

A DRIVER ATTITUDE INVENTORY
DESIGNED TO ASCERTAIN TOPICS
REQUIRING INSTRUCTIONAL EMPHASIS

Thesis for the Degree of Ph. D.
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WILLIAM JOHN MEDVE
1969

This is to certify that the

thesis entitled

A DRIVER ATTITUDE INVENTORY
DESIGNED TO ASCERTAIN TOPICS
REQUIRING INSTRUCTIONAL EMPHASIS

presented by

WILLIAM JOHN MEDVE

has been accepted towards fulfillment
of the requirements for

Ph.D degree in Ed.

Date 7-3-67

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ABSTRACT

A DRIVER ATTITUDE INVENTORY DESIGNED TO ASCERTAIN TOPICS REQUIRING INSTRUCTIONAL EMPHASIS

by William John Medve

Introduction

If driver education is to play an effective role in the reduction of traffic accidents, then the development of desirable driving attitudes should be one of the major program objectives. Since the attitudes of students enrolled in a course cannot be readily detected, teachers must resort to the use of suitable measuring devices. Unfortunately, most of the available driver attitude scales have been designed to evaluate student attitudes per se rather than to serve as instructional guidelines.

Statement of the Problem

The purpose of this study was to develop a practical attitude inventory which would be concise, relatively easy to administer and interpret and yet give some indication of student attitudes as they related to motor vehicle regulations and driving practices. The intended function of the inventory was not to evaluate individual attitudes per se,

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1. Appropriate channels of instructional emphasis for the purpose of changing or modifying student attitudes which may be distorted in their expression or negative in their effects. (Pre-test)
2. The effectiveness of instructional procedures in modifying or changing student attitudes. (Post-test)

Development of the Preliminary Inventory

Based on the review of the literature and existing driver attitude scales, the following universe of content was postulated: (1) Laws, (2) Enforcement, (3) Licensing, (4) Alcohol, (5) Speeding, (6) Accidents, (7) Equipment, (8) Emotions, (9) Courtesy, and (10) Driver education. Sixty complete sentence statements of varying degrees of favorability and unfavorability were initially formulated. However, after the editing process, only fifty were retained. These statements were subjected to further scrutiny by several individuals in the field of driver and traffic safety education to ensure that the terminology was within the reading and comprehension level of the average twelve year old.

Suggested revisions were made and the fifty statements were placed in the Likert five-response format, employing Thurstone's instructions designed for use by a judging group. The preliminary draft of the inventory was then mailed to 287 individuals from three levels of driver

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Statistical Procedure

The responses of the 207 persons who returned the preliminary form of the inventory were used to compute scale values and interquartile range scores for the purpose of item analysis. Low ambiguity values and high acceptance factors were used as criteria for retaining thirty-three of the original fifty statements. The remaining statements were then analyzed by orthogonal and oblique principal components factor analysis solutions to assess the extent to which the postulated universe of content was independent of factoring methods. Eight factors were judged to exist over three of the four derived solutions and the two factors that were not labeled were assumed to be logical components of the Enforcement factor. Considerable evidence was thus obtained which supported: (1) the classification of the statements within each factor, (2) the validity of the inventory, and (3) the appropriateness of obtaining separate subscale scores for the ten postulated factors.

Development of the Final Inventory

The final inventory employed a three-phase response and contained thirty statements proportionately distributed

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over the ten original factors. Two parallel forms were developed for the purpose of pre and post course administration. Form A or the Pre-test was prescribed to ascertain areas that may require instructional emphasis whereas Form B or the Post-test was proposed for use in determining the extent of attitude change resulting from instruction, insight or knowledge attainment.

Clear, concise student instructions and administrative guidelines were written, concentrating on the elicitation of truthful responses. To facilitate the scoring procedure, the statements were arranged in sets of three and uniformly dispersed throughout the inventory. An answer sheet and a scoring key were developed to enable the attainment of sub-scores for each factor. The standard responses and the validity of the inventory were determined by the judgment of the 207 driver and traffic safety educators who responded to the preliminary draft of the inventory.

Concluding Statement

As with any measuring device, the accuracy of the inventory and the worth of its findings are dependent upon proper administration and interpretation. This inventory, in and of itself cannot solve the traffic accident problem. However, it is hoped that it will enable driver educators to organize and evaluate their courses in a more meaningful and effective manner.

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A DRIVER ATTITUDE INVENTORY DESIGNED TO ASCERTAIN
TOPICS REQUIRING INSTRUCTIONAL EMPHASIS

By

William John Medve

A THESIS

Submitted to
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in partial fulfillment of the requirements
for the degree of

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College of Education

1969

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This study was made possible through the cooperation of many individuals. Although it is not possible to acknowledge all of them formally, the following deserve special recognition. Dr. Robert Gustafson, the chairman of my committee, whose suggestions and recommendations were invaluable in developing the final product; Dr. Robert Nolan, Dr. Robert Winborn and Dr. Charles Blackman, the other committee members, who provided counsel and guidance throughout the research project; Dr. William Mann, who stimulated the initial interest which led to the undertaking of the study; Dr. Nicholas Rayder, who gave unstintingly of his time in providing direction in scaling methodology; Mr. John Draper, who assisted in developing the programs essential to the statistical procedures involved; and, Dr. Russell Brumbaugh, who took time from his busy schedule to administer the preliminary draft of the inventory to the graduate students within his department.

With the exception of Dr. Brumbaugh from Eastern Michigan University, all of the other individuals cited were from Michigan State University.

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CHAPTER I

THE PROBLEM

Introduction

The progressive increase in the annual number of traffic fatalities has received considerable attention in the past few years. As a result, significant progress has been made in promoting and improving safer vehicle and roadway conditions and driver education programs have been expanded. In spite of these improvements, there has been no noticeable reduction in the number of motor vehicle fatalities. Even the death rate per 100 million miles traveled, which had formerly shown annual decreases, has gradually plateaued and currently indicates a slight increase. Statistics have further revealed that the most prominent augmentation in fatalities has taken place among drivers in the fifteen to twenty-four age range.¹

Research has disclosed that approximately 90 per cent of all traffic accidents may be attributed to some form of human failure.² It is thus indicated that external

¹Automotive Safety Foundation, ASF Report, Vol. 2, No. 6, March, 1969.

²Clara G. Stratemeyer, Accident Research for Better Safety Teaching, National Commission on Safety Education, N.E.A., Washington, D.C., 1964.

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or environmental conditions, although important, are not the basis of the problem. The solution apparently has educational implications, since education can influence or affect individual attitudes and behavior patterns. Therefore, emphasis must be placed on education with the accent on young drivers.

Driver educators have done a commendable job of imparting knowledge regarding traffic laws and teaching driving skills. However, due to program limitations, they have been able to do very little in fostering knowledge and skill with desirable driving attitudes. It must be realized that even though potential drivers may be well informed about the hazards of driving and have excellent driving skills, they will inevitably cause or be involved in traffic accidents if they have undesirable driving attitudes. Consequently, the development of desirable attitudes should be one of the basic objectives of driver education programs.

The objective of this study was to develop an instrument that could be used to evaluate student attitudes in order to ascertain topics that may require instructional emphasis.

Importance of the Study

Most traffic safety authorities concur that good driving attitudes are an extremely important consideration in producing accident-free drivers. Yet, for the most part, educational attempts at modifying or changing student attitudes have been ignored because attitudes have generally

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been classified as one of the so-called intangibles. Improvements have been made in evaluating general knowledge and skill, however, very little has been done in the area of attitude measurement. There is no doubt that attitudes are difficult to measure and that it is easier to evaluate the current ability of the students than it is to measure their future behavior patterns. Educators agree that the value of the educational process is dependent upon the total affect it has on the students and not merely how well they have learned specific subject matter. Consequently, safe driving can only be attained when knowledge and skill are fortified with good driving attitudes.

If success is to be achieved in reducing traffic accidents, the schools must provide driver education programs that are designed to influence student behavior patterns. Driver educators cannot readily detect the undesirable attitudes which their students may have, hence, they must resort to the use of appropriate measuring devices. In the past few years, several attitude scales have been developed for this purpose. A few of these scales have proven to be very useful, however, they are not employed extensively since: (1) their correlation with actual behavior has not been established, (2) the available scales are generally designed to evaluate the attitudes of individual students, or (3) the application and interpretation of the results obtained from these scales have not been clearly defined.

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With driver education currently under scrutiny, it is pertinent that driver educators accept the responsibility of attempting to identify the undesirable or vague beliefs of their students in order to encourage them to develop desirable attitudes relative to safe driving. Little can be done to positively influence undesirable attitudes until they are detected. Consequently, an instrument must be sought to assess student attitudes for the purpose of ascertaining topics which may require instructional emphasis.

Purpose of the Study

If driver education is to represent an honest attempt at the reduction of traffic accidents, then the development of desirable driving attitudes should be one of the major program objectives. Before driver educators can endeavor to change or modify student attitudes, they must know where to place the necessary emphasis. It is the purpose of this study to develop a practical attitude inventory which will be concise, relatively easy to administer and interpret, and yet give some indication of student attitudes as they relate to motor vehicle regulations and driving practices.

The intended function of the inventory is not to evaluate individual attitudes per se, but to use grouped attitude scores to designate:

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2. The effectiveness of instructional procedures in modifying or changing student attitudes. (Post-test)

Educators must recognize that although attitude inventories represent only the verbalized attitudes their students are willing to express, they can still be used to ascertain phases of the program that may require instructional emphasis.

Definitions of Terms Used

Driving Attitudes.--The term "driving attitudes" as used in this study is the sum total of individual feelings which influence the pattern of human behavior relating to motor vehicle regulations and driving practices. Since the definition can be rather extensive, it is necessary to designate attitudes toward specific persons, situations, places or things such as: laws, enforcement and accidents.

Attitude Inventory.--An "attitude inventory" deals with a person's degree of negative or positive affect associated with some psychological object. It usually consists of a series of statements or phrases involving several opinion items. An attitude inventory differs from an opinionnaire in that the latter frequently deals with a

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single question and is a verbal expression of an attitude whereas an attitude inventory involves a series of statements consisting of several opinions.

Driving Responsibilities.--The term "driving responsibilities" comprises all the behavior patterns of drivers which enable them to operate a motor vehicle legally, safely and efficiently. This would include considerations such as adherence to traffic laws, respect for authority, a regard for other users of the road and safe driving practices.

Overview of the Thesis

This study is designed to develop an instrument that can be used as a guide to determine the topics that should be emphasized in the organization of a driver education course. Consequently, the content is structured in a format developed to fulfill the designated purpose.

In Chapter II, the pertinent literature relating to attitudes is reviewed with the primary emphasis being placed upon: (1) traffic accidents and attitudes, (2) methods of affecting attitudinal change, (3) driver attitude scales, and (4) attitude scale methodology.

Chapter III contains information recounting the development of the preliminary inventory, while Chapter IV outlines the statistical procedures that were followed to select the items to be used in the final inventory.

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The two forms of the final inventory and the administrative guidelines are presented in Chapter V and the study is culminated in Chapter VI which contains the summary, conclusions and recommendations.

In order to construct a driver attitude inventory, it is necessary to comprehend the nature and development of attitudes and their relationship to traffic accidents. A selected review of the relevant literature is presented in the following chapter.

CHAPTER II

REVIEW OF THE LITERATURE

In order to disclose the background information pertinent to the study, in a comprehensive manner, it was necessary to divide this chapter into four sections. Section 1 contains selected literature relating to accident analysis and review. Section 2 is comprised of a group of studies concerning methods of affecting attitudinal change, Section 3 contains information about existent driver attitude scales, and in Section 4, the literature pertaining to attitude scale methodology is reviewed.

SECTION 1

Accident Analysis and Review

It is beyond the purpose and scope of this study to report on the numerous investigations regarding the causes of traffic accidents. Hence, a selected review has been made only of the literature which had psychological implications. This section has two subdivisions. The first presents studies of a general nature, while the second reviews studies involving psychological techniques.

Studies of a general nature.--In the past decade, numerous investigations have been conducted in the area of accident causation. Most of these studies have been concerned with accident-repeaters and accident-involved drivers.

In three independent studies, LaShan,³ Penn,⁴ and Rosenblatt,⁵ examined the characteristics of accident repeaters and arrived at similar conclusions. They described this group as being emotionally unstable, impulsive, ego-centric and aggressive. It was also expressed that their subjects were generally disrespectful toward or frequently even resentful of authority.

Similar studies have revealed that chronic violators were also an education problem, since a large percentage of the drivers examined were school drop-outs or individuals with poor grades.⁶

³Lawrence LaShan, "Dynamics in Accident Prone Behavior," Psychiatry, 15:73-80, February, 1952.

⁴Robert Penn, "An Investigation of Methodological and Psychological Problems Related to Accident Proneness" (unpublished Doctoral dissertation, Carnegie Institute of Technology, Pittsburgh, Pennsylvania, 1956).

⁵Gerald Rosenblatt, "A Critical Examination of the Accident Proneness Concept" (unpublished Master's thesis, Yale University, New Haven, Connecticut, 1955).

⁶D. H. Schuster and J. P. Guilford, "An Analysis of Accident Repeaters and Chronic Violator Drivers," Traffic Project - Report No. 1, University of Southern California, Los Angeles, 1959. A. G. Arbons and J. E. Kerrich, "Accident Statistics and a Concept of Accident Proneness," Biometric, 7:340-432, December, 1951; and Charles A. Drake, "Accident Proneness: a Hypothesis," Character and Personality, 8:335-341, June, 1940.

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In 1948, the Center for Safety Education at New York University directed a clinical investigation to analyze the differences between 252 accident-repeaters and 261 accident-free drivers. Some of the findings recorded were: (1) there was a close relationship between accidents and traffic violations, (2) chronic repeaters tended to be more upset by frustration and annoyances, and (3) there was a pronounced resistance to authority depicted by laws, stop signs, traffic signals and the police.⁷

Other researchers have inferred that the most prominent types of behavior demonstrated by accident-repeaters included: (1) exceeding speed limits, (2) violating traffic laws, (3) drunken driving, (4) failing to obey traffic signs and signals, and (5) reckless driving. It was concluded that accidents and laws were closely related, since a large percentage of accidents involved one or more violations of traffic laws.⁸

⁷New York University, Center for Safety Education, "A Comparative Study of Accident Free and Accident Involved Drivers" (published by Eno Foundation for Highway Traffic Control, 1948).

⁸Harry R. DeSilva, Why We Have Automobile Accidents (New York: J. Wiley and Sons, Inc., 1942); J. K. Boek, "Automobile Accidents and Driving Behavior," Traffic Safety Research Review, IV, No. 4 (December, 1958), 2-12; W. Hadden and others, Accident Research (New York: Harper and Row Publishers, 1964); and Leon Brody, "Personal Characteristics of Chronic Violators and Accident Repeaters," Highway Board Bulletin 152 (Driver Characteristics), 1957.

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Rawson⁹ studied accidents involving drivers of trucks and other commercial vehicles and concluded that the human factor, rather than the environmental, vehicle or roadway factors, was the primary cause of the majority of the accidents reviewed. He denoted that most of his subjects had undesirable attitudes as indicated by their tendency to avoid responsibility, to resent authority and to act impulsively.

It was also reported by Lykes¹⁰ that faulty attitudes, lack of emotional stability and poor adjustment were more prone to cause motor vehicle accidents than poor sensory or physical characteristics.

The Director of the Detroit Psychiatric Clinic for Traffic Violators has expressed that most violators, at one time or another, exhibited what he called "faulty attitudes." He justified his theory on the basis that many of the offenders interviewed, had indicated that they frequently used their car as a weapon to avenge themselves for wrongs or to compensate for feelings of inadequacy. It was further hypothesized that the automobile was frequently used as a means of temperamental expression or escape from reality.¹¹

⁹A. J. Rawson, "Accident Proneness," Psychosomatic Medicine, 6:88-94, January, 1944.

¹⁰Norman R. Lykes, Psychological Approach to Accidents (New York: Vantage Press Inc., 1954), pp. 129-35.

¹¹Alan Canty, Detroit Psychiatric Clinic Report, 1965.

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McFarland and others have also suggested that although accident repeaters may have sufficient knowledge and adequate skills, they can usually be classified as having undesirable attitudes.¹²

Other investigations have also revealed that the behavior patterns evidenced in reckless driving, frequent speeding, and driving while intoxicated were usually due to some basic fault in the driver's attitude.¹³

The writings of Dumber and Brody¹⁴ have maintained that although the lack of knowledge and inadequate skills contributed to some accidents, the principal causes were associated with undesirable or faulty attitudes. More recent investigations by Bishop¹⁵ and Brody¹⁶ have also

¹²Ross A. McFarland and others, "Human Variables in Motor Vehicle Accidents - A Review of the Literature," Harvard School of Public Health, Boston, Mass., pp. 191-210; Automotive News Staff, "Search for the Cause of Accidents," Automotive News, April 18, 1966, p. 14; and Alan A. McLean, "Accident Proneness - A Clinical Approach to Injury-Liability," Industrial Medicine and Surgery, March, 1955, pp. 122-126.

¹³Ross A. McFarland, "Why Drivers Have Accidents," Public Safety, Vol. 48, No. 4, April, 1956, p. 7; and D. E. Billion, "Community Study of the Characteristics of Drivers and Driver Behavior Related to Accident Experiences," Highway Research Board Bulletin 172 (Driver Characteristics and Behavior Studies), 1958.

¹⁴Flanders Dumber and Leon Brody, Basic Aspects and Applications of the Psychology of Safety, Center for Safety Education, Division of General Education, New York University, 1959.

¹⁵Richard W. Bishop, "One-Car Accidents and the Young Driver" (abstract of Doctoral thesis, New York University, Detroit Auto Club of Michigan, 1963).

¹⁶Leon Brody, "The Accident Phenomenon," Personnel Administration, November-December, 1963.

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indicated that traffic accidents have many underlying causes, most of which are psychological in nature.

In the past few years, several studies have been conducted to examine the driving records of young drivers. In one of these studies, Rommel¹⁷ attempted to isolate those personality characteristics and attitudes which might serve to distinguish between young drivers involved in accidents and those who were accident-free. His subjects consisted of two groups of high school drivers. Those in the first group had been involved in two or more accidents, while the subjects in the second group, although having similar driving experience, had not been in any accidents.

The results of this study disclosed that the subjects having accidents tended to score high with regard to attitudes conducive to unsafe driving. It was thus concluded that students with undesirable attitudes were more likely to manifest behavior which resulted in accidents.

Another study by Birnbach¹⁸ showed that accident-free students had better attitudes and knowledge of safe driving practices than accident-repeaters. He also noted a close relationship between accidents and violations.

¹⁷R. C. Rommel, "Personality Characteristics and Attitudes of Youthful Accident-Repeater Drivers," Traffic Safety Research Review, Vol. 54, No. 3, March, 1959, pp. 13-14.

¹⁸Sidney B. Birnbach, "Personal Characteristics of Traffic Accident Repeaters," Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1948.

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Reviews of accident data have revealed that fifteen to twenty-four year old drivers had more accidents than any other age group. This group, which represents approximately 18 per cent of the driving population, was involved in approximately 30 per cent of all traffic accidents.¹⁹

Marcus²⁰ and his associates have attributed the high accident rates of young drivers to the fact that younger persons usually react to tensions and pressure through motor responses.

Studies involving psychological techniques.--In the past few years, the characteristics of the driver have been subjected to closer scrutiny, for accident research has indicated that faulty and unsafe driving practices account for a large percentage of traffic accidents. Consequently, attitudes have become a focal point in the search for a solution to the accident problem.

A study was conducted by Case²¹ and others in which two trained interviewers examined a group of three hundred

¹⁹National Safety Council, "1968 Motor Vehicle Deaths Analyzed," Annual Report, March, 1969.

²⁰Irwin Marcus and others, An Interdisciplinary Approach to Accident Patterns in Children (Child Development Publications, Vol. 25, No. 2, Purdue University, LaFayette, Indiana, 1960).

²¹Harry W. Case and others, "A Study of Habitual Traffic Violators" (unpublished study, Institute of Transportation and Traffic Engineering, University of California, Los Angeles, 1950).

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traffic law violators. The interview procedure was informal, carefully structured, standardized and was twelve months in duration. It was designed to disclose the intellectual capacity of the violators and to allow them to exhibit their personality patterns.

The most frequent violations of the subjects included speeding, running red lights, failing to stop at stop signs and making improper turns. Although the majority of the subjects expressed opinions in accordance with traffic laws, they indicated negative feelings toward the police.

The interviews disclosed that the individuals in the study group seemed to have an awareness of both the need and usefulness of traffic laws and enforcement personnel. The subjects also expressed an opinion as to what constituted a serious offense and showed a tendency to commit violations other than those which they believed to be serious.

Several investigators have resorted to the use of projective instruments and psychological tests to describe probable accident subjects. The results of these examinations were congruent in finding repeat violators to be usually aggressive, excessively active, adventuresome and impulsive.²²

²²Earl D. Heath, "The Relationship Between Driving Records, Selected Personality Characteristics and Biographical Data of Traffic Offenders and Non-Offenders"

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Other studies by Conger²³ and Newman²⁴ have disclosed that accident-repeaters are usually defiant toward authority, take unnecessary chances, show a disregard for laws and are generally unconcerned about the rights and welfare of other individuals.

Brody conducted a study in 1957 with the cooperation of the New Jersey Accident Prevention Clinic.²⁵ He compared three groups of motorists on a number of psychological and personality factors. The subjects fell into one of three categories: chronic violators, accident repeaters and drivers with good records. His main conclusion was that the problem of safe, lawful, courteous driving was primarily a problem of emotional make-up and social adequacy.

(unpublished Doctoral dissertation, New York University, New York, 1957); Ronald C. Moore, and Ross A. McFarland, "Human Factors in Highway Safety," New England Journal of Medicine, April-May, 1957, pp. 792-99, 837-45, 890-97; and W. A. Tillman and G. E. Hobbs, "The Accident Prone Automobile Driver: A Study of the Psychiatric and Social Background," American Journal of Psychiatry, November, 1949, pp. 321-31.

²³John J. Conger and others, "Personal and Interpersonal Factors in Motor Vehicle Accidents," American Journal of Psychiatry, 113:1069-74, June, 1957.

²⁴Gerald G. Newman and others, "A Pilot Study of Drivers Incurring Automobile Accidents," American Journal of Public Health, 48:1512-15, November, 1958.

²⁵Leon Brody, "The Accident Phenomena," Personnel Administration, November-December, 1963.

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Research by Beamish and Malfetti,²⁶ engaging high school students as subjects, culminated with similar conclusions.

In 1948, an experiment was undertaken to empirically examine the relationship between accident rates and the personality of drivers. The Minnesota Multiphasic Personality Inventory was administered to seventy male drivers who had no less than two years of driving experience. All of the subjects were interviewed to obtain personal information and driving experience data.

The statistical analysis of the data produced a coefficient of contingency of .41 for personality and accident involvement. The correlations found for the individual scales and minor accidents of admitted fault indicated that the subjects involved tended to have high T-scores in the psychopathic deviate, hypo-mania and schizophrenic scales.²⁷

Siebrecht²⁸ employed his own attitude scale to examine the driving attitudes of two hundred high school

²⁶Jerome J. Beamish and L. Malfetti, "A Psychological Comparison of Violator and Non-Violator Automobile Drivers in the 16 to 19 Year Age Group," Traffic Safety Research Review, Vol. 6, No. 1 (National Safety Publications, March, 1962), pp. 12-15.

²⁷Roger Brady, "The Relationship Between Accident Rates and the Personality of Automobile Drivers" (preliminary study, Graduate School of Arts and Sciences, Catholic University of America, Washington, D.C., 1948).

²⁸Elmer B. Siebrecht, "Attitude Scale for Measuring Driver Attitudes" (published study, Center for Safety Education, New York University, 1941).

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students in grades nine through twelve. He noted significant differences between the mean scores of the different grade levels with a progressive increase in group means from the lower to the higher grades. It was also deduced that driving attitudes improved with driver education and driving experience.

A similar study was made by Conover in 1947,²⁹ using 150 Iowa high school students as his subjects. Although he employed verbal symbols rather than complete sentence statements as used by Siebrecht, his results followed the same pattern as Siebrecht's investigation. Hence, he also concluded there was a strong indication that the driving attitudes of high school students improved with age and education.

Another investigation by Siebrecht³⁰ disclosed the mean attitude scores of college students to be similar to those of high school students who had taken driver education and had some driving experience. His findings were comparable to those in his previous study, since upperclass college students had more favorable scores than freshmen or sophomores. Consequently, Siebrecht confirmed his earlier

²⁹John Conover, "Development of Certain Techniques for the Measurement of Driver Attitudes" (unpublished study, Iowa State College, 1947).

³⁰Elmer B. Siebrecht, Driver Attitudes - Techniques of Study and Results Obtained, Driver Research Laboratory, Iowa State College, 1955.

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conclusion that driving attitudes improved with age, education and experience.

Agan³¹ administered the Conover Attitude Inventory to high school students in an attempt to compare their attitude scores before and after a course in driver education. He found significant improvements in the post-test scores of the 144 subjects taking part in the study. Attitude changes were recorded in all of the cases studied, thus indicating the effectiveness of a driver education program in modifying student attitudes.

A similar study of post-high school students enrolled in a five week summer driver education course, arrived at a concordant decision.³²

SECTION 2

Methods of Affecting Attitude Change

The majority of the conclusions derived from current accident research have denoted that the human factor, in most cases improper attitudes, should be of major concern in reducing accident rates. However, very few of the

³¹Raymond J. Agan, "Effect of Driver Education Instruction on Learning Attitudes" (unpublished study, Iowa State College, 1949).

³²Elmer B. Siebrecht, "Siebrecht Attitude Scale for Measuring Driver Attitudes" (published study, Center for Safety Education, New York University, 1941).

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researchers have recommended effective means of changing or modifying the human variable. This section contains a review of the literature relating to methods of affecting attitude change.

General information.--Case³³ and Hayes,³⁴ among others, have acknowledged the modification of attitudes to be an exceedingly difficult process and concurred there is much to be learned about effective procedures in affecting attitude change. They recommended that attention should be focused on the role of perception in changing the concepts of students toward traffic safety.

Experiments conducted by Kelman³⁵ with junior high school students have demonstrated that change could be produced only when it paralleled personal advantages or needs. He disclosed significant modification only when the situation required the students to deal directly with the material themselves, and found lasting effects were secured only when the students had rapport with the teacher.

³³Harry Case, "Attitudes - What Are They? How Are They Changed?" Traffic Safety, Vol. 31 (1950 Transactions of the National Safety Conference), pp. 75-81.

³⁴Arthur B. Hayes, "How to Improve Driver Attitudes," Driver Education Newsletter, 2:1-3, Fall, 1958.

³⁵H. C. Kelman, "Attitude Change As A Function Of Response Restriction," Human Relations, June, 1953, pp. 185-214.

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According to McClintock,³⁶ individuals form and maintain those attitudes which help them to achieve their goals or motives. Negative attitudes, he theorized, can be accounted for by two distinct personality syndromes. Since the attitude source could be different in each case, different change techniques may have to be employed. He concluded that no single procedure could be expected to move a total population and that the reason for the maintenance of a given attitude would be essential in devising procedures to change it.

A number of studies have inferred that attitudes toward such topics as laws and enforcement markedly affect what is retained from class presentations on these subjects. Quite often, a person who has a negative attitude toward a particular policeman, reacts in much the same way towards all policemen. Therefore, it was emphasized, teachers should make an attempt to diagnose their students' negative attitudes in order to deal with them more appropriately.³⁷

³⁶C. G. McClintock, "Personality Factors in Attitude Change" (unpublished Doctoral dissertation, University of Michigan, Ann Arbor, Michigan, 1956).

³⁷Stannard J. Baker, "Effect of Enforcement and Licensing on Driver Attitude," Traffic Safety, Vol. 31 (1950 Transactions of the National Safety Congress), pp. 29-39; Edward C. Fisher, "The Courts Responsibility Toward Improving Driving Attitudes," Traffic Safety, 31:48-52, 1951; and Karl Menninger, "The Mental Attitude of Automobile Drivers Toward Enforcement," National Safety Council Transactions, Vol. 32, Part 2, 1943, pp. 7-10.

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Loft³⁸ and Damon³⁹ have evidenced attitude change when there were definite indications of students having internalized volitional messages as revealed by obvious changes or alterations of their perceptions, affects and overt actions, as well as their verbalized judgments. Both men agreed that subjective teacher evaluations alone were not valid measures of attitude change.

Allgaier⁴⁰ has further elaborated on how effective teaching can produce a more or less permanent change in the learner's behavior. This change may range from the acquisition of relatively simple skills, general terms of information or a complete reversal of previously exhibited attitudes or opinions. Well-planned and well-directed instruction, he thus deduced, was the most effective method of dealing with student attitudes.

It has also been written that the behavior of rational persons can be controlled if the value and factual premises upon which they base their decisions were

³⁸Bernard I. Loft, "The Effects of Driver Education on Driver Knowledge and Attitudes in Selected Public Secondary Schools," Traffic Safety Research Review, Vol. 4, No. 2, June, 1960, pp. 12-15.

³⁹Norman Damon, "Developing Driver Attitudes" (1959 National Safety Congress Transactions), Vol. 26, pp. 13-17.

⁴⁰Earl Allgaier, "Psychology and the Education of Road Users," American Automobile Association Publication, A.A.A., Washington, D.C., 1959.

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specified for them. Since students may carry to the classroom, negative attitudes about the material they are to learn, teachers must function as persuaders in attempting to change their minds and behavior patterns by changing their attitudes.⁴¹

Other studies have reported the most effective change in attitudes occurring: (1) under circumstances that are ambiguous, (2) when standards of judgment are necessary, or (3) when the content of the information is new or has little or no pertinence to the individuals who receive them. It was noted that since teachers did not have to waste time unlearning their students, it was relatively easy to develop good attitudes in uncertain or new situations.⁴²

Strassner⁴³ and Kerr⁴⁴ have stated that students in high school tend to establish action patterns and habits which are likely to carry-over to later years. They

⁴¹Arthur L. Mahony, "Teaching for Attitudes Conducive to Safe Driving" (unpublished Doctoral dissertation, New York University, New York, 1957).

⁴²L. W. Doob, "Some Factors Determining Change in Attitudes," Journal of Abnormal and Social Psychology, 35: 549-65, 1940; and Norman Damon, "Developing Driver Attitudes" (1959 National Safety Congress Transactions), Vol. 26, pp. 13-17.

⁴³Marland K. Strassner, Fundamentals of Safety Education (New York: The MacMillan Company, 1964), pp. 163.

⁴⁴Willard Kerr, "Complimentary Theories of Safety," Psychology, 45:3-9, February, 1957.

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believed high school years presented an opportune time to guide students in developing an understanding of and wholesome attitudes toward traffic safety. It was also stressed that since students enrolled in driver education classes are self-motivated, the instructor should take advantage of this interest to fortify good attitudes and modify undesirable attitudes.

According to Brody,⁴⁵ the attitudes requiring development are those which are concerned with the realization that accidents are not an inevitable consequence of the risks inherent in driving. He held driver educators responsible for the fortification of good attitudes and modification of the undesirable attitudes.

Pine⁴⁶ and Baldwin⁴⁷ have inferred that any techniques that tend to control impulsive responses and encourage thoughtful behavior would tend also to lessen accidents.

Studies using specific methods.--Since the bulk of the research relating to attitudes has reflected upon the fact that attitudes are modified as a result of education

⁴⁵Leon Brody, "Accidents and Attitudes," Basic Aspects and Applications of the Psychology of Safety. Center for Safety Education, New York University, 1959, pp. 6-22.

⁴⁶Jerome L. Pine and others, The Development of Criterion for Driving Behavior, Teacher's College, Columbia University, New York, 1965.

⁴⁷David M. Baldwin, "Accident Causes and Counter Measures," Traffic Engineering, March, 1966, pp. 31-33.

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and maturation, education has been used as the primary method to affect attitudinal change.

As viewed by Brody,⁴⁸ desirable attitudes can be developed through proper education, not just driver education, but all education. He emphasized that young drivers should be taught to employ their knowledge and skills to insure their own safety, as well as the safety of others.

Yost⁴⁹ has noted that driver education programs have not been very effective in changing student attitudes, since too much attention has been focused on the identification of specific knowledge to be acquired and on particular skills to be developed. In his opinion, little, if any, recognition has been given to the importance of improper attitudes and the need to change them.

It has also been suggested by Ojemann⁵⁰ and Loft⁵¹ that merely teaching knowledge and skill is insufficient

⁴⁸Brody, op. cit., p. 21.

⁴⁹Charles P. Yost, "An Analysis of Graduate Theses of School Safety in the U.S. from 1925 to 1950" (published Doctoral dissertation, University of Pittsburgh, Pittsburgh, Pennsylvania, 1956).

⁵⁰Ralph H. Ojemann, "Tests and Evaluation Methods Used in Driver and Safety Education," National Commission on Safety Education, Washington, D.C., 1959, pp. 1-48.

⁵¹Bernard I. Loft, "The Effects of Driver Education on Driver Knowledge and Attitudes in Selected Public Secondary Schools of Indianapolis and Marin County" (unpublished Master's thesis, Indiana University, Bloomington, Indiana, 1956).

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for the development of desirable driving attitudes. If driver education is expected to produce safer drivers, then greater concentration must be placed on perceptions, emotions and attitudes.

McGuire⁵² has likewise cited the ineffectiveness of educational procedures in reducing accidents. Only limited success has been attained thus far because the approach employed has been academic and technical rather than personal. Further achievement, he concluded, was dependent upon the competence of driver educators in fortifying knowledge and skill with desirable attitudes.

Recent reports have also prompted questions in regards to the effectiveness of driver education in producing safer drivers. The National Commission on Safety Education has stated that research attempts to justify driver education solely on the basis of the driving records of subjects with and subjects without the course, have been inadequate and do not provide valid evidence that the returns are commensurate with the investment. It was recommended that greater concentration should be placed on curriculum content and teaching methods which can effectively influence the human factor or behavioral

⁵²Frederick L. McGuire, "An Outline for a New Approach to the Problem of Highway Accidents," U.S. Armed Forces Journal, 7:1157-66, August, 1956.

characteristics judged to be pertinent to the safe operation of a motor vehicle.⁵³

In one of the few studies conducted to evaluate the effectiveness of different methods of changing attitudes, Schreiber⁵⁴ disclosed no lasting modification occurring in driver behavior as a result of: (1) discussions about pertinent safety topics, (2) preparations for a special "President's Safe Driving Day," (3) installation of a warning sign, and (4) the presence of a clearly marked police vehicle. As a result, he concluded that driver educators must seek more influential teaching methods and procedures to induce attitude change.

Research by Malfetti⁵⁵ noted scare techniques as an ineffective means of changing behavior or modifying attitudes. He recommended that driver educators should not instill fear in their students but must stress self-preservation and personal gain. In so doing, the emphasis should be placed on possible injury and not on the gory results of an accident.

⁵³Traffic Safety. "What the 'Moynahan Report' Really Said About Driver Education," June, 1968, pp. 36-38; and "The N.E.A. Has Its Say," December, 1968, pp. 14-15.

⁵⁴Robert J. Schreiber, "The Development of Procedures for the Evaluating of Educational Methods Used in Accident Prevention" (unpublished Doctoral dissertation, Columbia University, New York, 1957).

⁵⁵James Malfetti, "Scare Techniques and Traffic Safety," Traffic Quarterly, April, 1961.

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The National Safety Council⁵⁶ checked for possible changes in driver attitudes following a television documentary depicting the hazards of driving on a holiday weekend. The immediate effects appeared to be a general decrease in anxiety levels and a tendency to externalize the danger as something that applied to other drivers. However, after a three week interval, the attitudes of the subjects had resumed the pre-program status.

Sawers⁵⁷ suggested the aid of lectures to reinforce good attitudes or positively orient weak or vague ones, but he noted that it was extremely difficult to modify or change improper attitudes through lecture alone. He found group discussions to be the most effective classroom procedure in affecting change.

Research conducted in recent years strongly supports the view that group dynamics may be the most convincing means of changing or modifying improper attitudes. Group discussions can stimulate group analysis of driving situations and enable the class members to profit from their pooled experiences or reflections. For the best results,

⁵⁶ National Safety Council, The Effects of C.B.S. Reports "The Great Holiday Massacre" on Attitudes Toward Safety and The National Safety Council (Creative Research Associates, Chicago, Illinois, 1961), pp. 1-47.

⁵⁷ Kenneth Sawers, Group Discussion Techniques in Driver Education, Center for Safety Education, New York University, 1962.

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the subjects for discussion should be relatively real and specific, and the teacher should establish a friendly, informal atmosphere. Change is evidenced when the students internalize the attitudes, beliefs and values of the group in such a way that they look upon them as their own rather than as something imposed upon them by others.⁵⁸

Gardner⁵⁹ supports the theory of group acceptance and group recognition as motivation for most students. Consequently, personal involvement of the individual members of the class is essential in having them conform to the expectations of the group.

The Department of Motor Vehicles in the District of Columbia has also reported considerable success in inducing change in attitudes through group discussions in their driver improvement clinics.⁶⁰

Several investigators have advocated the employment of students' needs as a guide to attitude development. Since motives are the chief "why" of behavior, and attitudes

⁵⁸William Hackley and Lawrence Schlesinger, "Changing Driver Attitudes Through Group Discussion" (An Experimental Study, George Washington University, Washington, D.C., January, 1964).

⁵⁹I. C. Gardner, "The Effect of a Group of Social Stimuli Upon Attitudes," Journal of Educational Psychology, 26:471-78, 1935.

⁶⁰Richard Myrick, "Driver Improvement Clinic Induces Attitude Change by Group Discussions," Traffic Digest and Review, 2:9-11, May, 1963.

influence behavior, educators must concentrate on motivation to affect behavior change.⁶¹

In the past few years, the idea of programmed instruction has received considerable attention in its endeavors to efficiently improve instructional methods in driver education. Reports have been made which indicate that programmed instruction has the potential of inducing rapid and efficient learning as well as developing positive attitudes toward the material being learned.⁶²

SECTION 3

Attitude Scales Used In Driver Education Programs

Since accident research has supported the fact that good attitudes are an essential element of safe driving, and educators have maintained that attitudes affect what students learn and therefore what they retain from their educational experiences, attitude measurement has been

⁶¹Helen Peak, "Attitudes and Motivation," Nebraska Symposium on Motivation, University of Nebraska Press, Lincoln, Nebraska, 1955, 149-189; Fred Schreier, Human Motivation (Glencoe, Illinois: The Free Press, 1957), pp. 240-52; and William Barlow, Centering Traffic Safety Around Driver's Motivations, American Traffic Association Foundation, Washington, 1958.

⁶²Edward H. Fisher and Lawrence Schlesinger, "Programmed Instruction for Driver Education," CALDEA Calendar, 10:5, January, 1963; and Lawrence Schlesinger and others, "How Are We Devising Programmed Driver Instruction," Police Chief, 19:14, September, 1962.

incorporated as a phase of most driver education programs. This section contains information relating to some of the attitude scales that are currently being used.

A general overview.--Dr. Ojemann⁶³ has reviewed the field of attitude testing as it related to driving and noted that attitudes were evaluated in numerous ways: the "agree-with," "disagree-with" concept employed in the Siebrecht scale, the "pleasing-displeasing" notion presented by the Conover test, and, the "personality" adjustment connotation. In his estimation, the Siebrecht and Conover instruments have been reliable to a satisfactory extent, but their correlation with actual driving behavior has not been clearly established.

In 1941, Elmer B. Siebrecht⁶⁴ constructed a scale to measure driving attitudes. He formulated sixty statements utilizing twelve factors which he considered to be important in the safe operation of a motor vehicle. The factors he included were: (1) passing on curves and hills, (2) driving as a privilege, (3) knowledge and skills, (4) courtesy, (5) condition of drivers, (6) violations,

⁶³Ralph H. Ojemann, Test and Evaluation Methods Used in Driver and Safety Education, National Commission on Safety Education Publication, pp. 1-48, 1959.

⁶⁴Elmer B. Siebrecht, Siebrecht Attitude Scale for Measuring Driver Attitudes (published Doctoral dissertation, Center for Safety Education, New York University, 1941).

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(7) enforcement of traffic regulations, (8) speeding, (9) responsibility, (10) condition of the automobile, (11) cooperation, and (12) examination for a driver's license.

The desirable response to each statement was standardized by 125 judges consisting of commissioners of motor vehicle departments, license examiners and accident-free drivers of commercial fleets. The validity of the scale was initially based upon the judgments of the 125 "so-called experts." However, the final scale retained only those statements which differentiated significantly between the mean scores of high and low scoring groups of one hundred high school students.

In its final form, the scale consisted of forty complete sentence statements with the following response pattern: (1) strongly disagree, (2) disagree, (3) undecided, (4) agree, and (5) strongly agree.

At a later date, Conover⁶⁵ constructed a driver attitude inventory in partial fulfillment of the requirements for a Master's Degree at Iowa State College. He used verbal symbols in the form of words and phrases rather than complete sentences. The final form of the inventory consisted of 150 words and phrases such as double parking, ticket, speeding and policeman. In this test, the

⁶⁵John Conover, "Development of Certain Techniques for the Measurement of Driver Attitude" (unpublished Master's thesis, Iowa State College, 1947).

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respondents are requested to express their attitude by marking one of the five following responses: (1) very pleasing, (2) pleasing, (3) indifferent, (4) displeasing, and (5) very displeasing.

A driver attitude survey was also developed by Mann⁶⁶ of Michigan State University. His final survey consisted of sixty-three sentences and employed the following response pattern: (1) always, (2) usually, (3) sometimes, (4) rarely, and (5) never. Scoring is based upon the progressive assignment of points for each response deviating from that stipulated. Consequently, the higher the score, the greater the indication of poor driving attitudes. A copy of this scale is presented in Appendix A.

In 1965, the American Automobile Association published a driver attitude checklist which was developed by the Western Division of the New York Telephone Company.⁶⁷ This checklist included twenty-five question-items and was designed as a self-evaluation tool to be distributed to employees. Responses are classified as: (1) frequently, (2) occasionally, (3) rarely, and (4) never. A duplicate of this checklist can be seen in Appendix B.

⁶⁶William Mann, "Mann Personal Attitude Survey" (Highway Traffic Safety Center, Continuing Education Service, Michigan State University, 1964).

⁶⁷New York Telephone Company, Driver Attitude Check List, published by American Automobile Association, October 10, 1957.

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Since there are very few driver attitude scales that have been published, some driver educators and motor vehicle personnel have taken it upon themselves to construct scales to be used for their own purposes. Two such instruments have circulated in the State of New Jersey for several years.

The J-M Attitude Scale,⁶⁸ which consists of fifty complete sentence statements, was apparently designed to be administered to licensed drivers. It has a four pattern response which includes: (1) habitually, (2) frequently, (3) occasionally, and (4) only if an officer is around. This scale is reproduced in Appendix C.

The Fletcher Attitude Test for Safe Driving,⁶⁹ is another self-rating scale which employs twenty-five question statements. Responses are listed as: (1) frequently, (2) occasionally, and (3) rarely. Low total score is designated as being indicative of good driving attitudes. A copy of this test is presented in Appendix D.

Due to the dearth of acceptable driver attitude tests, some investigators have resorted to the use of other instruments. Research by Brady⁷⁰ indicated the Minnesota

⁶⁸Billy J. Jones and Russell G. Martin, "The J-M Attitude Scale." Other information not available.

⁶⁹Harry Fletcher, "Fletcher Attitude Test For Safe Driving." Other information not available.

⁷⁰Roger Brady, "A Preliminary Study Into the Relationship Between Accident Rates and the Personalities of Automobile Drivers" (unpublished Master's thesis, Catholic University of America, Washington, D.C., 1948).

Multiphasic Personality Inventory could be a valuable tool in analyzing the attitudes of drivers. He recommended an item analysis of the M.M.P.I. in order to construct an inventory which would be more adequate for use with driver education students.

Beamish and Malfetti⁷¹ have stated that the personality trait of emotional stability as measured by the Guilford-Zimmerman Temperament Inventory, and mood as measured by the Minnesota Counseling Inventory, seemed to show a differentiation between violators and non-violators.

According to McGuire,⁷² it is not yet known which type of testing devices can most accurately and most consistently reveal the attitudinal patterns which lead to unsafe driving behavior.

Critical analysis.--Despite the current emphasis on attitudes, some individuals have expressed that very little can be done about attitudes in the brief duration of a driver education course. They have inferred that driver educators should accept their students' attitudes and apply them to the driving task assuming that they had good attitudes on entering the course.

⁷¹J. J. Beamish and J. L. Malfetti, "A Psychological Comparison of Violator and Non-Violator Automobile Drivers in the 16 to 19 Year Age Group," Traffic Safety Research Review, Vol. 6, No. 1, 1962, pp. 12-15.

⁷²Frederick L. McGuire, "An Outline for a New Approach to the Problem of Highway Accidents," U.S. Armed Services Medical Journal, 7:1157-66, August, 1956.

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Conversely, those driver educators who have attempted to employ attitude measurement in their programs, have been hindered by the fact that there are relatively few standardized attitude scales available in published form and those that are available, have their limitations. The basic, fundamental, structural and administrative limitations of current driver attitude scales have been denoted by several authors as follows.⁷³

1. The majority of the scales are designed to measure the attitudes of licensed drivers rather than those of potential drivers.
2. Many of the available tests do not apply specifically to the variables of the driving task, but incorporate unrelated general attitudes or personality factors.
3. Most of the scales are intended to evaluate individual attitudes rather than to reveal group attitudes for the purpose of placing instructional emphasis.
4. The validity and reliability of many of these instruments are questionable.

⁷³Andrew Ellis, "Recent Research with Personality Inventories," Journal of Psychology, 17:45-49, 1963; Robert M. Allen, Personality Assessment Procedures (New York: Harper and Row Publishers, 1958); L. L. Thurstone, "Theory of Measurement," Psychological Review, 36:222-41, 1929; Raymond Agan, "Effect of Driver Education Instruction on Learning Attitudes" (unpublished study, Iowa State College, 1947); and Ralph H. Ojemann, Tests and Evaluation Methods Used in Driver and Safety Education, National Commission on Safety Education Publication, 1959.

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5. Many of the items included are ambiguous and irrelevant in evaluating driver attitudes.
6. The instructions provided are generally vague and tend to confuse the subjects as well as the instructor. Consequently, students respond in terms of what they think is desirable rather than express their actual feelings.
7. The scales are employed as a means of student evaluation rather than as a tool to improve improper attitudes.
8. Manuals of administration and interpretation are not provided or if provided, they are too vague or too confusing.
9. Some scales are designed to be administered in terms of self-evaluation. Although the results thus obtained may help to stimulate class discussion, there is no guarantee that crucial issues will be discussed.
10. Many of the attitude inventories do not conform to recommended structural guidelines.

SECTION 4

Attitude Scale Methodology

In order to develop an attitude inventory to fulfill the designated purpose, it was necessary to review the literature relating to attitude scale construction. The major areas of concern in this section pertain to

formulating and editing appropriate attitude statements and the structural and format methods that may be employed.

General information.--Although the term attitude is frequently used, it very seldom conveys the same meaning for two or more individuals. Similarly, many psychologists do not employ the same concept of attitudes in their writings. The following paragraph presents composite information relating to the concept of attitude.

Attitudes have generally been referred to as a person's disposition to respond in a certain way toward specific persons, places, situations or things. Although attitudes are common to all individuals, they are possessed in different degrees, thus impelling a person to react in ways that can be called favorable or unfavorable. Opinions are relevant to attitudes, since they have been classified as verbal expressions of attitudes. Because fact can change opinion, attitudes are also subject to change. However, their direction and strength are sufficiently enduring to justify treating them as personality traits. Although attitudes are not directly observable and measurable, they can be inferred from a person's reactions to particular stimuli. Hence, attitude scales or inventories can be used as research tools or as instruments for experimental evaluation of educational objectives external to the domain of knowledge and skills.⁷⁴

⁷⁴L. L. Thurstone and E. J. Chave, The Measurement of Attitude, Chicago University Press, Chicago, Ill., 1929;

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Attitudes can be measured by the following three methods: (1) direct questioning, (2) observation and evaluation of behavior, or (3) administration of prepared attitude scales. Of the three, a valid attitude scale would be the most advantageous, since it provides a set of selected responses which can be presented to a group of individuals and then be measured to obtain a quantified value.

According to Payne,⁷⁵ if an investigator desires to acknowledge how his subjects feel about a particular psychological object, the most logical procedure would be to ask them. However, he noted the following disadvantages of the direct questioning method: (1) many individuals are reluctant to publicly express their feelings or attitudes, (2) the investigator must employ experienced interviewers, and (3) the interview technique is too time consuming.

Since a good measure of a person's attitude is his behavior in daily activities, direct observation has been

B. F. Green, "Attitude Measurement," Handbook of Social Psychology (Cambridge, Mass.: Addison-Wesley, 1954), pp. 335-369; Andrew Ellis, "Recent Research With Personality Inventories," Journal of Psychology, 17:44-49, 1963; H. A. Murray and others, Explorations in Personality (New York: Oxford University Press, 1938); Bernard M. Bass and Irwin A. Berd, Objective Approaches to Personality Assessment (New York: VanNostrand Inc., 1954); and Allen L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts, 1957).

⁷⁵S. L. Payne, The Art of Asking Questions (Princeton, New Jersey: Princeton University Press, 1951).

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another approach used to investigate attitudes. Remmers⁷⁶ has disclosed limitations of this method also because:

(1) considerable time may be required before the subjects react to the stimulus presented, (2) its use is not feasible with large groups of subjects, and (3) the subjects may react contrary to their actual feelings, if they suspect they are being observed.

As cited by Edwards,⁷⁷ investigators using either the interview or observation technique must realize their inferences may be incorrect simply because the responses or behavior of their subjects may be determined by factors other than the subjects feelings.

The development of attitude scales and inventories has been stimulated by the need for a quick, convenient instrument usable with large groups. A well constructed scale consists of a number of statements which have been carefully selected in accordance with certain criteria. If an attitude inventory is administered under controlled conditions and with standardized instructions, the responses thus obtained are usually more reliable than those resulting from other methods. Although the primary limitation of attitude scales involves the subjects fabrication of

⁷⁶H. H. Remmers, An Introduction to Opinion and Attitude Measurement (New York: Harper and Row Publishers, 1954).

⁷⁷A. L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts, Inc., 1957).

responses, this can be controlled through the explicit explanation of procedure and purpose. Unfortunately, many researchers have abused attitude scales, since they have been inclined to draw conclusions from meager or inadequate samples.

Cronbach⁷⁸ has stated that the question of degree to which a person's behavior in an identifiable situation will represent behavior in real life has prompted researchers to construct unreliable attitude scales.

Methodology.--The most troublesome problem confronting investigators desirous of constructing attitude scales, is that of selecting the initial set of statements. Wang, Edwards, and others have established criteria requisite for selecting items to be used in attitude scales.⁷⁹ There appeared to be some consistency with regards to the following recommendations:

1. The statements should be simple, clear and direct.
2. The number of statements that could be endorsed by everybody or nobody, should be at a minimum.

⁷⁸Lee L. Cronbach, Essentials of Psychological Testing (New York: Harper and Row Publishers, 1960).

⁷⁹K. A. Wang, "Suggested Criteria for Writing Attitude Statements," Journal of Social Psychology, 3:367-373, 1932; L. L. Thurstone and E. J. Chave, The Measurement of Attitude, Chicago University Press, Chicago, Illinois, 1929, pp. 28-35; C. Bird, Social Psychology (New York: Appleton-Century-Crofts, 1940, pp. 11-17; and A. L. Edwards and F. P. Kilpatrick, "A Technique for the Construction of Attitude Scales," Journal of Applied Psychology, 32:374-94, 1948.

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3. Statements that refer to the past rather than the present, should be avoided.
4. The statements should be worded so that they can be endorsed or rejected in accordance with the respondent's attitudes.
5. Ambiguous statements should be avoided.
6. Statements should be representative of the attitude variables to be measured.
7. Factual statements should be avoided.
8. Statements that are irrelevant to the object should be avoided.
9. The terminology employed should be comprehensible to the subjects.
10. Each statement should contain only one thought.

Thurstone⁸⁰ has also suggested that a minimum should be left to the personal judgment of the investigator, when selecting statements for the final scale.

There are two general methods that may be employed in developing the final scale from an accumulated set of attitude statements. They include: (1) the use of judges to sort the statements, and (2) selections based on the direct responses of the subjects.

⁸⁰L. L. Thurstone, "Theory of Attitude Measurement," Psychological Review, 29:222-41, 1929.

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In the judgment or Thurstone method, each statement is printed on a separate card and judges are requested to sort these statements on an eleven point continuum. The members of the judging group are instructed to base their sorting procedure on the degree of negative or positive affect associated with each item, rather than their own agreement or disagreement with the statement. The responses of the judges are then used to compute scale and inter-quartile-range values for each item. The statements with the lowest values are retained for the final scale, which is presented to the desired subjects with instructions to indicate their agreement with each item. It is assumed that the agree-disagree responses of the subjects are a function of the degree of affect associated with the psychological object.

An attitude score for each subject can be found by locating the median of the scale values of the statements with which he agreed. This score is assumed to be an indication of the subject's location on the same psychological continuum that was presented by the scaled statements. A subject's score can be interpreted independent of the distribution of scores from a particular group of subjects.⁸¹

⁸¹L. L. Thurstone and E. J. Chave, The Measurement of Attitudes, Chicago University Press, Chicago, Illinois, 1929; P. R. Farnsworth, "Attitude Scale Construction and Method of Equal-Appearing Intervals," Journal of Social Psychology, 50:245-48, 1954; R. J. Longstreet, "An Experiment with the Thurstone Attitude Scale," School Review, 1935, pp. 43-50; and A. L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts, 1957).

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The second method is based upon direct responses of agreement or disagreement with the attitude statements. The response or Likert method does not resort to the use of judges or scale values, since the investigator's assumptions determine the extent of favorableness or unfavorableness of each statement.

The procedure for constructing a Likert-type scale requires the investigator to assemble a large number of items that he considers relevant to the attitude he wishes to study. These items are then administered to a group of subjects representative of those with whom the scale is to be used. The subjects are requested to indicate their response to each item by checking one of five categories (strongly agree, agree, uncertain, disagree, strongly disagree). The responses to the various items are scored in such a way that a response indicative of the most favorable attitude is given the highest score.

Each individual's total score is computed by adding his item scores and the responses are analyzed to determine which of the items discriminate most clearly between the high score and the low scores on the total scale. Items that do not show a substantial correlation with the total score are eliminated to ensure that the scale is internally consistent.

A set of the best twenty to twenty-five statements is retained for the final scale which reverts to the

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original format. Weighted values are assigned to each of the five possible responses and individual scores can be obtained by summing the points received for each response. Unlike the Thurstone method, the interpretation of a subject's score cannot be made independently of the distribution of scores of some defined group of subjects.⁸²

Edwards and Kenny⁸³ have conducted a study to compare Thurstone's method of equal-appearing intervals and Likert's method of summated ratings. They noted that the Likert method was more comprehensive and less laborious than Thurstone's method and that it took twice as long to construct a Thurstone scale than it did the Likert scale. It was also indicated that the Likert method provided more reliable scores with fewer items than did the Thurstone method.

The scale-discrimination technique was an early effort by Edwards and Kilpatrick⁸⁴ as a synthesis of the scaling and response methods for developing an attitude

⁸²L. W. Ferguson, "A Study of the Likert Technique for the Construction of Attitude Scales," Journal of Applied Psychology, 13:51-57, 1941; R. Likert, "A Technique for the Measurement of Attitudes," Psychological Archives, No. 140, 1932; and A. L. Edwards, op. cit., pp. 149-69.

⁸³A. L. Edwards and Katherine Kenny, "A Comparison of the Thurstone and Likert Techniques of Attitude Scale Construction," Journal of Applied Psychology, 30:72-83, 1946.

⁸⁴A. L. Edwards and F. F. Kilpatrick, "A Technique for the Construction of Attitude Scales," Journal of Applied Psychology, 32:374-84, 1948.

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scale. This technique makes use of Thurstone's scaling procedure and retains Likert's procedure for evaluating the discriminatory power of individual items. Since it has not been used extensively to date, its effectiveness and practicality have not been established.

In the past three decades, several attempts have been made to develop more effective scaling instruments. A few of the better known methods will be discussed in the following paragraphs.

In Guttman's⁸⁵ scale analysis theory, the investigator hypothesizes a variable and a number of descriptive statements are written that represent this variable. Each item is given two or more alternative responses and subjects marking the responses that indicate the desired quality most strongly, receive the highest scores. The number of reversals in responses that deviate from the perfect correlation, is counted and the numbers of such errors are summed for all items to arrive at a final attitude score.

Guilford's⁸⁶ analysis of Guttman's theory has revealed that the criterion of scalability can rarely be achieved, even when total scores reach an acceptable level of reliability. He described this method as unrealistic

⁸⁵L. Guttman, "A Basis for Scaling Qualitative Data," American Sociological Review, Vol. 9, 1944.

⁸⁶J. P. Guilford, Psychometric Methods (New Jersey: McGraw-Hill Book Company, 1954).

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and useless since it favors groups of items which are rewordings of the same content. Thus, the variable emphasized could be a specific rather than a common factor.

The subjects and stimuli are both represented as points along a psychological continuum in Coombs⁸⁷ unfolding model. Coombs operates on the premise that the distance of any stimulus from a particular subject is directly related to the extent to which that subject is willing to endorse or choose a particular stimulus. The consistency of the respondents' judgments can be determined, since they are requested to designate stimuli in rank order according to their preferences.

According to some critics, this model is likely to remain of more theoretical than practical interest, inasmuch as it is exceedingly stringent with no extraneous variations permitted.⁸⁸

Rating scales have also been employed in recent years to evaluate individual reactions to given stimuli. Although there are several kinds of rating scales, they function in a similar way, since they all require the assignment of objects by inspection. Although rating scales

⁸⁷C. H. Coombs, A Theory of Data (New York: John Wiley and Sons, 1964).

⁸⁸E. M. Shaw and J. M. Wright, Scales for the Measurement of Attitudes (New Jersey: McGraw-Hill Book Co., 1967).

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are easy to administer, they necessitate well-trained raters because they are subject to constant errors and require quantitative observations with some degree of precision and objectivity.⁸⁹

Semantic differential, Lazarsfeld's latent structure model, multidimensional scaling and others are relatively recent in origin, therefore, they have not been applied to any great extent in the development of attitude scales.⁹⁰

Although opinion polling has become fairly prominent in recent years, it has its limitations since it involves attitude measurement in only the most rudimentary sense.⁹¹

Those who are familiar with psychological scaling techniques, have concurred that regardless of method, an attitude can only measure the feelings that are actually expressed. It must be realized that the subjects may on occasion intentionally conceal their true attitudes. Hence, a valid indication of their attitudes may not be reflected to an appreciable degree in the scale results. Consequently, it is important that precautions be taken

⁸⁹J. P. Guilford, Psychometric Methods (New Jersey: McGraw-Hill Book Co., 1954), pp. 15-24.

⁹⁰Shaw and Wright, op. cit., pp. 127-29.

⁹¹H. H. Remmers, Introduction to Opinion and Attitude Testing (New York: Harper and Row Publishers, 1954).

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Summary

The review of the literature has presented some degree of consistency relative to accident causation and psychological factors. Although accidents involve a complex interaction of many variables, there appears to be an increasing amount of evidence which suggests that undesirable driving attitudes are the underlying causes of most traffic accidents. Research studies with accident repeaters cited faulty attitudes as being accountable for the pronounced resentment of authority and the intentional violation of traffic laws.

Although several writers concurred that accident prevention and attitude change were basically an educational problem, they also inferred that driver educators have not been very effective in fortifying knowledge and skills with desirable attitudes. Efforts to change and modify attitudes were generally described as being inappropriate or non-existent. Dogmatic and direct teaching, drives and slogans, and shock and fear campaigns were noted to have

⁹²L. L. Thurstone and E. J. Chave, The Measurement of Attitude, Chicago University Press, Chicago, Illinois, 1929, pp. 19-20; and R. Likert, "A Technique for the Measurement of Attitudes," Archives of Psychology, No. 140, 1932.

some momentary value, but accomplished no lasting results in changing attitudes. It was indicated that programmed instruction and group dynamics may be the most effective means for developing or modifying attitudes.

Most researchers acknowledged the value of practical driver attitude scales as instruments to divulge attitudinal patterns which may lead to unsafe driving behavior. However, there are relatively few standardized scales available in published form and those which are available have many limitations. The scales reviewed were apparently designed to evaluate individual attitudes and meager attempts have been made to adapt or standardize these scales for the purpose of determining areas requiring instructional emphasis.

The literature concerning attitude scale methodology confirmed the possibility of measuring attitudes by the opinions individuals endorse. Several methods and procedures were outlined and it was indicated that the Likert technique was the most comprehensive and least laborious.

Hence, the review of the literature has disclosed the need, purpose and methodology for the construction of a practical driver attitude inventory.

CHAPTER III

DEVELOPMENT OF THE PRELIMINARY INVENTORY

Formulation of the Statements

In order to formulate the statements to be contained in the proposed inventory, it was necessary to determine the most appropriate factors to be considered. Based on the review of the literature and the existing driver attitude scales, the following universe of content was developed.

1. Traffic laws
2. Enforcement
3. Licensing procedures
4. Alcohol and narcotics
5. Speeding
6. Traffic accidents
7. Vehicle condition
8. Emotions
9. Courtesy
10. Driver education

Sixty complete sentence statements were written, six for each of the ten factors in the universe. However, nine of these statements were discarded as a result of the

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editing criteria suggested by Thurstone, Chave and others.⁹³ To facilitate the construction of the preliminary inventory, one additional statement was eliminated, thus providing fifty items with a proportional distribution of five statements to represent each of the ten factors in the universe. Hence, 10 per cent of the statements were devoted to each of the ten factors. An attempt was also made to provide a balance of negatively and positively oriented items.

The following statements were retained for further consideration:

Traffic laws

1. Drivers should be given some degree of freedom in obeying traffic laws.
2. Those who habitually violate traffic laws should be deprived of the privilege to drive.
3. It is necessary to obey stop signs at all times.
4. Traffic laws are necessary to promote the safe, efficient flow of traffic.
5. When a driver is in a hurry, it is all right for him to go through a red light if there is no traffic.

Enforcement

1. In most cases, the police enforce the law as it is written.

⁹³L. L. Thurstone and E. J. Chave, The Measurement of Attitude, Chicago University Press, Chicago, Illinois, 1929; R. Likert, "A Technique for the Measurement of Attitudes," Archives of Psychology, No. 140, 1932; K. A. Wang, "Suggested Criteria for Writing Attitude Statements," Journal of Social Psychology, 3:367-73, 1932; and A. L. Edwards and F. P. Kilpatrick, "A Technique for the Construction of Attitude Scales," Journal of Applied Psychology, 32:374-384, 1948.

2. Policemen are too strict in enforcing traffic laws.
3. The police should not be lenient with traffic violators.
4. Policemen should enforce all moving violations.
5. Policemen are more critical of teenage drivers than they are of any other age group.

Licensing procedures

1. Drivers who habitually violate traffic laws should have their licenses revoked.
2. The driver licensing procedure is too difficult.
3. Drivers should be re-tested at designated intervals.
4. Prospective drivers should not be required to take a visual examination.
5. The driving skill phase of the licensing examination should be difficult but realistic.

Alcohol and narcotics

1. Alcoholic beverages and narcotics impair a person's ability to drive.
2. Those persons who make a habit of driving while intoxicated should be deprived of the privilege to drive.
3. The laws governing drivers under the influence of alcohol or narcotics are too strict.
4. Drivers should not be required to take a sobriety test even if they are suspected of being under the influence of alcoholic beverages.
5. If a person drinks alcoholic beverages or takes drugs, he should not drive an automobile.

Speeding

1. Driving a car should give a feeling of dominance.
2. Drivers should not exceed posted speed limits.
3. The driver should get the full benefit of a car's potential speed whenever possible.

4. It is all right to speed on the open highway.
5. Speed limits help to promote the safe, efficient movement of traffic.

Traffic accidents

1. Careful drivers cause as many accidents as reckless drivers.
2. Faulty driving behavior is a major cause of traffic accidents.
3. Accidents do not happen by chance, they are caused.
4. Most traffic accidents cannot be avoided.
5. Middle-aged drivers are involved in more accidents than teenagers.

Vehicle condition

1. A car with defective brakes should not be driven until the proper adjustments have been made.
2. Motor vehicle inspections are a waste of time.
3. It is dangerous to drive with tread-bare tires.
4. Extra equipment should be put on a car to attract attention.
5. Defective cars should be kept off the highway.

Emotions

1. Driving is a good way to forget daily problems.
2. It is natural for a driver to get nervous in heavy traffic.
3. A person should not drive when he is extremely angry about something.
4. Cautious drivers do not get impatient in heavy traffic.
5. The car horn should be used freely in clearing the road of slow drivers.

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Courtesy

1. Most courteous drivers are not good drivers.
2. When conditions permit, drivers should stop to assist motorists who have vehicle difficulties.
3. Courtesy is a good driving practice.
4. Driving courtesy is a reflection of a person's character.
5. Courtesy is not a necessary element of safe driving.

Driver education

1. Most parents are qualified to teach their teenagers how to drive.
2. Driver and traffic safety education courses can help to prepare better qualified drivers.
3. Skill is the most important factor in the safe operation of a motor vehicle.
4. The major goal of a driver and traffic safety education course should be to train teenagers to secure a driver's license.
5. Prospective drivers should be required to take an approved course in driver and traffic safety education.

The fifty statements were then distributed to seventy-two graduate driver and traffic safety education students from Michigan State University and Eastern Michigan University for further analysis. As a result of their suggestions, some minor changes were made and the statements were subjected to further scrutiny and refinement by a three man committee representing the Counseling and Personnel Services, Highway Traffic Safety Center and Police Administration Departments of Michigan State University.

Recommended revisions were made and Thorndike's⁹⁴ text was used as a reference to ensure that all the terms employed were within the reading and comprehension level of the average twelve year old.

Construction of the Inventory

Having developed fifty statements relevant to the measurement of driving attitudes, it was decided to use a synthesis of the Thurstone and Likert techniques in constructing the preliminary form of the inventory.

Thurstone's⁹⁵ method of using judgments as a basis for determining scale values of the statements upon a designated psychological continuum was used in conjunction with his instructions specifying that judgments be based upon expressions indicating desirable attitudes rather than the judges' own agreement or disagreement with the statements.

The statements were arranged in the Likert⁹⁶ format and the following five category response was employed: (1) strongly agree, (2) agree, (3) uncertain, (4) disagree,

⁹⁴E. L. Thorndike and Irving Lorgue, The Teacher's Word Book, Teachers College, Columbia University, New York, 1944.

⁹⁵L. L. Thurstone and E. J. Chave, The Measurement of Attitudes, Chicago University Press, Chicago, Illinois, 1920.

⁹⁶R. Likert, "A Technique for the Measurement of Attitudes," Archives of Psychology, No. 140, 1932.

and, (5) strongly disagree. The "strongly agree" category denoted the most favorable statements and the "strongly disagree" category represented the most unfavorable statements.

The inventory requisite for the judging procedure is presented in Appendix E.

Selection of the Judges

The primary purpose of this study was to develop an inventory which would assist driver educators to ascertain the areas of instruction that should be emphasized to foster the development of positive driving attitudes. Consequently, the most logical individuals to judge the degree of affect represented by the statements were driver educators from three levels of responsibility. The levels that were selected included:

1. The supervisors of driver and traffic safety education from the state departments of education of the fifty states.
2. The directors of driver and traffic safety education from 117 colleges and universities offering three or more courses in this field.⁹⁷

⁹⁷ National Safety Council, Higher Education Section, Safety Education Courses in Colleges and Universities, Chicago, Illinois, 1967.

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3. One hundred and twenty high school driver education teachers representing a minimum of ten states. This group consisted of authors of driver education textbooks, personal acquaintances and other recommended driver educators.

Distribution of the Inventory

The distribution of the inventory ensued the selection of the 287 judges. An "explanatory letter" as seen in Appendix F, was written and with the exception of a few personal deliveries, the inventory was mailed to the members of the judging group.

Summary

Basic to the development of the desired driver attitude inventory were: (1) the selection of the appropriate universe of content, (2) the writing and editing of suitable statements, (3) the construction of the inventory, (4) the selection of the judges, and, (5) the distribution of the inventory.

The universe of content was selected and sixty statements were written, six for each of the following areas: (1) traffic laws, (2) enforcement, (3) licensing procedures, (4) alcohol and narcotics, (5) speeding, (6) traffic accidents, (7) vehicle condition, (8) emotions, (9) courtesy, and (10) driver education. As a consequence of

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the editing, scrutinizing and refining process, only fifty statements were retained. The preliminary inventory was constructed incorporating Thurstone's judgment method in the Likert format. The judges were selected from three levels of driver education responsibility: (1) state departments of education, (2) colleges and universities, and (3) high schools. An explanatory letter and the preliminary inventory were mailed to the 287 members of the judging group to determine the degree of affect represented by the fifty statements.

CHAPTER IV

STATISTICAL ANALYSIS OF THE DATA

Source of Data

Requisite to the item analysis and factor analysis procedures was the tabulation of the inventory responses. The tabulation process was terminated four months from the date the inventories were distributed. It was believed that this time allotment was sufficient for those individuals who intended to respond to the inventory. Seventy-two per cent of the inventories distributed, 207 of 287, were returned. Information regarding the states and institutions representative of the inventories received are presented in Appendix G. The response patterns of the 207 judges are tabulated in Table 1.

Item Analysis

Median or scale values and interquartile range or "Q" scores were used as criteria to determine the merits of each statement contained in the preliminary inventory.⁹⁸

⁹⁸A. L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts Inc., 1957), pp. 88-92.

Table 1.--Response pattern of the 207 judges.

Variable	Response Categories				
	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	4	44	22	67	70
2	157	49	1	0	0
3	142	49	5	6	5
4	166	41	0	0	0
5	0	0	7	100	100
6	61	86	25	31	4
7	0	0	17	141	49
8	54	141	12	0	0
9	78	90	21	17	1
10	0	0	28	141	38
11	83	112	12	0	0
12	0	0	14	154	39
13	101	100	5	1	0
14	5	18	25	92	67
15	89	94	18	6	0
16	148	30	27	1	1
17	128	71	8	0	0
18	0	0	5	52	150
19	0	1	17	83	106
20	118	66	16	7	0
21	6	16	21	88	76
22	107	83	12	4	1
23	0	0	3	56	148
24	0	0	13	127	67
25	34	101	41	16	15
26	12	13	30	86	66
27	96	108	3	0	0
28	114	88	5	0	0
29	0	0	8	115	84
30	9	19	64	75	40
31	96	104	7	0	0
32	0	0	2	98	107
33	149	54	3	1	0
34	4	9	18	82	94
35	105	86	11	3	2
36	0	0	14	101	92
37	4	25	20	99	59
38	142	61	4	0	0
39	15	106	27	45	14
40	0	0	6	108	93
41	0	2	9	69	127
42	42	128	35	0	2
43	154	51	2	0	0
44	109	61	37	0	0
45	0	0	5	75	127
46	2	11	36	96	62
47	136	42	29	0	0
48	0	0	16	143	48
49	0	0	4	98	105
50	124	80	3	0	0
					N = 207

The numbers within each response category represent the total number of judges making that response.

Numerical values ranging from one for "strongly agree" through five for "strongly disagree" were assigned to facilitate the computation of the basic statistics for the response data. The percentage of judges, who placed each statement in the different categories, was used to calculate the values of each statement upon the designated five point psychological continuum. The numerical values representing the basic statistical data are presented in Table 2.

The scale value for a given statement was designated as the 50th percentile or median position assigned to it by the 207 judges. Prime consideration was given to statements which had the highest and lowest scale values, since the strongly agree and strongly disagree limits were of major concern.

The interquartile range was used to measure the variation of the judgment distribution for each statement. The "Q" scores contain the middle 50 per cent of the judgments and were determined by computing the difference between the 75th and 25th percentiles. The mean "Q" score, 1.04, was used as the measure of delineation between good and poor statements. Statements with scores larger than 1.04 were interpreted as indicating poor agreement among the judges while smaller scores implied good agreement. Disagreement among the judges as to the degree of the attribute possessed by a given statement was interpreted as an indication that there was something wrong with that particular statement.

Table 2.--Basic statistics for the fifty variables.

Variable	Range	Q ₁	Median	Q ₃	Mean	SD	Q
1	1-5	2.67	4.00	4.77	3.75	1.19	2.10
*2	1-3	0.83	1.16	1.49	1.25	0.44	0.66
*3	1-5	0.86	1.23	1.78	1.46	0.86	0.91
*4	1-2	0.82	1.12	1.44	1.20	0.40	0.62
*5	3-5	3.95	4.47	4.99	4.45	0.56	1.04
6	1-5	1.35	1.99	2.85	2.18	1.08	1.50
*7	3-5	3.74	4.11	4.48	4.16	0.54	0.74
*8	1-3	1.46	1.85	2.22	1.80	0.53	0.76
9	1-5	1.16	1.78	2.36	1.91	0.94	1.20
*10	3-5	3.67	4.04	4.41	4.05	0.56	0.74
*11	1-3	1.12	1.68	2.15	1.66	0.58	1.03
*12	3-5	3.74	4.08	4.42	4.12	0.49	0.68
*13	1-4	1.04	1.53	2.08	1.55	0.57	1.04
14	1-5	3.54	4.10	4.73	3.97	0.97	1.19
15	1-4	1.08	1.65	2.21	1.72	0.74	1.13
*16	1-5	0.85	1.20	1.76	1.44	0.77	0.91
*17	1-3	0.90	1.31	1.89	1.42	0.57	0.99
*18	3-5	4.40	4.81	5.16	4.70	0.51	0.76
19	2-5	3.91	4.52	5.02	4.42	0.66	1.11
20	1-4	0.94	1.38	2.07	1.58	0.78	1.13
21	1-5	3.60	4.19	4.83	4.02	1.02	1.23
*22	1-5	0.98	1.47	1.98	1.59	0.73	1.00
*23	3-5	4.37	4.80	5.15	4.70	0.49	0.78
*24	3-5	3.80	4.21	4.73	4.26	0.56	0.93
25	1-5	1.68	2.19	3.01	2.41	1.08	1.33
26	1-5	3.39	4.06	4.72	3.87	1.11	1.33
*27	1-3	1.04	1.57	2.05	1.55	0.53	1.01
*28	1-3	0.95	1.41	1.97	1.47	0.55	1.02
*29	3-5	3.88	4.33	4.89	4.37	0.56	1.01
30	1-5	2.87	3.65	4.35	3.57	1.04	1.48
*31	1-3	1.04	1.57	2.08	1.57	0.56	1.04
*32	3-5	4.01	4.53	5.02	4.51	0.52	1.01
*33	1-4	0.85	1.19	1.64	1.30	0.52	0.79
34	1-5	3.75	4.38	4.95	4.22	0.92	1.20
35	1-5	1.00	1.49	2.10	1.61	0.75	1.10
*36	3-5	3.87	4.38	4.91	4.37	0.61	1.04
37	1-5	3.53	4.05	4.63	3.89	1.01	1.10
*38	1-3	0.86	1.23	1.72	1.33	0.51	0.86
39	1-5	1.85	2.34	3.65	2.69	1.08	1.80
*40	3-5	3.93	4.41	4.95	4.43	0.54	1.02
*41	2-5	4.09	4.69	5.10	4.55	0.63	1.01
*42	1-5	1.58	1.99	2.41	2.01	0.69	0.83
*43	1-3	0.84	1.17	1.54	1.27	0.46	0.70
44	1-3	0.98	1.45	2.27	1.65	0.76	1.29
*45	3-5	4.13	4.69	5.10	4.59	0.54	0.97
46	1-5	3.53	4.07	4.67	3.99	0.88	1.14
*47	1-3	0.88	1.26	1.92	1.48	0.73	1.04
*48	3-5	3.75	4.11	4.48	4.16	0.53	0.73
*49	3-5	3.99	4.52	5.02	4.49	0.54	1.03
*50	1-3	0.91	1.33	1.89	1.41	0.52	0.98

All numbers have been rounded to the nearest tenth. Variables with * have mean "Q" values of 1.04 or less.

Although both "scale" and "Q" values were used as criteria for selecting statements to be considered for the final form of the inventory, preference was given to statements with low "Q" scores. The thirty-three statements which follow were retained for further analysis.

Laws

- 1.**A driver who makes a habit of breaking traffic laws should have his license taken away.
2. *It is not necessary to obey stop signs at all times.
- 3.**Traffic laws are necessary for the safe movement of motor vehicles.
4. It is all right for drivers to go through red lights if there is no traffic.

Enforcement

- 1.**Policemen are too strict with drivers who break traffic laws.
2. *The police should be strict with drivers who purposely break traffic laws.
3. Policemen are more strict with young drivers than with any other age group.

Licensing

1. *Persons desiring a driver's license should pass a general knowledge test before taking the road test.
2. The testing program for a driver's license is too difficult.
3. *All licensed drivers should be re-tested at least every four years.

Alcohol and narcotics

1. *Alcohol and narcotics can impair a person's driving ability.

- 2.**Those who make a habit of driving when affected by alcohol, should lose their driver's license.
3. *The laws concerning drivers who have been drinking alcohol are too strict.

Speeding

- 1.**A person should not drive faster than the posted speed limit.
2. *A person should get the full benefit of his car's potential speed whenever possible.
- 3.**It is all right to go faster than the posted speed limit on the open highway.

Accidents

1. Poor driving behavior is a major cause of traffic accidents.
- 2.**Traffic accidents do not just happen; they are caused.
3. *Traffic accidents cannot be avoided on over-crowded roads.

Vehicle condition

1. A car with bad brakes should not be driven until the brakes have been repaired or replaced.
2. Motor vehicle inspections are a waste of time.
- 3.**It is dangerous to drive with badly worn tires.

Emotions

1. Driving provides a good way to forget daily problems.
2. A person should not drive when he is upset or angry.
3. The car horn should be used freely to clear the road of slow drivers.

Courtesy

1. Most courteous drivers are not good drivers.

- 2.**When conditions permit, drivers should stop to help motorists who have car trouble.
3. Courtesy is a good driving practice.
- 4.**Courtesy is a necessary part of safe driving.

Driver Education

1. *A driver education course can help a person to become a better driver.
2. Skill is the most important factor in the safe operation of a motor vehicle.
3. The major goal of driver education courses should be to train teenagers to get a driver's license.
4. *A driver education course should be taken before getting a driver's license.

Twenty statements were altered in varying degrees from their original structure, to ensure that the terminology was within the reading and comprehension level of the average twelve year old. The statements preceded by single asterisks were modified as a result of the reiterated suggestions of the judges, while those with double asterisks contain word changes that were recommended by two eighth grade English teachers.

To facilitate the examination of the factor analysis tables, the thirty-three variables were grouped according to the postulated factors. This information is presented in Table 3.

Table 3.--Grouping of variables by postulated factors.

Postulated Factors	Variable Number Sequence
1. Laws	1, 2, 3, 4
2. Enforcement	5, 6, 7
3. Licensing	8, 9, 10
4. Alcohol	11, 12, 13
5. Speed	14, 15, 16
6. Accidents	17, 18, 19
7. Equipment	20, 21, 22
8. Emotions	23, 24, 25
9. Courtesy	26, 27, 28, 29
10. Driver Education	30, 31, 32, 33

Factor Analysis

The principal components⁹⁹ form of factor analysis was selected as the means of examining the validity of the postulated factors and to determine if the relationships within each set of variables could be presented or reproduced with little error or loss of information from a group of common factors smaller in number than the ten original factors.

The varimax rotation of factor matrices which maximizes the variance in columns,¹⁰⁰ and the quartimax rotation which simplifies the distribution in each row,¹⁰¹ were undertaken to clarify and interpret the extracted factors. Three solutions were executed with the Kiel-Wrigley Option set at 5, 0 and 2 respectively¹⁰² and all operations were executed on the I.B.M. 3600 at Michigan State University.

⁹⁹Merrill Flood, "A Computational Procedure for the Method of Principal Components," Psychometrika 5:169-72, 1940; and G. E. Burrough and H. W. Miller, "The Rotation of Principal Components," Bi-annual Journal of Statistical Psychology, 14:35-49, 1961.

¹⁰⁰H. F. Kaiser, "The Varimax Criterion for Analytic Rotation in Factor Analysis," Psychometrika, 23:187-200, 1958; _____. "Computer Program for Varimax Rotation in Factor Analysis," Educational Psychology Measurement, 19: 413-420, 1959.

¹⁰¹Jack Neuhaus and Charles Wrigley, "The Quartimax Method," Bi-annual Journal of Statistical Psychology, 7:81-91, 1954.

¹⁰²T. W. Anderson, "Asymptotic Theory for Principal-Component Analysis," Annals of Mathematical Statistics, 34: 122-48, 1963; and Harry H. Harmon, Modern Factor Analysis (Chicago, Illinois: University of Chicago Press, 1968), pp. 130-46.

1

Intercorrelation matrix.--The computation of an intercorrelation matrix for the thirty-three variables was requisite to the execution of the varimax and quartimax rotations. The data contained in Table 4 disclosed that the intercorrelations were relatively low, ranging from -.01 to -.59. The low correlations were attributed to the low variances resulting from the excellent agreement among the judges.

It was decided that only correlations of .25 or larger would be accepted as indicative of item comparability. The highest correlation -.59 was obtained for items #28 and #29 which represented the Courtesy factor. All of the variables contained in the Speed and Accident factors had correlations of .25 or larger, as did two of the four Driver Education items.

The Enforcement and License factors did not provide any variables which met the prescribed limits. Items #4, #5, #6, and #10 correlated .25 or larger with a few statements representing other factors, but did not correlate highly within their own set. Relatively low correlations were obtained for items #2, #7, #8, #9, #11 and #27. The correlation of variables within postulated factors can be more readily observed in Table 5.

Orthogonal rotation leadings.--Both quartimax and varimax rotations were executed for the three principal component solutions and only those factors were considered

Table 4.--Intercorrelation matrix for 33 variables.

Variables																																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
1	1.0																																
2	14	1.0																															
3	30	09	1.0																														
4	-13	-08	-20	1.0																													
5	-19	-02	-14	03	1.0																												
6	17	09	24	-12	-18	1.0																											
7	03	-08	-15	08	12	-08	1.0																										
8	23	08	13	-15	-18	07	-08	1.0																									
9	-01	-01	01	10	09	06	07	-08	1.0																								
10	04	-04	10	03	-13	02	-11	04	-03	1.0																							
11	05	09	06	-05	-03	05	01	12	-06	13	1.0																						
12	11	16	15	-24	-15	12	-11	23	-06	17	15	1.0																					
13	-25	-23	-16	18	15	-12	02	-17	05	-01	-15	-39	1.0																				
14	31	17	19	-07	-18	11	01	06	01	01	22	06	-20	1.0																			
15	-31	-03	-24	-09	-06	-07	07	-05	03	-07	-14	-03	11	-41	1.0																		
16	-18	01	-19	22	23	-11	13	-09	09	-20	-18	-18	17	-25	34	1.0																	
17	23	-01	29	-17	-23	21	-15	17	-11	17	15	26	-18	18	-30	-29	1.0																
18	18	19	23	-13	-26	08	-23	16	-02	18	-02	15	-27	17	-23	-31	42	1.0															
19	-15	04	-13	22	18	-29	13	-10	08	-13	-01	-15	15	-10	12	19	-30	-38	1.0														
20	10	18	19	-25	-24	10	-19	20	-21	13	18	16	-30	19	-05	-23	35	24	-19	1.0													
21	-27	-11	-25	11	15	-10	15	-08	06	-23	-10	-18	30	-21	29	31	-33	-32	24	-36	1.0												
22	28	21	29	-04	-11	05	-18	12	01	17	16	14	-30	19	-19	-12	15	24	-10	23	-21	1.0											
23	-18	05	-24	19	26	-20	10	-14	01	-04	-06	-13	21	-17	25	24	34	-27	25	-23	14	-18	1.0										
24	19	15	20	-05	-10	20	-04	03	07	14	16	20	-30	27	-34	-25	27	32	-13	20	-33	27	-24	1.0									
25	-12	-04	-13	16	12	-10	07	-13	15	-10	-22	-21	24	-22	25	28	-26	-28	21	-25	29	-19	31	-29	1.0								
26	-18	-18	-15	08	18	-17	01	-13	-06	-03	-06	-07	26	-17	24	13	-22	-27	09	-21	24	-23	14	-29	20	1.0							
27	07	04	13	-16	-08	-03	-10	09	-05	11	01	13	-06	01	-15	-09	17	13	-10	10	-03	11	-19	10	-22	-14	1.0						
28	15	13	19	-01	-07	14	-05	07	09	16	08	13	-24	18	-14	-15	29	34	-15	24	-24	23	-11	40	-28	-38	14	1.0					
29	-25	-16	-23	07	12	-21	18	-16	-01	-18	-15	-18	29	-19	30	24	-33	-39	25	-30	37	-26	17	-40	32	43	-17	-59	1.0				
30	26	18	27	-07	-15	16	-09	19	-01	03	12	15	-24	19	-18	-13	24	15	-15	19	-28	25	-12	18	-25	-19	14	22	-27	1.0			
31	-04	06	-24	24	22	-13	20	-06	08	-25	-02	-09	15	-12	16	19	-23	-15	12	-13	14	-18	28	-10	22	06	-15	07	12	-11	1.0		
32	-17	-01	-25	29	19	-11	08	-14	-02	-18	-03	-33	22	-16	18	21	-33	-20	24	-12	31	-12	19	-14	24	03	-09	-14	18	-18	36	1.0	
33	15	12	19	-14	-17	13	-13	-16	-04	16	07	23	-25	24	-28	-23	28	29	-12	23	-29	15	-19	38	-28	-13	10	35	-28	28	-14	-33	1.0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	

All numbers have been rounded to the nearest tenth and decimal points have been omitted.

Table 5.--Variable correlations within postulated factors.

Postulated Factors	Variables	Correlation
1. Laws	1 and 3	.30
2. Enforcement		
3. Licensing		
4. Alcohol	12 and 13	.39
5. Speed	14 and 15	.41
	14 and 16	.25
	15 and 16	.34
6. Accidents	17 and 18	.42
	17 and 19	.29
	18 and 19	.36
7. Equipment	20 and 21	.36
8. Emotions	24 and 25	.29
9. Courtesy	28 and 29	.59
10. Driver Education	31 and 32	.36
	32 and 33	.33

Only those variables having correlations of .25 and larger are presented.

relevant which contained comparable loadings for both rotations on the same variable. Guidelines specified by Reyburn and Taylor¹⁰³ were employed to interpret the factor loading solutions.

Solution #1.--In the initial solution, the Kiel-Wrigley Option was set at 5 and three quartimax and five varimax factors were produced. The three factors examined yielded the following results.

1. Although eleven variables were noted in Factor 1, only item #28, Courtesy, produced both quartimax and varimax loadings.
2. Factor 2 contained twenty-two variables of which eleven contained double loadings. The highest loading was on Accidents with all three items #17, #18 and #19 represented. Enforcement and Driver Education provided two paired loadings, while Laws, Speed, Courtesy and Emotions yielded one each.
3. Laws, Licensing, Alcohol and Driver Education were equally represented in Factor 3 which loaded on ten different variables.
4. Factors 4 and 5 yielded only varimax loadings on three and five items respectively.

¹⁰³H. A. Reyburn and J. G. Taylor, "On the Interpretation of Common Factors: A Criticism and a Statement," Psychometrika, 8:53-64, 1943.

Although this solution did not produce any pronounced factors, it was indicated that a ten factor solution would be feasible, since the first component of the principal axis analysis had an Eigenvalue¹⁰⁴ of 6.64 and nine other values were larger than one. The data relevant to this solution is tabulated in Table 6.

Solution #2.--Dependent upon the Eigenvalues obtained for the first solution, the second solution was executed with the Kiel-Wrigley Option set at 0, stipulating the rotation of ten factors.

The results of this solution disclosed that there was a greater consistency for paired quartimax and varimax loadings within each of the ten rotated factors. The following factor representations were noted:

1. Observing the loadings associated with Factor 1, it was found that moderately high loadings were related to Courtesy items #26, #28 and #29 with moderate loadings for Accidents and Emotions. Item #21, Equipment, was also represented.
2. Moderately high loadings were noted in Factor 2 for items #5 and #6, Enforcement. Single Accidents and Emotions items were also included within this factor.

¹⁰⁴Larry Irwin, "A Method of Clustering Eigenvalues," Psychometrika, 31:11-13, 1966; and Harry Harmon, Modern Factor Analysis (Chicago, Illinois: University of Chicago Press, 1968), pp. 140-46.

Table 6.--Quartimax and varimax rotated factor loadings:
Solution No. 1.

Postulated Factors	Items	Highest Factor Loadings									
		1		2		3		4		5	
		Q	V	Q	V	Q	V	Q	V	Q	V
1	1					36			51		
	2					65	56				
	3			-46	-40						
	4	45			41						
2	5			43	44						
	6			-31							-43
	7			32	35						
3	8					35	50				
	9	39									-49
	10			-38							37
4	11					31					47
	12	-37					51				
	13					-58	-59				
5	14			-34					69		
	15			48					-70		
	16			56	39						
6	17			-66	-54						
	18		54	-59	-42						
	19			50	53						
7	20			42			42				
	21		-42	53							
	22		36			43					
8	23			56	55						
	24		58	-45							
	25			52							-34
9	26		-56			-37					
	27			-31	-27						
	28	48	76								
	29		-74	51							
10	30					41	39				
	31			53	60						
	32			55	56						
	33		37	-49							
Highest Loading		48	76	-66	60	65	-59		-70		-49
Proportion of Variance		05	10	18	10	07	07		07		04

Decimals have been omitted and all numbers have been rounded to the nearest tenth. Kiel-Wrigley Option was set at 5.

3. Factor 3 loaded on items #2 and #10, Laws and Licensing.
4. Speed was the only independent factor noted. This finding was also supported by the intercorrelations among the three variables in this set. Item #14 correlated .41 with item #15, item #15 correlated .34 with item #16 and the smallest, although acceptable correlation was .25 between items #14 and #16.
5. Factor 5 loaded equally on variables representing Licensing and Equipment.
6. Moderate to moderately high loadings were obtained for Factor 6 on items #4, #12 and #32, Laws, Alcohol and Driver Education respectively.
7. Single items #3, #7 and #22 associated with the postulated factors of Laws, Enforcement and Equipment were noted in Factor 7.
8. Factor 8 included a single, but relatively high loading $-.75$ for item #27, Courtesy.
9. A single but moderately high loading $-.79$ for item #11, Licensing, was presented in Factor 9.
10. Single loadings were recorded for Laws, Licensing and Driver Education in Factor 10.

The aforementioned information was derived from the data outlined in Table 7.

Solution #3.--In an attempt to further isolate the postulated factors, a third principal components' solution was executed in which the Kiel-Wrigley Option was set at 2.

Table 7.--Quartimax and varimax rotated factor loadings; Solution No. 2.

Postu- lated Factors	Items	Highest Factor Loadings																			
		1		2		3		4		5		6		7		8		9		10	
		Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
1	1																				
	2																				
	3					62	42													62	64
	4																				
2	5																				
	6																				
	7																				
	8																				
3	9																				
	10																				
	11																				
	12																				
4	13																				
	14																				
	15																				
	16																				
5	17																				
	18																				
	19																				
	20																				
6	21																				
	22																				
	23																				
	24																				
7	25																				
	26																				
	27																				
	28																				
8	29																				
	30																				
	31																				
	32																				
9	33																				
	34																				
	35																				
	36																				
10	37																				
	38																				
	39																				
	40																				
Highest Loadings Proportion of Variance	41																				
	42																				
	43																				
	44																				

Decimals have been omitted and all numbers have been rounded to the nearest tenth.
Kiel-Wrigley Option was set at 0 and 10 factors were rotated.

The rotated factor loadings for this solution are presented in Table 8.

Nine factors were derived, however, only seven yielded paired quartimax and varimax loadings. The following variable loadings were noted:

1. Factor 1 loaded most consistently on the postulated factor of Courtesy, since items #26, #28 and #29 had moderate to high loadings. Moderate loadings were also recorded for items #24 and #25, Emotions, while Accidents and Equipment variables were also represented. The loadings for this factor were identical to Factor 1 in solution two.
2. Moderate loadings were noted for two of three variables for the postulated factors of Enforcement and Accidents. Item #23, Emotions, also had paired quartimax and varimax loadings.
3. Items #2 and #3, Laws, produced the highest loadings for Factor 3. Single Licensing, Equipment and Driver Education items were also noted.
4. Consistent with solution two, Factor 4 yielded moderately high loadings for all three variables #14, #15 and #16 representing the postulated Speed factor; however, in this case, item #1, Laws, was also represented.
5. Moderately high loadings were noted in Factor 5 for items #9 and #20, Licensing and Equipment.

1

Table 8.--Quartimax and varimax rotated factor loadings; Solution No. 3.

Postu- lated Factors	Items	Highest Factor Loadings																	
		1		2		3		4		5		6		7		8		9	
		Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
1	1																		
	2																		
	3					62	60												
	4					37	44	49	47			-49	-55	-59					
2	5																		
	6																		
	7																		
	8																		
3	9																		
	10																		
	11																		
	12																		
4	13																		
	14																		
	15																		
	16																		
5	17																		
	18																		
	19																		
	20																		
6	21																		
	22																		
	23																		
	24																		
7	25																		
	26																		
	27																		
	28																		
8	29																		
	30																		
	31																		
	32																		
9	33																		
	34																		
	35																		
	36																		
10	37																		
	38																		
	39																		
	40																		
Highest Loadings	41																		
	42																		
	43																		
	44																		
Proportion of Variance	45																		
	46																		
	47																		
	48																		

Decimals have been omitted and all numbers have been rounded to the nearest tenth. Kiel-Wrigley Option was set at 2.

6. Factor 6 produced moderate to moderately high loadings for single items representing the postulated factors Laws, Alcohol and Driver Education.
7. Although four items loaded on Factor 7, no matched quartimax and varimax pairs were produced.
8. Item #31, Driver Education, was the single paired but relatively low loading noted for Factor 8.
9. Only a single varimax loading for item #11, Alcohol, was recorded under Factor 9.

Oblique rotation loadings.--Since the three orthogonal rotations of the principal components axis did not produce distinct, acceptable factors, an oblique rotation was also executed. The factor loadings for this solution are presented in Table 9.

The derived oblique solutions obtained produced the eight comparable common factors which follow:

1. Although Factor 1 loaded on seven variables, the highest loadings were on three of four Courtesy items, #26, #28 and #29. It seemed reasonable therefore to name this factor Courtesy.
2. Factor 2 loaded only on the three Speeding variables; hence, it was obvious that this factor represented Speeding.
3. The highest loadings for Factor 3 were on Enforcement items #5 and #6; however, moderately high loadings were also presented for Accidents and Emotions variables.

Table 9.--Oblique rotated factor loadings.

Postulated Factors	Items	Highest Factor Loadings									
		Factors									
		1	2	3	4	5	6	7	8	9	10
1 Laws	1					86					
	2									-48	
	3					57					
	4					-73					
2 Enforcement	5			87							
	6			-96							
	7						-50				
3 Licensing	8					81					
	9							99			
	10									94	
4 Alcohol	11										89
	12				97						
	13				-65						
5 Speed	14		-89								
	15		94								
	16		74								
6 Accidents	17			71							
	18	60									
	19			79							
7 Equipment	20							-68			
	21	-53									
	22								-93		
8 Emotions	23			72							
	24	85									
	25			-59							
9 Courtesy	26	-87									
	27								-86		
	28	98									
	29	-96									
10 Driver Education	30					87					
	31						-83				
	32				-86						
	33	64									

Decimals have been omitted and all numbers have been rounded to the nearest tenth.

4. Three loadings were noted for Factor 4, two of which were on Alcohol variables, hence, this factor was named Alcohol.
5. Factor 5 loaded on five variables, three (#1, #3 and #4) represented the postulated Laws factor. It was thus reasonable to identify this factor as Laws.
6. Of the two items represented in Factor 6, the highest loading was on item #31, Driver Education, as a result this factor was called Driver Education.
7. A very high loading .99 was noted for item #9, Licensing, in Factor 7. Although an Equipment variable #20 also loaded $-.68$, it was feasible to name this factor Licensing.
8. Two items loaded on Factor 8, #22, Equipment and #27, Courtesy. Since statement #2 had the highest loading $-.93$ and the Courtesy variable had a low correlation with other items within its set, this factor was called Equipment.
9. Factor 9 contained loadings on two variables, #2, Laws and #10, Licensing, which had already been classified.
10. A moderately high loading was noted on Factor 10 for item #11, Alcohol; however, the correlation of this item with other Alcohol variables was relatively low.

In order to define the factors to be used in the final inventory, variables were deemed to be relevant only if they appeared on a distinguishable factor for at least

three of the four derived solutions. The following factors were reasonably invariant over the factoring methods employed:

1. Speeding
2. Courtesy
3. Licensing
4. Alcohol
5. Equipment
6. Driver education
7. Laws
8. Enforcement

Although Emotions and Accidents factors were not named, they were strongly and logically represented in the Enforcement factor.

The factor intercorrelations presented in Table 10 were computed to determine if the eight factors were appropriately labelled. Since the intercorrelations were small, ranging from .25 to -.33, it was indicated that all of the factors were relatively independent.

Of the eight factors listed, only the Speed factor was linearly independent of other variables and factors. Statements representing the Laws factor were found to load on several of the extracted factors, but the extent and direction of the associations varied with the factor and the solution. It was thus indicated that several statements representing other postulated factors were either confounded

Table 10.--Factor intercorrelations.

Factor	1	2	3	4	5	6	7	8	9	10
1	1.00	.17	.08	-.04	.01	-.05	-.15	.12	.04	.04
2	.17	1.00	.01	-.07	.11	-.08	-.10	.07	-.03	.15
3	.08	.01	1.00	.03	.07	.02	.01	.06	.07	-.09
4	-.04	-.07	.03	1.00	-.14	.01	-.02	.05	.02	-.02
5	.01	.11	.07	-.14	1.00	-.05	-.04	.08	.09	-.05
6	-.05	-.08	.02	.01	-.05	1.00	.25	.04	-.18	.16
7	-.15	-.10	.01	-.02	-.04	.25	1.00	-.04	-.24	.19
8	.11	.07	.06	.05	.08	.04	-.04	1.00	.03	-.02
9	.04	-.03	.07	.02	.09	-.18	-.24	.03	1.00	-.33
10	.04	.15	-.09	-.02	-.05	.16	.19	-.02	-.33	1.00

All numbers have been rounded to the nearest tenth.

with Laws, or Laws were involved in most driver attitude variables. Table 11 presents the factor loading matrix which illustrates the heavy loadings of the Laws variables #1, #2, #3 and #4 on other items.

The factor analysis data indicated that most of the thirty-three statements had considerable discriminatory ability and supported the classification of the items according to the postulated factors. Consequently, sufficient evidence was provided to retain the ten original factors for use in the final form of the inventory.

Cluster analysis.--In order to maintain a proportional distribution of items to be included in the final inventory, three of the weakest statements were discarded. An ordering or clustering program was developed to further analyze the thirty-three statements in order to decide which three would be omitted. Table 12 presents the data relative to the Ordered R-Matrix for the thirty-three variables.

The variables representing the postulated factors of Laws, Courtesy and Driver Education were of major concern since each of these factors contained four variables. Although several clusters were noted, items #2, #7, #8, #9, #11 and #27 did not fit into any of these clusters or correlate .25 or larger with any other variables. Consequently, items #2, Laws, and #27, Courtesy, were discarded, for these statements were within the factors being examined. Item #30

Table 11.--Factor loading matrix for 33 variables.

Postu- lated Factors	Items	Variables																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
1	1																															
	2	38	47							36						39						32										
	3	48						36													-32										33	
	4	-32	37	31				32																								
2	5	-38				30						54																				
	6	32			-48					-30	33																					
	7				33	-46								-36																		
3	8	31	41							45				34																		
	9	31			-37	43										-35	32															
4	10								-31																							
	11					51							-49																			
	12	41	42		41																											
5	13	-52	-41																													
	14	44				50																										
	15	-48			34-46																											
	16	-50																														
6	17	62																														
	18	60																														
	19	-42																														
7	20	51																														
	21	-59																														
	22	45						46																								
8	23	-47																														
	24	56	33																													
	25	-54																														
	26	-45-40																														
9	27																															
	28	52	40		-34																											
	29	-64-32																														
	30	46																														
10	31	-37	47							31																						
	32	-47	37																													
	33	54																														

Decimals have been omitted and all numbers have been rounded to the nearest tenth. Only the loadings above .30 for each row are included. Variables No. 30 through No. 33 are not present in the row listing, since all the loadings included were less than .30.

Table 12.--Ordered R-matrix for the 33 variables.

Variables																																	
29	28	24	33	32	31	23	17	18	19	6	3	1	14	15	16	21	20	13	12	4	27	25	30	22	26	2	11	10	5	8	7	9	
29	59	40				33	39	25							30		36	30	29				32	27	26	43							
28	59	40	35			29	34															28			37								
24	40	40	38			27	32						27	34	25	33	30					29			27	29							
33	28	35	38	33		29	29						28		29	25						28	28										
32						33				25					32			33	29														
31						36	28																										
23						28	34	27	25						25							31					25	27					
17	33	29	27	29	33	34	42	29		29			30	29	33	35	26				25												
18	39	34		29		27	42	36					31	32			27				28												
19	25					25	29	38	29																								
6																																	
3						25		29					30	31	31	27	25																
1													31	41	41	25																	
14													31	41	34	29																	
15	30					25	30						25	34	31																		
16						25	29	31					25	27	29	31	36	30															
21	36					33	32						25	27	29	31	36	30															
20	30					35							25			36	30	25															
13	29					30	25						25			30	30	39															
12						33																											
4						29																											
27																																	
25	32	26	29	28		31	25	28					25	28	29	25																	
30	27			28						27	26					28																	
22	26			27						29	28																						
26	43	37	29					27																									
2																																	
11																																	
10						25																											
5																																	
8																																	
7																																	
9																																	
29	28	24	33	32	31	23	17	18	19	6	3	1	14	15	16	21	20	13	12	4	27	25	30	22	26	2	11	10	5	8	7	9	

All numbers have been rounded to the nearest tenth and decimal points have been omitted. Only variables with correlations larger than .25 are included.

correlated .28 with item #33, but did not correlate with any other variables within its set, hence, item #30 was also excluded.

Summary

The responses of the 207 judges who returned the preliminary inventory were tabulated and their judgments were used as a basis of determining the scale values and "Q" scores of the fifty statements upon the five point psychological continuum. The mean "Q" score of 1.04 was used as the upper limit in selecting the thirty-three statements that were retained for further analysis.

Three orthogonal and one oblique factor analysis principal components solutions were executed to assess the extent to which the ten postulated driver attitude factors were independent of factoring methods. Eight common factors were judged to exist over three of the four derived solutions. They were: (1) Speeding, (2) Courtesy, (3) Licensing, (4) Alcohol, (5) Equipment, (6) Laws, (7) Driver Education and (8) Enforcement. Although Emotions and Accidents factors were not classified, they were logically represented in the Enforcement factor. Statements representing the postulated Law factor were found to load on several of the other factors, hence it was implied that Laws were a component part of most driver attitude variables. There was no evidence that driving attitudes

existed as a single general characteristic, therefore justifying the use of the ten postulated factors in the final form of the inventory.

It was decided that the final inventory would consist of thirty items with a proportional distribution of three statements for each of the ten factors. Cluster analysis was used to select the best items in terms of the highest intercorrelations between variables within each factor.

CHAPTER V

DEVELOPMENT OF THE FINAL INVENTORY

Selection of Statements

The thirty items to be included in the final inventory were selected in terms of item analysis, inter-correlation analysis and cluster analysis. Primary consideration was given to:

Content: Three statements were retained to represent each of the ten postulated factors.

Scale value: A balanced distribution of favorable and unfavorable items was maintained.

Q score: Only the best statements were included as determined by their index of ambiguity.

Intercorrelated matrix: The variables were chosen in terms of the highest correlations between items within each set.

Construction of the Inventory

Format.--Since the function of the final inventory was to assess student attitudes toward motor vehicle laws and driving practices for the purpose of placing instructional emphasis, only three response categories were deemed necessary. They included "Agree," "Uncertain" and

"Disagree." With the exception of the "Uncertain" category, the basic format was similar to that prescribed by Thurstone. The need for a neutral response was based on the reasoning that vague or undeveloped attitudes were more conducive to positive influence than expressed negative attitudes.

Two parallel forms of the inventory were constructed by rearranging the order of the thirty statements.

Instructions.--It was necessary to develop two sets of directions, one for the Pre-test and another for the Post-test. The only difference between the two dealt with the function of each inventory. The purpose of Form A or the Pre-test was designated as obtaining information that would be used to develop and organize the course content. Form B or the Post-test was introduced as a means of evaluating the effectiveness of the driver education course in meeting the students' needs and expectations.

Measures were taken to keep the instructions clear, precise and comprehensive. An attempt was also made to elicit truthful responses by the statement of purpose and by stressing that: (1) there were no right or wrong answers, (2) there was no grade involved, and (3) answers should not be changed.

Administrative Guidelines

To insure the inventory was used as intended, it was necessary to develop clear, detailed and comprehensive administrative guidelines. These guidelines included information relative to:

1. The function of the inventories
2. Recommended administrative procedures
3. The structure of the inventories
4. Standard responses and scoring techniques
5. Use and interpretation of the scores.

Concentration was placed upon eliciting truthful responses from the students by stressing that the instructor:

1. Clearly defines the purpose of each inventory.
2. Assures the students that their responses would in no way affect their grades.
3. Acknowledges that there were actually no right or wrong answers, since the extent of agreement or disagreement with each statement reflected personal opinions.
4. Encourages the students not to change their answers, for spontaneous responses usually express true feelings.
5. Illustrates the response procedure on the blackboard.
6. Gives the students the opportunity to ask questions relating to purpose and instructions, but does not

permit questions during the response period.

7. Limits the response period to five minutes. This would not include the time spent introducing and explaining the inventory.
8. Expresses that signatures on the answer sheet were optional.
9. Does not inform the students that they will be responding to a similar inventory upon the conclusion of the course.

Scoring.--The standard responses to the thirty items and the validity of the inventory were determined by the judgments of the 207 driver and traffic safety education personnel who designated the responses that were indicative of desirable driving attitudes.

An answer sheet and a scoring key were developed to facilitate the scoring procedure. The answer sheet was arranged in three columns so that a subscore for each of the postulated factors could be obtained by scoring across rows. The scoring key that was designed had four columns and ten rows. The first three columns represented the standard responses to the thirty statements while the fourth column provided a check-point for the ten factors being examined.

It was stipulated that the answer sheets be scored across rows, answers deviating from the standard responses be marked and all rows having two or more undesirable

answers be noted in the fourth column. A subscore for the ten factors could be obtained by summing the number of undesirable responses within each row. However, it was recommended that only the factors which had two or more undesirable responses should be recorded. After all the answer sheets had been scored, a tally should be made to determine the number of times each factor was checked.

Interpretation.--"Agree" responses are to be interpreted as indicating that the students believed and accepted a particular statement, while "Disagree" responses imply that they disbelieved and rejected the statement. If the student responses to a set of statements representing a given factor coincide with the standardized responses, they associate positive affect or feeling with that factor and can be classified as having desirable attitudes towards it. Conversely, those students who associate negative affect with a given factor can be said to have undesirable attitudes toward the topic represented by that factor. Uncertain responses are to be interpreted as implying that the students neither accept nor reject certain statements because they are undecided or doubtful about their feelings towards the factor represented by the statement.

The summation of the subscore for each factor was designated as the means of interpreting the results of both inventories. For the Pre-test, it was believed that factors which totaled six or more notations warranted

special consideration in the organization of the course content. It was also emphasized that the number of "Uncertain" responses be carefully noted since it is much easier to develop desirable attitudes in uncertain or new situations than it is to modify or change firmly established attitudes.

The administrative guidelines stressed the consideration of class scores for a given factor rather than individual scores for the entire inventory. It was also stated that the areas requiring special attention may vary from one class to another, consequently, different topics may have to be emphasized in different classes.

A comparison of the Pre-test and Post-test scores for the same class can provide some indication as to the effectiveness of the instructional procedures in modifying or changing undesirable student attitudes. A considerable decrease in the number of factors that are recorded in the undesirable classification implies that change has taken place as a result of instruction, insight or knowledge attainment. If no change is noted between Pre-test and Post-test subscores or if there is only a slight decrease in the total number of factors recorded, then it is indicated that more effective instructional techniques should be sought and employed.

The recommended Administrative Guidelines, developed inventories, answer sheet and scoring key are presented on the following pages.

The Final Product

MEDVE DRIVER ATTITUDE INVENTORY ADMINISTRATIVE GUIDELINES

Introduction. If driver education programs are to be effective in producing safer drivers, then the development of desirable driving attitudes should be one of the major program objectives. However, before driver educators can endeavor to change or modify student attitudes, they must know where to place the necessary emphasis. The inventories contained herein have been designed to assess student attitudes toward motor vehicle regulations and driving practices for the purpose of placing instructional emphasis.

Structure of the Inventory. Two inventories are included in this program. Form "A" is to be used as a Pre-test and form "B" as a Post-test. Both inventories are introduced with an elaborate explanation of purpose and detailed instructions. Each inventory is composed of thirty statements representing ten factors. Three statements apply to each factor. The ten factors and their grouping sequence is as follows:

<u>Factors</u>	<u>Statement Numbers</u>
1. Traffic laws	1, 11, 21
2. Enforcement	2, 12, 22
3. Licensing	3, 13, 23
4. Alcohol and narcotics	4, 14, 24
5. Speeding	5, 15, 25
6. Accidents	6, 16, 26
7. Vehicle condition	7, 17, 27
8. Emotions	8, 18, 28
9. Courtesy	9, 19, 29
10. Driver education	10, 20, 30

The statements contained in both inventories are identical, only the numbering sequence has been changed.

Administration. The two forms of the inventory have distinct functions.

1. Form A is to be administered during the initial meeting of each class. The purpose of the Pre-test is to ascertain areas that may require instructional emphasis to change or modify student attitudes which may be distorted in their expressions or negative in their effects.
2. Form B should be administered during the last session of the course. The purpose of the Post-test is to determine if the response patterns of the students have been modified or changed as a result of instruction, insight, or knowledge attainment.

The main problem encountered in attempting to measure attitudes is eliciting truthful responses from the subjects. The desire to do well stimulates students to respond in terms of what they believe to be correct rather than express their own feelings. It must be realized that the answers marked by the students represent only the attitudes they are willing to express. Consequently, the instructor should strive to create a classroom environment which is conducive to honest responses. Truthful responses can be secured more readily when:

1. The purpose of the inventory is clearly defined.
 - a) The expressed intention of the Pre-test should be to obtain information that will be used as a guide to develop the course content.
 - b) The reason for the Post-test should be noted as the evaluation of the effectiveness of the driver education program.

2. Students are assured that their responses will in no way affect their grades. It is recommended that this inventory be used to secure group scores rather than to evaluate individual students.
3. The instructor acknowledges that there are no right or wrong answers, since the extent of agreement or disagreement with each statement reflects personal opinions.
4. The students are encouraged not to change their answers, for spontaneous responses usually express true feelings.
5. Instructions are clear and precise. To assure student understanding, it is recommended that the instructor illustrate the response procedure on the blackboard. Responses are expressed as Agree, Uncertain, and Disagree.
6. Students are given the opportunity to ask questions relating to purpose and instructions. They should not be permitted to read the statements in advance and no questions should be permitted during the response period. The students must rely on their own interpretation of the statements included in the inventory.
7. The actual response period is limited to five minutes. To insure spontaneous responses, no more than five minutes should be allotted for the students to answer the thirty statements. The command to begin should be given after the preliminary information and instructions have been discussed and all questions have been answered.
8. Student signatures on the answer sheet are optional. If the examiner has given an explicit explanation of purpose, most students will not be reluctant to sign their answer sheets.
9. The students are not informed that they will be responding to a similar inventory at a later date.

A well prepared examiner should be able to administer the inventory in ten minutes. This does not include the question and answer period that may ensue the collection of the answer sheets.

Scoring. The responses to the thirty statements were standardized by 207 judges from three levels of responsibility:

1. Supervisors of driver and traffic safety education from thirty-eight state departments of education.
2. Directors of driver and traffic safety education from eighty-six colleges and universities.
3. Eighty-three high school driver education instructors from ten states.

The standard responses are expressed as follows:

Statement	Response	Statement	Response	Statement	Response
1	Agree	11	Disagree	21	Agree
2	Disagree	12	Agree	22	Disagree
3	Agree	13	Disagree	23	Agree
4	Agree	14	Disagree	24	Agree
5	Disagree	15	Agree	25	Disagree
6	Agree	16	Disagree	26	Agree
7	Agree	17	Disagree	27	Agree
8	Disagree	18	Agree	28	Disagree
9	Agree	19	Disagree	29	Agree
10	Disagree	20	Agree	30	Disagree

An answer sheet and a scoring key are provided to facilitate the scoring procedure. The answer key has four columns and ten rows. The first three columns designate the standard responses to the thirty statements while the fourth column provides a check-point for the ten factors being examined.

Scoring should be done across rows and the answers deviating from the stipulated standard responses should be marked. All rows which have two or more undesirable answers should be noted. For example:

Scoring Key

Standard Responses				Factors	
1. <input checked="" type="radio"/>	11. <input type="radio"/>	21. <input checked="" type="radio"/>		<input checked="" type="radio"/> 1	Laws
2. <input type="radio"/>	12. <input checked="" type="radio"/>	22. <input type="radio"/>		<input type="radio"/> 2	Enforcement
3. <input checked="" type="radio"/>	13. <input checked="" type="radio"/>	23. <input type="radio"/>		<input checked="" type="radio"/> 3	Licensing

The marked statements deviate from the standard responses. Factors Number 1 . . . Laws, and Number 3 . . . Licensing, have two undesirable responses, hence the number representing these factors is recorded on the answer sheet.

The score for a given factor can be obtained by summing the number of undesirable responses within its row. However, only the factors which have two or more responses deviating from the stipulated standard responses should be recorded. After all the answer sheets have been scored, a tally should be made to determine the number of times each factor was checked. The total number recorded for each factor will be indicative of the areas that may require instructional emphasis.

Interpretation of Results

Pre-test.--Factors which total six or more notations warrant special consideration in the organization of the course content. The number of uncertain responses should be carefully noted, since it is much easier to

develop desirable attitudes in uncertain or new situations than it is to modify or change firmly established attitudes.

Class scores for a given factor should be considered rather than individual scores for the entire inventory. It must also be realized that the areas requiring special attention may vary from one class to another. Hence, it may be necessary to emphasize different topics in different classes.

Post-test.--A comparison of the Pre-test and Post-test scores for the same class, can provide some indication as to the effectiveness of instructional procedures in modifying or changing undesirable student attitudes. A considerable decrease in the number of factors that are recorded implies that change has taken place as a result of instruction, insight or knowledge attainment. If there is no change or only a slight decrease in the total number of factors noted, then it is indicated that more effective instructional techniques should be sought and employed.

Validity.--The validity of the inventory was determined by the judgments of the 207 driver and traffic safety education personnel who designated the responses that were indicative of desirable driving attitudes. The final form of the inventory contains only those statements which were mutually agreeable to the judging group.

MEDVE DRIVER ATTITUDE INVENTORY

Form A

Introduction: The following statements relate to feelings and attitudes toward traffic laws and driving practices. There are no right or wrong answers, since the extent of agreement or disagreement with each statement reflects personal opinions. The answers will not be graded, as the purpose of this inventory is to obtain information that will be used to develop and organize the course content.

Instructions: Read each statement carefully and express your feelings by darkening the code letter representing your response in the proper column on the answer sheet provided. For example, if you Agree with statement number 1, you should darken the letter "A" in the first column of the answer sheet . . . 1. ~~U~~ D. Likewise, if you Disagree with statement number 1, you should darken the letter "D" . . . 1. A U ~~D~~. If you are Uncertain, then darken the letter "U" . . . 1. A ~~D~~ U.

Work quickly, but carefully. Respond to all statements. Do not change any of your answers, since your first reaction to each statement is of major concern.

The response code is as follows:

A = Agree
U = Uncertain
D = Disagree

EXPRESS YOUR FEELINGS HONESTLY, FOR YOUR RESPONSES WILL INFLUENCE THE ORGANIZATION OF THE COURSE CONTENT.

1. Traffic laws are necessary for the safe movement of motor vehicles.
2. Policemen are more strict with young drivers than with any other age group.
3. All licensed drivers should be re-tested at least every four years.
4. Alcohol and narcotics can impair a person's driving ability.
5. It is all right to go faster than the posted speed limit on the open highway.
6. Traffic accidents do not just happen; they are caused.
7. It is dangerous to drive with badly worn tires.
8. The car horn should be used freely to clear the road of slow drivers.
9. Courtesy is a good driving practice.
10. The major goal of driver education courses should be to train teenagers to get a driver's license.
11. It is all right for drivers to go through red lights if there is no traffic.
12. The police should be strict with drivers who purposely break traffic laws.
13. The testing program for a driver's license is too difficult.
14. The laws concerning drivers who have been drinking alcohol are too strict.
15. A person should not drive faster than the posted speed limits.

16. Traffic accidents cannot be avoided on over-crowded roads.
17. Motor vehicle inspections are a waste of time.
18. A person should not drive when he is upset or angry.
19. Most courteous drivers are not good drivers.
20. A driver education course should be taken before getting a driver's license.
21. A driver who makes a habit of breaking traffic laws should have his license taken away.
22. Policemen are too strict with drivers who break traffic laws.
23. Persons desiring a driver's license should pass a general knowledge test before taking the road test.
24. Those who make a habit of driving when affected by alcohol should lose their driver's license.
25. A driver should get the full benefit of his car's potential speed whenever possible.
26. Poor driving behavior is a major cause of traffic accidents.
27. A car with bad brakes should not be driven until the brakes have been repaired or replaced.
28. Driving provides a good way to forget daily problems.
29. Courtesy is a necessary part of safe driving.
30. Skill is the most important factor in the safe operation of a motor vehicle.

MEDVE DRIVER ATTITUDE INVENTORY
Form B

Introduction: The following statements relate to feelings and attitudes toward traffic laws and driving practices. There are no right or wrong answers, since the extent of agreement or disagreement with each statement reflects personal opinions. The answers will not be graded, as the purpose of this inventory is to evaluate the effectiveness of the driver education course in meeting your expectations.

Instructions: Read each statement carefully and express your feelings by darkening the code letter representing your response in the proper column on the answer sheet provided. For example, if you Agree with statement number 1, you should darken the letter "A" in the first column of the answer sheet . . . 1. ~~U~~ D. Likewise, if you Disagree with statement number 1, you should darken the letter "D" . . . 1. A U ~~D~~. If you are Uncertain, then darken the letter "U" . . . 1. A ~~D~~ U.

Work quickly, but carefully. Respond to all statements. Do not change any of your answers, since your first reaction to each statement is of major concern.

The response code is as follows:

A = Agree
U = Uncertain
D = Disagree

EXPRESS YOUR FEELINGS HONESTLY, FOR ONLY TRUTHFUL
RESPONSES CAN HELP TO IMPROVE THE DRIVER EDUCATION PROGRAM.

1. A driver who makes a habit of breaking traffic laws should have his license taken away.
2. Policemen are too strict with drivers who break traffic laws.
3. Persons desiring a driver's license should pass a general knowledge test before taking the road test.
4. Those who make a habit of driving when affected by alcohol should lose their driver's license.
5. A driver should get the full benefit of his car's potential speed whenever possible.
6. Poor driving behavior is a major cause of traffic accidents.
7. A car with bad brakes should not be driven until the brakes have been repaired or replaced.
8. Driving provides a good way to forget daily problems.
9. Courtesy is a necessary part of safe driving.
10. Skill is the most important factor in the safe operation of a motor vehicle.
11. It is all right for drivers to go through red lights if there is no traffic.
12. The police should be strict with drivers who purposely break traffic laws.
13. The testing program for a driver's license is too difficult.
14. The laws concerning drivers who have been drinking alcohol are too strict.
15. A person should not drive faster than the posted speed limits.

16. Traffic accidents cannot be avoided on over-crowded roads.
17. Motor vehicle inspections are a waste of time.
18. A person should not drive when he is upset or angry.
19. Most courteous drivers are not good drivers.
20. A driver education course should be taken before getting a driver's license.
21. Traffic laws are necessary for the safe movement of motor vehicles.
22. Policemen are more strict with young drivers than with any other age group.
23. All licensed drivers should be re-tested at least every four years.
24. Alcohol and narcotics can impair a person's driving ability.
25. It is all right to go faster than the posted speed limit on the open highway.
26. Traffic accidents do not just happen; they are caused.
27. It is dangerous to drive with badly worn tires.
28. The car horn should be used freely to clear the road of slow drivers.
29. Courtesy is a good driving practice.
30. The major goal of the driver education courses should be to train teenagers to get a driver's license.

MEDVE DRIVER ATTITUDE INVENTORY

ANSWER KEY

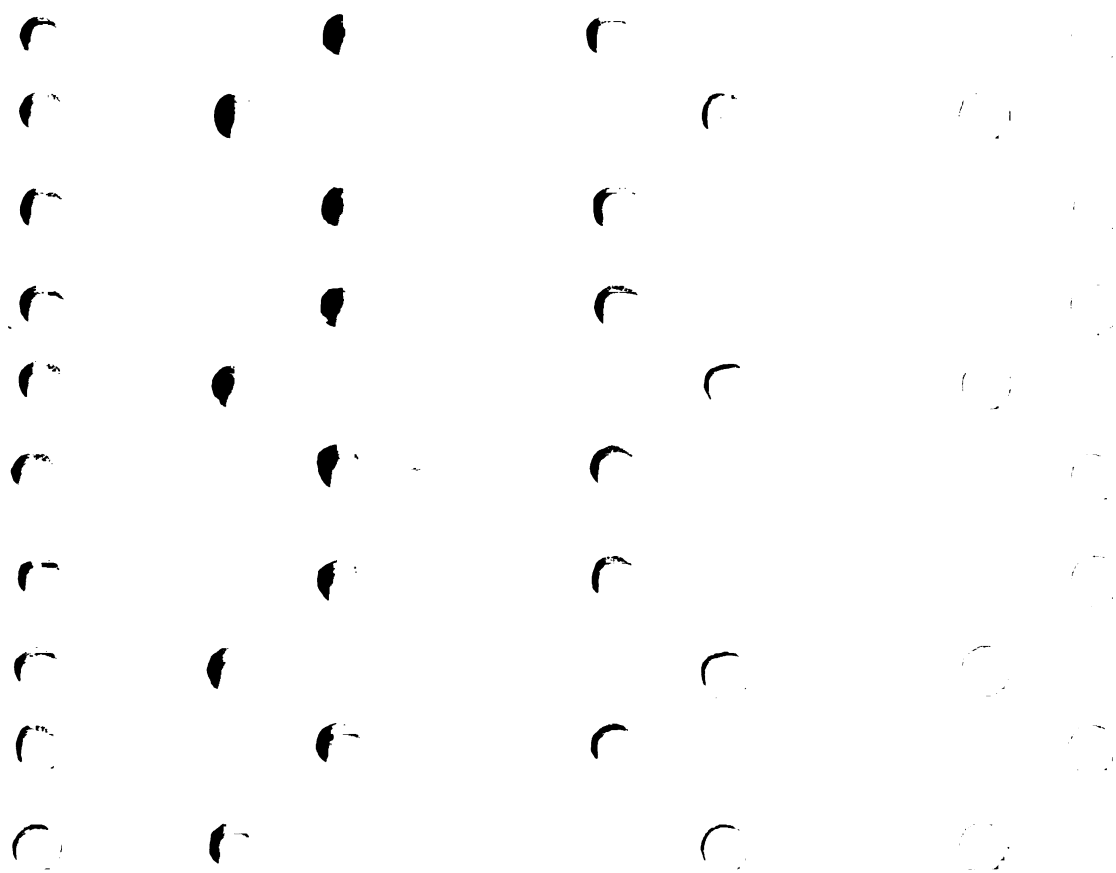
Forms A and B

Instructions

Scoring should be done across rows and the answers deviating from the stipulated standard responses should be noted. All rows which have two or more undesirable answers should be marked by placing the number representing the factor in the space provided.

STANDARD RESPONSESFACTORS

<u>STANDARD RESPONSES</u>			<u>FACTORS</u>
			Laws
1. A	11. D	21. A	1. <input type="radio"/>
			Enforcement
2. D	12. A	22. D	2. <input type="radio"/>
			Licensing
3. A	13. D	23. A	3. <input type="radio"/>
			Alcohol
4. A	14. D	24. A	4. <input type="radio"/>
			Speeding
5. D	15. A	25. D	5. <input type="radio"/>
			Accidents
6. A	16. D	26. A	6. <input type="radio"/>
			Vehicle
7. A	17. D	27. A	7. <input type="radio"/>
			Emotions
8. D	18. A	28. D	8. <input type="radio"/>
			Courtesy
9. A	19. D	29. A	9. <input type="radio"/>
			Driver Ed.
10. D	20. A	30. D	10. <input type="radio"/>



ANSWER SHEET

MEDVE DRIVER ATTITUDE INVENTORY

Name _____ Class Period _____ Date _____

Directions: Express your personal feelings by darkening the letters which represent your desired responses. The response pattern is as follows:

A = Agree

U = Uncertain

D = Disagree

Statement	Response	Statement	Response	Statement	Response
1.	A U D	11.	A U D	21.	A U D
2.	A U D	12.	A U D	22.	A U D
3.	A U D	13.	A U D	23.	A U D
4.	A U D	14.	A U D	24.	A U D
5.	A U D	15.	A U D	25.	A U D
6.	A U D	16.	A U D	26.	A U D
7.	A U D	17.	A U D	27.	A U D
8.	A U D	18.	A U D	28.	A U D
9.	A U D	19.	A U D	29.	A U D
10.	A U D	20.	A U D	30.	A U D

Elaboration of Inventory Function

The primary function of the Pre-test was to give the driver education instructor some indication of existent student attitudes toward motor vehicle regulations and driving practices, thereby enabling him to place the appropriate instructional emphasis in his courses. Since the inventory functions to disclose undesirable or vague driving attitudes, it can assist the instructor to:

1. Ascertain the entry behavior of his students.
2. Associate expressed student opinions with the desired terminal behavior.
3. Orient his instruction to areas in which undesirable or uncertain driving attitudes may exist.
4. Openly discuss and analyze undesirable or unclear attitudes.
5. Employ instructional techniques which fortify knowledge and skill with desirable attitudes.

The Post-test should be used to determine the effectiveness of instructional procedures in modifying or changing student attitudes toward motor vehicle regulations and driving practices. The attitudes expressed by the students in a given class after their exposure to the course content should be of major concern. Many times a change in student responses may be associated with the course content and program emphasis and should be evaluated in these terms.

A comparison of the subscale scores for pre and post inventory administration can provide some indication that:

1. Modification or change of undesirable student attitudes has occurred.
2. Desirable attitudes have been developed in weak or vague areas.
3. The driver education program has given the students some basic information which enabled them to re-assess, modify or change their attitudes.
4. The instructional techniques employed have or have not been effective in affecting the development of desirable driving attitudes.

It must be realized that the accuracy of the inventory and the worth of its findings are dependent upon proper administration and interpretation. This inventory in and of itself cannot solve the traffic accident problem, however, it is hoped that it will enable driver educators to organize and evaluate the course content in a more meaningful and effective manner.

Summary

This chapter contains the information relevant to the development of the proposed product of the study.

In its final form the inventory consisted of thirty complete sentence statements requiring either an

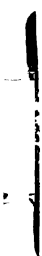
agree, uncertain or disagree response. Three statements were retained to represent each of the ten postulated factors and an attempt was made to maintain a balance of negatively and positively oriented items. Two parallel forms of the inventory were developed for the purpose of pre and post course administration. Form A or the Pre-test was designed to measure student attitudes toward the ten factors represented by the inventory in order to ascertain areas that may require instructional emphasis. The Post-test or Form B was intended as a comparative instrument to examine the extent of attitude modification as a result of instruction, insight or knowledge attainment.

Clear, concise student instructions and administrative guidelines were written with emphasis being placed upon the elicitation of truthful responses. The statements were arranged in sequence so each number represented a specific factor. Consequently, ten sets of statements were formed which facilitated the scoring procedure. An answer sheet and a scoring key were developed to fit both forms of the inventory. Scoring was designed to be done across rows in order to yield a subscore for each of the ten factors. Thus the number of factors having two or more incorrect responses could be noted and tallied. It was recommended that factors having six or more notations deserved special consideration in the placement of instructional emphasis. Concentration on group scores within

each of the ten areas of the universe was stressed and no provisions were made to arrive at a total score for the thirty statements.

The standard responses, as well as the validity of the inventory, were determined by the judgments of the 207 driver education personnel.

The chapter was concluded with an elaboration of inventory function.



CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary

Statement of the problem.--The primary objective of this research project was to develop a driver attitude inventory that could be used to assess student attitudes for the purpose of placing instructional emphasis.

Development of the preliminary inventory.--Based on the review of the literature and existing driver attitude scales, the following universe of content was postulated: (1) Laws, (2) Enforcement, (3) Licensing, (4) Alcohol, (5) Speeding, (6) Accidents, (7) Equipment, (8) Emotions, (9) Courtesy, and (10) Driver Education. Sixty complete sentence statements of varying degrees of favorability and unfavorability were initially formulated. However, after the editing process, only fifty were retained. These statements were subjected to further scrutiny by several individuals in the field of driver and traffic safety education to insure that the terminology was within the reading and comprehension level of the average twelve year old. Suggested revisions were made and the fifty statements were placed in the Likert

five-response format, employing Thurstone's instructions designed for use by a judging group. The preliminary inventory was then mailed to 287 judges from three levels of driver and traffic safety education responsibility: the state departments of education, colleges and universities, and high schools.

Statistical procedure.--The responses of the 207 judges who returned the preliminary inventory were used to compute scale values and interquartile range scores for the purpose of item analysis. The mean "Q" score of 1.04 was used to discriminate between good and bad statements, thus eliminating seventeen items. The response data for the thirty-three remaining items were further analyzed by orthogonal and oblique factor analysis solutions to assess the extent to which the postulated driver attitude factors were independent of factoring methods. Eight factors were judged to exist over three of the four derived solutions, and the two factors that were not labelled were assumed to be logical components of the enforcement factor. Consequently, it seemed feasible to retain the ten postulated factors and to obtain separate subscores for each of these factors.

Development of the final inventory.--In its final form, the inventory consisted of thirty statements proportionately distributed over the ten postulated factors.

To maintain factorial validity, parallel forms of the inventory were developed by rearranging the statements in Form A or the Pre-test to constitute Form B or the Post-test. Form A was designed to assess student attitudes, in order to ascertain areas that may require instructional emphasis, whereas Form B was proposed for use in determining the extent of attitude change as a result of instruction, insight or knowledge attainment.

Clear, concise student instructions and administrative guidelines were written, emphasizing the elicitation of truthful responses. The students are requested to express their feelings by checking one of three alternatives: agree, uncertain or disagree. To facilitate the scoring procedure, an answer sheet and a scoring key were developed, and the statements were uniformly dispersed throughout the inventory. A subscore for each factor could be obtained by scoring across rows. It was suggested that all factors having two or more incorrect responses should be noted, and that those which had six or more notations deserved instructional emphasis. No provisions were made for arriving at a total score for the inventory, since ratings were to be considered in relation to the individual factors.

The validity of the inventory and the standardized responses were determined by the judgments of the 207 driver and traffic safety education personnel.

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Conclusions

Within the limitations of this study, the following conclusions seem to be justified.

1. The review of the literature disclosed the need for an administratively feasible attitude inventory that could be used to assess the attitudes of students for the purpose of placing instructional emphasis.
2. The intercorrelations of the thirty-three items that were retained as a result of the item analysis of the original fifty statements, were relatively low, ranging from $-.01$ to $-.59$. The low correlations were attributed to the low variances resulting from the excellent agreement of the 207 members of the judging group.
3. Item and factor analysis evidence supported the classification of the thirty statements contained in the final form of the inventory, according to the ten original factors that were postulated. It was also indicated that almost all of the postulated items had considerable discriminatory ability.
4. The results of the three orthogonal and one oblique factor analysis solutions led to the classification of the following eight factors: (1) Speeding, (2) Courtesy, (3) Licensing, (4) Alcohol, (5) Equipment, (6) Laws, (7) Driver Education, and (8) Enforcement.

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Emotions and Accidents factors were not named; however, they were logical components of the Enforcement factor.

5. The statistical findings indicated that driving attitudes were a complex affair which could not be wholly described by any single factor or variable. It was thus assumed that attitudes towards the ten factors were reflective of attitudes towards motor vehicle regulations and driving practices, thereby supporting the concept of obtaining separate subscores for each of the ten factors.
6. The final form of the inventory was deemed relevant to the purpose of the study since considerable evidence was obtained which supported the classification of the statements within each factor, the validity of the inventory, and the appropriateness of obtaining separate subscale scores for each factor included in the inventory.

Discussion

If driver education is to play an effective role in the reduction of traffic accidents, courses should be designed to equip the students with preliminary and theoretical knowledge of the personal and social implications essential to the safe and efficient operation of a motor vehicle. Programs should be developed on the premise that driving behavior is the sum total of an individual's knowledge, skill and attitude. Knowledge about traffic

laws and driving practices must be imparted, good driving skills must be taught and perfected, and most important, knowledge and skill must be fortified with desirable driving attitudes. Driver educators must realize that the effectiveness of their program does not depend solely on the amount of knowledge or proficiency the students possess on completing the course, but upon how well the instruction has equipped them to be safer drivers. Therefore, greater concentration should be placed upon teaching methods which can influence the behavioral characteristics judged to be pertinent to safe motor vehicle operation.

Driver education teachers cannot be expected to change the personalities of students, however, appropriate course emphasis can have some affect on their terminal behavior. Requisite to this end is the belief that it is possible to modify undesirable attitudes. Driver educators must recognize that even a small amount of attitude training can be of great educational value if it is dispersed effectively throughout the driver education program. If a term or more of attitude-oriented instruction produces only slight effects in changing or modifying undesirable attitudes, it would still be a remunerative educational endeavor.

Since the attitudes of students enrolled in a course cannot be readily observed, teachers must resort to the use of suitable measuring devices. Unfortunately, most

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of the available driver attitude scales have been designed to evaluate student attitudes per se rather than to serve as instructional guidelines. The inventories contained herein have been developed for instructional purposes. Both forms are designed to assess student attitudes towards motor vehicle laws and driving practices. The Pre-test can be used to ascertain undesirable driving attitudes while the Post-test was proposed for use in determining the effectiveness of instructional procedures in affecting attitude change.

The illusion that an inventory of this nature can answer all the questions relating to the modification of undesirable driver attitudes, should be avoided. As with any instrument, the accuracy of the inventory and the value of its results are dependent upon proper administration and interpretation. It should be understood that this instrument can only record in a systematic fashion, the responses of students to the sets of statements which suggest in a loose sense, attitudes towards motor vehicle laws and driving practices. The procured answers represent only the verbalized attitudes which the students are willing to express. Hence, the instructor should strive to develop a classroom environment which is conducive to eliciting truthful responses. The scores obtained from the inventory should not be used to evaluate individual students but to ascertain areas that may require instructional emphasis.

Although the inventory cannot solve the traffic accident problem, it is hoped that it will enable driver educators to organize the course content so that it is more conducive to the development of desirable driving attitudes.

Recommendations

The review of the research relevant to this study was very informative, but indicated a need for more extensive and conclusive investigations in certain areas. It was deduced that further research should include studies which would:

1. Examine the personality characteristics of accident repeaters to detect the most prevalent forms of undesirable driving attitudes.
2. Disclose the underlying causes of unsafe driving behavior so that driver educators can more readily help their students to understand and modify attitudes that can lead to accidents.
3. Ascertain the types of testing devices which can most accurately and most consistently discern the personality characteristics and attitudinal patterns leading to unsafe driving behavior.
4. Determine the effects of different types of driver education programs (i.e. two-phase, three-phase, or four-phase) on the attitudes of students.

5. Examine and classify classroom procedures according to their effectiveness in affecting attitude change.
6. Relate attitude modification at different phases of the driver education program to determine the learning experiences that were pertinent to the desired terminal behavior.

If driver educators are to plan their programs on a sound basis and not on suppositions, then there must be continuous research of a high order to determine the most appropriate teaching techniques that are conducive to the development of desirable driving attitudes.

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APPENDICES

APPENDIX A

MANN PERSONAL ATTITUDE SURVEY

NAME _____ AGE _____ SEX _____ MONTH'S DRIVING
EXPERIENCE _____

The following statements reflect your attitude and feelings about yourself and your relations to others. There are no right or wrong answers. Fill in on the answer sheet the answer that reflects your feelings the best.

Do not mark on the test booklet:

A. always B. usually C. sometimes D. rarely E. never

1. I like (liked) to take part in organized extra-curricular activities in school.
2. Young people are much better drivers than middle-aged people.
3. Policemen are sincere in enforcing the laws.
4. My parents are reasonable in their relations with me.
5. My community is a happy place to live.
6. I put off until tomorrow things I should do today.
7. I like to daydream while I am driving.
8. I feel full of pep when I get behind the wheel.
9. I live in a home that is happy.
10. If I see a police officer when I am driving I am more careful.
11. Over-careful drivers cause more accidents than the so-called reckless ones.

1

12. I enjoy being out late at night and sleeping mornings.
13. I get a feeling of real power when driving a car.
14. Courses in school are set up to meet the needs and interest of the student.
15. I am concerned about the way my clothes look.
16. Slow drivers should be kept off the highways.
17. All young people should be required to take a course in driver education.
18. Unsafe drivers should be deprived of the right to drive.
19. Accidents don't just happen; they are caused.
20. I like to get everything out of a car that it has in it.
21. The chief work of most policemen should be traffic control.
22. My parents exert too much control over me.
23. The people in my community want the traffic laws enforced.
24. I have been tempted to cheat on a test at school.
25. I get impatient when driving in heavy traffic.
26. There are times when it seems like everyone is against me.
27. Old, defective cars should be kept off the road.
28. Drivers should be given more freedom in obeying traffic signs.
29. People should drive when they are angry.
30. Passing on hills and curves is exceedingly dangerous.
31. It is necessary to stop at "stop" signs if no other cars are in sight.
32. I like to put extras on my car to attract attention.
33. I am good at talking the police out of giving me a traffic ticket.

34. Strong discipline in practice makes a better team.
35. I am (was) popular with most of the kids in my class.
36. Cops are rougher on teen-agers than on adults.
37. Teachers want to help students with their problems.
38. My father gets traffic tickets for moving violations.
39. I have as good table manners at home as when I eat out.
40. I have been wrong in an argument but wouldn't admit it to my opponent.
41. The school should have the right to question the way I drive.
42. I like to razz the team when it is losing.
43. I am proud of my reputation in the community.
44. I am considered a friendly person.
45. I like most of my school work.
46. Our family spends a great deal of time together.
47. Attitudes toward driving are more important than ability to handle the car.
48. I like to take chances when I'm driving.
49. Traffic laws are set up to promote safety.
50. Courtesy toward other drivers is important.
51. I like a great deal of freedom.
52. I don't mind being told what to do.
53. My grades in school are (were) a good indication of my ability.
54. I sometimes become concerned about what other people think of me.
55. I find that older people tend to be too bossy.
56. I feel somewhat nervous when I drive a car.
57. I think courtesy towards others is a good reflection of a person's character.

- 58. I get more fun out of driving a car than in any other activity.
- 59. The police are only trying to do the job for which they were hired.
- 60. My folks insist that I spend most week-day evenings at home.
- 61. I am considered a reliable person.
- 62. I like to help a person who is in trouble.
- 63. I am more courteous than the average driver.

How do you feel about answering these questions?
(Write on back of answer sheet)

APPENDIX B

Traffic Engineering & Safety Dept.
American Automobile Association
1712 G Street, N. W.
Washington, D. C. 20006

October 10, 1957
Reprint April 1965

DRIVER ATTITUDE CHECK LIST

from

New York Telephone Company

The Western Division of the New York Telephone Company has been using a rather unique check list. At least, it will remind drivers of a few things that make for bad attitude. This test is reproduced below.

Read each question carefully and check the box which best describes your attitude.

<u>DO YOU:</u>	Frequently	Occasionally	Rarely	Never
1. Use the suicide door?	()	()	()	()
2. Fail to signal when pulling from the curb?	()	()	()	()
3. Wonder how other drivers sometimes get their license?	()	()	()	()
4. Try hard to be the first away on the green light?	()	()	()	()
5. Get sore when traffic situations go wrong?	()	()	()	()

6. Block other drivers out when they try to get in line? () () () ()
7. Park illegally if you think you won't get caught? () () () ()
8. Double park if it's only going to take a minute? () () () ()
9. Mumble to yourself when seeing a traffic cop hiding and looking for violators? () () () ()
10. Drive after imbibing a couple drinks? () () () ()
11. Get impatient when pedestrians don't hurry across the street? () () () ()
12. Fail to come to a "Complete Stop" where traffic signs and signals call for it? () () () ()
13. Become peeved when the driver behind you honks his horn? () () () ()
14. Fail to give adequate warning before backing? () () () ()
15. Neglect to put on chains because of the effort required? () () () ()
16. Wait for the other driver to dim high lights first? () () () ()
17. Go back on the high beam, if the other driver doesn't dim? () () () ()
18. Pass up other motorists when they are in trouble? () () () ()
19. Fail to consider that the slow pedestrian or driver may have a physical handicap? () () () ()
20. Seek revenge when other drivers annoy you? () () () ()
21. Take it for granted the other drivers will obey the light first? () () () ()
22. Try to scare the pedestrians with your horn? () () () ()

23. Fail to acknowledge courtesy signals for the other driver? () () () ()
24. Think your "Driver Attitude" is worse than your "Pedestrian Attitude." () () () ()
25. Think the other driver considers you a better-than-average driver? () () () ()
-
-

To Get Your Score:

- | | | | | |
|-----------------------------------|-------|-------|-------|-------|
| 1. Add checks in each column | _____ | _____ | _____ | _____ |
| 2. Multiply by | x1 | x2 | x3 | x4 |
| 3. Write totals | _____ | _____ | _____ | _____ |
| 4. Add Totals. This is your score | _____ | | | |

Use the following table to interpret your score:

- | | |
|----------|---|
| 80 - 100 | Almost honor roll or you're lying like hell |
| 65 - 79 | Just getting by |
| 40 - 64 | Watch your step |
| 25 - 40 | Your attitude smells |

APPENDIX C

THE J - M ATTITUDE SCALE

by
Billy J. Jones
and
Russell G. Martin

Directions:

Below is a series of statements about problems related to the driving of motor vehicles. There are no correct answers for these statements. This test is of value only if the questions are answered truthfully. Read the questions and then check the box under the answer you feel actually fits your own driving habits.

YOU, AS THE DRIVER:	Only if of- ficer is around	Occa- sion- ally	Fre- quent- ly	Hab- itu- ally
1. Come to a complete stop at stop signs.	_____	_____	_____	_____
2. Properly signal intentions in ample time.	_____	_____	_____	_____
3. Dim lights at appropriate times.	_____	_____	_____	_____
4. Sound your horn only when necessary.	_____	_____	_____	_____
5. Observe no-passing zones.	_____	_____	_____	_____
6. Stop behind crosswalks.	_____	_____	_____	_____
7. Yield the right-of-way to pedestrians.	_____	_____	_____	_____

- | | | | | |
|---|-------|-------|-------|-------|
| 8. Control your emotions when something "foolish" happens. | _____ | _____ | _____ | _____ |
| 9. Drive in city traffic with dim lights. | _____ | _____ | _____ | _____ |
| 10. Adjust your driving to assure safe passage of other vehicles passing you. | _____ | _____ | _____ | _____ |
| 11. Carefully check traffic before pulling out to pass another vehicle. | _____ | _____ | _____ | _____ |
| 12. Observe a reasonable and proper speed. | _____ | _____ | _____ | _____ |
| 13. Drive in the proper lanes. | _____ | _____ | _____ | _____ |
| 14. Yield the right-of-way to emergency vehicles. | _____ | _____ | _____ | _____ |
| 15. Keep your vehicle in good mechanical condition. | _____ | _____ | _____ | _____ |
| 16. Await your proper time at a four way stop. | _____ | _____ | _____ | _____ |
| 17. Stop behind school buses. | _____ | _____ | _____ | _____ |
| 18. Slow down in school zones. | _____ | _____ | _____ | _____ |
| 19. Yield right-of-way to turning vehicles. | _____ | _____ | _____ | _____ |
| 20. Follow other vehicles at reasonable distance. | _____ | _____ | _____ | _____ |
| 21. Keep aware of changing conditions. | _____ | _____ | _____ | _____ |
| 22. Do not drive after drinking or taking drugs. | _____ | _____ | _____ | _____ |
| 23. Are tolerant of other drivers errors. | _____ | _____ | _____ | _____ |
| 24. Take time to park the vehicle properly. | _____ | _____ | _____ | _____ |
| 25. Refrain from throwing refuse along highway. | _____ | _____ | _____ | _____ |
| 26. Practice the "Golden Rule." | _____ | _____ | _____ | _____ |
| 27. Refrain from weaving in and out of traffic. | _____ | _____ | _____ | _____ |

46. Are not goaded into an unwise act by
others' careless driving or remarks. _____
47. Have a willingness to yield the right-
of-way, to avoid delay. _____
48. Wave on other drivers when you yield the
right-of-way to avoid traffic tie-ups. _____
49. Avoid bluffing other drivers in attempt-
ing to get the right-of-way. _____
50. Have a willingness to accept your re-
sponsibility as a driver. _____

APPENDIX D

FLETCHER ATTITUDE TEST FOR SAFE DRIVING

	fre- quent- ly	occa- sion- ally	rarely
1. Do you wonder how other drivers ever managed to get operators' licenses?	_____	_____	_____
2. Do you feel that you yourself are the best judge of the speed at which you should be permitted to drive?	_____	_____	_____
3. Do you disregard a "No Parking" sign or a fire hydrant area if you're only going to be parked for a minute?	_____	_____	_____
4. Do you disregard traffic lights at night when the streets are practically deserted?	_____	_____	_____
5. Do you bluff your way through an intersection, figuring that the other driver will stop?	_____	_____	_____
6. Do you let another car that's trying to pass you get along side you and then race it?	_____	_____	_____
7. Do you feel that people are admiring you as you drive down the street?	_____	_____	_____
8. Do you try hard to be the first one away when a red light turns green?	_____	_____	_____
9. Do you want your friends to admire the way you don't have to pay attention to the road when you're driving?	_____	_____	_____
10. Do you brag about the times you broke the law and didn't get caught?	_____	_____	_____



11. Do you take chances in traffic "just for the fun of it?" _ _ _
12. When you are at the wheel, do you insist on your rights as a citizen? _ _ _
13. When traffic situations go wrong, do you get "sore?" _ _ _
14. Do you figure there is no sense in giving the other driver an "even break" if he doesn't insist on it? _ _ _
15. Do you hug the middle of the highway when another driver tries to pass you? _ _ _
16. Do you resent someone's being a hotter driver than you are? _ _ _
17. In your "book" is it the other driver who is always wrong? _ _ _
18. Do you "lean on the horn" to keep pedestrians out of your way? _ _ _
19. In night driving, do you wait for the approaching driver to dim his headlights first? _ _ _
20. If the driver coming toward you at night doesn't dim his headlights, do you throw yours back on the high beam? _ _ _
21. Do you blow your horn if the driver ahead doesn't start moving the instant the light changes? _ _ _
22. Do you speed just for the sense of power you get when your foot presses down on the gas pedal? _ _ _
23. Do you disregard traffic laws when someone or something has made you angry? _ _ _
24. Do you feel that having the legal right-of-way lets you out of having to share the road? _ _ _
25. Do you feel that traffic tickets should be "fixed" if you know the "right" people? _ _ _

Give yourself 4 points for each check under FREQUENTLY, 2 points for each check under OCCASIONALLY, and 1 point for each check under RARELY, and add up your total score. The LOWER your score - the BETTER your driving attitudes. If you scored 60 or more, you'd better do something about improving your attitudes. Sooner or later, they can get you into trouble.

APPENDIX E

INVENTORY DESIGNED FOR JUDGING PROCEDURE

Instructions: The following statements relate to feelings and attitudes toward traffic laws and driving responsibilities. Read each statement carefully and circle the letter which represents FAVORABLE or DESIRABLE driving attitudes. For example, if you Strongly Agree that statement #1 . . . expresses a desirable driving attitude, you should circle (SA). Likewise, if you believe statement #1 . . . indicates an undesirable driving attitude, you should circle (SD).

NOTE: MAKE A SINCERE EFFORT NOT TO PERMIT YOUR PERSONAL FEELINGS OR BIASES TO INFLUENCE YOUR RESPONSES.

Response Pattern

SA - Strongly Agree
A - Agree
U - Uncertain
D - Disagree
SD - Strongly Disagree

Statement

Response

- | | |
|--|-----------------|
| 1. Drivers should be given some degree of freedom in obeying traffic laws. | SA, A, U, D, SD |
| 2. Those who continually violate traffic laws should have their driving privilege taken away. | SA, A, U, D, SD |
| 3. Unless otherwise directed by a police officer, it is necessary to obey stop signs at all times. | SA, A, U, D, SD |
| 4. Traffic laws are necessary for the safe and efficient movement of traffic. | SA, A, U, D, SD |
| 5. It is all right for drivers to go through red lights if there is no traffic. | SA, A, U, D, SD |

Response Pattern:

SA - Strongly Agree
 A - Agree
 U - Uncertain
 D - Disagree
 SD - Strongly Disagree

StatementResponse

- | | |
|--|-----------------|
| 6. In most cases, the police enforce the law as it is written. | SA, A, U, D, SD |
| 7. Policemen are too strict in enforcing traffic laws. | SA, A, U, D, SD |
| 8. The police should not be lenient with traffic violators. | SA, A, U, D, SD |
| 9. Policemen should enforce all moving violations. | SA, A, U, D, SD |
| 10. Policemen are more strict with young drivers than they are with any other age group. | SA, A, U, D, SD |
| 11. Candidates for a driver's license should be required to pass a general knowledge test before taking the road test. | SA, A, U, D, SD |
| 12. Driver license tests are too difficult. | SA, A, U, D, SD |
| 13. Drivers should be re-tested periodically. | SA, A, U, D, SD |
| 14. Drivers should not be required to take an eye test. | SA, A, U, D, SD |
| 15. The road test for a driver's license should be thorough. | SA, A, U, D, SD |
| 16. Alcohol and narcotics reduce a person's ability to drive. | SA, A, U, D, SD |
| 17. Those who make a practice of driving while under the influence of alcohol should lose their driving privilege. | SA, A, U, D, SD |
| 18. Traffic laws governing drivers under the influence of alcohol or narcotics are too strict. | SA, A, U, D, SD |

Response Pattern:

SA - Strongly Agree

A - Agree

U - Uncertain

D - Disagree

SD - Strongly Disagree

StatementResponse

- | | |
|--|-----------------|
| 19. Drivers should not be required to take a breath test even if they are suspected of being under the influence of alcohol. | SA, A, U, D, SD |
| 20. A person should not drive an automobile if he is under the influence of alcohol or drugs. | SA, A, U, D, SD |
| 21. Driving a car should give a feeling of power. | SA, A, U, D, SD |
| 22. Drivers should not exceed posted speed limits. | SA, A, U, D, SD |
| 23. The driver should use the car's capacity for speed and acceleration whenever possible. | SA, A, U, D, SD |
| 24. It is all right to exceed the posted speed limit on the open highway. | SA, A, U, D, SD |
| 25. Speed limits are necessary to control the safe movement of traffic. | SA, A, U, D, SD |
| 26. Cautious drivers cause as many accidents as careless drivers. | SA, A, U, D, SD |
| 27. Poor driving behavior is the major cause of traffic accidents. | SA, A, U, D, SD |
| 28. Traffic accidents do not happen by chance, they are caused. | SA, A, U, D, SD |
| 29. Traffic accidents cannot be avoided. | SA, A, U, D, SD |
| 30. Middle-aged drivers are involved in more accidents than young drivers. | SA, A, U, D, SD |
| 31. A car with bad brakes should not be driven until they have been repaired or replaced. | SA, A, U, D, SD |

Response Pattern:

SA - Strongly Agree
 A - Agree
 U - Uncertain
 D - Disagree
 SD - Strongly Disagree

StatementResponse

- | | |
|--|-----------------|
| 32. Motor vehicle inspections are a waste of time. | SA, A, U, D, SD |
| 33. It is dangerous to drive with tread-bare tires. | SA, A, U, D, SD |
| 34. Decorative equipment should be put on a car to attract attention. | SA, A, U, D, SD |
| 35. Unsafe cars should be kept off the highway. | SA, A, U, D, SD |
| 36. Driving is a good way to forget daily problems. | SA, A, U, D, SD |
| 37. It is natural for drivers to get nervous in heavy traffic. | SA, A, U, D, SD |
| 38. A person should not drive when he is upset or angry about something. | SA, A, U, D, SD |
| 39. Cautious drivers do not get impatient in heavy traffic. | SA, A, U, D, SD |
| 40. The car horn should be used freely in clearing the road of slow drivers. | SA, A, U, D, SD |
| 41. Most courteous drivers are not good drivers. | SA, A, U, D, SD |
| 42. When conditions permit, drivers should stop to assist motorists who have vehicle difficulties. | SA, A, U, D, SD |
| 43. Courtesy is a good driving practice. | SA, A, U, D, SD |
| 44. Driving courtesy is a good indication of a person's character. | SA, A, U, D, SD |
| 45. Courtesy is not a necessary element of safe driving. | SA, A, U, D, SD |

11

Response Pattern:

SA - Strongly Agree
 A - Agree
 U - Uncertain
 D - Disagree
 SD - Strongly Disagree

StatementResponse

- | | |
|--|-----------------|
| 46. Most parents are qualified to teach their teenagers how to drive. | SA, A, U, D, SD |
| 47. Driver and traffic safety education courses can help to prepare better qualified drivers. | SA, A, U, D, SD |
| 48. Skill is the most important requirement in the safe operation of a motor vehicle. | SA, A, U, D, SD |
| 49. The major goal of driver education courses should be to train teenagers to get a driver's license. | SA, A, U, D, SD |
| 50. A driver and traffic safety education course should be taken before getting a driver's license. | SA, A, U, D, SD |

APPENDIX F

EXPLANATORY LETTER SENT TO THE JUDGES

Dear Sir:

I am in the process of developing an inventory designed to measure the attitudes of driver education students toward the responsibilities of driving a motor vehicle. The primary purpose of this inventory will be to determine the areas of instruction that should be emphasized to foster the development of positive driving attitudes. The tentative inventory consists of fifty statements which include five items for each of the following areas: (1) Traffic laws, (2) Enforcement, (3) Licensing, (4) Alcohol and narcotics, (5) Speeding, (6) Traffic accidents, (7) Vehicle condition, (8) Emotions, (9) Courtesy, and (10) Driver education.

I would appreciate your cooperation in scrutinizing the statements that are presented and designating the responses that would be indicative of desirable driving attitudes. I wish to emphasize that I am not examining your attitudes, but requesting you to act as a judge in selecting appropriate statements and responses to be used in the construction of the final inventory. Consequently, it is important that you make a sincere effort not to permit your personal feelings or biases to influence your responses.

Kindly follow the instructions on the following page, mark all items, indicate those that you feel are inappropriate and provide comments that would help to improve the statements. Your assistance in this matter will be greatly appreciated.

Sincerely,

APPENDIX G

STATES AND INSTITUTIONS REPRESENTATIVE OF THE JUDGMENT GROUP

State Departments of Education

Inventories were received from thirty-eight state departments of education of the following states:

- | | |
|-------------------|--------------------|
| 1. Alabama | 20. North Carolina |
| 2. Arizona | 21. New Hampshire |
| 3. California | 22. New Jersey |
| 4. Colorado | 23. New York |
| 5. Delaware | 24. Oklahoma |
| 6. Florida | 25. Oregon |
| 7. Georgia | 26. Pennsylvania |
| 8. Illinois | 27. Rhode Island |
| 9. Iowa | 28. South Carolina |
| 10. Kansas | 29. South Dakota |
| 11. Kentucky | 30. Tennessee |
| 12. Maine | 31. Texas |
| 13. Maryland | 32. Utah |
| 14. Massachusetts | 33. Virginia |
| 15. Michigan | 34. Vermont |
| 16. Minnesota | 35. Washington |
| 17. Missouri | 36. West Virginia |
| 18. Montana | 37. Wisconsin |
| 19. Nevada | 38. Wyoming |

n = 38

High Schools

Driver educators representing seventy-nine high schools from ten states responded to the inventory. Approximately 71 per cent of the eighty-three responses were

from New Jersey, New York, Michigan and Pennsylvania due to the author's accessibility to and acquaintance with driver educators from these states. The number of responses from each state were as follows:

1. New Jersey	(29)	6. Ohio	(3)
2. Michigan	(16)	7. Illinois	(3)
3. New York	(13)	8. North Carolina	(2)
4. Pennsylvania	(8)	9. Washington	(2)
5. Wisconsin	(5)	10. Florida	(2)

n = 83

Colleges and Universities

Eighty-six colleges and universities from thirty-five states returned inventories. Included in this group were:

Arizona

1. Arizona State University
2. University of Arizona

California

3. Chico State College
4. Fresno State College
5. San Diego State College
6. Sacramento State College
7. San Francisco State College
8. San Jose State College

Colorado

9. Colorado State University

Connecticut

10. Central Connecticut State College
11. Southern Connecticut State College

District of Columbia

12. George Washington University

Florida

- 13. Florida State University
- 14. University of Florida
- 15. University of Miami

Georgia

- 16. Georgia Southern College
- 17. Savannah State College
- 18. University of Georgia

Idaho

- 19. University of Idaho

Illinois

- 20. Eastern Illinois University
- 21. Illinois State University
- 22. Northern Illinois University
- 23. Southern Illinois University
- 24. University of Illinois
- 25. Western Illinois University

Indiana

- 26. Ball State University
- 27. Indiana State University
- 28. Indiana University
- 29. Purdue University

Iowa

- 30. Iowa State University
- 31. Western College

Kansas

- 32. College of Emporia
- 33. Kansas State College of Pittsburgh
- 34. Kansas State University

Kentucky

- 35. Eastern Kentucky University
- 36. Murray State University
- 37. University of Kentucky

Louisiana

- 38. Louisiana State University

Maine

- 39. University of Maine

Maryland

- 40. Salisbury State College
- 41. University of Maryland

Michigan

- 42. Central Michigan University
- 43. Eastern Michigan University
- 44. Northern Michigan University
- 45. Wayne State University
- 46. Michigan State University

Minnesota

- 47. Bemidji State College
- 48. Concordia College
- 49. Mankato State College
- 50. University of Minnesota

Mississippi

- 51. Mississippi State University

Missouri

- 52. Northeast Missouri State College

Montana

- 53. University of Montana

Nebraska

- 54. Chadron State College
- 55. University of Nebraska

New York

- 56. Brooklyn College
- 57. Columbia University
- 58. New York University
- 59. Buffalo University
- 60. Oswego University

North Carolina

- 61. Agricultural and Technical College
- 62. East Carolina College

North Dakota

- 63. Mayville State College

Ohio

- 64. Kent State University

Oklahoma

- 66. Oklahoma State University
- 67. Southern State College

Pennsylvania

- 68. Clarion State College
- 69. Indiana University
- 70. Millersville State College
- 71. Pennsylvania State University
- 72. Slippery Rock State College
- 73. West Chester State College

South Dakota

- 74. Northern State College

Tennessee

- 75. University of Tennessee

Texas

- 76. Prairie View A. & M. College
- 77. University of Houston

Utah

- 79. University of Utah
- 80. Utah State University

Washington

- 81. Central Washington State College
- 82. Eastern Washington State College

West Virginia

- 83. West Virginia State College
- 84. West Virginia University

Wisconsin

- 85. University of Wisconsin
- 86. Wisconsin State University at River Falls

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