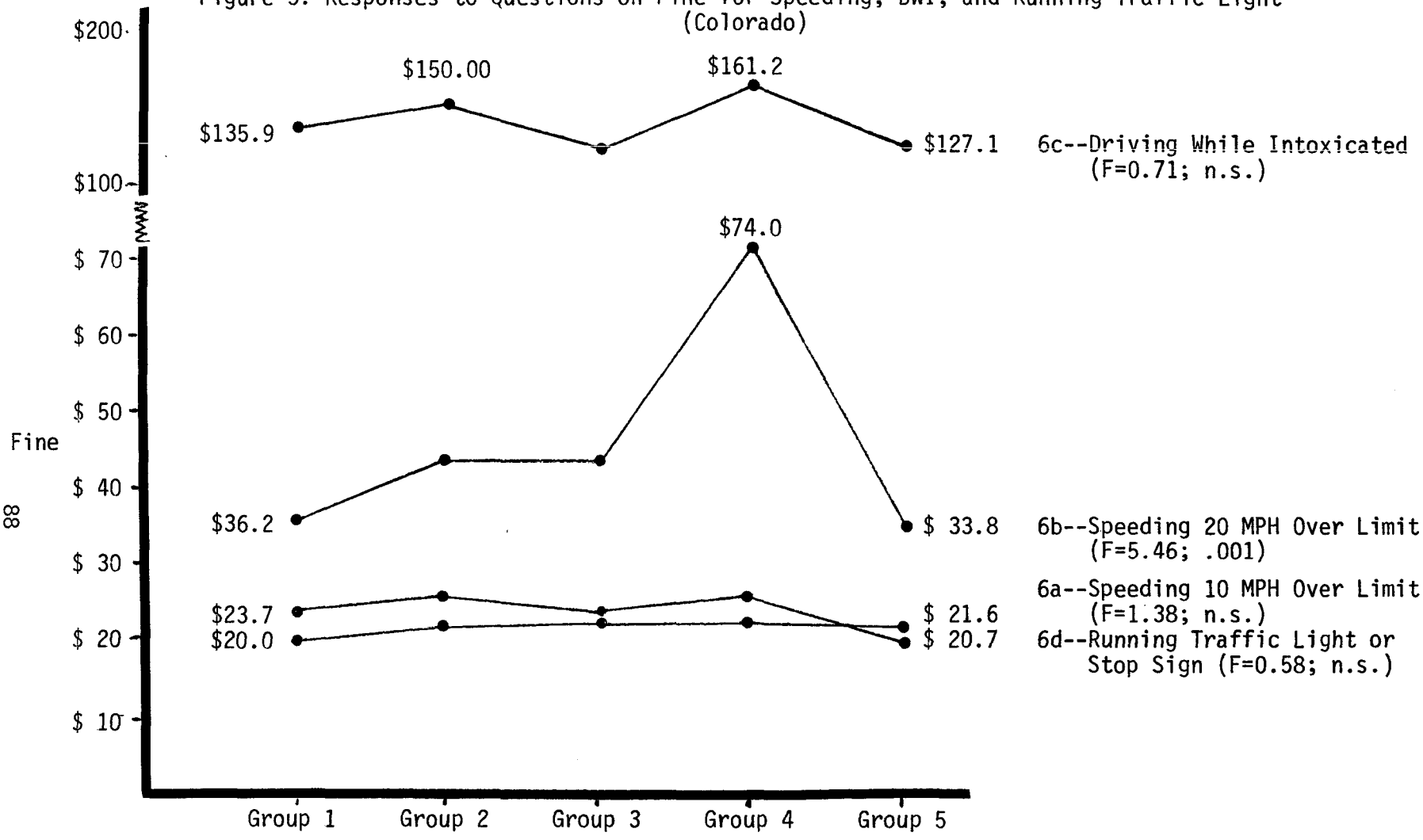
Median Values for Question 6

Question	Group 1	Group 2	Group 3	Group 4	Group 5	Correct Value
6a	20	23	25	20	25	25
6b	30	35	40	40	30	Court
6c	100	100	100	100	100	75-125
6d	20	25	25	20	20	10-24
6e	15	15	20	15	15	5-24
6f	20	20	20	20	15	8-18
6g	20	18	15	15	15	10-24

An examination of the response distribution for Group 4 indicates a median estimate of $40 (compared to a median value of $30 for Group 1) and one estimate each of $250 and $1,000. These latter values tend to boost the mean to the value shown in Figure 5. For Group 5, the median value was $30--a value corresponding to that of Group 1.

The range of average fine estimates for DWI indicates that Groups 3 and 5 produced slightly lower estimates than Group 1

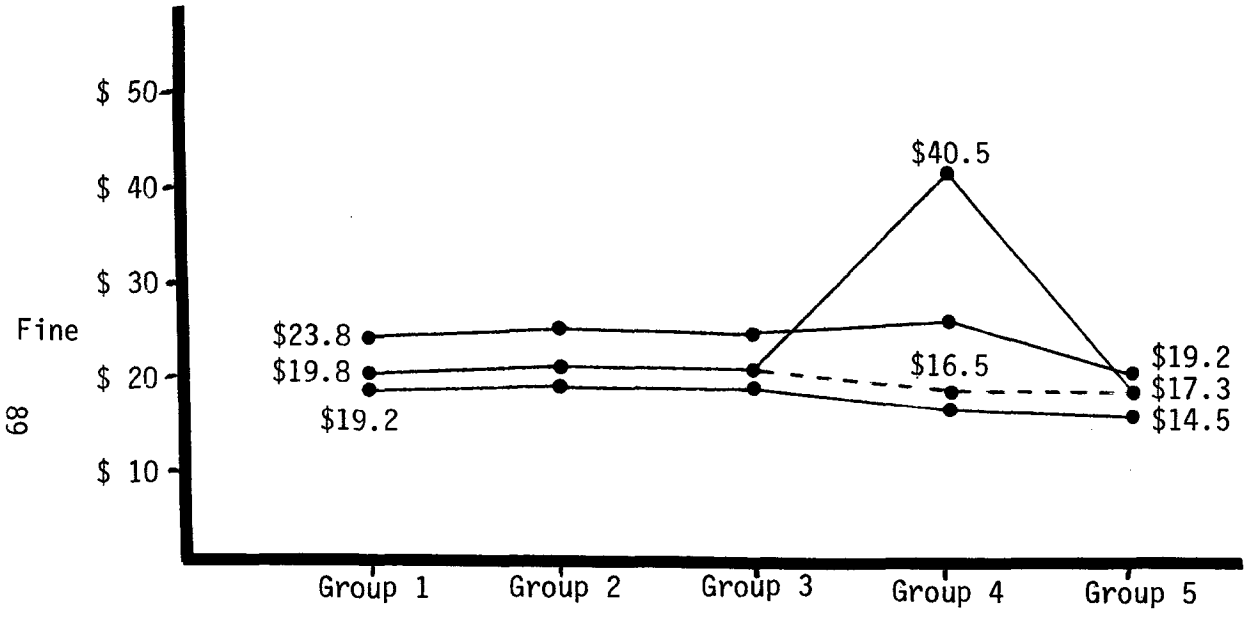
Figure 5. Responses to Questions on Fine for Speeding, DWI, and Running Traffic Light (Colorado)



Overall Statistics				
Question	Responses	Average	Range of Responses Dollars (Number)	Correct Answer
6a	862	$ 21.17	$0 (13) to $ 330 (1)	$25.00
6b	869	$ 41.18	$0 (1) to $1000 (2)	Court App.
6c	860	$142.46	$0 (8) to $1000 (1)	$75-$125
6d	866	$ 24.51	$0 (8) to $ 302 (1)	$10-$24

Figure 6

Responses to Questions on Fine for Following Too Closely, Turning Into Traffic and Crossing Center Line (Colorado)



Overall Statistics				
Question	Responses	Average	Range of Responses Dollars (Number)	Correct Answer
6e	860	$ 18.70	$0 (21) to $ 500 (1)	$5-$24
6f	866	$ 24.07	$0 (14) to $ 500 (1)	$8-$18
6g	856	$ 20.98	$0 (22) to $1000 (1)	$10-$24

while those for Groups 2 and 4 were considerably higher than Group 1. Group 1, 3, and 5 estimates were only slightly higher than the upper level of the "correct" value. The median estimated fine for all groups was $100, a measure of uniformity that fell midway in the range of the "correct answer." Contributing to the higher sample mean for Group 2 was the fact that 23 respondents estimated $500, three estimated $750 and seven estimated $1,000. Similarly, for the relatively smaller Group 4, four estimated $200, two estimated $300, and four estimated $500.

For Question 6c, if the respondent described a penalty in addition to the fine estimate, it was listed; 379 respondents (44 percent) provided a second penalty. Table 21 lists the penalties described by each group. Of those providing additional penalties within groups, the principal responses were license suspension and rehabilitation program. Although only three respondents answered from Group 5 (which included some multiple DWI offenders), none of them listed License Suspension and two listed Probation. Similarly, the percentage of Group 4 respondents listing Probation suggests it must be a penalty that came to mind in response to experience. It should also be noted that the penalty of a Jail Sentence, while not listed often, was only suggested by non-violators and those having only minor violations on their record. This is reflective of the fact that jail is seldom imposed even for DWI, a fact that may have been known among the Group 4 and 5 respondents.

With one exception (Group 4, Question 6g), the estimated fines for Running a Traffic Light/Stop Sign (Figure 5), Following Too Closely, Turning into Traffic, and Crossing the Center Line (Figure 6) fall within a narrow range across groups. Nearly all fine estimates fall within the correct range of fine. For Group 4 on

Table 21

Other Penalty Responses for DWI
(Colorado)

	Loss/Revoked License	Points on Record	Jail/ Prison	Rehabilitation Driver School	Probation	Warning	Total
Group 1	223 (90.7%)	8 (3.3%)	3 (1.2%)	10 (4.1%)	1 (0.4%)	1 (0.4%)	246
Group 2	253 (94.1%)	6 (2.2%)	3 (1.1%)	4 (1.5%)	3 (1.1%)	-	269
Group 3	23 (100.0%)	-	-	-	-	-	23
Group 4	42 (89.4%)	-	-	2 (4.3%)	1 (2.1%)	2 (4.3%)	47
Group 5	9 (90.0%)	1 (10.0%)	-	-	-	-	10
Overall	550 (92.4%)	15 (2.5%)	6 (1.0%)	16 (2.7%)	5 (0.8%)	3 (0.5%)	595

Question 6g, the median value was $15*, the sample size was relatively small and one response of $1,000 skews the sample mean to such an extent that it should be ignored. Removing the data point produces a mean of 16.5 as shown in the dotted curve in Figure 6.

If one concentrates on the upper value of the range of "correct fines" described previously for Questions 6a, d, e, f and g, which is the fine that would be paid in County Court if the citation were issued by the Denver Police Department, then nearly all the mean estimates are close to the actual fine. Only for the Turning Into Traffic (6f) offense do the respondents estimate the fine higher than the actual Denver value. The median estimates for some violations are not quite as close to the upper value of the correct fine. Questions 6a, d and f can be considered close while all groups tended to underestimate on Questions 6e and g.

Analysis of Sanction Severity

Two questions were designed to measure the respondents' beliefs on the severity of traffic sanctions. Question 7 asked the respondent to rate the severity of the fine the respondent had given in Question 6. Question 7 was phrased as follows:

> 7. In this question, the interviewer has written in what you thought the fine would be for each of the violations stated in Question 6. Now, please circle the number of the scale below which most accurately reflects your feelings on how severe the fine is as you stated it.

Each of the seven offenses was then listed along with the respondent's answer from Question 6. The respondent then rated the severity of the fine on a five point Likert scale from 1 (not at all severe) to 5 (extremely severe).

*The median values for the other groups for Question 6g were $20, $18, $15 and $15, respectively. This suggests that the response from Group 4 should not be considered any different from the other groups.

In Question 8, the respondent is shown what the actual fine is and is then asked to rate the severity of the fine on the same five point scale. Question 8 was phrased as follows:

> 8. For these same offenses we are listing below the actual range of fines in the Denver area for a person who has been given a ticket and merely wishes to pay the standard fine. In the case of driving while intoxicated, the penalty given is about what is usually given when the driver is found guilty of a first offense after being arrested and going to court. Please indicate how severe you feel each penalty is, considering the standard fine in relation to the seriousness of the offense. Please circle one number for each offense to indicate where you think the penalty falls on the scale of severity.

The seven offenses were then listed along with the actual fine information.

For each violation, Table 22 shows the group-average severity estimates given in response to Questions 7 and 8. With only one exception (Group 5, Question 7c) the averages for Question 7 are between 2.4 and 2.8, indicating an assessment of moderate severity. Responses to Question 8 are generally correlated with the responses to Question 6 on the estimated fine. For violations a, d, e, and g the respondents tended to estimate the fines lower than the actual value. For these violations most groups tended to revise slightly upward their average assessments of severity when informed that the actual fine was higher than their original fine estimate. The differences between actual fines and average estimated fines were not large and only in isolated instances, generally involving the relatively populous Groups 1 and 2, were the differences in severity estimates (from Question 7 to Question 8) statistically significant (by the t-test).

Table 22

Sanction Severity Averages
(Colorado)

Speeding 10 MPH Over Limit

	7a	8a	t-value
Group 1	2.4	2.8	- 6.8**
Group 2	2.6	2.9	- 4.3**
Group 3	2.7	3.0	- 1.1
Group 4	2.6	2.8	- .9
Group 5	2.5	2.8	- .9

Speeding 20 MPH Over Limit

	7b	8b	t-value
Group 1	2.6	2.8	- 3.3**
Group 2	2.8	2.8	- 1.7
Group 3	2.7	2.9	- .6
Group 4	2.7	2.9	- .9
Group 5	2.7	3.3	- 2.0

Driving While Intoxicated

	7c	8c	t-value
Group 1	2.6	2.6	.4
Group 2	2.6	2.7	- 1.8
Group 3	2.6	2.7	- .6
Group 4	2.9	3.3	- 2.0
Group 5	3.7	3.8	- .5

Running a Traffic Light or Stop Sign

	7d	8d	t-value
Group 1	2.5	2.4	2.8**
Group 2	2.6	2.5	2.5*
Group 3	2.8	2.5	1.6
Group 4	2.5	2.5	- .1
Group 5	2.4	2.5	- .4

Following Too Close

	7e	8e	t-value
Group 1	2.4	2.4	.8
Group 2	2.5	2.3	3.0**
Group 3	2.4	2.5	- .6
Group 4	2.4	2.3	- .4
Group 5	2.6	3.1	- 1.4

Turning Into Traffic

	7f	8f	t-value
Group 1	2.5	2.2	4.3**
Group 2	2.5	2.2	4.5**
Group 3	2.5	2.1	2.7**
Group 4	2.4	2.4	.1
Group 5	2.8	2.8	0

Crossing Center Line

	7g	8g	t-value
Group 1	2.5	2.4	1.4
Group 2	2.4	2.5	- 1.1
Group 3	2.4	2.7	- 1.6
Group 4	2.5	2.5	0
Group 5	2.5	2.8	- 1.8

* Significant at the .05 level.

** Significant at the .01 level.

For DWI violations the respondents' average estimate of fine was higher than the actual but their severity estimates for Question 8 were slightly higher than for Question 7 (except Group 1 which made no change). If one considers the median estimate (which was midway in the range of actual fines), then this increase in severity estimate is more plausible. It should be noted that the changes in severity estimate from Question 7c to Question 8c were not statistically significant for any group.

For the Turning Into Traffic Offense, the respondents' estimate of the fine was higher than actual. In response to this high estimate the average revised severity estimate (Question 8f) decreased significantly for Groups 1, 2 and 3 and remained the same for Groups 4 and 5.

There was only one instance in which the group estimate of severity approached the value of four on the scale. For the DWI question, Group 5 (all of whom had at least one DWI conviction) thought that the penalty was fairly severe--giving a 3.7 average for Question 7c and a 3.8 average for Question 8c. It can be assumed that their response may have been highly influenced by their experience, an experience in which a much higher penalty than described in the interview may have been imposed on them.

ANALYSIS OF OTHER SANCTIONING ISSUES

The last set of questions in the interview was concerned with the perceptions of respondents on several sanctioning subjects. These subjects included the effects of warning tickets, appearances before a judge, the sanction of attendance at a court traffic school, whether sanctions have preventive or educational effects and the impact of insurance premium escalation.

Special and General Effects

Questions 9 and 10 were directed at whether sanctions in general have preventive effects or educational effects. The questions were phrased as follows:

9. Which of the statements below comes closest to your feeling about the way the penalties for traffic violations affect most drivers who have committed traffic violations?

   Preventive or deterrent effect--keeps people from doing the same thing again.

   Educational effect--teaches people what the driving laws are and how to drive safely.

   No effect--penalties have no effect on the drivers concerned.

10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who have not committed traffic violations?

    (Same three alternatives as above.)

Table 23 shows the results for these two questions. For Question 9 on special effects, i.e., the effects on those sanctioned, overall, about 21 percent of the respondents felt that there was no effect. The non-violators (Group 1) and moderate violators (Group 2) expressed the "no effect" view more strongly than the other (heavy violator) groups. Among those who thought there was an effect the differences between preventive or educational effect were not large (except for Group 5). Group 1 and 2 respondents slightly favored the preventive or deterrent effect. As the seriousness of record increased (toward Group 5), the respondents increasingly felt the principal effect was educational.

Question 10 was aimed at learning the (general) effects of sanctions on drivers who have not committed traffic violations. The overall statistics are about the same as for the special

Table 23

Questions 9 and 10 -- Effect of Penalties on Drivers
(Colorado)

	QUESTION 9			QUESTION 10		
	Preventive or Deterrent Effect	Educational Effect	No Effect	Preventive or Deterrent Effect	Educational Effect	No Effect
Group 1	45.4%	31.5%	23.1%	48.8%	32.2%	19.1%
Group 2	42.3%	38.3%	19.4%	42.5%	40.1%	17.5%
Group 3	42.1%	42.1%	15.8%	38.5%	23.1%	38.5%
Group 4	41.5%	46.3%	12.2%	26.8%	51.2%	22.0%
Group 5	8.3%	75.0%	16.7%	41.7%	16.7%	41.7%
Overall	43.2%	36.2%	20.6%	44.5%	35.8%	19.7%

Question 9. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who have committed traffic violations?

Question 10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect drivers who have not committed traffic violations?

Preventive or deterrent effect -- keeps people from doing the same thing again
Educational effect -- teaches people what the driving laws are and how to drive safely
No effect -- penalties for traffic violations have no effect on the drivers concerned

effects of Question 9. As can be seen in the table, there are some differences among the groups. Groups 3 and 5--those with more sanction experience--more strongly felt that there were no sanction effects on the general population. Even for Group 4, nearly twice as many as thought there would be no special effects thought there would be no general effects. It is possible that violator-respondents who have been in both the non-violator and violator status may be giving an indication of the relative differences between the impact on them of others being sanctioned (prior to their own sanction experiences) and the impact on themselves of their subsequent sanction experience.

About the same percentages of Groups 1 and 2 respondents felt that there would be a general deterrent effect as felt there would be a special deterrent effect. The same is true for the educational effect. For Group 3, about the same percentage of these multiple-minor violators thought that sanctions had a preventive/deterrent effect on both the violators (sanctioned) and non-violators (non-sanctioned). Only about half as many Group 3 respondents as thought there was a special (violator) educational effect thought there was a general education effect as well. The Group 4 members gave about the same preference to general deterrence and no effect but had much more confidence in a general educative effect. In contrast, Group 5 had the opposite view of Group 4 with respect to general effects--a view that differed from its own position on special effects. The Group 5 members apparently felt that they learned a lot from their experience but those who have not experienced sanctions do not learn anything from the fact that others have been sanctioned.

Influence of Warning Tickets

Question 11 asks about the influence warning tickets have on drivers as compared to getting a ticket. The question was phrased as follows:

> 11. When the police see a traffic violation, they can stop the driver and give him/her a warning (instead of a ticket). Please circle the number below which best describes how such a warning would influence your driving practices when compared to getting a ticket.
>
> 1. Has the same effect as getting a ticket.
> 2. Has a greater effect.
> 3. Some effect but not as much as a ticket.
> 4. No effect.

The responses to the question were as follows:

	(1) Same	(2) Greater	(3) Some	(4) No Effect
Group 1	35.6%	33.8%	28.6%	2.0%
Group 2	30.1%	34.9%	32.3%	2.7%
Group 3	30.8%	28.2%	41.0%	-
Group 4	26.8%	31.7%	39.0%	2.4%
Group 5	16.7%	33.3%	41.7%	8.3%
Overall	32.3%	33.9%	31.4%	2.3%

Although half or more than half of all groups indicated that a warning would be as effective as or more effective than a ticket, the groups more exposed to tickets--3, 4, and 5--had larger proportions indicating that the warning would be less effective or ineffective than did Groups 1 and 2. This suggests that more of the drivers who received tickets for serious offenses or for a number of minor violations felt that they would not have responded to a mere warning.

Influence of Court Appearance

Question 12 was aimed at beliefs on the effects of appearances before a judge. The question was phrased as follows:

> 12. A traffic law violator may choose either to (1) appear before a judge to plead his/her case, or (2) pay a fine by mail or to a court clerk. To what extent would a lecture and fine given by a judge influence a person's driving behavior when compared to paying the fine without appearing before the judge? Would you way it would have
>
> 1. Lesser influence
> 2. Greater influence
> 3. No difference
> 4. No opinion

The responses to the question were as follows:

	(1) Lesser	(2) Greater	(3) No Difference	(4) No Opinion
Group 1	7.4%	71.9%	15.8%	4.9%
Group 2	6.5%	64.8%	21.8%	7.0%
Group 3	5.1%	71.8%	20.5%	2.6%
Group 4	14.6%	48.8%	26.8%	9.8%
Group 5	16.7%	66.7%	8.3%	8.3%
Overall	7.4%	67.7%	19.0%	6.0%

The responses show a strong belief that court appearances have a greater influence on driving behavior as compared to paying the fine without appearance. The overall statistics show that two-thirds of the respondents giving the "Greater Influence" answer. The individual group averages vary around this overall average with no significant differences between group averages.

Influence of Court Traffic School

Questions 13 and 14 asked about the sanction of court traffic school:

13. Do you know that some traffic violators are penalized by having to attend a court traffic school or a Department of Motor Vehicles education program?

14. Do you think such a penalty would positively influence your driving?

The positive response to these questions was overwhelming. Overall, 88.5 percent responded "Yes" to Question 13, indicating an extensive awareness of traffic violator schools or licensing agency classes as an alternative sanction. Regarding effectiveness, 81.3 percent of the respondents felt such a penalty would positively influence their driving.

Influence of Insurance Premiums

There were three questions related to knowledge about insurance premiums. The questions were as follows:

15. Do you know that some drivers have their insurance premiums increased, or their insurance cancelled, following conviction for a traffic violation?

16. Is your driving influenced by your awareness of what insurance companies do?

17. In this state, some insurance companies raise premiums by 25% (for example, $25 added to a $100 annual premium) following conviction for two routine moving violations in the past three years. This increased rate is in effect for three years. The same insurance company raises premiums by 75% following three such convictions in three years. Do you think your driving will be influenced by your awareness of what insurance companies do?

Question 15 was asked to each respondent. If the respondent answered "Yes," Question 16 was asked; if the respondent answered "No," to Question 15, Question 17 was asked.

Figure 7 shows the responses to the questions. It is obvious that an insurance premium is a well-known practice since 93 percent of the respondents indicated an awareness of it. Nearly 70 percent of those who were aware of this insurance practice indicated that the practice influenced their driving. This indicates that 65 percent of all drivers in the sample are so influenced.

DATA ON SPEEDS

In order to have a better indication of the actual violation rates, the decision was made to collect data on the speeds of vehicles in the Denver, Colorado area. For this purpose, four separate road segments were selected as being typical of the type of street and daily traffic volumes in the area. The road segments selected were as follows:

Hampden Avenue--The actual location was on U.S. Route 285 eastbound approximately one half mile east of South Sheridan Boulevard. The speed limit is 55 MPH.

Sante Fe Drive--The location on Sante Fe Drive was northbound approximately one fourth mile north of the Englewood City limits. The speed limit is 45 MPH.

Highway 72--The location was on the northbound avenue approximately one half mile north of West 82nd Avenue. The speed limit is 45 MPH.

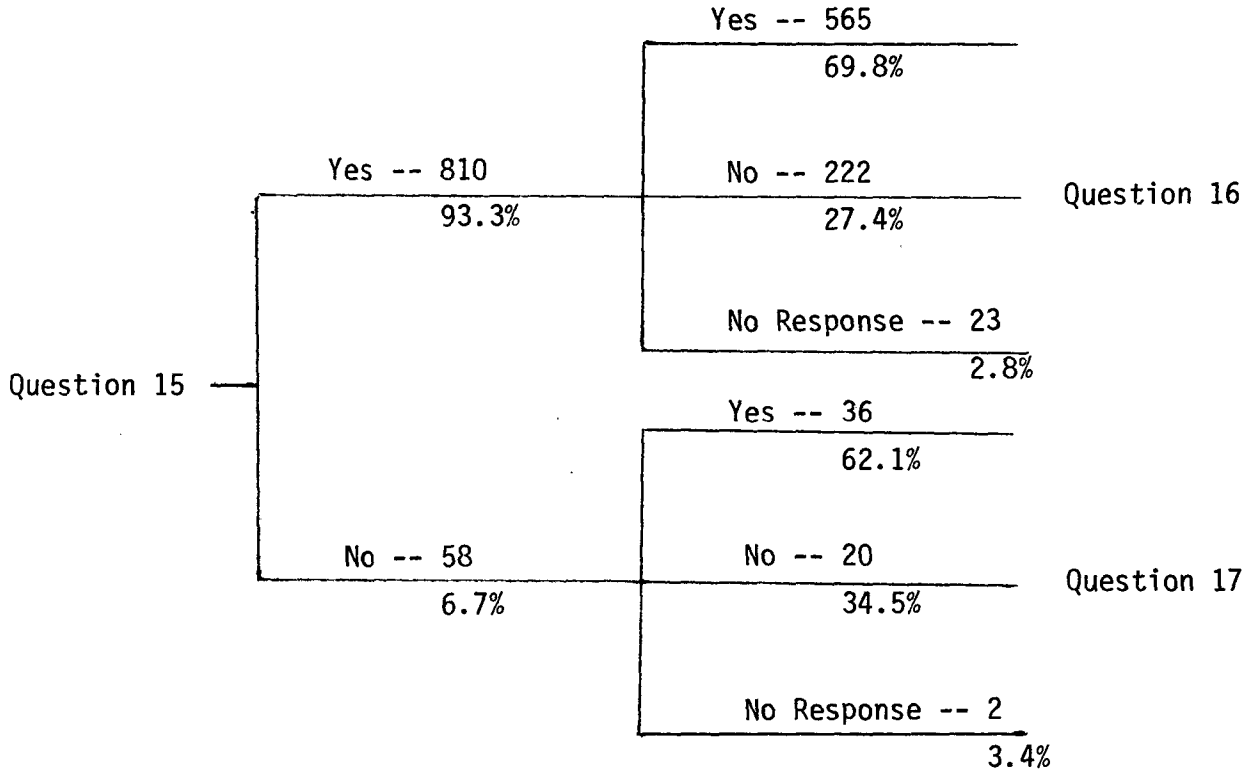
Sheridan Boulevard--The location was northbound approximately one fourth mile north of West 44th Avenue. The speed limit is 35 MPH.

Hampden Avenue is representative of freeway activity in the Denver area and Highway 72 has typical multi-lane traffic. Sheridan Boulevard is a residential/commercial area and Sante Fe Drive is a two-lane rural road.

For collecting speed data, Leupold and Stevens, Inc. Model CVS 545 speed measuring devices were used. A device was placed at

Figure 7

Responses to Questions on Insurance Premiums
(Colorado)



Question 15. Do you know that some drivers have their insurance premiums increased, or their insurance cancelled, following conviction for a traffic violation?

Question 16. Is your driving influenced by your awareness of what insurance companies do?

Question 17. In this state, some insurance companies raise insurance premiums by 25% (for example, $25 added to a $100 annual premium) following conviction for two routine moving violations in the past three years. This increased rate is in effect for three years. The same companies raise premiums by 75% following three such convictions in three years. Do you think your driving will be influenced by your awareness of what insurance companies do?

each site for a seven day period and data were collected at four times each day (6:30 a.m., 10:00 a.m., 3:30 p.m., and 7:30 p.m.). The installation consisted of placing two cables approximately six feet apart across the desired lanes of traffic. The cables were connected to a processing and recording box located at the side of the road segment. The box allowed for collecting speed data in each lane of traffic on the following speed intervals: Less than 35 MPH, 35-39 MPH, 40-44 MPH, 45-49 MPH, 50-54 MPH, 55-57.4 MPH, 57.5-59 MPH, 60-62 MPH, 62.5-64 MPH, 65-69 MPH, 70-74 MPH, and over 75 MPH.

Before presenting the results of the speed measurements, it should be mentioned that some problems were encountered in collecting these data. The major problem was that the device for Highway 72 malfunctioned during the week it was in place at that location. Therefore, no data are presented for this location. Also, some observations are missing because adverse weather conditions prevented data collection of normal traffic patterns. Further, it was determined that the devices did not count the number of vehicles accurately during busy times. More specifically, if the traffic volume exceeded 200 vehicles in a five-minute interval, the units undercounted the volume of traffic by 12-15 percent. The results of three five-minute tests during busy periods were as follows:

Actual Count	Device Count
211	187
206	180
224	190

For this reason, the traffic counts on the freeway and expressway presented in the tables are slightly lower than actual because of busy period activity. However, this is not a serious problem since the primary interest is in the speeds of vehicles. The devices

were accurate in classifying the speeds of the vehicles it counted. Further, the undercounting of traffic volume does not appear to seriously affect the calculation of the median speeds and percent of vehicles exceeding the speed limit.

Tables 24-26 show the speed data by day or week and time period. Shown in the table are (1) the total traffic volume of the time periods, (2) the 85th percentile speed, and (3) the percent of vehicles exceeding the speed limit by at least 10 miles per hour. The data in the tables can be further summarized as follows:

	Hampden Avenue	Sante Fe Drive	Sheridan Boulevard
Average Daily Traffic Volume	18,600	15,700	9,300
Average 85th Percentile	57.7 MPH	47.6 MPH	39.9 MPH
Range of 85th Percentiles	55.7-59.4	46.1-51.1	37.0-40.9
Average Percent Exceeding Speed Limit by at Least 10 MPH	1.7%	2.7%	4.0%
Range of Percent Exceeding Speed Limit by at Least 10 MPH	0.8-4.9%	1.1-7.5%	1.5-6.9%

The figures show that the 85th percentile is always 2-4 miles per hour above the speed limit. Further, the figures show that there are some drivers exceeding the speed limit by at least 10 miles per hour in every time interval of the day. There is also a fairly large range on the percent of drivers exceeding the speed limit by at least 10 miles per hour.

Table 24

Hampden Avenue Vehicle Speed Data
(Colorado)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	7,374	3,881	4,806	3,757	3,391	3,497	3,365
85th Percentile	57.5	55.7	55.7	58.0	57.8	57.8	57.9
% Exceeding 65 MPH	1.2%	1.0%	1.1%	1.9%	1.9%	1.4%	2.2%
6:30 AM-10:00 AM							
Traffic Volume	2,192	4,249	3,711	4,979	5,490	5,283	4,559
85th Percentile	58.1	57.9	58.0	55.7	57.9	57.7	59.4
% Exceeding 65 MPH	2.4%	1.3%	1.5%	.8%	0.7%	0.7%	4.9%
10:00 AM-3:30 PM							
Traffic Volume	4,850	5,665	5,240	5,562	5,626	5,505	5,816
85th Percentile	58.0	58.2	58.1	58.1	58.2	58.0	58.2
% Exceeding 65 MPH	1.8%	2.6%	1.9%	1.9%	2.5%	1.5%	3.6%
3:30 PM-7:30 PM							
Traffic Volume	3,401	4,033	4,337	4,696	4,342	5,898	4,884
85th Percentile	57.7	57.8	57.8	57.5	57.8	57.6	57.9
% Exceeding 65 MPH	0.8%	1.0%	1.0%	0.9%	1.0%	1.0%	2.6%

Table 25

Sante Fe Drive Vehicle Speed Data
(Colorado)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	2,782	3,098	4,683	3,188	3,295	3,082	2,921
85th Percentile	50.1	50.0	46.4	50.0	49.6	50.0	50.1
% Exceeding 55 MPH	3.9%	4.0%	2.3%	3.5%	3.3%	3.9%	4.6%
6:30 AM-10:00 AM							
Traffic Volume	1,434	4,609	3,034	4,582	-----	4,482	2,746
85th Percentile	51.1	46.3	46.2	46.1	-----	46.1	50.5
% Exceeding 55 MPH	7.5%	1.8%	1.8%	1.3%	-----	1.1%	5.1%
10:00 AM-3:30 PM							
Traffic Volume	2,742	4,762	4,968	4,759	4,700	5,586	4,916
85th Percentile	50.7	46.3	46.3	46.4	46.3	46.1	46.5
% Exceeding 55 MPH	6.1%	1.7%	1.6%	2.3%	1.7%	1.7%	2.8%
3:30 PM-7:30 PM							
Traffic Volume	2,382	3,833	3,852	4,115	4,290	7,739	2,941
85th Percentile	46.4	46.2	46.3	46.2	46.3	46.4	46.3
% Exceeding 55 MPH	2.0%	1.5%	1.6%	1.4%	1.5%	2.4%	1.8%

Table 26

Sheridan Boulevard Vehicle Speed Data
(Colorado)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	3,171	2,282	2,357	2,058	3,281	3,266	----
85th Percentile	39.6	40.5	40.8	40.9	40.7	40.7	----
% Exceeding 45 MPH	3.3%	4.6%	6.9%	6.0%	5.9%	6.1%	----
6:30 AM-10:00 AM							
Traffic Volume	932	2,116	2,783	2,401	2,016	2,830	1,244
85th Percentile	40.6	40.3	40.4	40.8	40.8	40.3	40.9
% Exceeding 45 MPH	5.5%	4.4%	4.3%	5.3%	6.9%	4.3%	5.2%
10:00 AM-3:30 PM							
Traffic Volume	3,126	3,204	2,786	3,818	3,715	----	2,185
85th Percentile	37.6	39.3	40.0	40.2	40.0	----	37.0
% Exceeding 45 MPH	2.9%	2.3%	3.9%	3.7%	3.2%	----	3.5%
3:30 PM-7:30 PM							
Traffic Volume	2,073	2,954	4,361	3,038	3,365	----	2,712
85th Percentile	39.2	39.1	39.7	40.2	40.1	----	37.0
% Exceeding 45 MPH	2.5%	1.6%	1.5%	1.5%	1.5%	----	2.3%

CHAPTER SIX
ANALYSIS OF MARYLAND SURVEY

CHARACTERISTICS OF RESPONDENTS

A total of 917 persons were interviewed at the Motor Vehicle Administration (MVA) headquarters in Glen Burnie, Maryland. After the interviews were completed, citation histories for the previous three years were obtained for all persons interviewed. There were 13 persons for whom no information could be found because of missing or incorrect driver's license on the questionnaire instrument. A total of 904 questionnaires and histories were thus available for analysis.

Groups of drivers were developed according to the number and type of violation convictions received during the three-year period prior to the survey. The group definitions (and sample sizes) were as follows:

Group 1--No minor and no major violations (412)

Group 2--One to three minor violations and no major violations (313)

Group 3--Four or more minor violations and no major violations (94)

Group 4--One major violation and possibly some minor violations (68)

Group 5--Two or more major violations and possibly some minor violations (17).

Table 27 lists the minor and major violations which were used in the development of these definitions. Minor violations are generally the offense types for which 1, 2, or 3 points may be assessed by the Maryland MVA while major offense types have 4 or more points associated with them.

Table 27

Classification of Traffic Offenses in Maryland

Major Offenses
• Driving While Ability was Impaired by Consumption of Alcohol or Drugs or a Combination of Alcohol and Drugs • Driving After Cancellation, Revocation, or Suspension of License • Failure to Stop After Accident • Fleeing in an Attempt to Avoid Arrest • Participating in a Speed Contest • Reckless Driving • Speeding in Excess of the Posted Speed Limit by 30 Miles Per Hour or More
Minor Offenses
• Failure to Grant Right of Way • Failure to Keep Right of Center • Failure to Obey Flashing Signal • Failure to Obey Traffic Device • Failure to Reduce Speed to Avoid Accident • Failure to Stop at Through Highway • Failure to Stop for School Bus • Following Another Vehicle Too Close • Improper Lane Changing • Improper Passing • Improper Turn • Negligent Driving • Speeding in Excess of the Posted Speed Limit by 10 Miles Per Hour or More • Stop Sign Violation • Wrong Way on a One Way Street

General Characteristics

Before presenting the results of the principal questions from the survey, some descriptive information will be given on the persons interviewed. The drivers were asked how many years they had been driving and approximately how many miles they drove each year. The results by group are given in Tables 28, and 29. Table 28 shows that, in general, drivers in Groups 3, 4, and 5 had been driving for fewer years than drivers in Groups 1 and 2. Groups 3, 4, and 5 had 41.5 percent, 32.4 percent, and 41.2 percent, respectively, of the respondents driving less than five years while Groups 1 and 2 had 8.7 percent and 9.9 percent respectively.

From Table 29, Group 1 shows 73.5 percent indicating less than 15,000 miles each year as compared to 54.7 percent for Group 2. Group 3 had 31.9 percent driving less than 15,000 miles each year while 55.3 percent indicated 20,000 miles or more in a year. Groups 4 and 5 were more evenly spread among the possible responses.

The following table shows the distribution by sex of the persons interviewed:

Sex of Respondents

	Group 1	Group 2	Group 3	Group 4	Group 5
Male	222 55.6%	235 75.1%	82 88.2%	63 92.6%	14 87.5%
Female	183 44.4%	78 24.9%	11 11.8%	5 7.4%	2 12.5%

The Group 1 percentages are representative of the general driving population in the state of Maryland. In the remaining groups there is a disproportionate number of males represented.

Table 30 summarizes the highest level of education for the persons interviewed. Groups 1 and 2 generally had attained higher

Table 28

Years of Driving Experience
(Maryland)

Group	Less Than 5 Years	5 to 9 Years	10-19 Years	20 Years or More
Group 1	36 (8.7%)	44 (10.7%)	126 (30.6%)	206 (50.0%)
Group 2	31 (9.9%)	81 (25.9%)	101 (32.3%)	100 (31.9%)
Group 3	39 (41.5%)	23 (24.5%)	26 (27.7%)	6 (6.4%)
Group 4	22 (32.4%)	15 (22.1%)	17 (25.0%)	14 (20.4%)
Group 5	7 (41.2%)	3 (17.6%)	6 (35.3%)	1 (5.9%)

Table 29

Miles Driven Per Year
(Maryland)

	Under 10,000 Miles	10,000-15,000 Miles	15,000-19,000 Miles	20,000 or More Miles
Group 1	206 (50.0%	97 (23.5%)	43 (10.4%)	66 (16.0%)
Group 2	96 (30.7%)	75 (24.0%)	62 (19.8%)	80 (25.6%)
Group 3	8 (8.5%)	22 (23.4%)	12 (12.8%)	52 (55.3%)
Group 4	17 (25.0%)	20 (29.4%)	11 (16.2%)	20 (29.4%)
Group 5	6 (35.3%)	5 (29.4%)	3 (17.6%)	3 (17.6%)

Table 30

Education of Respondents
(Maryland)

	Did not Complete Grade Sch.	Completed Grade School	Attended High School	Completed High School	Attended College	Completed College	Attended Graduate School	Completed Graduate School
Group 1	3 (0.7%)	18 (4.4%)	65 (15.8%)	131 (31.8%)	106 (25.7%)	47 (11.4%)	12 (2.9%)	30 (7.3%)
Group 2	8 (2.6%)	12 (3.8%)	40 (12.8%)	110 (35.3%)	76 (24.4%)	39 (12.5%)	8 (2.6%)	19 (6.1%)
Group 3	0 (0.0%)	2 (2.1%)	22 (23.4%)	32 (34.0%)	29 (30.9%)	7 (7.4%)	0 (0.0%)	2 (2.1%)
Group 4	1 (1.5%)	1 (1.5%)	22 (32.4%)	28 (41.2%)	12 (17.6%)	2 (2.9%)	1 (1.5%)	1 (1.5%)
Group 5	1 (6.3%)	2 (12.5%)	3 (18.8%)	3 (18.8%)	7 (43.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

levels of education than Groups 3, 4, and 5. With Groups 1 and 2, a college degree had been obtained by 21.6 percent and 21.2 percent of the drivers while with Groups 3, 4, and 5, a college degree was obtained by 9.5 percent, 5.9 percent, and 0.0 percent, respectively.

Violation History of Respondents

As with the Colorado survey, it is of interest to know the volume and types of violations which Groups 2, 3, 4, and 5 acquired over the three year period under study. The overall totals and averages for the groups are as follows:

	Sample Size	Total Number of Citations	Average Number of Citations
Group 2	313	430	1.37
Group 3	94	453	4.82
Group 4	68	185	2.72
Group 5	17	72	4.24
Total	492	1,140	2.32

The average number of citations are, of course, consistent with the definitions of the groups. Group 3, for example, is comprised of all respondents with 4 or more minor violations and therefore the Group 3 average is above that number at 4.82 violations per Group 3 respondent. Group 4 was defined as those respondents with 1 major violation. The Group 4 average of 2.72 violations means that the respondents in this group had 1 major violation and averaged 1.72 minor violations over the three-year period. The average for Group 5 respondents was 4.24 citations. Further analysis showed that respondents from this group averaged 2.35 major violations and 1.89 minor violations.

Table 31 provides the number of violations by type of offense for Groups 2, 3, 4, and 5 in Maryland. As expected, the categories for speeding violations account for a significant portion of the

Table 31

Violation History of Respondents
by Offense Type
(Maryland)

		Speeding Less Than 10 MPH	Speeding Greater Than 10 MPH	Running Red Light/Stop Sign	DWI	Other Offense
Group 2	N	93	152	66	-	64
	Citations	100	190	68	-	70
Group 3	N	61	88	46	-	56
	Citations	91	204	65	-	92
Group 4	N	20	37	16	36	41
	Citations	24	56	21	36	51
Group 5	N	6	6	2	12	14
	Citations	8	11	3	19	31
Total	N	180	283	130	48	175
	Citations	223	461	157	55	244

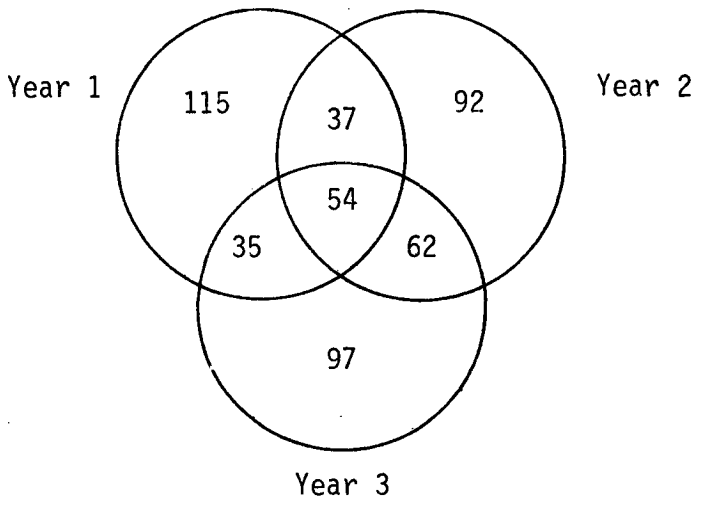
Table 32

Number of Violations by Year
(Maryland)

		Year 1 December 1976- November 1977	Year 2 December 1977- November 1978	Year 3 December 1978- November 1979
Group 2	N	145	123	106
	Citations	170	140	120
Group 3	N	55	79	86
	Citations	97	163	193
Group 4	N	28	33	48
	Citations	47	51	87
Group 5	N	13	10	8
	Citations	28	29	15
Total	N	241	245	248
	Citations	342	383	415

total. With Group 2, 68 percent of the total violations were for speeding. Sixteen percent were for running red light or stop sign and 16 percent were for other offenses such as following too closely, turning into traffic, and careless driving. Group 3 follows roughly the same distribution by type of offense as Group 2. The definition of Groups 4 and 5 with major violations causes these groups to have a different distribution. The DWI category accounts for 19 percent and 23 percent of the totals, respectively, for these groups.

Table 32 shows the number of offenses by year for the three-year period for the Maryland respondents. The years are defined in twelve-month increments prior to the survey: Year 1 is December 1976-November 1977; Year 2 is December 1977-November 1978; and Year 3 is December 1978-November 1979. Thirty percent of the citations occurred during Year 1; 33.6 percent during Year 2; and 36.4 percent during Year 3. These figures reflect an increase in the number of citations over the three-year period. Of course, some respondents received citations during each of these years and other respondents only in one or two of the years. These combinations can be illustrated in a Venn diagram with three overlapping circles for the years:



The 54 respondents in the middle are the respondents who had at least one violation in each of the three years. Similarly, there were 115 respondents who had a violation only during Year 1; 92 only during Year 2; and 97 only during Year 3.

SURVEY RESPONSES

In the following sections, an analysis is provided on the results of the survey given to the 904 respondents. The analysis includes the averages of the responses to the questions along with appropriate statistics for testing group differences.

Responses to Questions on Violation Detection and Conviction

Two questions on the interview instrument asked about the perceptions of the respondents in regard to the chances of being caught by the police for certain offenses and of being found guilty at a court appearance for the offenses. Question 4 was phrased as follows:

4. Following are a number of traffic violations. For every 100 drivers who commit these acts, how many, in your opinion, will be caught by the police in this county? You may assume no accidents are involved.
   a. Speeding 10 miles per hour over the posted speed limit
   b. Speeding 20 miles per hour over the posted speed limit
   c. Driving while intoxicated (drunk driving)
   d. Running a traffic light or stop sign
   e. Following a moving car too closely
   f. Turning left in front of oncoming traffic or pulling out into traffic (like at an intersection or on a freeway)
   g. Crossing the center line of the road.

The aim of the question was to determine how drivers in the county perceive the police traffic law enforcement activities.

Question 5 was phrased to elicit similar perceptions on the courts in the county for the same list of seven violations:

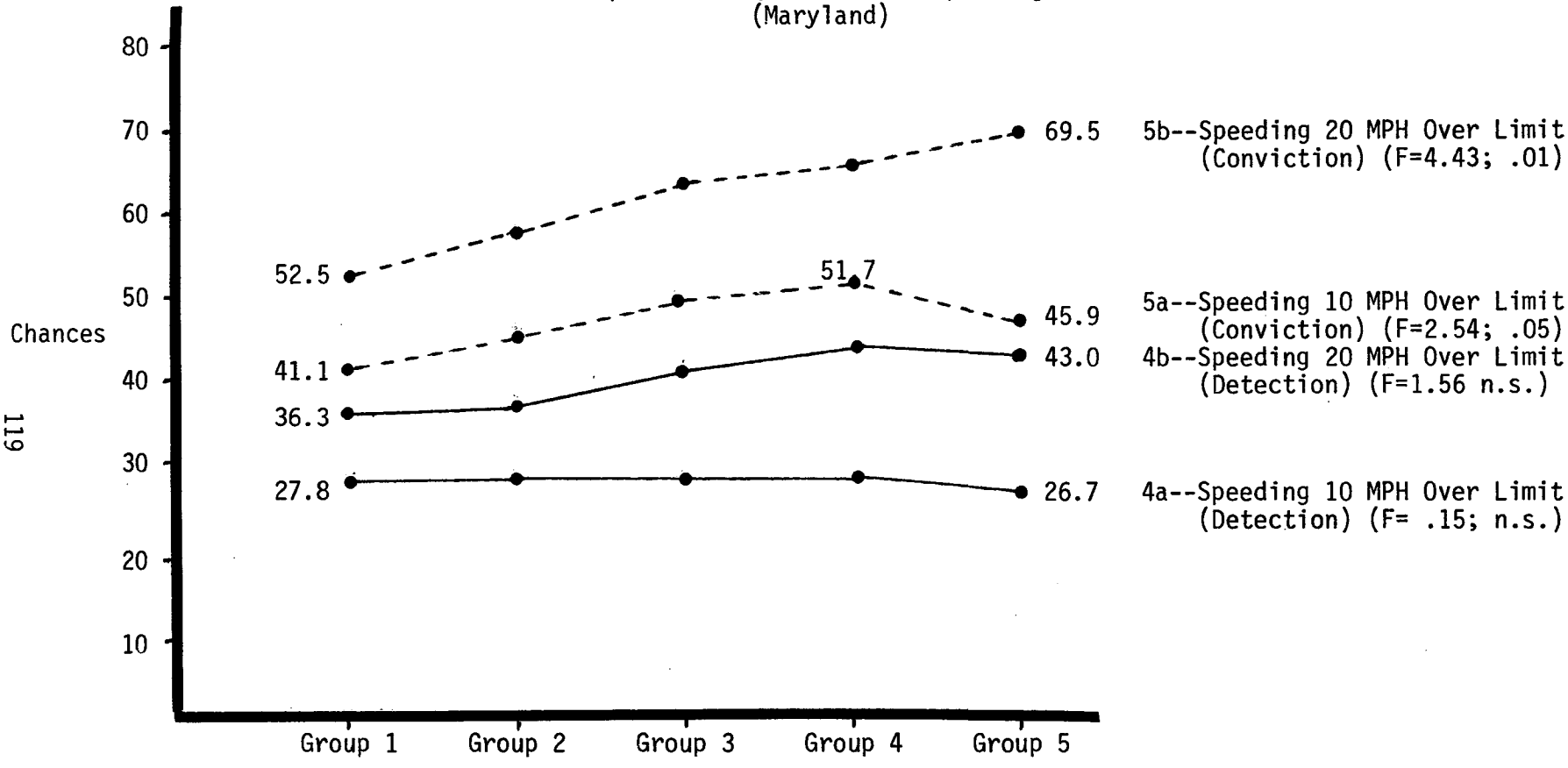
> 5. In this County, once a person has been caught by police and given a ticket for most of these violations, he can usually pay or mail in the fine or he can challenge the ticket in court. For every 100 drivers who are ticketed and arrested, and choose to take it to court, how many, in your opinion, will be found guilty of committing the violation? Again, you may assume that no accidents are involved?

ANALYSIS OF QUESTIONS ON SPEEDING

Figure 8 illustrates the responses given on the two violations of Speeding 10 Miles Per Hour Over the Posted Speed Limit and 20 Miles Over the Posted Speed Limit. Each line in the graph gives the averages by group for the particular violation. For example, with Question 4a, Group 1 respondents reflected an average of 27.8 percent of drivers being caught for driving 10 miles per hour over the limit and Group 5 responded with an average of 26.7 percent. The line of average responses to Question 4a is flat with virtually no differences among the averages. An F-test was calculated to determine whether the averages were significantly different. As shown in Figure 8, the F-ratio is .15 for Question 4a which is clearly not large enough to be significant. In regard to court actions for speeding 10 MPH over the limit, the average responses are higher. Group 1 responded that 41.1 percent of the drivers who challenge the violation in court will be found guilty. The line for Question 5a rises to a high of 51.7 percent for Group 4 and then falls to 45.9 percent for Group 5. The F-ratio of 2.54

Figure 8

Responses to Questions on Speeding
(Maryland)



Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4a	904	28.3	0% (27) to 100% (10)
4b	904	37.2	0% (5) to 100% (13)
5a	904	44.2	0% (38) to 100% (40)
5b	904	56.4	0% (7) to 100% (102)

is significant at the .05 level indicating a difference between the groups' responses to Question 5a.

The ranges of responses shown at the bottom of Figure 8 are also of interest. With Question 4a, there were 27 respondents who stated that none of the violators speeding 10 MPH over the limit would be caught and at the other extreme there were 10 respondents who stated that all violators would be caught. With Question 5a, there were 30 responses stating that the court would not find anyone guilty and there were 40 responses that all violators would be found guilty. Some of the extreme perceptions, e.g., zero chance of detection for a 10 MPH and 100 percent chance of conviction for a 20 MPH violation, may be correct in some enforcement and adjudication environments. However, the 100 percent detection estimates and zero court conviction rate estimates are unrealistic.

Question 4b asked about the chances of being caught by the police for driving 20 MPH over the limit. With this question, Groups 1 and 2 have virtually the same average response of 36.3 percent followed by a slightly higher response for Group 3 and again slightly higher for Groups 4 and 5. Even though there is a rise in the averages, the differences are not great enough to be statistically significant; the F-ratio is 1.56 which is not significant at the .05 level.

On Question 5b on court actions for speeding 20 MPH over the limit, Figure 8 shows a steady increase for the groups. Group 1 respondents showed an average of 52.5 percent and the averages rise steadily to 69.5 percent for Group 5. There is a significant difference between groups; the calculated F-ratio is 4.43 which is significant at the .01 level.

The table at the bottom of the figure shows the range of responses to the questions of speeding more than 20 MPH over the

limit. Five respondents stated that no violator would be caught by the police when speeding 20 MPH over the limit while 13 respondents stated that all such violators would be caught by the police. For Question 5b, seven respondents stated that the courts would not find anyone challenging the citation guilty of the violation while 102 respondents stated that the courts would find all such persons guilty. When examined by group, these 102 respondents were as follows:

Group 1--41 (10.0 percent of respondents)
Group 2--31 (9.9 percent of respondents)
Group 3--12 (12.8 percent of respondents)
Group 4--12 (17.6 percent of respondents)
Group 5-- 6 (35.3 percent of respondents)

It should be noted that the percentages increase from Group 1 to Group 5. In terms of these percentages, the drivers with more citations and court experiences tend to have more extreme views on court convictions.

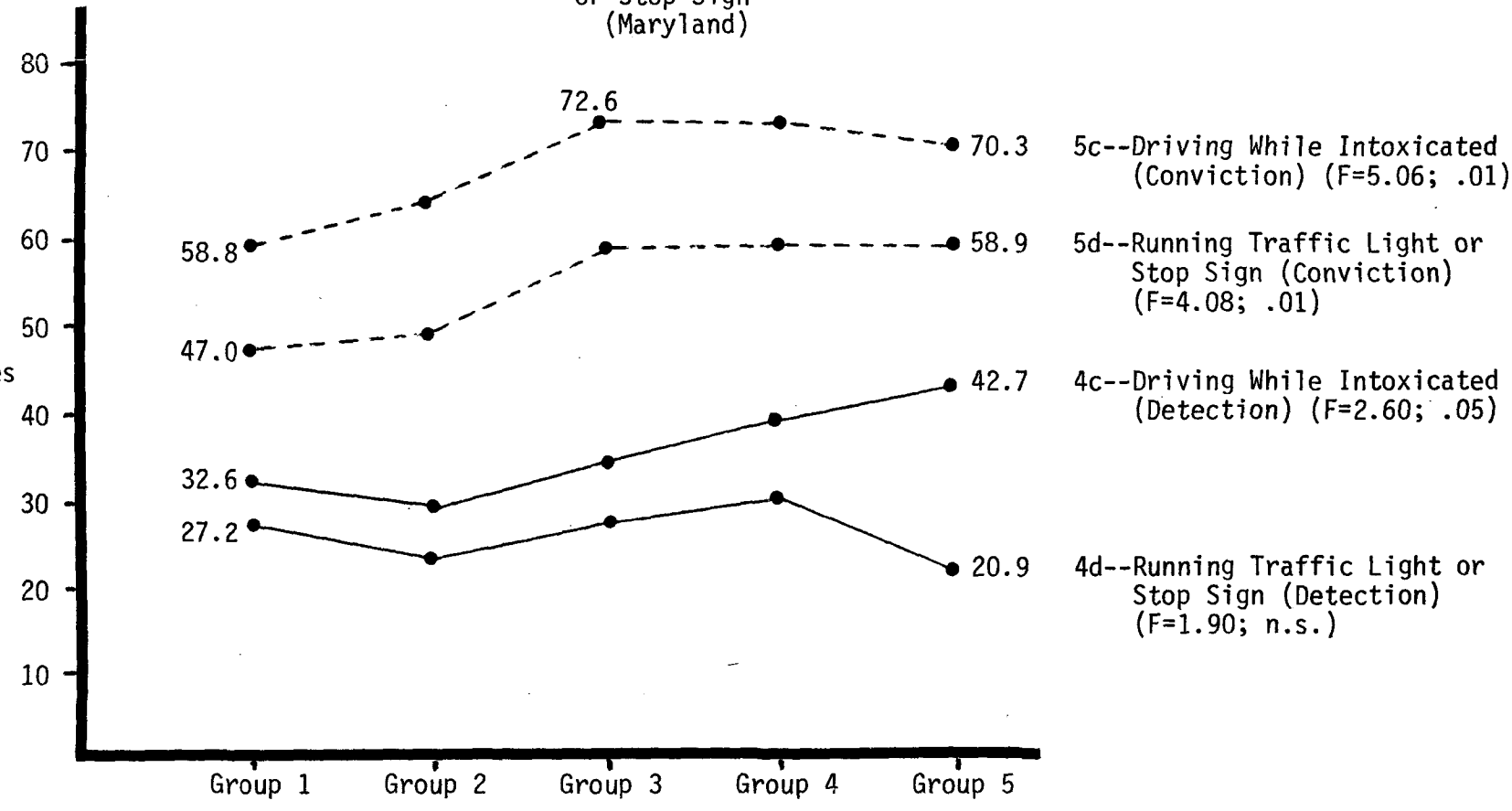
Analysis of Questions on Driving While Intoxicated and Running a Traffic Light or Stop Sign

In Figure 9, the results for the offenses of Driving While Intoxicated (DWI) and Running a Traffic Light or Stop Sign have been displayed. With the DWI offense (Question 4c), Group 1 believed that 32.6 percent of the violators would be caught by the police, Group 2 had a slightly lower average and then an increase occurs in the group averages to 42.7 percent for Group 5. There is a statistically significant difference in these averages as indicated by the calculated F-test value of 2.6. It is also of interest that these averages are between the averages for the questions on speeding.

With regard to court actions on DWI (Question 5c), there are differences between Groups 1 and 2 versus Groups 3, 4, and 5.

Figure 9

Responses to Questions on DWI and Running Traffic Light Or Stop Sign (Maryland)



Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4c	904	32.4	0% (7) to 100% (11)
4d	899	26.3	0% (14) to 100% (6)
5c	903	63.0	0% (7) to 100% (173)
5d	903	50.0	0% (14) to 100% (85)

Group 1 had an average of 58.8 percent with a rise to 63.3 percent for Group 2. Group 3 is highest with 72.6 percent followed by 72.0 percent for Group 4, and 70.3 percent for Group 5. The latter three groups have had more experience with the courts and tended to respond higher than the other two groups. It should also be noted that all five group averages are higher than their counterparts for the speeding offenses.

As with the speeding questions, the respondents gave ranges of values from 0 to 100 percent. On Question 4c, there were 7 responses of zero percent and 11 responses of 100 percent. With Question 5c, there were 7 responses of zero percent and 173 responses of 100 percent. The 173 responses were distributed as follows:

Group 1--58 (14.1 percent of respondents)
Group 2--58 (18.6 percent of respondents)
Group 3--33 (35.4 percent of respondents)
Group 4--20 (29.4 percent of respondents)
Group 5-- 4 (23.5 percent of respondents)

With regard to the Running a Traffic Light/Stop Sign offense, the responses to Question 4d are mixed as shown in Figure 9. Group 1 had an average of 27.2 percent, Group 2 had a lower average followed by a rise to Group 4 and then a drop to 20.9 percent for Group 5. There is no significant difference between averages at the .05 level as reflected in the F-ratio value of 1.9. It should also be noted that these averages are below those for speeding 10 MPH over the limit.

On the court action question, Group 1 had an average of 47.0 percent and Group 2 was only slightly higher. Groups 3, 4, and 5 have very close averages around 58.9 percent. The averages among all groups are significantly different as reflected by the F-ratio of 4.08. It is also of interest that the first two groups have much lower averages than the other three groups. It is this difference which causes the averages to be significantly different.

The range of values was again from 0 to 100 percent. With Question 4d, there were 14 responses of zero percent and 6 responses of 100 percent. With Question 5d, there were 14 responses of zero percent and 85 responses of 100 percent.

Analysis With Median Values

As was the case in analyzing data from the survey in Colorado, the median values of each respondent group were examined to determine whether any different conclusions result than were obtained from the analysis with averages. This is done because of the number of extreme values and their potential impact on the sample averages. Extreme values can have an effect of making the sample means unrepresentative of the sample. Indeed, this section will show that this situation does occasionally occur with the responses. However, the overall conclusions on the trends of the responses remain the same whether the sample averages or sample medians serve as the basis.

Table 33 gives the medians for Questions 4a through 4d and 5a through 5d. The median is defined as the value at which 50 percent of the responses are below the value and 50 percent above the value. It is the midpoint of the data values. The results for Question 4a illustrate the differences between the sample mean and median. Table 33 shows that each group had a median of 20 percent. That is, half the respondents gave responses of 20 percent or below and half gave responses of 20 percent or more. It is noteworthy that the medians do not change among the groups so that there is obviously no reason to believe that differences among groups exist in regard to the perceptions of being caught by the police for speeding 10 MPH over the speed limit. Figure 8 showed that the averages for Question 4a were very close around 27 percent and that there was

Table 33

Medians for Questions 4 and 5

Question	Group 1	Group 2	Group 3	Group 4	Group 5
4a	20	20	20	20	20
4b	30	30	40	40	45
4c	25	20	25	35	40
4d	20	20	20	20	10
5a	35	50	50	50	50
5b	50	60	75	75	80
5c	70	75	90	90	75
5d	50	50	75	70	60

no significant difference among the averages. The results are therefore the same whether the sample averages or medians serve as the basis.

With Question 4b, regarding detection of speeding 20 MPH over the limit, the medians increase from 30 percent in Groups 1 and 2 to 45 percent for Group 5. With this question, there is a considerable increase in the medians which was not reflected in the averages.

With Question 4c (DWI detection) and 4d (traffic light/stop sign detection), the analysis of the medians gives the same conclusions as the averages in Figure 9. With both questions, the median values are below the averages. For Question 4c, the medians range from 20 percent with Group 2 to 40 percent with Group 5. For Question 4d, the first four groups have a median of 20 percent and the fifth group a median of 10 percent. The conclusion is that there are group differences with Question 4c but not with Question 4d.

The bottom portion of Table 33 shows the median values by group for Question 5 (convictions). The medians generally support the conclusions from Figures 8 and 9. With Question 5a, Group 1 has a median of 35 percent while the other four groups have a median of 50 percent. Group 1 is the largest group and it can therefore be argued that the Group 1 responses are different from the other groups. In Figure 8, there was also a significant difference among the averages due in large part to a lower average value for Group 1

With Questions 5b, 5c, and 5d, the medians show the same pattern as in Figures 8 and 9. The conclusions remain that the responses to Question 5b show an increase going from a median to 50 percent for Group 1 to 80 percent for Group 5. With Question 5c, the medians are 70 and 75 percent for the first two groups increasing to 90 percent for Groups 3 and 4 and 85 percent in Group 5. As with the averages in Figure 9, the first two groups have medians which are less than the other groups. The same pattern holds for the medians for Question 5d. The median is 50 percent for the first two groups and then changes to 75 percent, 70 percent, and 60 percent for the last three groups, respectively. The averages in Figure 9 are significantly different and this is reflected in the medians.

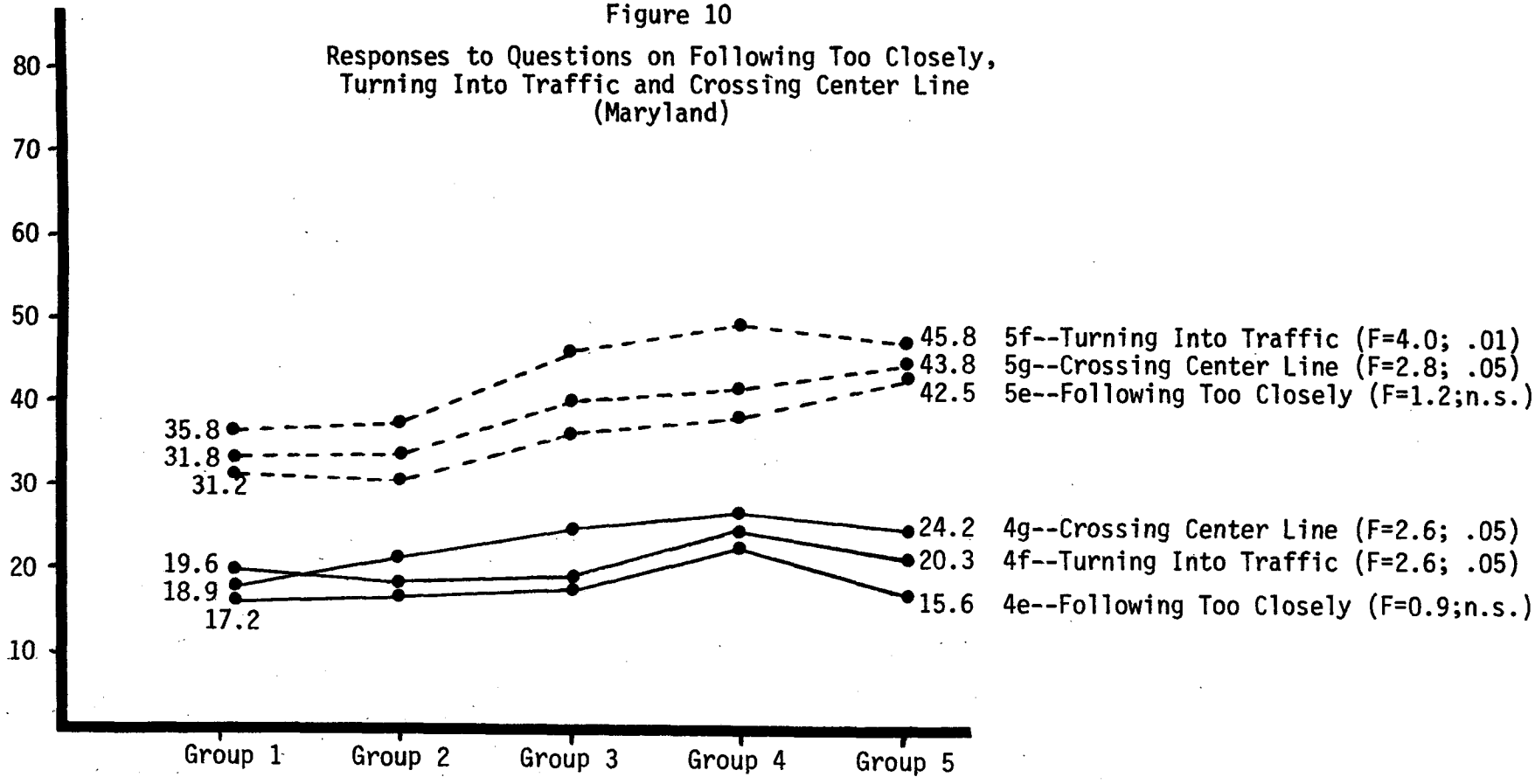
In summary, an analysis with medians rather than averages leads to the same conclusions on similarities and differences among groups. The medians have different values than the averages and enhance the understanding of the data.

Analysis of Questions on Following Too Closely, Turning Into Traffic, and Crossing the Center Line

Figure 10 shows the responses for the violations of Following Too Closely, Turning Into Traffic, and Crossing the Center Line.

Figure 10

Responses to Questions on Following Too Closely, Turning Into Traffic and Crossing Center Line (Maryland)



Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4e	901	18.7	0% (133) to 100% (9)
4f	904	20.6	0% (57) to 100% (4)
4g	904	17.6	0% (98) to 100% (7)
5e	902	32.8	0% (98) to 100% (37)
5f	904	38.4	0% (45) to 100% (63)
5g	904	33.5	0% (78) to 100% (46)

In general, these responses follow the same trends as the violation of Running a Traffic Light or Stop Sign. With the violation of Following Too Closely, the averages for Question 4e are very close for Groups 1, 2, and 3 at 17.2 percent. Group 4 is higher at 22.1 percent followed by Group 5 at 15.6 percent. The F-ratio of .86 is not significant. With Question 5e, there is again no difference between group average even though there is a steady rise in the averages. Groups 1 and 2 have very close averages around 31.2 percent followed by an increase to 42.5 percent for Group 5. Group 5 was the smallest group of respondents and therefore did not carry as much weight in the F-ratio calculation. The other four groups do not differ enough to cause a significant F-ratio.

With Question 4f on Turning Into Traffic, Group 1 is lowest with an average of 18.9 percent followed by increases to 24.8 percent for Group 4. There is then a decrease to 20.3 percent for Group 5. With Question 5f, the pattern is that Groups 1 and 2 have very close averages around 36.0 percent while Groups 3, 4, and 5 are higher with averages around 46.0 percent. The F-ratio is statistically significant at the .05 level.

With Question 4g on Crossing the Center Line, Groups 1, 2, and 3 have very close averages around 17.2 percent followed by an increase to 24.2 percent for Groups 4 and 5. The F-ratio value of 2.6 is significant at the .05 level. With Question 5g, Groups 1 and 2 have close averages around 31.8 percent while Groups 3, 4, and 5 have averages around 41.0 percent. The F-ratio of 2.8 is significant at the .05 level.

The ranges of values for these questions are shown at the bottom of Figure 10. These are of interest because of the number of responses at the extreme values. With Questions 4e, 4f, and 4g, there were relatively high numbers of respondents who gave

answers of zero percent (133 zero responses to 4d; 57 to 4f; and 98 to 4g). These zero responses were not concentrated in any particular group but were instead spread among the groups.

Comparisons With Violation History

Appearances and Court Conviction Perceptions

Up to this point, the analysis has concentrated on comparisons of different groups of violators. With regard to the perceptions of being found guilty in court, there have been several offense types for which there were differences between Groups 1 and 2 versus Groups 3, 4, and 5. As another approach to the analysis, it may be of benefit to consider respondents with court appearances as compared to respondents without court appearances. With this analysis, Group 1 respondents do not have any violations or court appearances but can still serve as a comparison group. At the other extreme, virtually all Group 4 and Group 5 respondents have had court appearances since their violations were major in nature. Their perceptions as reflected in the survey results have therefore been based on both their detection and adjudication experiences. With Groups 2 and 3, the respondents have some mandatory appearances but they also have appeared in court to challenge the citation which was issued. With all the groups, the court experience can be expected to affect only their perceptions of court actions rather than their perceptions of detection by the police.

Table 34 shows the response averages for Question 5 with Groups 2 and 3 split into Court/No Court Appearance categories. The averages for the "Court Appearance" columns were calculated from those respondents who had at least one court appearance for a citation during the three-year period under study. The averages

Table 34

Court Appearances and Court Conviction Perceptions
(Maryland)

Question	Group 1	Group 2		Group 3		Group 4	Group 5
		No Court Appearance	Court Appearance	No Court Appearance	Court Appearance		
5a	41.1	44.2	46.0	47.6	50.2	51.7	45.9
5b	52.5	58.4	54.7	59.9	64.3	65.3	69.5
5c	58.8	64.8	60.2	67.8	74.3	72.0	70.3
5d	47.0	51.7	44.5	50.2	61.3	59.3	58.9
5e	31.2	32.4	33.0	28.3	37.7	37.0	42.5
5f	35.8	37.2	36.9	44.5	46.5	48.1	45.8
5g	31.8	32.1	31.2	37.0	40.0	41.3	43.8

for the "No Court Appearance" columns were calculated from those respondents who decided to pay the fine and not challenge the citation in court. In Group 2, there were 196 persons without a court appearance and 117 persons with a court appearance, while in Group 3 there were 25 persons without a court appearance and 69 with a court appearance.

The averages in the table support the previous analysis. Of particular note is that with Group 3, the Court Appearance averages are higher than the No Court Appearances for every offense category. In fact, the Court Appearance averages for Group 3 are generally in line with the averages for Groups 4 and 5. It is for this reason that these three groups have had similar averages in the previous figures. With Group 2, the averages in the two categories are usually close and in most cases, the No Court Appearance average is higher than the Court Appearance category.

In summary, in Maryland, it appears that court appearances have the result of generally raising the perceptions of being found guilty. Both occasional court appearances, as in Group 3, and more frequent court appearances, as in Groups 4 and 5, have the effect of increasing the perceptions of being found guilty.

Time of Citations and Perceptions

As with the Colorado survey, there was interest in whether time had an effect on the response on the chances of detection. It was hypothesized that persons who had recently received a citation would have higher responses than persons whose citations occurred at an earlier time. One way of analyzing this effect is to consider "single year" offenders. These are defined as respondents who had received a citation during one of the three years but not the other two. From the Venn diagram presented earlier, it is possible to make the following definitions:

Group A: Respondents who received citations in Year 1 (December 1976-November 1977) but not during Years 2 or 3 (N=115).

Group B: Respondents who received citations in Year 2 (December 1977-November 1978) but not during Years 1 or 3 (N=92).

Group C: Respondents who received citations in Year 3 (December 1978-November 1979) but not during Years 1 or 2 (N=97).

These groups can be compared with Group 1 for Question 4 on detection as shown in the following figures:

Table 35

Relationships of Perceptions to Time

Question	Group A	Group B	Group C	Group 1
4a	31.1	29.7	23.7	27.8
4b	38.6	36.9	34.7	36.3
4c	31.5	30.5	31.5	32.6
4d	24.7	26.2	24.4	27.1
4e	15.8	19.7	18.7	19.6
4f	23.9*	18.6	23.6	28.9
4g	18.1	16.5	18.6	17.2

The asterisk means that the average is significantly higher than the Group 1 average. As shown, there is only one such average. Further, most of the averages in Groups A, B, and C are lower than the Group 1 which could be interpreted as saying that the citation had no effect on the driver's perceptions of being caught by the police. Also, there is no linear trend from Group A to Group B to Group C. In summary, there is no evidence from this approach that suggests a deterrent effect over time.

ANALYSIS OF ESTIMATED FINES AND SANCTION SEVERITY

Analysis of Estimated Fines

The aim of Question 6 was to determine the extent of the respondents' knowledge regarding the fines in the county for the seven violations. The question was phrased as follows:

> 6. For each of the same violations we've been talking about, I'd like to get your idea of what the fine in this County would be if the person had a clear driving record. If you're not sure, just give me your best guess. You may assume no accident is involved.

Note that the question asks for the respondent's estimate for the first offense (clear driving record) and with no accident involvements. The correct answers to the question are as follows:

Offense	Fine
6a -- Speeding 10 MPH Over Limit	$ 40.00
6b -- Speeding 20 MPH Over Limit	50.00
6c -- Driving While Intoxicated	125.00 plus a possible suspension of 30 days
6d -- Running a Traffic Light or Stop Sign	20.00
6e -- Following Too Closely	30.00
6f -- Turning In Front of Traffic	30.00
6g -- Crossing the Center Line	30.00

Except for DWI, these fines are exactly as given in the fine schedule for Maryland. DWI is different since it mandates a court appearance and the fine is determined at the hearing. As part of Question 6c, the respondent was also asked what other penalty there might be for a DWI first offense.

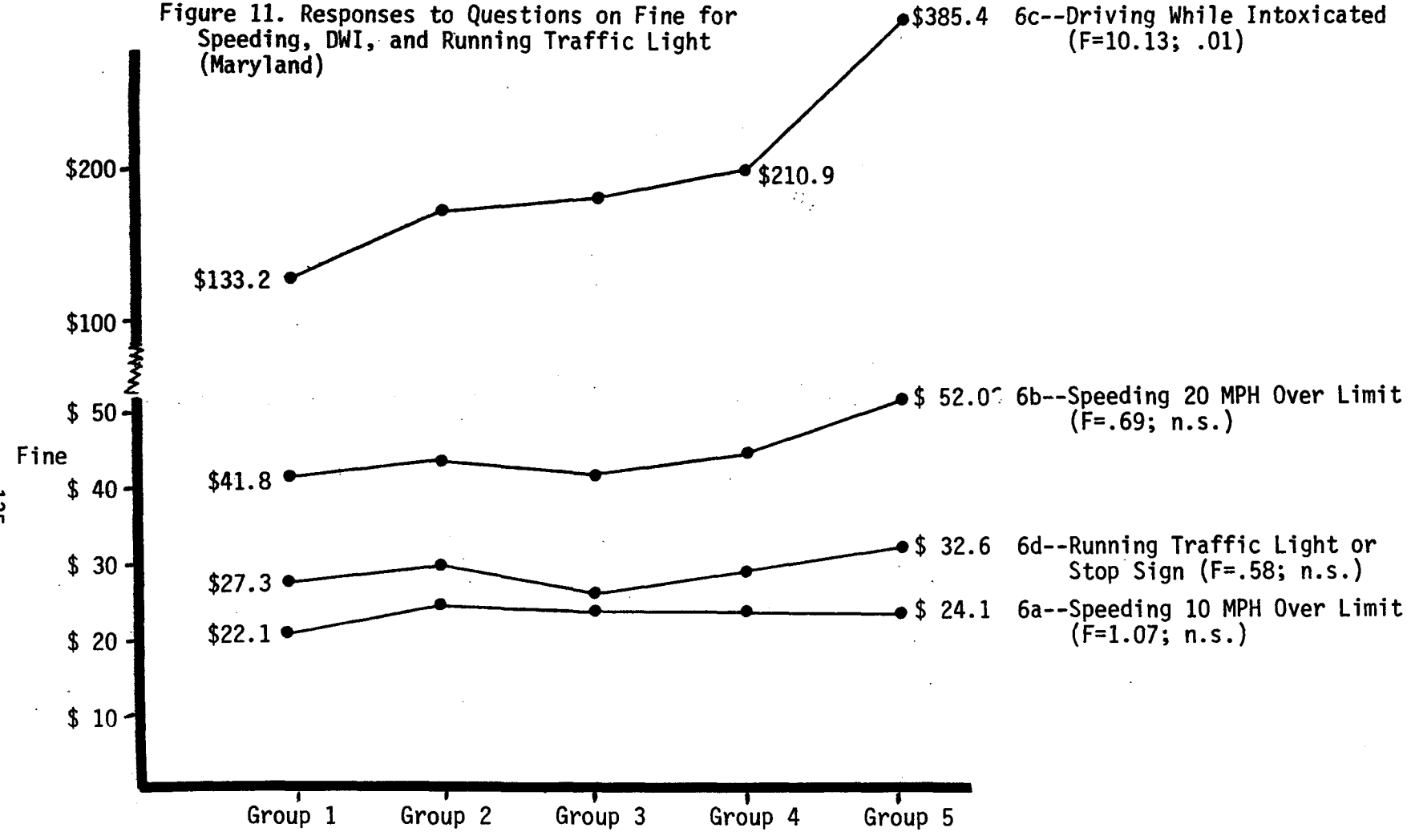
The Maryland law on DWI states that on the first conviction the criminal penalty can be up to one year and/or a fine of not more than $1,000. In addition, an administrative action can be taken to revoke the person's driving license for not less than 60 days. Discussions with court personnel in the District Court having jurisdiction in Anne Arundel County indicated that $125 was the average fine actually given for the first offense of DWI and that jail and license revocations were seldom invoked for the first offense.

Figures 11 and 12 show the analysis of responses to Question 6. With some exceptions, the group averages are lower than the actual fines for the two speeding offenses, Following Too Closely, Turning Into Traffic, and Crossing the Center Line. The group averages are higher than the actual fines for DWI and Running a Traffic Light or Stop Sign.

For the violation of Speeding 10 MPH Over the Limit, the group averages are very close, ranging between $22 and $24. The F-ratio of 1.07 is not significant. The same result is true with the violation of Speeding 20 MPH Over the Limit. The Group 5 average of $52 is slightly higher than the actual fine but otherwise the group averages are about $42 which is lower than the actual fine.

The group averages for DWI are the most interesting because they are all higher than the actual average fine and show an increase with the groups. The high average of $385 for Group 5 is the main reason for the F-ratio being significant. Of the 17 Group 5 respondents, two gave estimates between $500-$600 and four gave estimates of $1,000 or more. These estimates are not completely unreasonable for Group 5, given their history and the exact wording of the law but they do not reflect actual court practice.

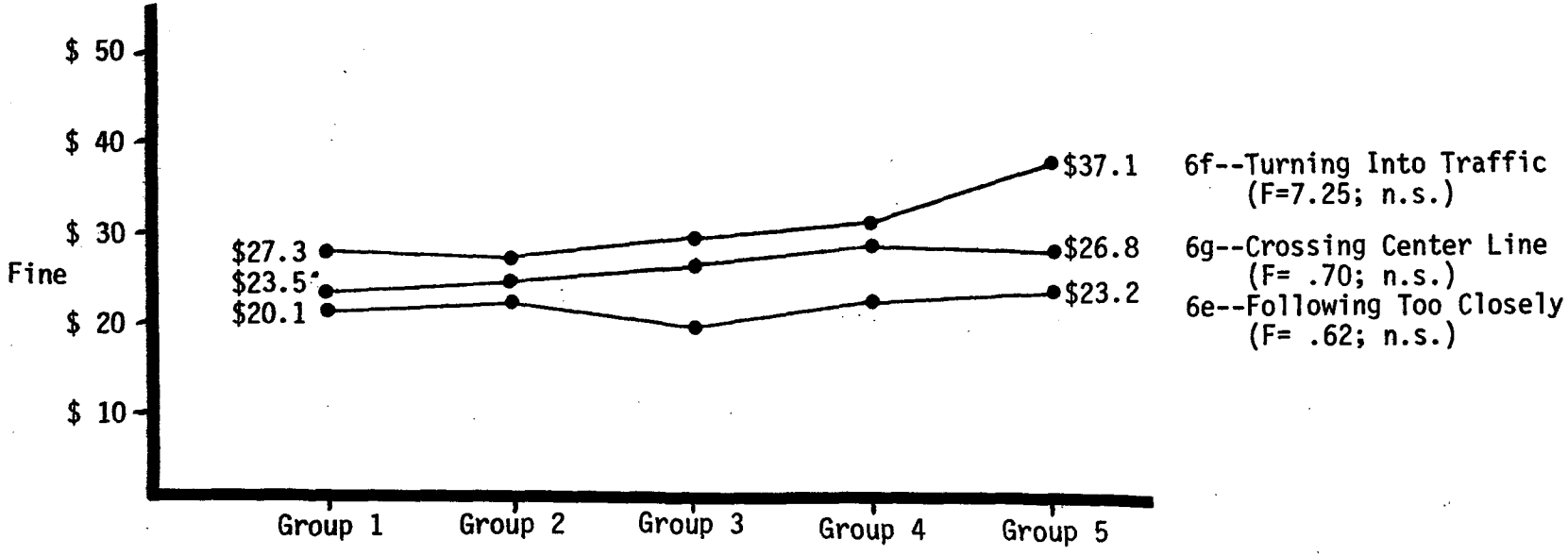
Figure 11. Responses to Questions on Fine for Speeding, DWI, and Running Traffic Light (Maryland)



Overall Statistics				
Question	Responses	Average	Range of Responses Dollars (Number)	Correct Answer
6a	900	$ 23.41	$0 (13) to $ 300 (2)	$ 40.00
6b	902	$ 43.01	$0 (9) to $ 500 (1)	$ 50.00
6c	876	$166.75	$0 (13) to $1000 (27)	$125.00
6d	897	$ 28.39	$0 (19) to $ 500 (1)	$ 20.00

Figure 12

Responses to Questions on Fine for Following Too Closely, Turning Into Traffic and Crossing Center Line (Maryland)



Overall Statistics				
Question	Number of Responses	Average	Range of Responses Dollars (Number)	Correct Answer
6e	895	$ 20.67	$0 (64) to $ 252 (1)	$30.00
6f	894	$ 27.56	$0 (36) to $ 200 (3)	$30.00
6g	890	$ 24.54	$0 (49) to $ 300 (1)	$30.00

The following table gives the median values for the fine estimates for each group and for each of the selected violations:

Table 36

Median Values for Question 6

Question	Group 1	Group 2	Group 3	Group 4	Group 5	Correct Value
6a	20	20	20	20	20	40
6b	40	40	40	40	50	50
6c	125	125	125	125	225	125
6d	25	25	25	25	25	20
6e	20	20	20	15	20	30
6f	25	25	25	25	35	30
6g	20	20	20	20	25	30

These values generally support the averages previously given. In the case of DWI, the first four groups have a median equal to the general practice in the county while the Group 5 is once again much higher.

As previously mentioned, the second part of Question 6c asked what other penalties might be associated with DWI. A total of 653 persons gave responses to this part of the question and these are summarized in Table 37. The majority of the responses are in the revocation category (64.6 percent) and points-on-record category (15.3 percent). These results are consistent across groups.

The actual fine for Running a Traffic Light or Stop Sign is $20 in Maryland. The group responses are higher than $20 for Group 1 with an average of $27 and Group 5 with an average of $33. The F-ratio is not significant.

Figure 12 shows the averages for the remaining three violations. Because of outlier values, some adjustments were necessary for the averages shown for Turning Into Traffic and Crossing the

Table 37

Other Penalty Responses for DWI
(Maryland)

	Loss/Revoked License	Points on Record	Jail/ Prison	Rehabilitation Driver School	Probation	Warning	Total
Group 1	195 (65.0%)	47 (15.7%)	23 (7.7%)	17 (5.7%)	2 (.7%)	16 (5.3%)	300
Group 2	150 (68.2%)	35 (15.9%)	20 (9.1%)	9 (4.1%)	1 (.5%)	5 (2.3%)	220
Group 3	40 (58.0%)	8 (11.6%)	8 (11.6%)	7 (10.1%)	0 (0.0%)	6 (8.7%)	69
Group 4	32 (66.7%)	7 (14.6%)	5 (10.4%)	3 (6.3%)	0 (0.0%)	1 (2.1%)	48
Group 5	5 (31.3%)	3 (18.8%)	5 (31.3%)	3 (18.8%)	0 (0.0%)	0 (0.0%)	16
Overall	422 (64.6%)	100 (15.3%)	61 (9.3%)	39 (6.0%)	3 (.5%)	28 (4.3%)	653

Center Line. Four respondents gave answers of more than $500 which had the effect of exploding the average for Group 4. These four responses were eliminated in deriving the averages shown in Figure 12. With each violation in Figure 12, the actual fine is $30 and the only group average which exceeds this amount is Group 5 for Turning Into Traffic. The Group 3 and Group 4 averages are close to $30 for the Turning Into Traffic violation. Otherwise, the averages in the figure for all fines and groups are lower than the actual fine. With the Following Too Closely violation, the averages are around $22 and with the Crossing Center Line violation, the averages are around $27. None of the F-ratios are significant at the .05 level.

Analysis of Sanction Severity

Two questions were designed to measure the respondents' beliefs on the severity of traffic sanctions. Question 7 asked the respondent to rate the severity of the fine the respondent had given in Question 6. Question 7 was phrased as follows:

> 7. In this question, the interviewer has written in what you thought the fine would be for each of the violations stated in Question 6. Now, please circle the number of the scale below which most accurately reflects your feelings on how severe the fine is as you stated it.

Each of the seven offenses was then listed along with the respondent's answer from Question 6. The respondent then rated the severity of the fine on a five-point Likert scale from 1 (not at all severe) to 5 (extremely severe).

In Question 8, the respondent is shown what the actual fine is and is then asked to rate the severity of the fine on the same five-point scale. Question 8 was phrased as follows:

8. For these same offenses we are listing below the actual fine in Anne Arundel County for a person who has been given a ticket and merely wishes to pay the standard fine through the mail. In the case of driving while intoxicated, the penalty given is about what is usually given when the driver is found guilty of a first offense after being arrested and going to court. Please indicate how severe you feel each penalty is, considering the standard fine in relation to the seriousness of the offense. Please circle one number for each offense to indicate where you think the penalty falls on the scale of severity.

The seven offenses were then listed along with the fine information.

Table 38 shows the average severity data for each of the seven violations. With Question 7, the averages are almost always between 2.5 and 3.0, reflecting a response of moderate severity. The responses to Question 8 are in almost exact correlation with the responses to Question 6 on the fine estimate. For example, with Speeding 10 MPH over the limit, the group responses in Question 6a were considerably below the actual fine. The respondents reacted to the knowledge of the actual fine being higher by rating it more severe than their own estimate. The group averages for Question 8a are all higher than Question 7a and the calculated t-value for the differences are all significant at the .01 level. The same result holds for the Following Too Closely violation with Groups 1, 2, 3, and 4. Each group was $8 to $11 lower on average than the actual fine and therefore rated the severity of the actual fine higher. All four t-values are significant at the .01 level. The Group 5 average was slightly higher than the other groups and closer to the actual fine. The average responses for Question 7e and 8e are much closer and not significantly different. With the Crossing Center Line violation, the same analysis holds for Groups 1, 2, and 3 which show significantly different average

Table 38

Sanction Severity Averages
(Maryland)

	Speeding 10 MPH Over Limit				Speeding 20 MPH Over Limit		
	7a	8a	t-value		7b	8b	t-value
Group 1	2.3	3.2	-13.7**	Group 1	2.6	2.8	- 2.8**
Group 2	2.6	3.4	-11.3**	Group 2	2.9	3.0	- 1.0
Group 3	2.6	3.5	- 6.8**	Group 3	2.7	3.1	- 2.8**
Group 4	2.6	3.3	- 4.7**	Group 4	2.9	2.9	.4
Group 5	2.1	3.2	- 4.2**	Group 5	2.2	2.5	- 1.0

	Driving While Intoxicated				Running a Traffic Light or Stop Sign		
	7c	8c	t-value		7d	8d	t-value
Group 1	2.7	2.4	4.3**	Group 1	2.5	2.4	1.7
Group 2	2.8	2.3	6.6**	Group 2	2.7	2.5	3.4**
Group 3	2.9	2.5	2.7**	Group 3	2.7	2.6	.9
Group 4	3.2	2.6	3.8**	Group 4	2.8	2.4	1.9
Group 5	3.1	2.1	2.5**	Group 5	2.3	1.6	2.0

	Following Too Close				Turning Into Traffic		
	7e	8e	t-value		7f	8f	t-value
Group 1	2.3	2.7	- 6.6**	Group 1	2.4	2.6	- 2.3*
Group 2	2.5	2.9	- 4.8**	Group 2	2.6	2.7	- 1.0
Group 3	2.4	3.0	- 4.9**	Group 3	2.7	2.8	- 0.4
Group 4	2.4	3.0	- 3.1**	Group 4	2.5	2.6	- 0.5
Group 5	2.2	2.3	- .2	Group 5	2.2	2.2	0.0

Crossing Center Line			
	7g	8g	t-value
Group 1	2.3	2.6	- 4.3**
Group 2	2.6	2.8	- 3.0**
Group 3	2.5	2.9	- 3.0**
Group 4	2.8	2.8	- .1
Group 5	1.9	2.2	- 1.4

*Significant at the .05 level

**Significant at the .01 level

severities on Question 7g and 8g after having estimated the fine lower than the actual amount.

The DWI violation analysis gives the same type of result but in the opposite direction. In Question 6c, the averages were all higher than the actual fine of $125 and, based on the analysis of medians, over half the respondents gave a higher estimate than $125. The responses to Question 8c show that the groups believed the actual fine not to be as severe as the estimate they had given. The t-values show that all the differences are significantly different.

ANALYSIS OF OTHER SANCTIONING ISSUES

The last set of questions in the interview were concerned with the perceptions of respondents on several sanctioning subjects. The subjects included the effects of warning tickets, appearances before a judge, the sanction of attendance at a court traffic school and whether sanctions have preventive or educational effects.

Special and General Effects

Questions 9 and 10 were directed at whether sanctions in general have preventive effects or educational effects. The questions were phrased as follows:

> 9. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who <u>have</u> committed traffic violations?
>
> Preventive or deterrent effect--keeps people from doing the same thing again.
>
> Educational effect--teaches people what the driving laws are and how to drive safely.

No effect--penalties have no effect on the drivers concerned.

10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who have not committed traffic violations?

(Same three alternatives as above)

Table 39 shows the results of the two questions. With Question 9, 16.9 percent of the respondents believed that sanctions had no effect while the rest of the respondents were split almost evenly between a preventive/deterrent effect (40.8 percent) and an educational effect (42.3 percent). The statistics show that there is no majority or overall strong opinion by the respondents on the type of effect which sanctions have. There are, however, some differences among groups which are of note. For example, none of the Group 5 respondents replied with a "No Effect" answer. The responses for "No Effect" follow a pattern with Groups 4 and 5 having smaller percentages than the other groups. Groups 4 and 5 tend to believe that there is some effect to penalties. The majority of Group 4 respondents believe the effect to be educational while the majority of Group 5 respondents believe the effect to be preventive or deterrent.

Question 10 was aimed at determining the effects of sanctions on drivers who have not committed traffic violations. The overall statistics are about the same as with Question 9 with 18.3 percent responding "No Effect" and the rest split between preventive/deterrent effects (39.6 percent) and educational effect (42.1 percent). There are some differences with individual groups. For example, Group 3 was evenly split among the three answers and Group 4 also had a more even distribution than on the prior question. These two groups have more experience with sanctions than the other groups. Their higher percentage responses of "No Effect" reflects a belief that the experience of a sanction is required before any effect occurs.

Table 39

Questions 9 and 10 -- Effect of Penalties on Drivers
(Maryland)

	QUESTION 9			QUESTION 10		
	Preventive or Deterrent Effect	Educational Effect	No Effect	Preventive or Deterrent Effect	Educational Effect	No Effect
Group 1	38.3%	41.3%	20.4%	42.0%	42.2%	15.8%
Group 2	45.0%	40.3%	14.7%	38.8%	45.5%	15.7%
Group 3	37.2%	44.7%	18.1%	33.0%	34.0%	33.0%
Group 4	38.2%	52.9%	8.8%	35.3%	38.2%	26.5%
Group 5	52.9%	47.1%	0.0%	52.9%	35.3%	11.8%
Overall	40.8%	42.3%	16.9%	39.6%	42.1%	18.3%

Question 9. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who have committed traffic violations?

Question 10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect drivers who have not committed traffic violations?

Preventive or deterrent effect -- keeps people from doing the same thing again
Educational effect -- teaches people what the driving laws are and how to drive safely
No effect -- penalties for traffic violations have no effect on the drivers concerned

Influence of Warning Tickets

Question 11 asks about the influence warning tickets have on drivers as compared to getting a ticket. The question was phrased as follows:

> 11. When the police see a traffic violation, they can stop the driver and give him/her a warning (instead of a ticket). Please circle the number below which best describes how such a warning would influence your driving practices when compared to getting a ticket.
>
> 1. Has same effect as getting a ticket.
> 2. Has a greater effect.
> 3. Some effect but not as much as a ticket.
> 4. No effect.

The responses to the question were as follows:

	Same Effect As a Ticket	Greater Effect	Not as Great as a Ticket	No Effect
Group 1	35.4%	29.1%	33.0%	2.4%
Group 2	33.7%	22.4%	39.4%	4.5%
Group 3	20.2%	14.9%	52.1%	12.8%
Group 4	33.8%	19.1%	36.8%	10.3%
Group 5	35.3%	11.8%	47.1%	5.9%
Overall	33.1%	24.3%	37.8%	4.9%

There are some differences among the group responses to the question. The majority of Groups 1 and 2 believe a warning ticket would have the same or greater effect than a citation. The percentages are 64.5% and 56.1%, respectively. Group 3 respondents were not as optimistic, with only 31.1 percent indicating the same or greater effect. Groups 4 and 5 are higher with 52.9 percent and 47.1 percent. In general, there is support for warning ticket programs. However, Group 3 respondents were defined as having

four or more minor violations and, therefore, the optimism must be tempered by the fact that warning tickets may have no effect on the more frequent violator.

Influence of Court Appearances

Question 12 was aimed at beliefs on the effects of appearances before a judge. The question was phrased as follows:

> 12. A traffic law violator may choose either to (1) appear before a judge to plead his/her case, or (2) pay a fine by mail or court clerk. To what extent would a lecture and fine given by a judge influence a person's driving behavior when compared to paying the fine without appearing before the judge, would you say it would have
>
> 1. Lesser influence
> 2. Greater influence
> 3. No difference
> 4. No opinion

The responses to the question were as follows:

	Lesser Influence	Greater Influence	No Difference	No Opinion
Group 1	8.5%	70.1%	16.3%	5.1%
Group 2	12.5%	63.3%	18.8%	5.4%
Group 3	16.0%	69.1%	12.8%	2.1%
Group 4	14.7%	66.2%	10.3%	8.8%
Group 5	18.8%	75.0%	6.3%	0.0%
Overall	11.3%	67.4%	16.2%	5.1%

The responses reflect a strong belief that court appearances have a greater influence on driving behavior as compared to paying the fine without appearance. The overall statistics show that two-thirds of the respondents gave the "Greater Influence" answer.

The individual group averages vary around this overall average with no significant differences between group averages.

Influence of Court Traffic School

Questions 13 and 14 asked about the sanction of court traffic school:

> 13. Do you know that some traffic violators are penalized by having to attend a court traffic school or a Department of Motor Vehicles education program?
>
> 14. Do you think such a penalty would positively influence <u>your</u> driving?

There was an overwhelmingly positive response to the questions. Overall, 89.9 percent responded "Yes" to Question 13 which indicates an extensive awareness that traffic schools are an available sanction. Similarly, 87.8 percent responded "Yes" to Question 14. In summary, the respondents were aware of the sanction and believed it to be effective as a positive influence on their driving behavior.

Influence of Insurance Premiums

There were three questions related to knowledge about insurance premiums. The questions were as follows:

> 15. Do you know that some drivers have their insurance premiums increased, or their insurance cancelled, following conviction for a traffic violation?
>
> 16. Is your driving influenced by your awareness of what insurance companies do?
>
> 17. In this state, some insurance companies raise premiums by 15% (for example, $15 added to a $100 annual premium) following conviction for one routine moving violation in the past three years. Other insurance companies raise premiums

by 29% following two such convictions in three years. Do you think your driving will be influenced by your awareness of what insurance companies do?

Question 15 was asked to each respondent. If the respondent answered "Yes," Question 16 was asked; if the respondent answered "No" to Question 15, Question 17 was asked.

Figure 13 shows the responses to the questions. Ninety-five percent of the respondents were aware of the potential increase in premium or cancellation following conviction. Of that number, 79.0 percent indicated that their driving was affected by insurance considerations. Taking the product of these two percentages gives 75.1 percent which is the percent of respondents who were aware of the insurance sanction and were influenced by insurance considerations. Another interpretation of this result is that 24.9 percent of the respondents either were not aware of the potential sanction or were not influenced by such a threat.

DATA ON SPEEDS

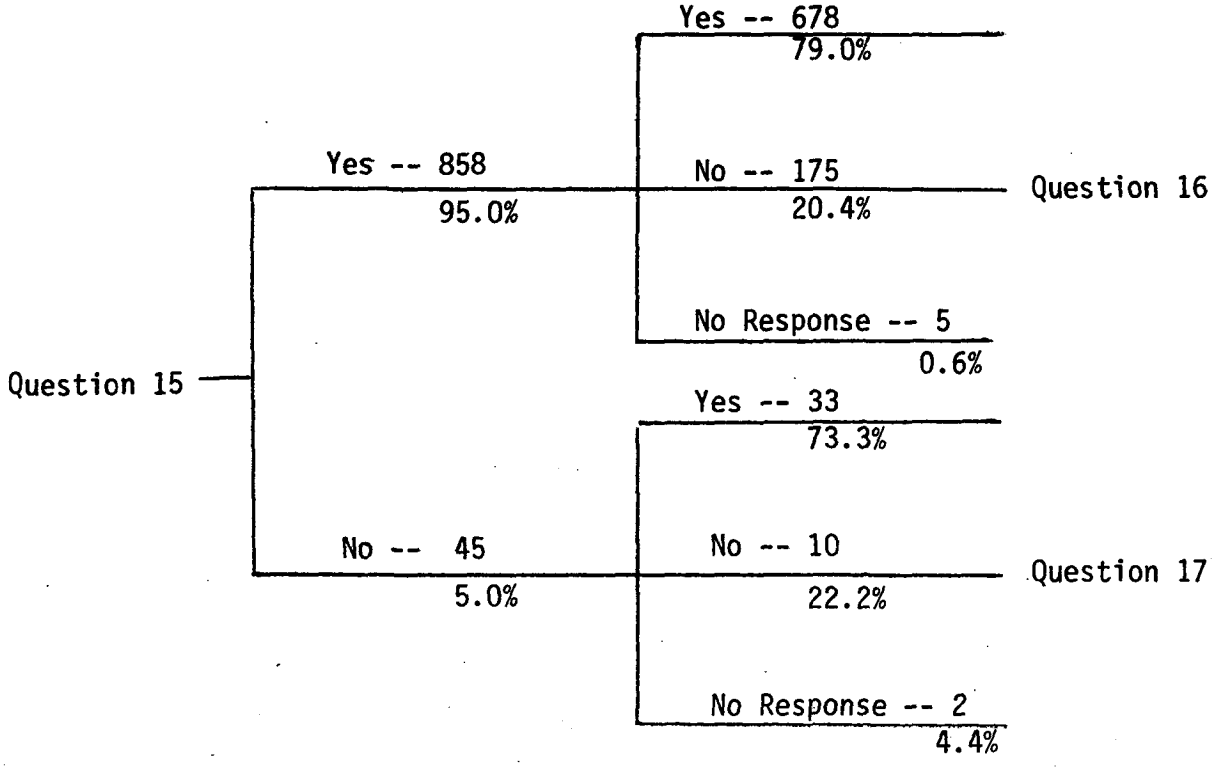
As in Colorado, a data collection effort was made to develop a better indication of the actual violation rates. Four separate road segments were selected as being typical of the type of street and daily traffic volumes in the county. The road segments selected were as follows:

Baltimore-Washington Parkway--The actual location was approximately two miles to the north of the Maryland 176, Dorsey Road exit. The speed limit is 55 MPH.

Maryland Route 100--The location was just east of the Business Route 3 interchange and one-half mile west of the Oakwood Road exit eastbound. The speed limit is 55 MPH.

Figure 13

Responses to Questions on Insurance Premiums
(Maryland)



Question 15. Do you know that some drivers have their insurance premiums increased, or their insurance cancelled, following conviction for a traffic violation?

Question 16. Is your driving influenced by your awareness of what insurance companies do?

Question 17. In this state, some insurance companies raise insurance premiums by 15% (for example, $15 added to a $100 annual premium) following conviction for one routine moving violation in the past three years. This increased rate is in effect for three years. Other insurance companies raise premiums by 29% following two such convictions in three years. Do you think your driving will be influenced by your awareness of what insurance companies do?

Ft. Smallwood Road (Maryland Route 173)--The location was just northeast of Maryland Route 172 going eastbound. The speed limit is 50 MPH.

Crain Highway--The location was the lower part of Business Route 3 at 704 Craig Highway. The speed limit is 30 MPH.

The Baltimore-Washington Parkway was selected as representative of freeway traffic and Maryland Route 100 as representative of a multi-lane expressway. Ft. Smallwood Road is a rural road and Crain Highway is in a residential/commercial area.

For collecting speed data, Leupold and Stevens, Inc. Model CVS 545 speed measuring devices were used. A device was placed at each site for a seven-day period and data were collected at four times each day (6:30 a.m., 10:00 a.m., 3:30 p.m., and 7:30 p.m.). The installation consisted of placing two cables approximately six feet apart across the desired lanes of traffic. The cables were connected to a processing and recording box located at the side of the road segment. The box allowed for collecting speed data in each lane of traffic on the following speed intervals: less than 35 MPH, 35-39 MPH, 40-44 MPH, 45-49 MPH, 50-54 MPH, 55-57.4 MPH, 57.5-59 MPH, 60-62.4 MPH, 62.5-69 MPH, 70-74 MPH, and over 75 MPH.

It should be noted that some observations are missing because of adverse weather conditions. Also, as discussed in the Colorado chapter, it was determined that the devices did not count the number of vehicles accurately during busy times. For this reason, the traffic counts on the freeway and expressway presented in the tables are slightly lower than actual because of busy period activity. Once again, it should be believed that the devices were accurate in classifying the speeds of the vehicles it counted.

Tables 40-43 show the speed data by day of week and time period for each street segment. Shown in the table are (1) the

Table 40

Baltimore-Washington Expressway Vehicle Speed Data
(Maryland)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	5,518	6,352	6,125	6,100	5,934	8,886	3,449
85th Percentile	59.9	60.4	60.6	60.6	62.7	60.4	60.5
% Exceeding 65 MPH	1.7%	5.5%	5.1%	6.1%	8.3%	4.3%	5.9%
6:30 AM-10:00 AM							
Traffic Volume	4,248	5,179	8,193	5,046	3,084	2,119	2,755
85th Percentile	60.6	60.5	62.9	63.2	62.9	60.6	60.6
% Exceeding 65 MPH	5.2%	3.8%	9.1%	13.7%	8.2%	4.7%	5.6%
10:00 AM-3:30 PM							
Traffic Volume	4,043	3,130	5,640	3,322	2,839	5,446	3,349
85th Percentile	62.9	62.5	59.1	62.8	62.7	60.2	62.8
% Exceeding 65 MPH	8.3%	4.6%	1.7%	7.8%	6.6%	3.0%	7.7%
3:30 PM-7:30 PM							
Traffic Volume	3,679	5,610	4,155	6,598	4,358	6,234	3,718
85th Percentile	62.7	60.6	62.8	62.8	62.8	60.4	62.9
% Exceeding 65 MPH	6.5%	5.4%	7.5%	8.3%	7.0%	3.9%	8.2%

Table 41

Route 100 Vehicle Speed Data
(Maryland)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	4,383	2,585	3,232	3,923	4,031	4,028	4,008
85th Percentile	58.2	60.0	60.0	58.1	60.3	60.2	60.2
% Exceeding 65 MPH	3.5%	4.6%	3.6%	3.1%	5.5%	5.4%	5.2%
6:30 AM-10:00 AM							
Traffic Volume	2,764	2,508	2,497	2,725	2,311	2,668	2,600
85th Percentile	60.2	60.3	60.5	60.1	62.4	60.5	60.5
% Exceeding 65 MPH	4.2%	4.7%	5.5%	3.7%	7.8%	4.8%	4.9%
10:00 AM-3:30 PM							
Traffic Volume	3,420	4,512	3,754	4,308	4,590	5,030	3,320
85th Percentile	60.1	60.4	60.2	60.5	60.3	60.2	60.2
% Exceeding 65 MPH	4.4%	4.9%	4.7%	4.6%	4.2%	4.6%	3.9%
3:30 PM-7:30 PM							
Traffic Volume	3,663	5,727	5,660	6,337	4,737	7,758	3,489
85th Percentile	58.2	60.0	58.1	57.8	60.0	59.4	59.7
% Exceeding 65 MPH	3.1%	3.0%	2.1%	1.1%	3.1%	2.6%	3.5%

Table 42

Ft. Smallwood Road Vehicle Speed Data
(Maryland)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	1,748	1,083	1,014	844	1,289	1,365	----
85th Percentile	50.6	50.4	49.3	46.3	50.8	49.4	----
% Exceeding 60 MPH	3.9%	3.2%	2.4%	1.7%	2.3%	2.2%	
6:30 AM-10:00 AM							
Traffic Volume	1,003	396	272	300	349	427	479
85th Percentile	51.2	50.5	50.5	50.0	50.6	50.7	51.4
% Exceeding 60 MPH	6.8%	2.0%	2.9%	2.0%	2.6%	2.3%	5.2%
10:00 AM-3:30 PM							
Traffic Volume	2,453	1,693	1,733	998	654	1,107	1,749
85th Percentile	46.4	49.8	49.0	46.5	49.9	49.2	46.4
% Exceeding 60 MPH	0.7%	1.0%	1.2%	0.8%	2.1%	1.1%	1.0%
3:30 PM-7:30 PM							
Traffic Volume	636	1,236	1,208	1,129	1,885	3,472	1,900
85th Percentile	49.2	50.3	46.3	50.7	50.1	49.6	49.1
% Exceeding 60 MPH	1.4%	1.0%	0.2%	0.8%	1.0%	1.4%	1.1%

Table 43

Crain Highway Vehicle Speed Data
(Maryland)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	3,376	1,970	2,340	2,609	2,254	2,478	3,102
85th Percentile	36.8	39.3	36.8	36.9	39.1	36.8	36.9
% Exceeding 40 MPH	10.4%	16.0%	9.8%	12.1%	15.6%	10.9%	11.4%
6:30 AM-10:00 AM							
Traffic Volume	1,216	----	1,684	1,832	1,412	1,772	1,449
85th Percentile	36.7	----	36.9	36.7	37.0	36.8	36.9
% Exceeding 40 MPH	8.7%	----	10.8%	8.5%	13.8%	10.1%	12.6%
10:00 AM-3:30 PM							
Traffic Volume	1,940	----	3,477	3,380	2,897	3,976	2,897
85th Percentile	36.7	----	36.8	36.5	36.7	36.6	36.8
% Exceeding 40 MPH	6.3%	----	7.8%	5.4%	6.2%	6.7%	7.0%
3:30 PM-7:30 PM							
Traffic Volume	2,406	3,491	----	3,670	3,557	3,851	3,557
85th Percentile	36.7	36.7	----	36.8	36.8	36.5	36.7
% Exceeding 40 MPH	7.7%	6.9%	----	8.7%	8.5%	7.0%	7.1%

total traffic volume for the time periods, (2) the 85th percentile speed, and (3) the percent of vehicles exceeding the speed limit by at least 10 MPH. The data in the tables can be further summarized as follows:

	Baltimore-Washington	Rt. 100	Ft. Smallwood	Crain
Average Daily Traffic Volume	19,300	15,600	4,800	10,700
Average 85th Percentile	61.6	59.8	49.4	37.0
Range of 85th Percentiles	59.1-63.2	58.1-62.4	46.3-51.4	36.5-39.3
Average Percent Exceeding Speed Limit by at Least 10 MPH	6.2%	4.2%	2.0%	9.4%
Range of Percent Exceeding Speed Limit by at Least 10 MPH	1.7-13.7%	1.1-7.8%	0.2-2.8%	5.4-16.0%

Generally, the 85th percentile is 5-6 miles per hour over the posted speed limit. Further, the figures show that there are drivers exceeding the speed limit by at least 10 miles per hour in every time interval of the day. For each site, there was also a fairly large range of speeds exceeding the limit by at least 10 MPH.

CHAPTER SEVEN
ANALYSIS OF NORTH CAROLINA SURVEY

CHARACTERISTICS OF RESPONDENTS

The license renewal applicant survey in North Carolina took place at the Raleigh-East and Raleigh-West stations of the Division of Motor Vehicles. A total of 881 interviews were conducted and the three-year driver records for 866 respondents were obtained from the licensing agency. The discussion which follows is based on the analysis of the set of 866 combined driver records and interview responses.

Although a stratified sampling approach was employed in selecting drivers for the interview, we were unable to obtain as many interviews as we had planned from drivers who had a serious traffic violation history. The interview responses and companion driver records were grouped according to the number and type of violation convictions received during the three-year period prior to the survey. The five analysis groupings that were employed and their sizes in the sample are:

Group 1--No minor and no major violations (366)

Group 2--One to three minor violations but no major violations (382)

Group 3--Four or more minor violations and no major violations (35)

Group 4--One major violation and possibly some minor violations (68)

Group 5--Two or more major violations and possibly some minor violations (15).

Table 44 lists the major and minor violations used to define the groups. Generally, a minor violation is one for which the Division of Motor Vehicles will assign three or fewer "points" to the

Table 44

Classification of Traffic Offenses in North Carolina

Major Offenses
• Alluding an Officer • Driving While Intoxicated (DWI) or Under the Influence of Drugs • Failure to Report an Accident • Leaving the Scene of an Accident • Speed Contest • Speeding Over 55 MPH and Reckless Driving • Speeding Over 55 MPH and Exceeding Limit by More than 15 MPH • Speeding Over 75 MPH
Minor Offenses
• Driving Too Fast for Conditions • Driving on the Wrong Side of the Road or One-Way Street • Exceeding Safe Speed • Failure to Reduce Speed • Failure to Yield Right of Way • Following Too Close • Illegal Passing • Improper Turn • Improper Use of Lane • Reckless Driving • Running a Red Light or Stop Sign • Speeding

driver record. Four or more points are assigned for the major violations listed.

General Characteristics

The first area of analysis describes the respondent population. A breakdown of the number of years of driving experience of the members of each driver group is shown in Table 45. If one considers Groups 1 and 2--those with three or fewer minor violations and no major violations in three years--as representing the general driver population, then a substantial majority of the general driving population (80 percent for Group 1 and 65 percent for Group 2) had more than ten years driving experience. In contrast, a majority of the repeat violator groups (3 and 5) had less than ten years of experience; more than one-fourth of Group 5 had less than five years of experience. The respondent estimate of annual miles driven (Table 46) provides an indication of violation (and accident) exposure. Slightly less than half of the violation-free drivers estimate that they drove under 10,000 miles per year. Driver groups with higher violation rates tended to drive more. Over half of the Group 3 and Group 5 respondents drove more than 20,000 miles per year.

The sex distribution for the groups is as follows:

Sex of Respondents

	Group 1	Group 2	Group 3	Group 4	Group 5
Male	202 55.5%	262 69.5%	33 94.3%	55 82.1%	15 100.0%
Female	162 44.5%	115 30.5%	2 5.7%	12 17.9%	0 0.0%

Table 45

Years of Driving Experience
(North Carolina)

Group	Less Than 5 Years	5 to 9 Years	10-19 Years	20 Years or More
Group 1	31 (8.5%)	41 (11.2%)	120 (32.8%)	174 (47.5%)
Group 2	63 (16.5%)	69 (18.1%)	123 (32.3%)	126 (33.1%)
Group 3	6 (17.1%)	13 (37.1%)	11 (31.4%)	5 (14.3%)
Group 4	13 (19.1%)	18 (26.5%)	18 (26.5%)	19 (27.9%)
Group 5	4 (26.7%)	5 (33.5%)	2 (13.3%)	4 (26.7%)

Table 46

Miles Driven Per Year
(North Carolina)

	Under 10,000 Miles	10,000-15,000 Miles	15,000-19,000 Miles	20,000 or More Miles
Group 1	155 (42.3%)	76 (20.8%)	48 (13.1%)	86 (23.5%)
Group 2	107 (28.1%)	87 (22.8%)	45 (11.8%)	140 (36.7%)
Group 3	6 (17.1%)	6 (17.1%)	5 (14.3%)	18 (51.4%)
Group 4	24 (35.3%)	10 (14.7%)	12 (17.6%)	20 (29.4%)
Group 5	2 (13.3%)	1 (6.7%)	4 (26.7%)	8 (53.3%)

Although more males than females are found in all the respondent groups, as the violation characterization of the groups increases both in seriousness and in number, the proportion of males also increases. The respondents' reported level of education is described in Table 47. The overall educational level of Groups 1, 2, and 3 was about the same with 35, 29, and 35 percent, respectively, having completed college. Overall, 19 percent of the serious violators (Groups 4 and 5 combined) had completed college. At the other end of the spectrum, less than 14 percent of Groups 1 and 2 did not complete high school while 20, 27 and 33 percent, respectively, of the more numerous/more serious violation groups (3, 4, and 5) had not completed high school.

Violation History of Respondents

It is also of interest to know the volume and types of citations which Groups 2, 3, 4, and 5 had acquired over the three year period under study. The overall totals and averages for the groups are as follows:

	Sample Size	Total Number of Citations	Average Number of Citations
Group 2	382	540	1.41
Group 3	35	164	4.69
Group 4	68	150	2.21
Group 5	15	61	4.07
Total	500	915	1.83

These figures are, of course, consistent with the definitions of the groups. For example, Group 3 was defined as those respondents who had at least four minor violations and the Group 3 average is 4.69 citations. Similarly, Group 4 was defined as those respondents with one major violation and the average of 2.21 means that each

Table 47

Education of Respondents
(North Carolina)

	Did not Complete Grade Sch.	Completed Grade School	Attended High School	Completed High School	Attended College	Completed College	Attended Graduate School	Completed Graduate School
Group 1	16 (4.4%)	8 (2.2%)	25 (6.9%)	95 (26.1%)	91 (25.0%)	70 (19.2%)	21 (5.8%)	38 (10.1%)
Group 2	4 (1.0%)	13 (3.4%)	31 (8.1%)	99 (26.0%)	122 (32.0%)	57 (15.0%)	28 (7.3%)	27 (7.1%)
Group 3	1 (2.9%)	0 (0.0%)	6 (17.1%)	7 (20.0%)	4 (25.7%)	8 (22.9%)	2 (5.7%)	2 (5.7%)
Group 4	1 (1.5%)	1 (1.5%)	16 (23.5%)	19 (27.9%)	16 (23.5%)	8 (11.8%)	1 (1.5%)	6 (8.8%)
Group 5	1 (6.7%)	0 (0.0%)	4 (26.7%)	5 (33.3%)	4 (26.7%)	0 (0.0%)	0 (0.0%)	1 (6.7%)

person in this group averaged one major violation and 1.21 minor violations over the three-year period under study. Group 5 respondents had an average of 4.07 citations. Further analysis revealed that this group averaged 2.33 major violations and 1.74 minor violations.

Table 48 gives the number of violations by type and group. As with the other two states, the categories for speeding violations accounted for a significant portion of the total number of violations. For Group 2, speeding violations accounted for over 70 percent of the total while other offenses, such as following too closely, turning into traffic, and careless driving, accounted for about 17 percent of the total. Group 3 follows almost exactly the same distribution as Group 2. With Groups 4 and 5, the distribution is different because they are defined with major violations. The DWI category, for example, accounts for 12 percent in Group 4 and 10 percent in Group 5.

Table 49 shows the distribution of the citations for each year under study. The years are defined in twelve-month increments prior to the time of the survey: Year 1 is December 1976-November 1977; Year 2 is December 1977-November 1978; and Year 3 is December 1978-November 1979. As seen in the table, there is a good representation of citations in each of the years. Of course, some respondents received citations in more than one of the years and others received citations in only one of the years. These combinations can be illustrated in a Venn diagram with three overlapping circles for the years. The 39 respondents in the center are respondents who had at least one citation during each of the three years. Similarly, there were 119 respondents who had a violation only in Year 1; 141 respondents only in Year 2; and 92 respondents only in Year 3.

Table 48

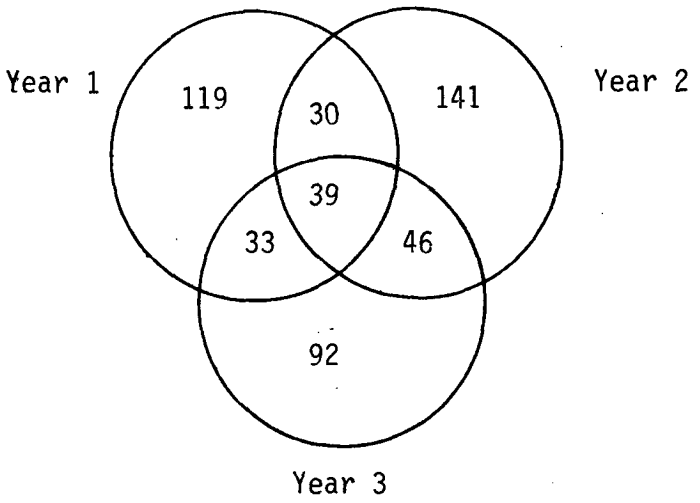
Violation History of Respondents
by Offense Type
(North Carolina)

		Speeding Less Than 10 MPH*	Speeding Greater Than 10 MPH	Running Red Light/Stop Sign	DWI	Other Offense
Group 2	N	177	171	58	-	84
	Citations	204	286	60	-	90
Group 3	N	31	29	15	-	19
	Citations	59	58	20	-	27
Group 4	N	23	19	9	18	40
	Citations	39	35	10	18	48
Group 5	N	8	6	4	5	13
	Citations	10	15	5	6	25
Total	N	239	225	86	23	156
	Citations	312	294	95	24	190

Table 49

Number of Violations by Year
(North Carolina)

		Year 1 December 1976- November 1977	Year 2 December 1977- November 1978	Year 3 December 1978- November 1979
Group 2	N	155	169	137
	Citations	175	193	172
Group 3	N	24	32	35
	Citations	36	47	81
Group 4	N	31	43	32
	Citations	36	67	47
Group 5	N	11	12	6
	Citations	23	27	11
Total	N	221	256	210
	Citations	270	334	311



SURVEY RESPONSES

The following sections are devoted to an analysis of the survey results. The responses are given for each question along with the appropriate analysis. In many of the questions, it was beneficial to compare the results across the five groups and tests were made to determine whether the group averages were significantly different in a statistical sense.

Responses to Questions on Violation Detection and Conviction

Two questions asked during the interview sought to assess the perceived risk of violation detection by law enforcement and the perceived risk of conviction following a court appearance on a citation. Question 4 was phrased as follows:

> 4. Following are a number of traffic violations. For every 100 drivers who commit these acts, how many, in your opinion, will be caught by the police in this County? You may assume no accidents are involved.

a. Speeding 10 miles per hour over the posted speed limit
b. Speeding 20 miles per hour over the posted speed limit
c. Driving while intoxicated (drunk driving)
d. Running a traffic light or stop sign
e. Following a moving car too closely
f. Turning left in front of oncoming traffic or pulling out into traffic (like at an intersection or on a freeway)
g. Crossing the center line of the road.

Question 5, which follows, was asked regarding the same list of seven violations:

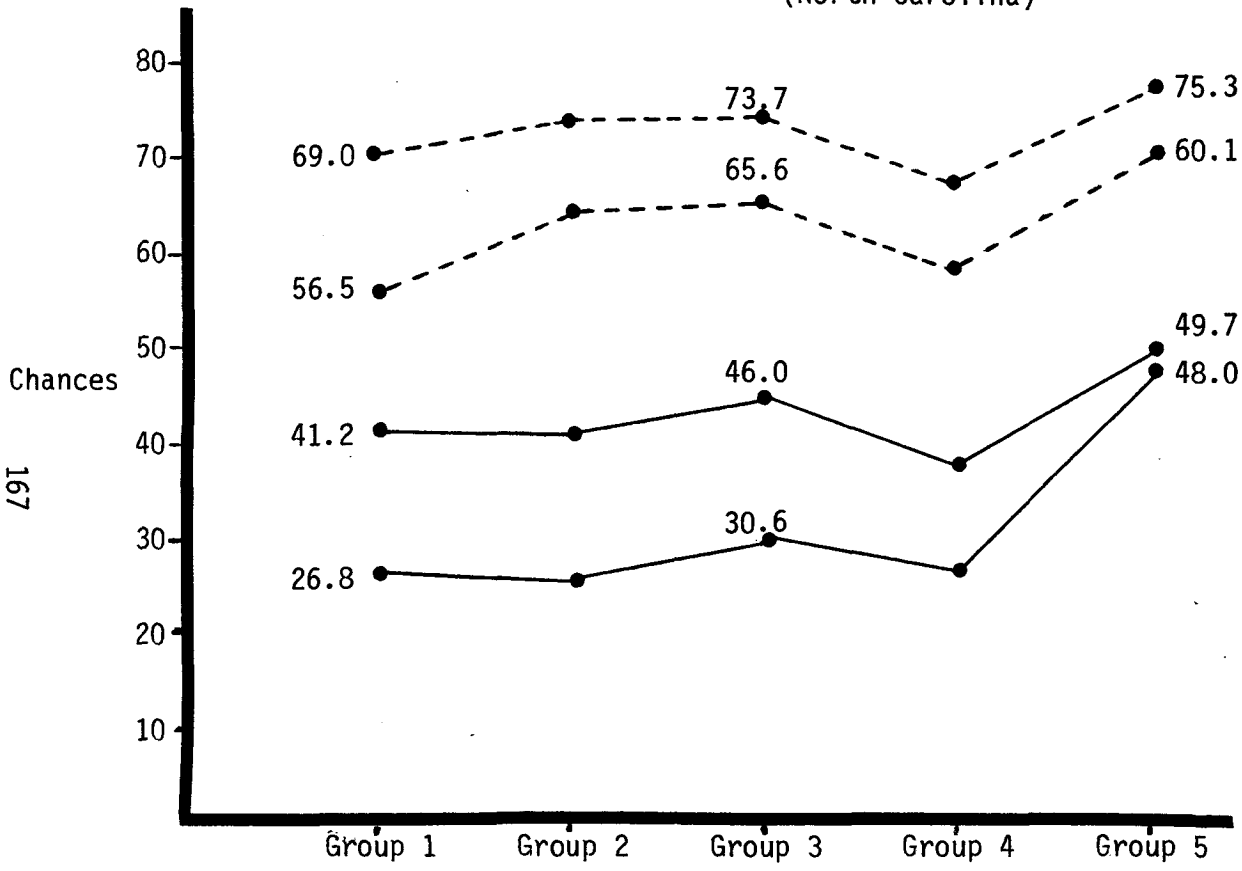
5. In this County, once a person has been caught by police and given a ticket for most of these violations, he can usually pay or mail in the fine or he can challenge the ticket in court. For every 100 drivers who are ticketed or arrested, and choose to take it to court, how many, in your opinion, will be found guilty of committing the violation? Again, you may assume that no accidents are involved.

The responses to these two questions are analyzed together.

Analysis of Questions on Speeding

Figure 14 shows the change, by group, of the group mean value of the respondents' estimate of the number of chances in 100 of detection/conviction for the two violations, Speeding 10 and 20 MPH Over the Speed Limit. The graph for Question 4a (detection of a 10 MPH Speed Violation), for example, shows that the average of the responses for Group 1 drivers was that 26.8 out of 100 such speeders would be detected or caught. The average estimates of Groups 2, 3, and 4 was about the same as or higher than that of Group 1 while the Group 5 average was much higher. For the 20 MPH Speed Violation (Question 4b), each group average estimate of the chances of detection was higher than for the 10 MPH

Figure 14
Responses to Questions on Speeding
(North Carolina)



5b--Speeding 20 MPH Over Limit (Conviction) (F=I.2; n.s.)
5a--Speeding 10 MPH Over Limit (Conviction) (F=3.0; .05)

4b--Speeding 20 MPH Over Limit (Detection) (F= .7; n.s.)
4a--Speeding 10 MPH Over Limit (Detection) (F=3.5; .01)

Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4a	864	26.60	0% (9) to 100% (7)
4b	863	41.52	0% (3) to 100% (12)
4c	863	60.31	0% (12) to 100% (82)
4d	862	70.90	0% (4) to 100% (173)

Violation. The (small-sized) Group 5 showed little difference in the detection estimate for these offenses. In light of their experience, it is difficult to understand why these estimates are so high and, also, why they are so close together. The average 20 MPH detection estimates for Groups 1 through 4 are about 1.5 times higher than the 10 MPH estimates. F-ratios were calculated to determine if the averages were significantly different (in a statistical sense). For each question, the results of this calculation are indicated next to the corresponding curve. The differences for Question 4a are statistically significant.

The upper (dashed) set of curves in Figure 14 represent the group average responses regarding chances of conviction in court for the selected offenses. The dashed curves are shaped much like the solid curves, suggesting that the between-group differences regarding the chances for detection are similar to those for conviction. The higher values shown for the conviction estimate suggest that the drivers realize that the chances of conviction (once detected) are higher than the chances of detection. In reality, the chances of detection are probably much lower than expressed by the drivers. The relative closeness of the conviction curves (5a and b) indicate that the drivers feel that for these two speeding violations, the difference in the chances of conviction is less than the difference in chances of detection.

At the bottom of Figure 14, the overall statistics regarding the two speeding questions are presented together with an indication of the number of drivers who chose maximum answers and those who chose minimum answers. Nine respondents thought that none of the 100 speeders at 10 MPH over the limit had a chance of detection while only three felt that way about a 20 MPH speeding offense. At the other extreme, seven drivers thought <u>all</u> 10 MPH speeders would be caught while 12 drivers felt that way about all

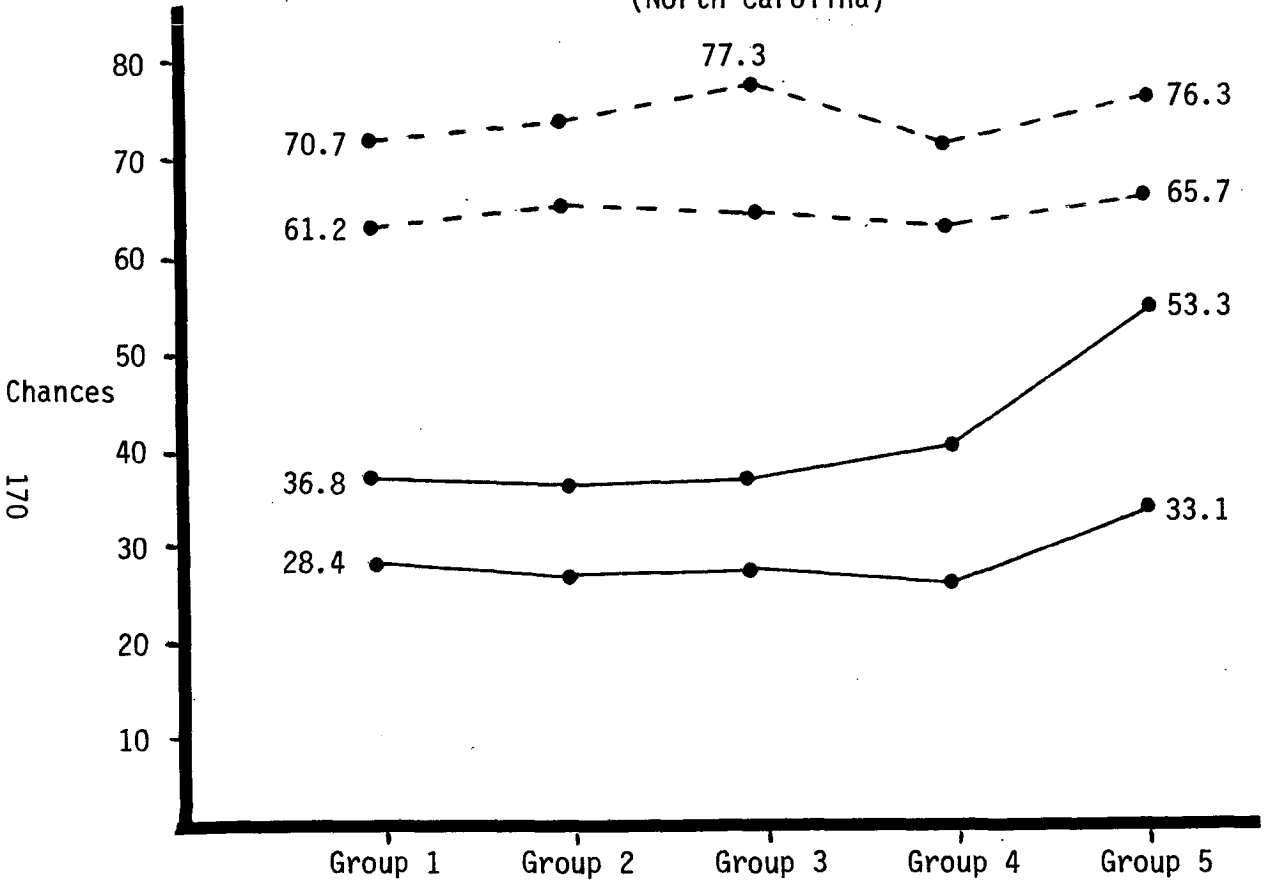
20 MPH speeders. For the same two offenses, twelve and four respondents, respectively, felt that zero drivers in 100 would be convicted in court while 82 and 173, respectively, felt that all would be convicted in court. Almost all estimates of either zero or 100 percent detection were obtained from Group 1 and 2 drivers. It should be pointed out that 100 percent estimates of detection and estimates that no drivers would be convicted are unrealistic. Yet they do influence the averages presented in the curves.

Analysis of Questions on Driving While Intoxicated and Running a Traffic Light or Stop Sign

The group average estimates of chances of detection and conviction for Driving While Intoxicated (DWI) (Questions 4c and 5c) and for Running a Traffic Light or Stop Sign (Questions 4d and 5d) are shown on the graphs of Figure 15. For DWI, Groups 1, 2, and 3 show no difference in average chances of conviction. Groups 4 and 5 that contain DWI offenders rate the chances of conviction higher, but not statistically significantly higher. Groups 2 and 3 rated the chances of DWI conviction slightly higher than Group 1. However, Group 4 members, some of whom were first offenders of DWI, rated the chances of court conviction for DWI the same as Group 1. Perhaps their response is based on prior experience with both convictions and acquittals/dismissals for DWI. The multiple serious offenders (Group 5) rate the chances of DWI conviction nearly as high as Group 3. None of the differences is significant, however. While the number of drivers estimating zero chances of detection and conviction and those estimating 100 percent detection were small, 182 respondents (21 percent) estimated a 100 percent chance of court convictions for DWI. Higher percentages of the violator groups estimated 100 percent conviction rates than did the non-violator

Figure 15

Responses to Questions on DWI and Running Traffic Light Or Stop Sign (North Carolina)



5c--Driving While Intoxicated (Conviction) (F= .67; n.s.)

5d--Running Traffic Light or Stop Sign (Conviction) (F= .35; n.s.)

4c--Driving While Intoxicated (Detection) (F=1.8; n.s.)

4d--Running Traffic Light or Stop Sign (Detection) (F= .57; n.s.)

Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4c	862	36.93	0% (2) to 100% (9)
4d	858	27.41	0% (4) to 100% (7)
5c	861	72.07	0% (4) to 100% (182)
5d	862	62.57	0% (4) to 100% (110)

group. These estimates do not conflict with the fact that in many jurisdictions, DWI conviction rates are higher than 90 percent.

The bottom curve of Figure 15 (Question 4d) shows the detection rate for the Running Traffic Light/Stop Sign Offense (Traffic Light). The responses for Groups 1-4 were about the same, while that for Group 5 was slightly (but not significantly) higher. These estimates were at about the same percentage level as reported for the 10 MPH speeding violation (Figure 14). The conviction rate estimates for the Traffic Light Offense are shown in the "5d" curve. The responses are almost the same for all groups. A group breakdown of the 110 respondents who estimated a 100 percent conviction rate for this offense indicates much higher percentages of such estimates by the violator groups than by the non-violator group.

Analysis With Median Values

Because the number of zero and 100 percent estimates was thought to be large and may have influenced the sample means, the median values of each group response to Questions 4a-d and 5a-d, shown in Table 50, were also examined for possibly different conclusions. Comparing these values with the sample mean data points in Figures 14 and 15 suggests that no different interpretation regarding group responses is in order. In fact, the detection data are very close while the median conviction data suggests higher conviction rates than the mean data.

Analysis of Questions On Following Too Closely, Turning Into Traffic, and Crossing the Center Line

Group average estimates of detection and court conviction for these offenses are shown in the graphs of Figure 16. With

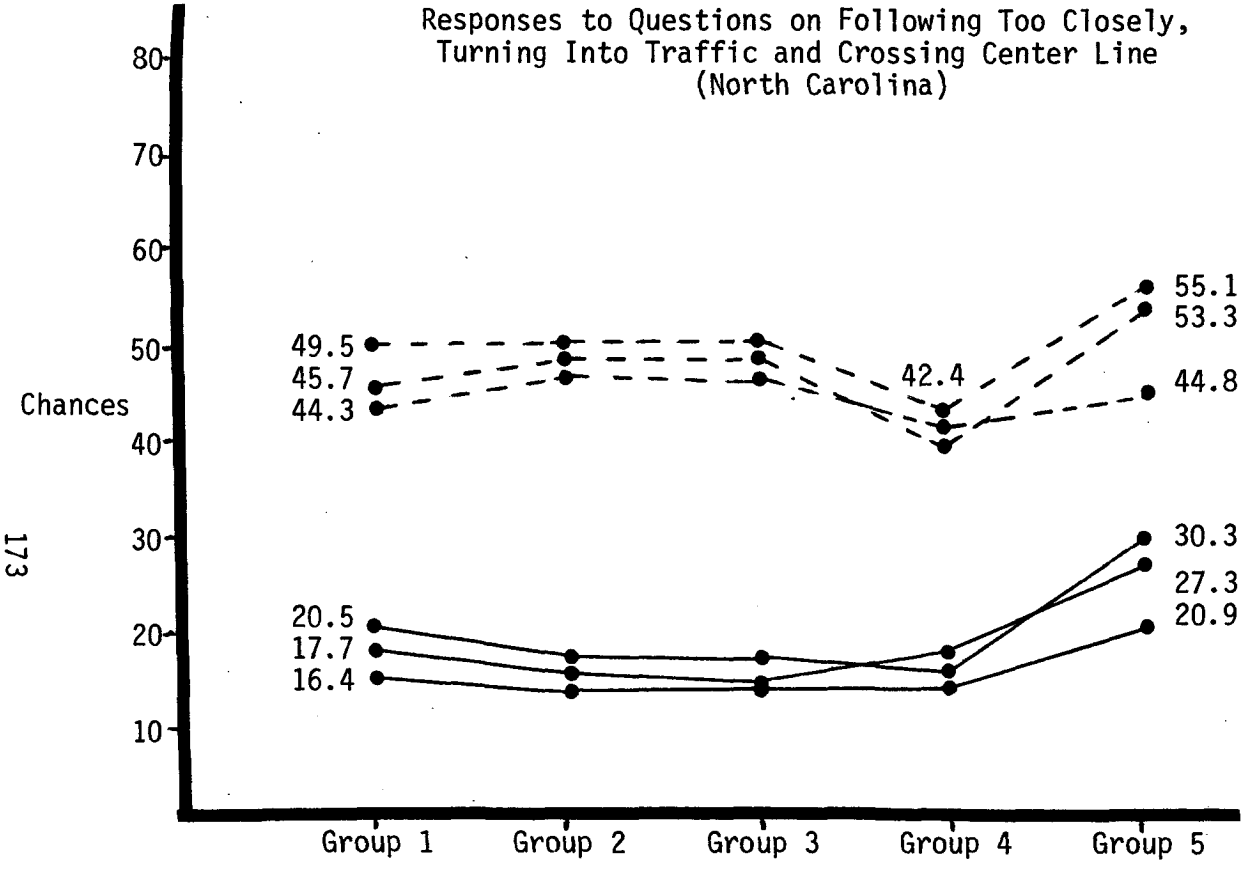
Table 50

Median Values for Questions 4 and 5

Question	Group 1	Group 2	Group 3	Group 4	Group 5
4a	20	20	25	25	50
4b	40	40	50	30	50
4c	30	30	30	40	50
4d	20	15	20	20	40
5a	65	75	90	80	90
5b	80	80	90	80	90
5c	80	85	90	80	80
5d	70	75	70	70	80

Figure 16

Responses to Questions on Following Too Closely, Turning Into Traffic and Crossing Center Line (North Carolina)



5f--Turning Into Traffic (Conviction) (F= .88; n.s.)
5e--Following Too Closely (Conviction) (F=1.40; n.s.)
5g--Crossing Center Line (Conviction) (F= .26; n.s.)

4f--Turning Into Traffic (Detection) (F=2.40; .05)
4g--Crossing Center Line (Detection) (F=1.68; n.s.)
4e--Following Too Closely (Detection) (F=1.11; n.s.)

Overall Statistics			
Question	Number of Responses	Average	Range of Responses Percent (Number)
4e	858	15.23	0% (80) to 100% (3)
4f	859	18.77	0% (56) to 100% (7)
4g	859	16.81	0% (60) to 100% (4)
5e	861	46.85	0% (35) to 100% (55)
5f	861	49.20	0% (26) to 100% (72)
5g	857	44.78	0% (43) to 100% (52)

the exception of Group 5, the detection rate estimate for all of these offenses is about the same for each group and not very different for the three offenses. The detection estimates for all of these offenses are lower than has been the case for the other offenses described previously. The percentage of the respondents estimating that zero drivers in 100 would be detected for these offenses ranged from seven to ten percent, a figure much higher than for the other offenses and one that points out the difficulty of taking enforcement action against these offenses. The conviction estimates for these offenses show little difference between groups and are lower than the estimates for other offenses. The respondents may feel that in addition to the difficulty of taking enforcement action against these violations, there is also some difficulty in many cases in producing evidence to convict.

Comparisons With Violation History

Court Appearances and Court Conviction Perceptions

The analysis so far has not shown many differences among the groups under study. With regard to detection, only two of the offenses showed statistically significant difference among the groups and with regard to court conviction, only one (speeding 10 MPH over the limit) showed a significant difference. At this point, it may be of benefit to compare respondents with court appearances versus respondents without court appearances. With this analysis, Group 1 respondents still serve as a comparison group since they did not have any violations or court appearances. At the other extreme, virtually all Group 4 and Group 5 respondents made court appearances since their violations were major in nature. Therefore, the averages previously presented for these two groups are reflective of both their detection and adjudication experiences. With Groups 2 and 3, there are also mandatory appearances and many

of the appearances are because the person decided to challenge the citation in court. More specifically, in Group 2 there were 20 persons with court appearances. With all the groups, the court experience can be expected to affect only their perceptions of court actions rather than their perceptions of detection by the police.

With this background, Table 51 shows the response averages for Question 5 with Groups 2 and 3 split into Court/No Court Appearance categories. The averages under the "Court Appearance" columns were based on those respondents who made court appearances during the three-year period under study while the averages under the "No Court Appearance" columns were based on those respondents who decided to pay the fine and not appear in court to challenge the citation.

There are some interesting comparisons from Table 51. For example, with Group 2, the averages for the subgroup without court appearances are larger than the subgroup with court appearances. With the offense of speeding 10 MPH over the limit, the averages for Group 2 are 64.9 for respondents without a court appearance and 61.5 for respondents with a court appearance. While this difference, as well as the other differences for Group 2, is small, the overall conclusion is consistent since it occurs with each category. Similarly, the Group 3 averages show the same conclusion except for the DWI category. With the offense of speeding 10 MPH over the limit, the averages for Group 3 are 73.2 for respondents without a court appearance and 59.9 for respondents with court appearances.

In summary, it appears that persons with occasional court appearances, as with Groups 2 and 3, will respond with perceptions

Table 51

Court Appearances and Court Conviction Perceptions
(North Carolina)

Question	Group 1	Group 2		Group 3		Group 4	Group 5
		No Court Appearance	Court Appearance	No Court Appearance	Court Appearance		
5a	56.5	64.9	61.5	73.2	59.9	57.4	69.1
5b	69.0	73.3	72.1	76.4	71.7	67.5	75.3
5c	70.7	73.5	71.4	76.3	78.0	70.8	76.3
5d	61.2	64.3	62.1	63.7	63.1	62.1	65.7
5e	45.8	50.6	43.5	54.9	44.3	39.7	53.3
5f	49.5	51.9	43.6	61.4	42.4	42.4	55.1
5g	44.3	46.8	42.6	52.1	40.8	41.5	44.8

of lower chances of being found guilty than their counterparts with no court appearances.

Time of Citations and Perceptions

As with the other states, there was interest in whether time had an effect on the chances of detection. It was hypothesized that persons who had recently received a citation would have higher responses than persons whose citations occurred at an earlier time. The following analysis is based on "single year" offenders. These are defined as respondents who had received a citation during one of the three years but not the other two. From the Venn diagram presented earlier, it is possible to make the following definitions:

Group A: Respondents who received citations in Year 1 (December 1976-November 1977) but not during Years 2 or 3 (N=119).

Group B: Respondents who received citations in Year 2 (December 1977-November 1978) but not during Years 1 or 3 (N=141).

Group C: Respondents who received citations in Year 3 (December 1978-November 1979) but not during Years 1 or 2 (N=92).

Comparing these groups with Group 1 as a control gives the figures in Table 52. With the definitions of the groups, the hypothesis is that the Group C average would be higher than Group B which would, in turn, be higher than Group A. The figures show this trend for every offense in Question 4. For example, with Question 4b (Speeding 10 MPH over the limit), Group A had an average of 34.9, Group B an average of 43.3, and Group C an average of 46.1. Thus, the data support the hypothesis that more recent citations raise the level of perceptions of being caught by the police. It should be noted, however, that all of the Group A

Table 52

Relationship of Perceptions to Time
Question 4--Chances of Being Caught by the Police

Question	Group A	Group B	Group C	Group 1
4a	24.2	27.1	27.2	26.8
4b	34.9	43.3	46.1	41.2
4c	35.0	36.2	40.2	36.8
4d	24.6	26.2	30.6	28.4
4e	13.1	15.0	17.1	16.4
4f	15.1	16.7	21.2	20.5
4g	13.7	16.2	20.0	17.7

averages and many of the Group B averages are below the Group 1 average. It is not clear why this should be the case except to say that the citations in Year 1 obviously did not have a lasting effect on the drivers.

ANALYSIS OF ESTIMATED FINES AND SANCTION SEVERITY

Analysis of Estimated Fines

Question 6 was asked to learn the extent of the respondents' knowledge of the fines imposed in the Raleigh area for the seven selected offenses.

> 6. For each of the same violations we've been talking about, I'd like to get your idea of what the fine in this County would be if the person had a clear driving record. If you're not sure, just give me your best guess. You may assume that no accident is involved.

The correct answers to the question are:

Offense	Fine
6a--Speeding 10 MPH Over Limit	$ 32.00
6b--Speeding 20 MPH Over Limit	Court Appearance
6c--Driving While Intoxicated	$127.00 plus 1-year license revocation*
6d--Running a Traffic Light or Stop Sign	$ 27.00
6e--Following Too Closely	$ 27.00
6f--Turning in Front of Traffic	$ 27.00
6g--Crossing the Center Line	$ 27.00

The fine listed for DWI is the typical fine imposed in court for a first offense. The other fines listed are those that are paid by mail or to the court clerk in the Raleigh/Wake County Area. As was the case in Colorado, no "typical" fine imposed following court appearance for speeding 20 MPH over the limit could be learned.

Group average responses for Question 6 are shown in Figures 17 and 18. For Question 6a--Speeding by 10 MPH--the estimates for Groups 1-4 are within two dollars of the actual fine (but on the low side) and that for Group 5 is high by about seven dollars. Similarly, all estimates for Question 6d--Traffic Light--are above, but within four dollars of the actual fine. Although possibly coincidental, the degree to which the estimates described come close to the actual value suggests that drivers, both violators and non-violators, may be very aware of the fines imposed for these violations. The fine estimates for a 20 MPH Speeding violation (Question 6b) range from about 45 dollars to 72 dollars.

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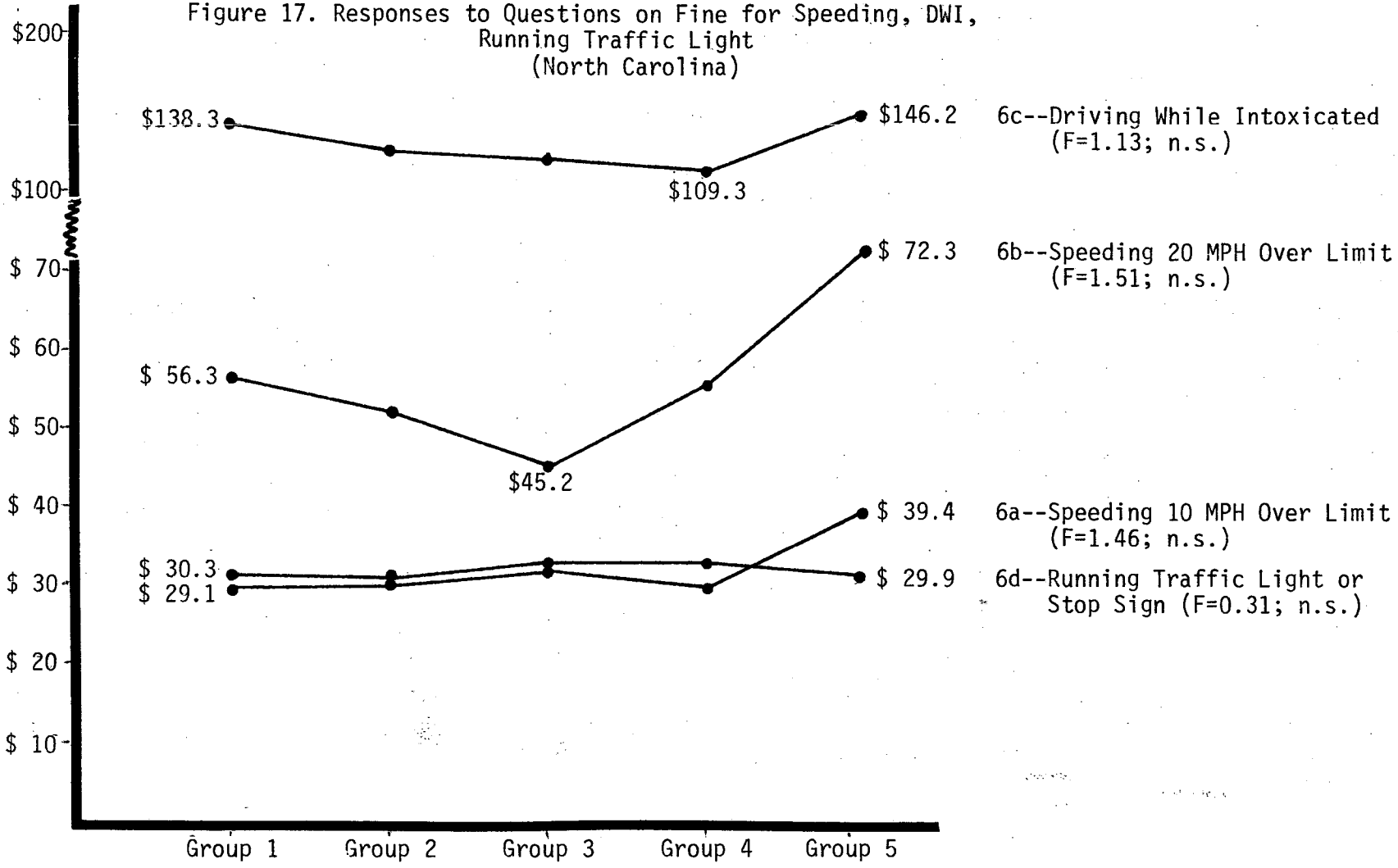
*Referred to interchangeably as license suspension in the text.

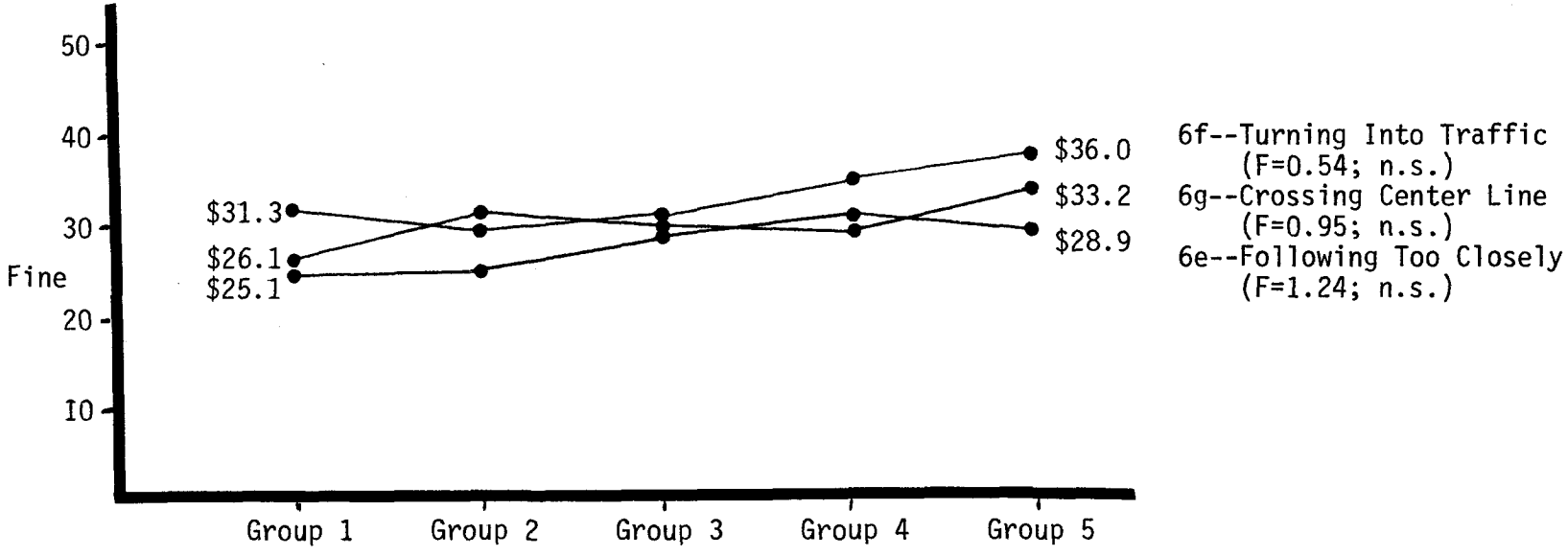
Figure 17. Responses to Questions on Fine for Speeding, DWI, Running Traffic Light (North Carolina)



Overall Statistics				
Question	Number of Responses	Average	Range of Responses Dollars (Number)	Correct Answer
6a	852	$ 29.63	$0 (10) to $ 250 (3)	$ 32
6b	826	$ 53.64	$0 (2) to $ 500 (3)	Court App.
6c	810	$128.77	$0 (18) to $1000 (5)	$127
6d	845	$ 30.24	$0 (10) to $ 200 (3)	$ 27

Figure 18

Responses to Questions on Fine for Following Too Closely, Turning Into Traffic and Crossing Center Line (North Carolina)



Overall Statistics				
Question	Number of Responses	Average	Range of Responses Dollars (Number)	Correct Answer
6e	833	$ 29.63	$0 (28) to $400 (1)	$27.00
6f	838	$ 30.67	$0 (20) to $500 (1)	$27.00
6g	821	$ 28.31	$0 (33) to $500 (2)	$27.00

Since there is no "correct" answer here, comparisons are difficult. It is noted that 15 percent of Group 4 members and 20 percent of Group 5 members had convictions for this offense and no members of the other groups had such convictions. Table 53 shows the median of estimated fines for Question 6. There is little difference between the median and mean values for Questions 6a, b, and d.

Table 53

Median Values for Question 6

Question	Group 1	Group 2	Group 3	Group 4	Group 5	Correct Value
6a	25	28	35	27	32	32
6b	45	42	42	40	50	Court
6c	100	100	100	100	127	127
6d	25	27	27	27	27	27
6e	25	25	27	25	27	27
6f	25	27	27	27	28	27
6g	25	27	27	27	28	27

For DWI, Groups 1 and 5 overestimated the fine while the other groups underestimated it. The disparity between the Group 4 and Group 5 estimates is difficult to explain since 27 percent and 33 percent, respectively, of these groups had DWI convictions. Examination of the median value of each group estimate for DWI shows Groups 1-4 all having median estimates of $100 and that of Group 5 at $127--the correct value.

If, in addition to a fine, the respondent described other penalties for DWI, that information was recorded; as shown in Table 54, 595 respondents (69 percent) provided a second penalty. The principal response, offered by 92 percent of those describing second penalties, was license suspension. This choice was nearly

Table 54

Other Penalty Responses for DWI
(North Carolina)

	Loss/Revoked License	Points on Record	Jail/ Prison	Rehabilitation Driver School	Probation	Warning	Total
Group 1	97 (51.1%)	10 (5.3%)	6 (3.2%)	63 (33.2%)	9 (4.7%)	5 (2.6%)	190
Group 2	68 (44.4%)	9 (5.9%)	4 (2.6%)	58 (37.9%)	13 (8.5%)	1 (0.7%)	153
Group 3	6 (40.0%)	2 (13.3%)	1 (6.7%)	5 (33.3%)	1 (6.7%)	0 (0.0%)	15
Group 4	7 (38.9%)	2 (11.1%)	0 (0.0%)	4 (22.2%)	4 (22.2%)	1 (5.6%)	18
Group 5	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	2 (66.7%)	0 (0.0%)	3
Overall	178 (47.0%)	23 (6.1%)	11 (2.9%)	131 (34.6%)	29 (7.7%)	7 (1.8%)	379

unanimous over all groups, indicating a familiarity with what penalties are imposed for DWI convictions.

The estimated fines for the remaining three violations (Figure 18) are all in the same range as those given for speeding by 10 MPH and Traffic Light (Figure 17), again suggesting that on the average drivers in this North Carolina survey are aware of minor violation penalties. Furthermore, the median responses for these questions were all within two dollars of the correct value.

Analysis of Sanction Severity

As was the case in the other states, two questions were asked regarding the severity of penalties. Question 7 asked the respondent to rate the severity of the fine he estimated in Question 6 on a five-point Likert scale from 1 to 5. In Question 8, the respondent was informed of the correct penalty and asked to rate its severity on the same scale.

Table 55 shows, for each violation, the group-average severity estimates. With two exceptions (Group 4 on Question 7/8f and Group 5 on Question 7/8g), the average severity rating given to the (correct) penalty in Question 8 was higher than that given to the respondents' uninformed estimate of the penalty in Question 7. The range of average severity estimates given lies between 2.20 (hardly severe) and 3.93 (rather severe) but more than three-fourths of the estimates were less than three (moderate severity), the midpoint of the scale. For the 10 and 20 MPH speeding violations, the violator groups all initially rated the severity higher than those with no sanction experience (in the preceding three years). The revised estimate of Group 3 for a 10 MPH violation (Question 8a) was slightly lower than that of Group 1. The t-test shows the revisions of both Groups 1 and 2 for the speed violations were

Table 55

Sanction Severity Averages
(North Carolina)

Speeding 10 MPH Over Limit

	7a	8a	t-value
Group 1	2.5	2.8	- 5.1***
Group 2	2.8	3.0	- 3.3***
Group 3	2.7	2.7	- .2
Group 4	2.7	3.1	- 2.2*
Group 5	3.3	3.3	0.0

Speeding 20 MPH Over Limit

	7b	8b	t-value
Group 1	2.2	2.5	- 4.0***
Group 2	2.5	2.8	- 3.4***
Group 3	2.7	3.0	- 1.0
Group 4	2.9	3.1	- 2.2
Group 5	3.1	3.3	- .5

Driving While Intoxicated

	7c	8c	t-value
Group 1	2.3	2.5	- 2.0*
Group 2	2.4	2.8	- 6.0***
Group 3	2.7	3.1	- 1.4
Group 4	3.1	3.2	- .8
Group 5	3.2	3.9	- 1.8

Running a Traffic Light or Stop Sign

	7d	8d	t-value
Group 1	2.4	2.5	- 1.7
Group 2	2.7	2.7	- 0.2
Group 3	2.2	2.7	- 1.9
Group 4	2.5	2.6	- 1.0
Group 5	2.6	3.1	- 1.2

Following Too Close

	7e	8d	t-value
Group 1	2.3	2.6	- 4.4***
Group 2	2.6	2.8	- 2.1*
Group 3	2.6	2.7	- 0.6
Group 4	2.6	2.7	- 1.2
Group 5	2.7	3.3	- 1.5

Turning Into Traffic

	7f	8f	t-value
Group 1	2.2	2.4	- 2.5*
Group 2	2.5	2.6	- 1.5
Group 3	2.2	2.3	- 0.5
Group 4	2.6	2.5	.5
Group 5	2.9	3.0	- .3

Crossing Center Line

	7g	8g	t-value
Group 1	2.2	2.6	- 5.0***
Group 2	2.5	2.8	- 4.1***
Group 3	2.3	2.7	- 1.5
Group 4	2.5	2.8	- 1.9
Group 5	3.1	3.1	.1

* Significant at the .05 level
** Significant at the .01 level
*** Significant at the .001 level

statistically significant at the .001 level. That for the relatively small Group 4 on the 10 MPH violation was also significant (.05).

For the DWI violation, the groups with DWI experience (4 and 5) initially rated the penalty severity greater than three and revised it further upward upon learning the correct penalty. Group 3's revision placed it above the level three severity and the upward revisions of Groups 1 and 2 made the differences statistically significant. If these ratings are considered in light of the mean estimates of the fines given for Question 7c, the upward severity revision by Groups 1 and 5 are difficult to explain because the mean estimates were higher than the actual fine. However, if it is recalled that the median estimates for Groups 1-4 were below the actual fine and that for Group 5 was equal to the actual fine, then the upward revision in severity estimate by all groups is possibly more understandable. It should also be recalled that 64 percent of all respondents listed license suspension as a DWI penalty. It is reasonable that those who had not listed license suspension might want to increase their DWI penalty severity estimate upon learning about suspension being imposed. Additionally, some of those who had listed suspension might also raise their rating upon learning that the suspension lasted one year.

As can be seen in Table 55, trends similar to those described for the speeding violations can be noted for the other four minor violations. In some cases the difference between the mean estimates of Questions 7 and 8 is statistically significant.

ANALYSIS OF OTHER SANCTIONING ISSUES

Several sanction-related matters such as the effect of warning tickets, appearance before a judge, attendance at court traffic school, preventive versus educational effects and insurance premium impact were addressed in the driver interview. The following sections present the analysis regarding these matters.

Special and General Effects

Question 9 asked about special effects--those on drivers who have been sanctioned; Question 10 asked about general effects--those on drivers who have not been sanctioned. The questions were worded as:

> 9. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who <u>have</u> committed traffic violations?
>
> Preventive or deterrent effect--keeps people from doing the same thing again.
>
> Educational effect--teaches people what the driving laws are and how to drive safely.
>
> No effect--penalties for traffic violations have no effect on the drivers concerned.
>
> 10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect drivers who <u>have not</u> committed traffic violations?
>
> (Same three alternatives as above.)

The results for these two questions are shown in Table 56. All groups tend to favor the preventive/deterrent effect for those who have been sanctioned and only Group 5 favors it much more strongly than the others. Group 5 and Group 1 felt more strongly than the other groups that no special effect was to be achieved from sanctions. Overall, however, 13 percent felt there was no special

Table 56

Questions 9 and 10 -- Effect of Penalties on Drivers
(North Carolina)

	QUESTION 9			QUESTION 10		
	Preventive or Deterrent Effect	Educational Effect	No Effect	Preventive or Deterrent Effect	Educational Effect	No Effect
Group 1	52.3%	32.3%	15.3%	39.6%	46.4%	14.0%
Group 2	51.8%	36.3%	11.8%	37.1%	39.2%	23.7%
Group 3	54.3%	34.3%	11.4%	48.6%	25.7%	25.7%
Group 4	48.5%	39.7%	11.8%	33.8%	43.1%	23.1%
Group 5	60.0%	20.0%	20.0%	40.0%	40.0%	20.0%
Overall	52.0%	34.5%	13.4%	38.4%	42.0%	19.6%

Question 9. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who have committed traffic violations?

Question 10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect drivers who have not committed traffic violations?

Preventive or deterrent effect -- keeps people from doing the same thing again
Educational effect -- teaches people what the driving laws are and how to drive safely
No effect -- penalties for traffic violations have no effect on the drivers concerned

effect. The percentage of respondents by group favoring general preventive/deterrence effects was not much different than the overall average. The general educational effect was preferred over the general preventive/deterrent effect by all groups except Group 3. Although the overall difference is small, it is difficult to understand how the general educational effect would have more impact. About the same percentage of Group 1 as felt that there would be no special effects also felt there would be no general effects. Each of the other groups felt more strongly that no general effects would occur than they did about no special effects occurring. This outcome is quite reasonable.

Influence of Warning Tickets

The drivers were asked about the influence a warning ticket would have compared to receiving a citation. Question 11 stated:

> 11. When the police see a traffic violation, they can stop the driver and give him/her a warning (instead of a ticket). Please circle the number below which best describes how such a warning would influence your drivine practices when compared to getting a ticket.
>
> 1. Has same effect as getting a ticket.
> 2. Has a greater effect.
> 3. Some effect but not as much as a ticket.
> 4. No effect.

The responses given are shown below. Only for Group 3 did less than half of the respondents feel that a warning would be as effective or more effective than a ticket. Although only slightly less than half of Group 3 felt that way, it is assumed that their experience with multiple minor violations--the kind that might result in a warning--and the fact that they continue to violate after citations, made them honestly realize and state that the warning would have been less effective for them.

	Same Effect As a Ticket	Greater Effect	Not as Great as a Ticket	No Effect
Group 1	39.2%	25.8%	32.9%	2.2%
Group 2	30.8%	25.3%	42.1%	1.8%
Group 3	25.7%	22.9%	42.9%	8.6%
Group 4	26.5%	32.4%	38.2%	2.9%
Group 5	46.7%	13.3%	33.3%	6.7%
Overall	34.1%	25.7%	37.8%	2.4%

Influence of Court Appearance

The drivers' opinions regarding the effect of court appearance were sought in Question 12:

> 12. A traffic law violator may choose either to (1) appear before a judge to plead his/her case, or (2) pay a fine by mail or to a court clerk. To what extent would a lecture and fine given by a judge influence a person's driving behavior when compared to paying the fine without appearing before the judge? Would you say it would have
>
> 1. Lesser influence
> 2. Greater influence
> 3. No difference
> 4. No opinion

The responses were as follows:

	Lesser Influence	Greater Influence	No Difference	No Opinion
Group 1	9.6%	66.6%	20.3%	3.6%
Group 2	8.9%	61.6%	25.3%	4.2%
Group 3	8.6%	54.3%	31.4%	5.7%
Group 4	7.4%	69.1%	16.2%	7.4%
Group 5	13.3%	60.0%	20.0%	6.7%
Overall	9.2%	64.0%	22.6%	4.3%

The responses show a strong belief that court appearances have a greater influence on driving behavior as compared to paying the fine without appearance. The overall statistics show that nearly two-thirds of the respondents gave the "Greater Influence" answer. The individual group averages vary around this overall average with no significant differences between group averages.

Influence of Court Traffic School

The sanctions of court or licensing agency education programs were covered in Questions 13 and 14:

13. Do you know that some traffic violators are penalized by having to attend a court traffic school or a Department of Motor Vehicles education program?

14. Do you think such a penalty would positively influence your driving?

The positive response to these questions was overwhelming. Overall, 87.8 percent responded "Yes" to Question 13, indicating an extensive awareness of traffic violator schools or licensing agency classes as an alternative sanction. Regarding effectiveness, 84.7 percent of the respondents felt such a penalty would positively influence their driving.

Influence of Insurance Premiums

Three questions were asked that related to knowledge about insurance premiums:

15. Do you know that some drivers have their insurance premiums increased, or their insurance cancelled, following conviction for a traffic violation?

16. Is your driving influenced by your awareness of what insurance companies do?

17. In this state, all insurance companies raise premiums for the next three years by 10% (for example, $10 added to a $100 annual premium), following conviction for one routine (one-point) moving violation. For a two-point violation, such as speeding more than 55 miles per hour (or two 1-point violations), the premiums are raised by 40%. Do you think your driving will be influenced by your awareness of what insurance companies do?

Question 15 was asked to each respondent. If the respondent answered "Yes," Question 16 was asked; if the respondent answered "No" to Question 15, Question 17 was asked.

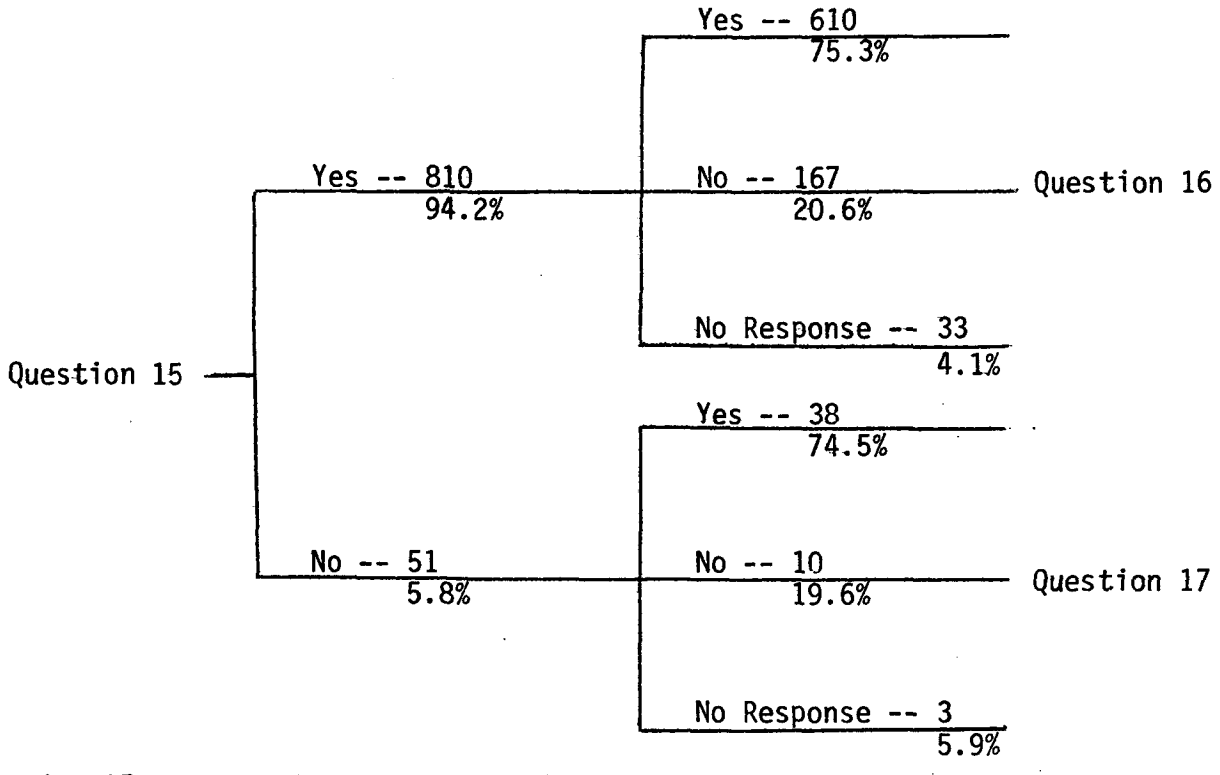
The responses to these questions are shown in Figure 19. North Carolina law requires that all companies offering auto insurance for sale in the state have a program of premium increase as described in Question 17. With 94 percent of respondents indicating an awareness of insurance premium increase or policy cancellation following a traffic conviction, it is clear that this practice is very well known. Three-quarters of those who were aware of these practices are influenced by them and 74 percent of those who were not aware of the practices said they would be influenced by their new knowledge of what the practices are in North Carolina.

DATA ON SPEEDS

As with the other two sites, it was of interest to develop a better indication of the actual violation rates in the Raleigh, North Carolina area. For this purpose, four separate road segments were selected as being typical of the type of street and daily traffic volumes in the area. Three of these segments were

Figure 19

Responses to Questions on Insurance Premiums
(North Carolina)



Question 15. Do you know that some drivers have their insurance premiums increased, or their insurance cancelled, following conviction for a traffic violation?

Question 16. Is your driving influenced by your awareness of what insurance companies do?

Question 17. In this state, all insurance companies raise premiums for the next three years by 10% (for example, $10 added to a $100 annual premium), following conviction for one routine (one point) moving violation. For a two point violation, such as speeding more than 55 miles per hour (or two 1-point violations), the premiums are raised by 40%. Do you think your driving will be influenced by your awareness of what insurance companies do?

on multi-lane highways or expressways which handled much of the traffic volume in Raleigh and the surrounding jurisdictions. These three were the Raleigh Durham Highway, U.S. 64, and the U.S. 64 and Route 1 Beltline. With all three, the speed limit was 55 miles per hour. A residential/commercial roadway was also selected along Six Forks Road between North Hills and a shopping center. This segment had a speed limit of 45 miles per hour until the area of the shopping center where the speed limit was 35 miles per hour.

The device used for collecting the speed data was a Leupold and Stevens, Inc. Model CVS 545 speed measuring instrument. An instrument was placed at each site for a seven-day period and data were collected at four times each day (6:30 a.m., 10:00 a.m., 3:30 p.m., and 7:30 p.m.). The installation consisted of placing two cables approximately six feet apart across the desired lanes of traffic. The cables were connected to a processing and recording box located at the side of the road segment. The instrument allowed for collecting speed data in each lane of traffic on the following speed intervals: less than 35 MPH, 35-39 MPH, 40-44 MPH, 45-49 MPH, 50-54 MPH, 55-57.4 MPH, 57.5-59 MPH, 60-62.4 MPH, 62.5-64 MPH, 65-69 MPH, 70-74 MPH, and over 75 MPH.

Some problems were encountered during the data collection process. On two occasions, the instruments were vandalized and the cables torn up from the roadway. Unfortunately, there was insufficient time for repeating the data collection on the exact day and time period when these incidents occurred. There were also some times when inclement weather caused abnormal traffic patterns and on these occasions, the data were not used. Further,

the instrument at U.S. 64 recorded only one lane of traffic rather than both lanes. Even in the one lane, the readings appeared to be very low and for these reasons, the data from this location have not been included in this report.

Tables 57-59 show the speed data by day of week and time period. Shown in the table are (1) the total traffic volume of the time periods, (2) the 85th percentile speed, and (3) the percent of vehicles exceeding the speed limit by at least 10 miles per hour. The data in the table can be further summarized as follows:

	Raleigh Durham	64 & #1 Beltline	Six Forks
Average Daily Traffic Volume	10,800	23,000	9,200
Average 85th Percentile	63.0 MPH	56.9 MPH	43.8 MPH
Range of 85th Percentiles	62.6-64.3	55.1-58.0	45.2-46.4
Average Percent Exceeding Speed Limit by at Least 10 MPH	10.3%	0.6%	1.0%
Range of Percent Exceeding Speed Limit by at Least 10 MPH	6.1-15.7%	0.2-1.3%	0.4-2.4%

The Raleigh Durham Highway stands out in these figures as having a much higher 85th percentile and a much higher percentage of vehicles going 65 miles per hour or greater. The data show one time period in which 15.7 percent of the drivers were exceeding 65 MPH. In general, the morning rush hour traffic along this highway had a high percentage of speeders. With the other two sites, the 85th percentiles and the percent of speeders is much lower and, as seen by the figures, the percent of speeders never exceeds 2.4% along these road segments.

Table 57

Raleigh Durham Highway
(North Carolina)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	2,370	2,069	4,311	2,039	----	1,906	3,630
85th Percentile	63.0	63.1	63.0	63.1	----	63.0	62.9
% Exceeding 65 MPH	9.8%	11.0%	10.4%	13.0%	----	9.9%	9.4%
6:30 AM-10:00 AM							
Traffic Volume	602	3,138	3,497	3,274	----	3,449	660
85th Percentile	63.1	63.2	63.2	64.3	----	63.1	63.1
% Exceeding 65 MPH	11.6%	13.7%	13.8%	15.7%	----	12.9%	11.2%
10:00 AM-3:30 PM							
Traffic Volume	2,904	2,712	2,565	2,197	----	3,513	3,662
85th Percentile	63.2	62.9	62.4	62.9	----	63.0	63.0
% Exceeding 65 MPH	13.9%	8.6%	11.6%	7.7%	----	9.4%	9.5%
3:30 PM-7:30 PM							
Traffic Volume	2,213	2,497	2,712	2,804	3,077	2,895	1,516
85th Percentile	62.7	62.9	63.0	62.6	63.0	62.6	62.7
% Exceeding 65 MPH	6.9%	8.9%	10.0%	6.1%	9.2%	6.7%	6.6%

Table 58

U.S. 64 and Route 1 Vehicle Speed Data
(North Carolina)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	5,459	3,005	----	5,047	4,660	4,780	5,164
85th Percentile	55.4	58.0	----	57.9	57.6	57.6	55.3
% Exceeding 65 MPH	0.4%	1.3%	----	1.1%	0.7%	1.0%	0.4%
6:30 AM-10:00 AM							
Traffic Volume	1,115	5,838	----	5,649	5,549	5,386	2,264
85th Percentile	57.9	57.9	----	58.0	57.9	57.8	57.8
% Exceeding 65 MPH	1.3%	0.6%	----	0.9%	0.4%	0.8%	1.3%
10:00 AM-3:30 PM							
Traffic Volume	5,507	7,821	6,936	7,402	6,680	8,105	8,021
85th Percentile	57.4	57.7	57.9	58.0	57.7	57.7	57.8
% Exceeding 65 MPH	0.4%	0.4%	0.7%	1.2%	0.6%	0.7%	0.8%
3:30 PM-7:30 PM							
Traffic Volume	4,045	6,034	6,619	6,785	7,174	8,586	5,996
85th Percentile	55.4	55.1	55.4	55.3	55.4	55.2	55.4
% Exceeding 65 MPH	0.3%	0.2%	0.3%	0.3%	0.4%	0.2%	0.2%

Table 59

Six Forks Vehicle Speed Data
(North Carolina)

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30 PM-6:30 AM							
Traffic Volume	1,916	751	----	1,787	1,608	1,547	1,815
85th Percentile	45.2	46.2	----	45.5	45.5	45.8	45.4
% Exceeding 55 MPH	0.5%	1.6%	----	0.8%	2.4%	1.3%	0.8%
6:30 AM-10:00 AM							
Traffic Volume	450	----	----	2,442	3,712	2,458	754
85th Percentile	46.0	----	----	46.4	46.3	46.3	46.3
% Exceeding 55 MPH	1.3%	----	----	2.1%	1.8%	1.5%	2.4%
10:00 AM-3:30 PM							
Traffic Volume	2,353	----	3,682	3,868	3,419	4,278	3,445
85th Percentile	45.7	----	45.6	45.7	45.6	45.5	45.8
% Exceeding 55 MPH	0.5%	----	0.9%	0.8%	0.9%	0.8%	0.9%
3:30 PM-7:30 PM							
Traffic Volume	1,435	----	2,481	2,559	2,738	3,367	2,081
85th Percentile	45.8	----	45.5	45.7	45.5	45.3	45.5
% Exceeding 55 MPH	0.8%	----	0.8%	0.9%	0.4%	0.7%	0.4%

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APPENDIX A

DRIVER QUESTIONNAIRE

Note: The questionnaire in this appendix was specifically designed for use in Wake County, North Carolina. The only difference between it and the questionnaires for the other two states is with Question 8 which lists the actual fine for the violations.

Opinion Research Corp.
Princeton, NJ 08540

51491
OMB No. 004-S77013
EXPIRES 12-31-79

TRAFFIC LAW SANCTIONS

DRIVER QUESTIONNAIRE

Time Started: _____ Time Ended: _____

Date: _____ GROUP: 1
2
3

Interviewer: _____

INTRODUCTION:

Hello, my name is _____, from Opinion Research Corporation, Princeton, New Jersey. We're conducting a survey for the U.S. Department of Transportation (authorized by 23 U.S.C. 403). The purpose of the survey is to learn how drivers feel about various safety problems and fines that can occur when people drive a car. The information is for a statistical survey and will not be disclosed outside the Department of Transportation. The interview will take about 10 to 15 minutes, and we would appreciate your cooperation, which is voluntary.

In evaluating the interview responses we will also perform an analysis of the driving records of all drivers who are interviewed. You have our assurance that once all the information is collected, all names and other identifying information will be removed.

1. About now many miles do you, yourself, drive in a year? (PROBE: Just your best estimate.)
   1 UNDER 10,000 MILES
   2 10,000 - 14,999
   3 15,000 - 19,999
   4 20,000 OR OVER
   5 DON'T KNOW

2. Roughly, how many years have you been driving a car?
   1 LESS THAN 5 YEARS
   2 5-9 YEARS
   3 10-19 YEARS
   4 20 YEARS OR MORE

On the next few questions, I'd like you to mark your own answers. The questions can be answered by simply circling the number that most nearly sums up your opinion. Please read each question and its instructions carefully before you answer. HAND RESPONDENT QUESTIONNAIRE AND PENCIL.

3. How good a job do you feel this State is doing in each of the following areas in holding down the number of traffic accidents? Please circle the number on each line that best describes how you feel. (Just your best impression.)

	Very Poor	Poor	Average	Good	Very Good
a. The motor vehicle inspection system	1	2	3	4	5
b. Setting high standards for people getting a driver's license	1	2	3	4	5
c. Designing and maintaining highways in a way that makes them safe to drive on	1	2	3	4	5
d. Overall enforcement of the laws that require motorists to follow safe driving practices	1	2	3	4	5

4. Following are a number of traffic violations. For every 100 drivers who commit these acts, how many, in your opinion, will be caught by the police in this County? You may assume no accidents are involved.

	Number of Violators Caught
a. Speeding 10 miles per hour over the posted speed limit	_____
b. Speeding 20 miles per hour over the posted speed limit	_____
c. Driving while intoxicated (drunk driving)	_____
d. Running a traffic light or stop sign	_____
e. Following a moving car too closely	_____
f. Turning left in front of oncoming traffic or pulling out into traffic (like at an intersection or on a freeway)	_____
g. Crossing the center line of the road	_____

5. In this County, once a person has been caught by police and given a ticket for most of these violations, he can usually pay or mail in the fine or he can challenge the ticket in court. For every 100 drivers who are ticketed or arrested, and choose to take it to court, how many, in your opinion, will be found guilty of committing the violation? Again, you may assume that no accidents are involved.

	Number of Caught Violators Who Challenge Ticket And Are Found Guilty
a. Speeding 10 miles per hour over the posted speed limit	_____
b. Speeding 20 miles per hour over the posted speed limit	_____
c. Driving while intoxicated	_____
d. Running a traffic light or stop sign	_____
e. Following a moving car too closely	_____
f. Turning left in front of oncoming traffic or pulling out into traffic (like at an intersection or on a freeway)	_____
g. Crossing the center line of the road	_____

PLEASE RETURN QUESTIONNAIRE TO INTERVIEWER.

INTERVIEWER:

TAKE BACK QUESTIONNAIRE AND SAY:

I'll ask you the next question instead of having you write in your own answers.

6. For each of the same violations we've been talking about, I'd like to get your idea of what the fine in this County would be if the person had a clear driving record. If you're not sure, just give me your best guess. You may assume that no accident is involved.

a.	First, what do you think the fine would be for a first offense for speeding, if you were given a ticket for going 10 miles per hour over the posted speed limit?	FINE: $ _____
b.	How about for 20 miles per hour over the posted speed limit?	FINE: $ _____
c.	How about driving while intoxicated? What do you think the fine or other penalty would be for a first offense?	FINE: $ _____ OTHER PENALTY: _____
d.	How about running a traffic light or stop sign?	FINE: $ _____
e.	How about following a moving car too closely?	FINE: $ _____
f.	How about turning left in front of oncoming traffic or pulling out into traffic?	FINE: $ _____
g.	And how about crossing the center line?	FINE: $ _____

INTERVIEWER:

WRITE IN, ON QUESTION 7, THE AMOUNTS MENTIONED BY RESPONDENT ON QUESTION 6. THEN TURN QUESTIONNAIRE TO RESPONDENT.

7. In this question, the interviewer has written in what you thought the fine would be for each of the violations stated in question 6. Now, please circle the number on the scale below which most accurately reflects your feelings on how severe the fine is as you stated it.

		Not At All Severe				Extremely Severe
a.	You have stated that the fine for driving 10 miles per hour over the speed limit is $_____. On a scale of 1 to 5, circle the number indicating how severe you think the fine is.	1	2	3	4	5
b.	How severe would you rate the $_____ fine you listed for speeding 20 miles per hour over the posted speed limit?	1	2	3	4	5
c.	How severe is the $_____ fine (and/or _____) you listed for driving while intoxicated?	1	2	3	4	5
d.	$_____ for running a traffic light or stop sign?	1	2	3	4	5
e.	$_____ for following a moving car too closely?	1	2	3	4	5
f.	$_____ for turning left in front of oncoming traffic or for pulling out into traffic?	1	2	3	4	5
g.	$_____ for crossing the center line?	1	2	3	4	5

8. For these same offenses we are listing below the actual fine in Wake County for a person who has been given a ticket and merely wishes to pay the standard fine. In the case of driving while intoxidated, the penalty given is about what is usually given when the driver is found guilty of a first offense after being arrested and going to court. Please indicate how severe you feel each penalty is, considering the standard fine in relation to the seriousness of the offense. Please circle one number for each offense to indicate where you think the penalty falls on the scale of severity.

	Not At All Severe				Extremely Severe
a. Speeding 10 miles per hour over the posted speed limit: $32.	1	2	3	4	5
b. Speeding 20 miles per hour over the posted speed limit: Required Court Appearance.	1	2	3	4	5
c. Driving while intoxicated: $127 plus one year license revocation.	1	2	3	4	5
d. Running a traffic light or stop sign: $27.	1	2	3	4	5
e. Following a moving car too closely: $27.	1	2	3	4	5
f. Turning left in front of oncoming traffic or pulling out into traffic: $27.	1	2	3	4	5
g. Crossing the center line: $27.	1	2	3	4	5

9. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect most drivers who have committed traffic violations?

CIRCLE ONE NUMBER

1 Preventive or deterrent effect -- keeps people from doing the same thing again

2 Educational effect -- teaches people what the driving laws are and how to drive safely

3 No effect -- penalties for traffic violations have no effect on the drivers concerned

10. Which of the statements below comes closest to your feeling about the way that penalties for traffic violations affect drivers who have not committed traffic violations?

CIRCLE ONE NUMBER

1 Preventive or deterrent effect -- keeps people from committing traffic violations

2 Educational effect -- teaches people what the driving laws are and how to drive safely

3 No effect -- penalties for traffic violations have no effect on drivers in general

11. When the police see a traffic violation, they can stop the driver and give him a warning (instead of a ticket). Please circle the number below which best describes how such a warning would influence your driving practices when compared to getting a ticket.

CIRCLE ONE NUMBER

1 Has same effect as getting a ticket.

2 Has a greater effect.

3 Some effect but not as much as a ticket.

4 No effect.

12. A traffic law violator may choose either to 1) appear before a judge to plead his case, or 2) pay a fine by mail or court clerk.

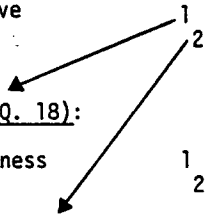
    To what extent would a lecture and fine given by a judge influence a person's driving behavior when compared to paying the fine without appearing before the judge, would you say it would have --

    CIRCLE ONE NUMBER
    1 Lesser influence
    2 Greater influence
    3 No difference
    4 No opinion

13. Do you know that some traffic violators are penalized by having to attend a court traffic school or a Department of Motor Vehicles education program? 1 Yes 2 No

14. Do you think such a penalty would positively influence your driving? 1 Yes 2 No

15. Do you know that all drivers in this state have their insurance premiums increased following conviction for a traffic violation? 1 Yes 2 No (Go to Q. 17)



(If "yes" on Q. 15, answer Q. 16, then go to Q. 18):

16. Is your driving influenced by your awareness of what insurance companies do? 1 Yes (Go to Q. 18) 2 No (Go to Q. 18)

(If "no" on Q. 15, answer Q. 17, then go to Q. 18):

17. In this state, all insurance companies raise premiums for the next three years by 10% (for example, $10 added to a $100 annual premium), following conviction for one routine (one point) moving violation. For a two point violation, such as speeding more than 55 miles per hour (or two 1-point violations), the premiums are raised by 40%. Do you think your driving will be influenced by your awareness of what insurance companies do? 1 Yes 2 No

18. Would you please circle the number below which best describes your family's total income in 1978, before taxes.

    1 Under $5,000
    2 $5,000-$9,999
    3 $10,000-$14,999
    4 $15,000-$19,999
    5 $20,000-$29,999
    6 $30,000 or over

19. Please circle the number which best describes your highest level of education.

    CIRCLE ONE NUMBER
    1 Did not complete grade school
    2 Completed grade school
    3 Attended high school
    4 Completed high school
    5 Attended college
    6 Completed college (four years)
    7 Attended graduate school
    8 Completed graduate school

20. Respondent's Sex: 1 Male 2 Female

PLEASE RETURN QUESTIONNAIRE TO INTERVIEWER.

THANK YOU FOR YOUR COOPERATION

INTERVIEWER:

WHEN THE RESPONDENT INDICATES THAT HE/SHE HAS COMPLETED QUESTION 19, OBTAIN THE FOLLOWING INFORMATION.

20. Respondent's Name: _____

Respondent's Driver's License No. _____

State: _____

21. Respondent's Date of Birth: _____ _____ _____
MONTH DAY YEAR

THANK THE RESPONDENT FOR THE COOPERATION AND TIME TAKEN TO COMPLETE THE QUESTIONNAIRE.