AN ASSESSMENT OF THE EFFECTIVENESS OF THE MANN ATTITUDE INVENTORY AS A PREDICTOR OF FUTURE DRIVING BEHAVIOR

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY
PHILIP JOHN O'LEARY

1971

This is to certify that the

thesis entitled

AN ASSESSMENT OF THE EFFECTIVENESS OF THE MANN ATTITUDE INVENTORY AS A PREDICTOR OF DRIVING BEHAVIOR FUTURE

presented by

Philip John O'Leary

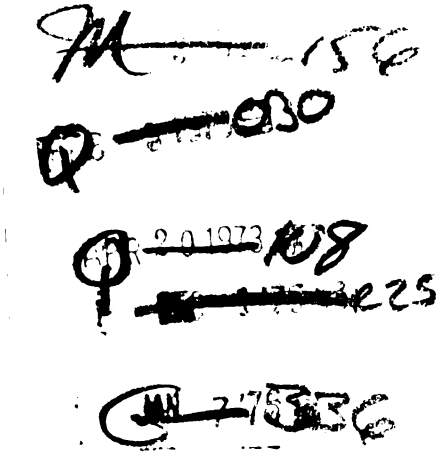
has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Education

William A. Mann Ed.D.

Major professor

Date May 20, 1971



ABSTRACT

AN ASSESSMENT OF THE EFFECTIVENESS OF THE MANN ATTITUDE INVENTORY AS A PREDICTOR OF FUTURE DRIVING BEHAVIOR

By

Philip John O'Leary

Efforts in most studies usually concentrate on one period of time with no attempt to follow-up using the same sample with more extensive information. This study expands upon some original research in addition to obtaining more information over a more extensive period of time.

The first purpose of the study was to determine whether the findings of Kenel, regarding the relationship between observed rating and driving behavior, endured over an extended period of time. The second purpose was to determine if the Mann Inventory rating and driving record correlated significantly in a 26-month and a 60-month period of time; and the third purpose was to determine which of the two ratings, teacher observed or Mann Inventory, had more predictive validity.

Four hundred and sixty-four male students who were part of Kenel's study were selected for this study for the following reasons:

1. Availability of driver license records.
2. Residence in Ingham, Eaton, or Clinton counties.

The hypotheses were tested using a one-way analysis of variance and statistical analysis revealed:

1. When students are grouped on the basis of observed behavior the groupings are significant as they relate to violations, Secretary of State action, and comprehensive records. This occurred in both the original as well as the follow-up period. Accident experience was significant in the original period, but not in the follow-up period.
2. When students were grouped on the basis of the Mann Inventory ratings, the groupings were significant for violations, Secretary of State action, and comprehensive records in the original as well as the follow-up period. The groupings were not significant for either time period for chargeable or non-chargeable accidents.
3. Both the Mann Attitude Inventory ratings and the teacher observed ratings for violations, Secretary of State action and comprehensive records were significant at the .05 level or better for both time periods.

AN ASSESSMENT OF THE EFFECTIVENESS OF THE MANN ATTITUDE INVENTORY AS A PREDICTOR OF FUTURE DRIVING BEHAVIOR

By

Philip John O'Leary

A THESIS

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

DOCTOR OF PHILOSOPHY

Department of Secondary Education and Curriculum

1971

ACKNOWLEDGMENTS

To Dr. William Mann, my major advisor, friend, and chairman of my guidance committee for his time, patience and advice, and encouragement.

To Dr. Charles Blackman, Dr. Walter Johnson, and Mr. Gordon Sheehe, the other members of my guidance committee for their help and advice.

To Dr. Frank Kenel, and Dr. Charles Porter, both of Illinois State University, for their assistance.

To my wife, Marilyn A. O'Leary and our children for the encouragement and the many sacrifices.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

The Problem

Dr. Leon Brody, in his study "Personal Causes of Chronic Violators and Accident Repeaters" in 1959, concluded.[1]

1. The problem of safe, lawful, and courteous driving is primarily a problem of emotional makeup and social adequacy.
2. The following specific characteristics tend to be evidenced by chronic violators and accident-repeaters: They tend to resent authority. They are inclined to have an exaggerated opinion of their importance and their abilities. They are likely to be lacking in responsibility and often act impulsively, on the spur of the moment.

---

[1]Leon Brody, "Personal Characteristics of Chronic Violators and Accident Repeaters," Bulletin No. 152, National Academy of Sciences, National Research Council. (Hereinafter referred to as "Personal Characteristics of Violators.")

3. Studies in this area are difficult. There is no simple formula for detection or correction of problem drivers.

The critical area that is of concern here is item three. To date, no reliable instrument has been developed that can accurately predict which individuals will, or will not, show signs and develop further evidence of deviant behavior. This deviant behavior can be manifested in driving, and evidence accrued can be in the form of violations and/or accidents.

Looking at the ever-increasing number of fatalities, 56,200 in 1969, the number of disabling injuries, over 2,000,000 in 1969, in addition to the economic loss to society, the necessity of identification of these individuals becomes more and more critical.

The National Safety Council has reported that the most frequently encountered problem driver is that individual who manifests characteristics of deviant behavior, which, in another sense, means that he cannot live within those rules imposed by our society. Kenel,[2] reported that educators have, for many years, accepted the premise that an individual well-trained in the behavioral sciences, can accurately predict the future behavior of individuals

---

[2]F. Kenel, "The Effectiveness of the Mann Inventory in Classifying Young Drivers Into Behavioral Categories and Its Relationship to Subsequent Driver Performance" (unpublished Ph.D. dissertation, Michigan State University, 1967). (Hereinafter referred to as "Effectiveness in Classifying Young Drivers Into Categories.")

whom they have come in contact with in their teaching assignments. According to the Eno Study[3] and the study conducted by Brody,[4] in addition to others, a driver's personality and observed behavior have been found to be very significant factors as they relate to driving performance. Pelz[5] and Shuman reported that drivers between the ages of sixteen and twenty-six are in a decade of turmoil. During this ten-year period, teens strive for adult status, but society refuses to grant the privilege, thus leading to emotional unrest and anti-social impulses. He also noted that several sociological inventories have been developed; none of these have proven acceptable to the people in this field.

In the thesis, "The Effectiveness of the Mann Inventory in Classifying Young Drivers into Behavioral Categories and its Relationship to Subsequent Driver Performance,"[6] Kenel determined that observed behavior in

---

[3]Eno Foundation for Highway Traffic Control, "Personal Characteristics of Traffic-Accident Repeaters," Saugatuck, Connecticut, 1948. (Hereinafter referred to as Eno Foundation, "Characteristics of Repeaters.")

[4]Brody, "Personal Characteristics of Violators."

[5]S. Schuman, et al., "Young Male Drivers," Journal of American Medical Association, XII, No. 200 (June, 1967), 1,026-30.

[6]Kenel, "Effectiveness in Classifying Young Drivers Into Categories."

driver education can be a predictor of future driver behavior categorized within defined groups. As an individual behavior deviated from category one toward category six, the individual record of convictions and/or collisions increased, with approximately 10 per cent reversals in each category.

The categories were:

Category 1 - Average
Category 2 - Average Constricted
Category 3 - Average Aggressive
Category 4 - Aggressive
Category 5 - Constricted
Category 6 - Aggressive Constricted

He also concluded from the data that a highly significant relationship exists between observed behavior in driver education and later driving record as attested by the absence or presence of convictions for traffic offenses and/or collisions.

Kenel used the driving records of 1,057 subjects for two years following driver education, a time when relatively little driving experience was accomplished.

Most studies are conducted where there is very little, if any, follow-up to the original research. Efforts usually concentrate on one period of time and fail to utilize the available information and project or follow through another sequence of time.

Statement of the Problem

The first purpose of the study is to determine whether the findings of Kenel, regarding the relationship between observed ratings and driving behavior, endured over an extended period of time. The second purpose is to determine if the Mann Inventory rating and driving record correlated significantly in the 26- and 60-month driving period. The third purpose of the study is to determine which of the two ratings, Teacher or Mann Inventory, is the better predictor of driving behavior, as shown by analyzing significant statistical levels.

Basic Assumptions

The investigation of this problem is based on the following assumptions:

1. An assessment of behavior is essential for identifying the majority of the underlying causes of traffic collisions and violations;
2. Characteristics observed by the raters and identified by the Mann Inventory will change very little over the seven-year period of time;
3. A delimiting factor would be the enforcement variable and the exposure variable, which cannot be well controlled. It will be assumed that the driving exposure is randomly distributed throughout the group to equalize.

4. Enforcement variable will have changed very little in the two separate periods of times under scrutiny.
5. Another delimiting factor is the unknown variable relating to residence in the Tri-County area of Ingham, Eaton and Clinton Counties, Michigan. It will be assumed that the individuals showing a residence in the Tri-County area did indeed reside there during this seven-year period of time, and any absences would be randomly distributed throughout the six groupings.

Hypotheses

The hypotheses to be tested in this study are:

HO 1: There is a significant, positive relationship between observed behavior ratings and moving violations in the follow-up period as during the original 26-month period.

HO 2: There is a significant, positive relationship between observed behavior ratings and chargeable accidents in the follow-up period as during the original 26-month period.

HO 3: There is a significant, positive relationship between observed behavior ratings and non-chargeable

accidents in the follow-up period as during the original 26-month period.

HO 4: There is a significant, positive relationship between observed behavior ratings and number of instances of Secretary of State action in the follow-up period as during the original period.

HO 5: There is a significant, positive relationship between observed behavior rating and composite records in the follow-up period as during the original period.

HO 6: There is a significant, positive relationship between Mann Inventory rating and moving violations in the follow-up period as during the original period.

HO 7: There is a significant, positive relationship between Mann Inventory rating and chargeable accidents in the follow-up period as during the original period.

HO 8: There is a significant, positive relationship between Mann Inventory rating and non-chargeable accidents in the follow-up period as during the original period.

HO 9: There is a significant, positive relationship between Mann Inventory rating and number of instances

of Secretary of State actions in the follow-up period as during the original period.

HO 10: There is a significant, positive relationship between Mann Inventory rating and the composite record in the follow-up period as during the original period.

HO 11: There is a significant, positive relationship between observed rated classification and Mann Inventory classification as they relate to driving record.

Definition of Terms

Conviction.--Legal action arising out of the issuance and conviction for a citation for a moving violation other than one received at the time of a collision. (A conviction arising out of a collision will be listed under the category "chargeable accident.")

Chargeable accident.--An accident involvement for which the driver record file indicates the issuance of a citation and conviction of a moving violation arising out of the involvement.

Nonchargeable accident.--An accident involvement for which no enforcement action was taken against the individual involved.

Secretary of State action.--This is any action taken by the Secretary of State as a result of either individual or cumulative occurrences of violations and/or accidents. This will include suspensions, revocation, warning letters, and any other action taken by the Secretary of State.

Organization of the Study

A general plan of the study is to present in Chapter II the review of the literature on the relationship of personality and personal social adjustments in driving performance.

The third chapter will be an account of the methodology used in collecting, organizing, and tabulating the data and the techniques employed in analyzing them. The analysis of the data will be reported in Chapter IV. The summary, conclusions, discussion of problems encountered, possible unstable effects or weaknesses in the assumptions or in the data available and need or implications for further study will appear in Chapter V.

CHAPTER II

REVIEW OF LITERATURE OF THE RELATIONSHIP OF PERSONALITY AND SOCIAL ADJUSTMENT

A review of the literature discloses that theory has continued to be the dominant factor involved in all studies with very little literature available on the practical application of valid instruments. Since Kenel's study[7] in 1967, very little additional material has been accumulated. Consequently, the review of the literature becomes rather repetitious when one is concerning himself with a follow-up dissertation.

The classic study of Tillman and Hobbs in 1949,[8] which investigates the psychological and social backgrounds of drivers who were involved in a disproportionately high number of accidents, is still the "lead"

---

[7]Kenel, "Effectiveness in Classifying Young Drivers Into Categories."

[8]W. Tillman and G. Hobbs, "The Accident-Prone Automobile Driver," The American Journal of Psychiatry, No. 106 (1949), 321-31.

study from which others evolved. In this study, forty taxi-cab drivers were interviewed to obtain personal history information while they performed their job. The information obtained in the personal history included the parental background, childhood and adolescent history, and subsequent adult adjustment. After this information was individually secured, the drivers were called into group discussions with each other to observe their individual adjustment to and standing within the groups. As additional sources of information, the police, juvenile authorities and social agencies were contacted.

The high accident group and the low accident group were compared with regard to several personality characteristics. Although the groups were small (twenty drivers in each), the results of the comparisons were highly significant. The high accident group was characterized by aggressiveness and the inability to tolerate authority, whether in the home or in the community. These characteristics appeared to be developed throughout childhood and continued through life often displayed as fits of temper. On the other hand, the low accident group appeared to be stable and well-adjusted individuals with well-integrated childhood experiences.

The characteristics which best described the high accident group were as follows:

1. Poor home life with a high rate of parental divorce accompanied by one or both parents being excessively strict. The father was often a poor provider, with a record of heavy drinking.
2. Inadequate childhood adjustment characterized by a history of instability of an aggressive nature, such as temper tantrums, fighting frequently, bully characteristics, leaders of gangs, and frequent appearances in Juvenile Court. However, an almost equal number (nine) had a history described as regressive in nature with characteristics on the opposite extreme of the continuum.
3. Deficient social adjustment displayed as poor school attendance records, short-time employment, many acquaintances but few friends, shallow emotional attachments, impulsiveness, and a lack of interest in hobbies.
4. Immature behavior patterns displayed by using foul language, constantly seeking to be the center of attention when in a group, lack of concern over problems, and eccentric dress.

In an attempt to apply the findings to the general driving public, since a sample of taxi drivers was not typical, a group of ninety-six drivers who had been

involved in four or more collisions was selected for study as a more representative accident-repeater group. A comparable control group of 100 accident-free motorists was also selected. The names included in both groups were submitted to the Juvenile Court, the Adult Court of records other than automobile accidents, three social service agencies, the public health agencies, venereal disease clinics and the local credit bureau to ascertain if these individuals were known to these agencies. In reply, it was found that 66 per cent of the high-accident group was known to one or more of the agencies while only 9 per cent of the low-accident group were known to any of the agencies. In addition, no one in the low-accident group was known to more than one of the agencies.

A breakdown of the involvement of the high-accident group was enlightening. Two of the individuals were known to all of the sources, while three were known to four of the sources, nine to three of the sources, sixteen to two sources, and thirty-two to at least one source. The credit bureau had contacted more than one-third of the high-accident group (34.3%) as had the Adult Court for charges other than traffic (34.3%). The social service agencies had contact with 17.7 per cent of the group, while the Juvenile Court had contact with 16.6 per cent, and the venereal disease clinics knew 14.4 per cent of the high-accident group.

On the other hand, the low-accident group was almost unknown to the referral agencies. The credit bureau had contact with six of the individuals; the social service agencies, the Juvenile Court and the Adult Court each had contact with one of the individuals in the low-accident group. Thus, it was readily apparent that social maladjustment of various types was much more frequent among the high-accident group than among those individuals in the low-accident group.

The Eno study[9] indicates a number of personality characteristics differentiating violation/accident repeater groups from violation/accident free groups. The outstanding differences were as follows:

1. Repeaters are not as well informed regarding safe driving practices and regulations as are free. The lack of information tends to increase among those with high accident frequencies.
2. Repeaters tend to have more personality maladjustment than free, and this condition tends to increase among the more serious repeaters. They have poor motor control under both normal and frustrating conditions, and are more easily upset by frustrating situations.

---

[9]Eno Foundation, "Characteristics of Repeaters."

3. Attitudes toward certain aspects of driving and law enforcement are significantly poorer among repeaters.

Brody, in summarizing the research project "Personal Characteristics of Chronic Violators and Accident Repeaters," states:

> . . . Three general conclusions . . .
> 1. The problem of safe, lawful, and courteous driving is primarily a problem of emotional makeup and social adequacy. So-called psychophysical functions (reaction time, glare recovery time, etc.) do not, per se, differentiate between good and bad drivers. The latter may excel in these functions in many instances, while the former may occasionally be inferior without jeopardy to their driving records.
> 2. With regard to the psychological (as distinguished from the psychophysical) factors noted above, other research studies indicate that the following specific characteristics tend to be evidenced by chronic violators and accident repeaters: they are apt to be aggressive and intolerant of others. They tend to resent authority. They are inclined to have an exaggerated opinion of their importance and their abilities. They are likely to be lacking in responsibility and often act impulsively, on the spur of the moment. The basis for such characteristics is likely to be obscure. Just as eight-ninths of an iceberg lies below the surface of the water, most of the factors and forces that shape an individual's personality are hidden in his background, often in early childhood experience.
> 3. Obviously, here is an extremely difficult and complicated problem. It is not surprising, therefore, that work at the New Jersey Clinic and similar work elsewhere have not produced simple formulas for detection or correction of problem drivers. While the general importance of personal adjustments and personality trends are indicated, it cannot be said with assurance: use this or that test in screening drivers for licensing purposes or in driver re-examination. But the development

> of such tests remains one of the prime needs and objectives. Experiments toward that end will be continued.[10]

Rommel[11] undertook a study to isolate personality characteristics and attitudes which might serve to distinguish youths who were accident-free. The accident repeaters possessed certain attitudes or a combination of attitudes which were considered to be conducive to unsafe driving behavior. These attitudes which were derived from the Driver Attitude Inventory developed by Schuster and Guilford[12] were as follows:

1. An attitude toward driving as a form of activity which relieves psychic tension.
2. An attitude toward driving as a form of behavior by which youthfulness may be compensated and the role of an adult may be assumed.
3. An attitude toward driving as a form of behavior in which a considerable amount of confidence in one's ability may be manifested.

---

[10] Brody, "Personal Characteristics of Violators."

[11] R. Rommel, "Personality Characteristics and Attitudes of Youthful Accident-Repeating Drivers," Traffic Safety Research Review, III, No. 1 (1959), 13-14.

[12] D. Schuster and J. Guilford, "An Analysis of Accident Repeater and Chronic Violator Drivers," National Safety Council Transactions, XXIV (October, 1958), 136-39.

4. An attitude toward driving which does not take into account speed as an element of danger or if considered dangerous, an attitude manifesting desire for danger.
5. An attitude toward driving which places greater emphasis on the power which a vehicle possesses than on either its style or utility.

Also the accident-repeater group tended to indicate their disregard for social mores, which could be interpreted as an open defiance for authority, as well as a tendency toward excessive activity and enthusiasm.

Several studies dealing with the prediction of future driving performance based their actions on personal and psychological data. Schuster[13] reported that attitude scales could be used to predict follow-up accidents and moving violations significantly. Also when attitude scales were combined with the previous driver record of moving violations and accidents an even better prediction could be made. Levonian indicated that negligent operators could be identified at a statistically significant level on the basis of four variables: driving exposure, age, sex, and marital status.

---

[13]D. Schuster, "Prediction of Follow-Up Driving Accidents and Violations," Traffic Safety Research Review, XII, No. 1 (1968), 17-21.

Haner[14] reported on an insurance company's underwriting program based on their use. The prediction devices were a personal history form and a psychological inventory. He found that the inventory discriminated among those tested on the variable of the number of collisions involving primary negligence. Also the relationship between the risk group of the insured and the seriousness of injury in collisions when the insured was primarily at fault was found to be significant. An adequate prediction could be made using only the personal history form, but the best predictions were made when both the devices were used.

Extensive investigation of driving records by Crancer,[15] Quiring, and McMurray has revealed several facts in the personal and social adjustment of drivers. It was found that:

---

[14]Charles P. Hanner, "Use of Psychological Inventory in Writing Insurance for Youthful Male Drivers," Traffic Safety Research Review, National Safety Council, VII, No. 1 (1963).

[15]A. Crancer and L. McMurray, "Credit Ratings As A Predictor of Driving Behavior and Improvement," Department of Motor Vehicles, State of Washington, Report No. 010, May, 1968; "Emotional Stress and Driving Performance: The Effect of Divorce," Department of Motor Vehicles, State of Washington, Report No. 016, August, 1968; A. Crancer and D. Quiring, "Driving Records of Persons Arrested For Illegal Drug Use," Department of Motor Vehicles, State of Washington, Report No. 011, May, 1968; "The Chronic Alcoholic As A Motor Vehicle Operator," Department of Motor Vehicles, State of Washington, Report No. 012, May, 1968; "The Mentally Ill As Motor Vehicle Operators," Department of Motor Vehicles, State of

1. Persons with a poor credit rating had more accidents and violations than the general driving population. Poor credit rating drivers also received a high proportion of negligent driving citations.
2. Individuals who were classified as psychoneurotic or who had personality disorders had a statistically higher accident and violation rate than comparable groups.
3. The accident rate of persons subsequently hospitalized for suicide gestures was 81 per cent higher than the general driving population while the violation rate was 146 per cent higher. This group had a significantly larger proportion of involvements for serious violations: drunken driving, reckless driving, hit and run, driving while license was suspended, and negligent driving. The proportion of bodily injury accidents was also higher.

Washington, Report No. 013, June, 1968; "Driving Records of Persons Hospitalized for Suicide Gestures," Department of Motor Vehicles, State of Washington, Report No. 014, July, 1968; "Driving Records of Persons With Selected Chronic Diseases," Department of Motor Vehicles, State of Washington, Report No. 015, July, 1968.

4. During the six months prior to and immediately following the filing of a divorce petition, individuals had a disproportionately high record of accidents and violations, especially during the high-accident first three months after the filing.
5. Diabetics under treatment displayed a driving problem with a higher accident and violation rate than expected.
6. Persons arrested for illegal drug use had driving records which had a large proportion of violations for reckless, hit and run, and negligent driving as did those drivers who were hospitalized as chronic alcoholics. Also the alcoholics were involved in a larger proportion of bodily injury accidents than the general driving population.

A very interesting and extensive ten-year study was undertaken in Johannesburg, South Africa, by Shaw[16] to determine if bus drivers could be screened effectively to lower accident losses to a minimum. Two projective tests--the Thematic Apperception Test (TAT) and a variation, the Social Relations Test (SRT)--were

---

[16]L. Shaw and H. Sichel, "The Reduction of Accidents in a Transport Company by the Determination of the Accident Liability of Individual Drivers," Traffic Safety Research Review, V, No. 4 (1961), 2-12.

administered to prospective drivers for the Public Utility Transportation Corporation (PUTCO). The results indicated a very strong relationship between the driving records and the responses to the two projective devices. In addition, the relationship between the total personality pattern and driving behavior and history was demonstrated.

Charles A. Charyne, General Motors Engineering Vice President, said, "Safety designs and devices not withstanding traffic safety is a direct function of the driver's basic sense of responsibility, his attitude, his self-discipline, his psychology or whatever you wish to call it." He pointed out that General Motors engineers developed a device to measure reaction time to determine whether good physical reflexes had any influence on a good driving record. The test results showed that some men with the most sluggish reflexes had the best driving records and driving histories. Many of the drivers with fine reflexes had poor driving records. He then cited his record of thirty-three years in the field of test engineering by pointing out that this experience showed test accidents occurred because safe driving practices were stretched or ignored. Good highway habits would reduce accidents.

Beamish and Malfetti's study was to determine (1) whether, in adolescents, certain psychological characteristics of traffic violators differ from those of

non-violators; (2) whether the intensity of these characteristics affect the violator's responsiveness to pedogogic/therapeutic retraining and (3) whether such intensity is connected with the quality of his attitude and relationships vis-a-vis his family and society at large.

On the basis of data obtained in this study, the following conclusions seem warranted: The personality traits of Emotional Stability and Objectivity as measured by the Guilford-Zimmerman Temperament Inventory, and the traits of Conformity and Mood as measured by the Minnesota Counseling Inventory appear to provide for differentiation between traffic violators and non-violators. The violators population rated lower on all variables. Political activity of parents appears to be a biographical item of value in differentiating violators from non-violators. The parents of non-violators are more active politically. For the purpose of differentiating violators who are remediable from those who are not remediable by means of a program such as that operated by the Cleveland Driver Improvement School, the personality trail of Sociability as measured by the Guilford-Zimmerman Temperament Survey appears reliable. The remediable group rated higher on this variable. Further, the following biographical items appear to be of value in distinguishing the remediable from the non-remediable. Activity Level, Extent of Social Activities, of Literary, Musical and

Artistic Activities and Dependence upon the Home. The remediable violator rates higher on each of these variables.

Malfetti and Fine studied the characteristics of a group of professional drivers for whom orderly, accurate driving records were available. Biographical and driving records were obtained for 5,244 drivers who for twenty years or more received a National Safety Council State Driving Award. Some 2,003 records were analyzed statistically and six drivers selected to undergo additional testing on the basis of an accident violation-exposure index and availability.

The study team will ultimately give a battery of medical, psychological, driving performance and knowledge tests to at least 1,000 of the drivers to see if a determination of safe driver characteristics might be of value to programs of driver licensing, selection and training. To make this ultimate testing program as efficient and meaningful as possible, two pilot studies were conducted.

In Pilot Study I, a battery of tests were given to the six selected subjects. The results of the battery revealed that the subjects (1) were average or below average in terms of established and suggested standards for medical fitness to drive; (2) had a measurable set of psychological characteristics which seemed to relate to safe driving and which could probably be measured with

tests suitable for group administration; (3) had distinct driving performance characteristic which could be measured by observer judgment and by special objective instrumentation in the vehicle; and (4) scored average to poor on knowledge tests of motor vehicle operation in traffic.

In Pilot Study II a more extended and intensive study of the driving performance of two subjects selected from the six confirmed the impression of the study team that objective instrumentation in the vehicle might profitably be considered for evaluating the safe driving potential of drivers. In addition, the unusually good and rapid organizational ability of safe drivers suggested itself as worthy of intense study.

CHAPTER III

DESIGN OF THE STUDY

Introduction

This study was an attempt to expand an original study, whereby it had been determined there was a significant positive relationship between teacher-observed rating of individuals and subsequent driving records in addition to a positive correlation between teacher-observed behavior and the Mann Inventory. This study will be longitudinal in scope as it encompasses more variables over a longer period of time.

The Test Instrument

The Mann Inventory consists of sixty-three items that appear to reflect an individual's feelings toward himself, others, and established social mores. Reaction to items in the "Inventory" are expressed by checking one of five responses--always, usually, sometimes, rarely, or never (see Appendix A for copies of the Mann Inventory and the response sheet).

The Mann Inventory, in its original form, consisted of 100 items selected on the basis of face validity by Mann.[17] The selected items represented a compilation of the feelings expressed by 100 Michigan high school students toward the police, school, cars, family, peers, personal expectations--desires--habits, and society. Intensive case studies, including personal interviews, had been conducted with each of these 100 students subsequent to identification by driver education teachers as the worst drivers in their respective schools. The persons involved in the gathering of this data were at the time enrolled in the course "Personality Factors in Traffic Safety," taught by Dr. Mann and were pursuing advanced degrees in the field of traffic and safety education.

A pilot study to ascertain potentially selective questions from among the list of 100 items was then conducted. Twenty high school teachers of driver education in central Michigan were requested to evaluate students enrolled in their classes. Prior to initiating this evaluative process, the teachers were brought together and criteria established for the identification of three behavioral categories: (1) very aggressive, (2) very

---

[17]William A. Mann, "Mann Attitude Inventory" (unpublished attitude inventory, Michigan State University, 1960).

reserved, (3) average. The criteria for evaluation was as follows:

1. Very aggressive; Any student who, in the opinion of the driver education instructor through personal observation in the classroom and/or during practice driving instruction, displays behavior that is exceedingly aggressive, is a show-off, is extremely egotistical or temperamental.
2. Very reserved; Any student who, in the opinion of the driver education instructor through personal observation in the classroom and/or during practice driving instruction, displays behavior that is exceedingly cautious and timid.
3. Average; All students who do not fall into either of the other classifications.[18]

The "Inventory" was then administered to a sample population of 451 students. (Figures are not available as to the numbers of male and female students involved.) As a result of observations employing the established criteria, 80 students were identified as very aggressive, 86 as very reserved, and 285 as average.

The response to each of the items was tabulated for each of the three identified categories, and significant differences were determined.

Observation tends to indicate, however, that greater discrimination of behavior is required than that employed in the initial efforts, namely, Very Aggressive, Very Reserved, and Average. As a result, the sample population in this study shall be classified according to the following six categories of observable behavior:

---

[18]John G. Schaff, "Personal Attitude Survey" (unpublished Master's dissertation, Michigan State University, 1957).

1. Behavior characterized by well-adjusted interaction with persons and consistent with the norms of the society in which the individual lives.
2. Behavior generally characterized by satisfactory interaction with persons and society, but with periodic withdrawal from contact with people.
3. Behavior generally characterized by satisfactory interaction with persons and society, but with periodic efforts toward assertive action.
4. Behavior characterized by forceful, outgoing action or vigorous efforts to assert oneself over others.
5. Behavior characterized by withdrawal from contact with other persons.
6. Behavior characterized by a pendulum effect, vacillating between extremes of aggression and withdrawal.

Population and Sample

Kenel's population consisted of 1,057 subjects, 523 males and 534 females, who were enrolled in driver education at Sexton High School in Lansing, Michigan, between September, 1958, and June, 1960. The driving

records of these persons were used in the original study as it was a relatively simple task to follow up these individuals since most of them tended to remain in the Lansing area.

A further check of the records of these 1,057 subjects was attempted in August, 1968. The records of the female drivers were virtually impossible to obtain because of the change of names that had occurred and it was decided that the female population would be eliminated from the follow-up study.

Of the 523 males in the original study, 497 were identified as still living in Michigan, and of these 497, 480 were found to be residing in the Tri-County area of Ingham, Eaton, and Clinton counties. Inasmuch as the factor of enforcement would be one of the most difficult variables to control, it was determined that only those persons who had remained in the Tri-County area would be used for the study.

Following the identification of the 480 individuals, a complete record check was obtained from the Secretary of State's files on the 480 males. Their driving records were then categorized into three separate groupings:

1. the first 26 months following driver education
2. 60 months following the original 26 month
3. total of the 26- and 60-month record

The Data

The following data were gathered for each student:

(1) Categorization by observed rating;

(2) Categorization by Mann Inventory rating;

(3) Individual driving records, with the following breakdown:

a. violations

b. non-chargeable accidents

c. chargeable accidents

d. Secretary of State action

The information on the driving records was not weighted; only cumulative compilation was made on this data.

The Null Hypotheses

The following is a restatement of the hypotheses of this study in the Null form, i.e., stating that no significant relationships between the variables exist for the purposes of the statistical treatments.

HO 1: There is no significant, positive relationship between observed behavior ratings and moving violations in the follow-up period as during the original 26-month period.

HO 2: There is no significant, positive relationship between observed behavior ratings and chargeable

accidents in the follow-up period as during the original 26-month period.

HO 3: There is no significant, positive relationship between observed behavior ratings and non-chargeable accidents in the follow-up period as during the original 26-month period.

HO 4: There is no significant, positive relationship between observed behavior ratings and number of instances of Secretary of State action in the follow-up period as during the original period.

HO 5: There is no significant, positive relationship between observed behavior rating and composite records in the follow-up period as during the original period.

HO 6: There is no significant, positive relationship between Mann Inventory rating and moving violations in the follow-up period as during the original period.

HO 7: There is no significant, positive relationship between Mann Inventory rating and chargeable accidents in the follow-up period as during the original period.

HO 8: There is no significant, positive relationship between Mann Inventory rating and non-chargeable

accidents in the follow-up period as during the original period.

HO 9: There is no significant, positive relationship between Mann Inventory rating and number of instances of Secretary of State actions in the follow-up period as during the original period.

HO 10: There is no significant, positive relationship between Mann Inventory rating and the composite record in the follow-up period as during the original period.

HO 11: There is no significant, positive relationship between observed rated classification and Mann Inventory classification as they relate to driving record.

Analysis of the Data

The data obtained were analyzed using the following: a one-way analysis of variance.

A one-way analysis of variance was employed to determine the differences between the six behavioral categories and their individual driving records, i.e., to determine if the records accumulated by those in each of the separate categories differed significantly from those in the other categories. The .05 level of significance was used to determine the acceptance or rejection of this hypothesis (HO 1).

Summary

A sample population was drawn from Lansing Sexton High School, Lansing, Michigan. Driving records of the individuals who remained in the Tri-County (Ingham, Eaton, and Clinton, Michigan) area were compiled for the eight-year period, 1960-68.

An analysis of variance for an unequal number of observations in each category was employed to determine the significance of differences between categories on the Mann Inventory and the individual driving record. A .05 level of significance was employed to determine the rejection or detention of the hypothesis.

CHAPTER IV

ANALYSIS OF RESULTS

The results of analysis of the data are presented in this chapter. The analysis of the following are presented:

1. The differences in the driving record of the individual groupings in each of the six behavioral categories as determined by the teacher rating as it relates to the following classifications:

   a. 26-month violation record
   b. 60-month violation record
   c. 26-month chargeable accident
   d. 60-month chargeable accident
   e. 26-month nonchargeable accident
   f. 60-month nonchargeable accident
   g. 26-month Secretary of State action
   h. 60-month Secretary of State action
   i. Cumulative violation
   j. Cumulative chargeable accident
   k. Cumulative nonchargeable accident
   l. Cumulative Secretary of State action
   m. Cumulative record

2. The differences in the driver license record of the individual groupings in each of the six behavioral categories as determined by the Mann Inventory, also according to the above-listed classifications.

3. The relationship between the driver record capability measure of the teacher-rated behavior and the adjustment measure of the Mann Inventory.

From the 523 male subjects included in the original study, 480 males met the criteria of still residing in the Tri-County (Ingham, Eaton and Clinton, Michigan) area. However, of these 480, sixteen individuals were disqualified because of some discrepancy or gross errors in driver license record or failure to have renewed driver license. The total number of subjects then used in the analysis amounted to 464.

Table 1 presents the composition of the sample population by behavioral category, as determined by teacher raters. Table 2 presents the composition of the sample population as determined by the Mann Attitude Inventory. The number of individuals in each category of both tables are not equal and categories 4, 5, and 6 have smaller numbers of individuals, as these categories included individuals characterized by problems in adjustment and, therefore, represent a small part of the population in the sample.

Table 3 reports the mean scores of the groups in the different classifications of the driver license record. These occurrences have not been weighted in the final analysis.

TABLE 1.--Teacher rating sample distribution.

Category	Males
1	192
2	76
3	74
4	43
5	36
6	43
	464

TABLE 2.--Mann Inventory rating sample distribution.

Category	Males
1	177
2	85
3	79
4	36
5	31
6	56
	464

For each of the hypotheses presented on the following pages, the results of an analysis of variance for an unequal number of subjects in each category using the rating with the criteria will be presented. In each instance, an F statistic of 2.21 was needed to demonstrate significance at the .05 level. At the .05 level or below, it will be assumed that the categorizations for the designated criteria will have predictive validity.

HO 1: There is no significant, positive relationship between observed behavior ratings and moving violations in the follow-up period as during the original 26-month period.

TABLE 3.--Average occurrences of violations, chargeable accidents, non-chargeable accidents, and Secretary of State actions by teacher and Mann Inventory categorization.

Category		26-Month				60-Month				Cumulative			
		V	CA	NA	SOS	V	CA	NA	SOS	V	CA	NA	SOS
1	T	.54	.09	.16	.00	2.87	.26	.84	.68	3.41	.35	1.00	.68
	M	.67	.11	.18	.02	2.73	.23	.82	.61	3.40	.34	1.00	.63
2	T	.57	.08	.15	.00	3.01	.33	.71	.72	3.58	.41	.86	.72
	M	.47	.11	.18	.00	3.19	.27	.79	.75	3.66	.38	.97	.75
3	T	.78	.09	.23	.06	3.06	.19	.91	.55	3.85	.28	1.14	.62
	M	.70	.16	.26	.05	3.60	.31	.83	.78	4.30	.47	1.09	.83
4	T	1.44	.31	.44	.11	4.64	.29	1.22	1.11	6.09	.60	1.67	1.22
	M	1.08	.17	.36	.06	4.72	.25	1.17	1.03	5.80	.42	1.53	1.09
5	T	1.21	.32	.45	.11	3.90	.32	.90	1.29	5.11	.63	1.34	1.40
	M	1.16	.26	.42	.16	3.61	.35	.90	1.29	4.77	.61	1.32	1.45
6	T	2.07	.36	.43	.25	4.91	.32	.89	1.23	6.98	.68	1.32	1.48
	M	1.79	.23	.27	.14	4.66	.36	1.00	1.14	6.45	.59	1.27	1.14
Mean for the Sample		.861	.150	.243	.052	3.360	.274	.875	.805	4.22	.424	1.119	.857

V - Violations; CA - Chargeable Accidents; NA - Non-Chargeable Accidents; SOS - Secretary of State Actions; T - Teacher Rating; M - Mann Inventory Rating.

Table 4 gives the F statistic and value for moving violations for groupings from the teacher behavior ratings for the 26-month original period and 60-month follow-up period.

TABLE 4.--Violations--teacher ratings.

	26 Months	60 Months
F Statistic	17.25	4.24
F Value	< .0005	.001

As indicated in the table, the F value for both time periods for moving violations was within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between teacher ratings and moving violations in the 60-month follow-up period as during the original 26-month period must be rejected.

HO 2: There is no significant, positive relationship between observed behavior ratings and chargeable accidents in the follow-up period as during the original 26-month period.

Table 5 gives the F statistic and value for chargeable accidents for groupings from the teacher behavior ratings for the 26-month original period and 60-month follow-up period.

TABLE 5.--Chargeable accidents--teacher ratings.

	26 Months	60 Months
F Statistic	7.75	1.15
F Value	< .0005	.332

As indicated in the table, the F value for both time periods for chargeable accidents was not within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between teacher ratings and chargeable accidents in the 60-month follow-up period as during the original 26-month period must be accepted.

HO 3: There is no significant, positive relationship between observed behavior ratings and non-chargeable accidents in the follow-up period as during the original 26-month period.

Table 6 gives the F statistic and value for non-chargeable accidents for groupings from the teacher behavior ratings for the 26-month original period and 60-month follow-up period.

TABLE 6.--Non-chargeable accidents--teacher ratings.

	26 Months	60 Months
F Statistic	4.72	1.34
F Value	< .0005	.245

As indicated in the table, the F value for both time periods for non-chargeable accidents was not within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between teacher ratings and non-chargeable accidents in the 60-month follow-up period as during the original 26-month period must be accepted.

HO 4: There is no significant, positive relationship between observed behavior ratings and number of instances of Secretary of State action in the follow-up period as during the original period.

Table 7 gives the F statistic and value for Secretary of State action for groupings from the teacher behavior ratings for the 26-month original period and 60-month follow-up period.

TABLE 7.--Secretary of State action--teacher ratings.

	26 Months	60 Months
F Statistic	6.07	3.45
F Value	< .0005	.005

As indicated in the table, the F value for both time periods for Secretary of State actions was within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between

teacher ratings and Secretary of State actions in the 60-month follow-up period as during the original 26-month period must be rejected.

HO 5: There is no significant, positive relationship between observed behavior ratings and the comprehensive record in the follow-up period as during the original period.

Table 8 gives the F statistic and value for the comprehensive record for groupings from the teacher behavior ratings for the 26-month original period and 60-month follow-up period.

TABLE 8.--Comprehensive record--teacher ratings.

	26 Months	60 Months
F Statistic	20.92	3.57
F Value	< .0005	.004

As indicated in the table, the F value for both time periods for the comprehensive record was within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between teacher ratings and comprehensive record in the 60-month follow-up period as during the original 26-month period must be rejected.

HO 6: There is no significant, positive relationship between Mann Inventory rating and moving violations in the follow-up period as during the original period.

Table 9 gives the F statistic and value for the moving violations for groupings from the Mann Inventory ratings for the 26-month original period and 60-month follow-up period.

TABLE 9.--Moving violations--Mann Inventory ratings.

	26 Month	60 Month
F Statistic	10.87	3.68
F Value	< .0005	.003

As indicated in the table, the F value for both time periods for the moving violations was within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between Mann Inventory ratings and moving violations in the 60-month follow-up period as during the original 26-month period must be rejected.

HO 7: There is no significant, positive relationship between Mann Inventory rating and chargeable accidents in the follow-up period as during the original period.

Table 10 gives the F statistic and value for the chargeable accidents for groupings from the Mann Inventory

ratings for the 26-month original period and 60-month follow-up period.

TABLE 10.--Chargeable accidents--Mann Inventory ratings.

	26 Month	60 Month
F Statistic	1.54	1.01
F Value	.174	.411

As indicated in the table, the F value for both time periods for the chargeable accidents was not within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between Mann Inventory ratings and chargeable accidents in the 60-month follow-up period as during the original 26-month period must be accepted.

HO 8: There is no significant, positive relationship between Mann Inventory rating and non-chargeable accidents in the follow-up period as during the original period.

Table 11 gives the F statistic and value for the non-chargeable accidents for groupings from the Mann Inventory ratings for the 26-month original period and 60-month follow-up period.

As indicated in the table, the F value for both time periods for the non-chargeable accidents was not within the acceptance .05 level. Consequently, the Null

TABLE 11.--Non-chargeable accidents--Mann Inventory ratings.

	26 Month	60 Month
F Statistic	1.74	.87
F Value	.123	.503

Hypothesis of no significant positive relationship between Mann Inventory ratings and non-chargeable accidents in the 60-month follow-up period as during the original 26-month period must be accepted.

HO 9: There is no significant, positive relationship between Mann Inventory rating and number of instances of Secretary of State actions in the follow-up period as during the original period.

Table 12 gives the F statistic and value for the Secretary of State actions for groupings from the Mann Inventory ratings for the 26-month original period and 60-month follow-up period.

TABLE 12.--Secretary of State actions--Mann Inventory ratings.

	26 Month	60 Month
F Statistic	2.94	2.56
F Value	.013	.026

As indicated in the table, the F value for both time periods for the Secretary of State actions was within the acceptable .05 level. Consequently, the Null

Hypothesis of no significant positive relationship between Mann Inventory ratings and Secretary of State actions in the 60-month follow-up period as during the original 26-month period must be rejected.

HO 10: There is no significant, positive relationship between the Mann Inventory rating and the comprehensive record in the follow-up period as during the original period.

Table 13 gives the F statistic and value for the comprehensive record for groupings from the Mann Inventory ratings for the 26-month original period and 60-month follow-up period.

TABLE 13.--Comprehensive record--Mann Inventory ratings.

	26 Month	60 Month
F Statistic	8.14	3.19
F Value	< .0005	.008

As indicated in the table, the F value for both time periods for the comprehensive record was within the acceptable .05 level. Consequently, the Null Hypothesis of no significant positive relationship between Mann Inventory ratings and comprehensive record in the 60-month follow-up period as during the original 26-month period must be rejected.

HO 11: There is no significant, positive relationship between observed rated classification and Mann Inventory classification as they relate to driving record.

Table 14 gives the F value for the teacher ratings and the categorization and the Mann Inventory ratings and the categorization for the 26-month original period and the 60-month follow-up period. In addition, the acceptance or non-acceptance as it relates to the .05 level is also indicated.

As is indicated in the table, the teacher ratings had significant levels for the 26- and 60-month Secretary of State action, and the 26- and 60-month comprehensive record, plus 26-month chargeable and non-chargeable accidents; while the Mann Inventory had significant levels for the 26- and 60-month moving violations, Secretary of State action and comprehensive records, with no significant levels as it relates to accidents. On the basis of the accompanying information, the Null Hypothesis of no significant positive relationship between observed rating classification and Mann Inventory classification must be rejected.

Statistical analysis of the data reveals:

1. When students are grouped on the basis of observed behavior the groupings are significant as they relate to violations, Secretary of State actions, and comprehensive records.

TABLE 14.--Summation of teacher ratings and Mann Inventory ratings.

	F Value, Teacher Observed Behavior	Accepted, N/Accepted	F Value, Mann Inventory Rating	Accepted N/Accepted
26-Month Moving Violations	< .0005	Acc.	< .0005	Acc.
26-Month Chargeable Accidents	< .0005	Acc.	.174	N/Acc.
26-Month Non-Chargeable Accidents	< .0005	Acc.	.123	N/Acc.
26-Month Secretary of State Actions	< .0005	Acc.	.013	Acc.
26-Month Comprehensive Record	< .0005	Acc.	< .0005	Acc.
60-Month Moving Violations	.001	Acc.	.003	Acc.
60-Month Chargeable Accidents	.332	N/Acc.	.411	N/Acc.
60-Month Non-Chargeable Accidents	.245	N/Acc.	.503	N/Acc.
60-Month Secretary of State Actions	.005	Acc.	.026	Acc.
60-Month Comprehensive Record	.004	Acc.	.008	Acc.

This occurred in both the original as well as the follow-up period. Accident experience was significant in the original period, but not in the follow-up period.

2. When students were grouped on the basis of the Mann Inventory ratings, the groupings were significant for violations, Secretary of State action and comprehensive records in both the original period and the follow-up period. The groupings were not significant for either chargeable or non-chargeable accidents in either time period.
3. Both the Mann Attitude Inventory ratings and teacher ratings for violations, Secretary of State action and comprehensive record were significant at the .05 level or better in both the original period and the follow-up period.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The analysis of the data and the findings of the study were presented in the preceding chapter. In this chapter a brief statement will be presented of (1) the problem, method of procedure and major findings; (2) conclusions based on the findings; (3) recommendations for use of the Mann Inventory, as well as recommendations for further research.

Summary

Statement of the Problem

This research study was undertaken to determine if the results of Kenel's original study, "The Effectiveness of the Mann Inventory in Classifying Young Drivers into Behavioral Categories and Its Relationship to Subsequent Driver Performance," remained consistent over an extended period of time, as well as to determine if the Mann Attitude Inventory ratings were as accurate a predictor of future driving behavior as observed behavior ratings.

The male population of Kenel's study who were still residing, according to Secretary of State records, in the Ingham, Eaton, and Clinton county area were included in this investigation for the following reasons:

(1) A control of the enforcement variable as much as possible;

(2) The likelihood of comparable driving experience within groups;

(3) Availability of comprehensive driver license files;

(4) The availability of the necessary information from the original study.

All 480 students had completed the driver education program at Sexton High School and had completed the Mann Inventory and been rated by either Dr. Gutshall or Dr. Kenel. The 480 (the original sample was 523) were found to be residing in the Tri-County Area. The individuals were placed in categories by both the Mann Inventory and the teacher rating.

The hypotheses were tested by employing the analysis of variance.

Conclusions

The following are the conclusions based upon the findings of this investigation:

Conclusions on the Relationship of Observed Behavior and Driving Record

A highly significant relationship exists between observed behavior in driver education and the violation record of the groups of individuals.

1. In both the first 26 months and the follow-up 60 months the violation record was found to be significant at the .05 level.
2. The Secretary of State actions, which are largely dependent on violations, were also found to be significant at the .05 level in both the original period of time as well as the follow-up period.
3. The composite record, which was heavily weighted with violations, also was found to be significant at the .05 level in both the original as well as the follow-up period.
4. The level of significance for non-chargeable accidents was at the .05 level in the original period, but was not significant at that level in the follow-up period.
5. The same held true for chargeable accidents; that is, they were significant at the .05 level during the pre-period, but not during the follow-up period.

Conclusions on the Relationship of Mann Attitude Categories and Driving Record

A highly significant relationship exists between the Mann Attitude categories and the violation record.

1. For both the first 26 months and the follow-up 60 months the violation record was found to be significant at the .05 level.
2. The Secretary of State actions, which are largely dependent on violations, were also found to be significant at the .05 level in both the original period of time as well as the follow-up period.
3. The composite record, which was heavily weighted with violations, also was found to be significant at the .05 level in both the original as well as the follow-up period.
4. The Mann Attitude categorization did not prove significant at the .05 level in either the preliminary period or follow-up period in either the chargeable or non-chargeable accident criteria.

Conclusions on the Relationship of Observed Behavior Ratings and Mann Attitude Ratings

A highly significant relationship exists between observed behavior ratings in driver education and Mann

Attitude Inventory ratings based on the violation records of the groups of individuals involved.

1. Observed behavior ratings were significant for violations, Secretary of State actions and comprehensive record for the 26-month and 60-month periods. They were significant for chargeable and non-chargeable accidents in the 26-month period, but not during the 60-month follow-up period.
2. The Mann Attitude ratings were significant for violations, Secretary of State action and comprehensive records also in the 26-month original period as well as during the 60-month follow-up period; however, the ratings were not significant in either time period for chargeable and non-chargeable accidents.

Discussion

The study has shown that either the observed behavior ratings or the Mann Attitude Inventory can accurately predict the violation experience of the group categorization. However, neither are able to predict accident experience of the groups.

This would seem to indicate that paper and pencil tests administered in a pre-driver education experience could be useful in determining which individuals might

need individual or small group counseling sessions. The individuals who were classified in group 4, 5, or 6, according to the Mann Attitude Inventory, had a much higher violation experience than those categorized in 1, 2, or 3. Within the groupings there were some poor placements; that is, individuals who were predicted to have good records that developed bad records, and vice versa, but on an overall basis, less than 10 per cent were in this category.

It is possible that some of the assumptions referred to in Chapter I were not born out, but this was impossible to determine, as there is no acceptable way to determine driving exposure at this time. The analysis of this data was based on a seven-year period of time of driving for these individuals, and we have no way of determining how many of the individuals were, indeed, actually driving in the Tri-County Area; and, if they were, how much actual mileage they did drive.

While the accidents were not at a significant level, the incidence of such were so small that they probably tended to be out weighted by the high incidence of violations, which tended to skew the results. Here again, the lack of consistency of reporting of accidents, whether in the Tri-County Area or throughout the country, gives little credence to the non-acceptability of the

significance levels of the chargeable or non-chargeable accidents for either the Mann Inventory or observed ratings.

The writer had some impressions while working with the raw data that might be worthwhile reporting at this time. One was that there were a number of individuals who experienced high violation records, such as ten or more, in this seven-year period of time, during which they had no reported accidents. As a matter of conjecture, the writer feels that these individuals very possibly were excellent handlers of the automobile and were selective in the times they chose to violate. The pattern of violations with most of these individuals was that it was speeding violations, and with one being seventy miles over the limit.

Another impression arrived at by dealing with the raw data, was that Secretary of State actions, whether they were warning letters, suspension, or revocation, did little to reduce the violation activity of a certain number of these individuals. In fact, some of the individuals received moving violation citations while under suspension or after being revoked. This would seem to imply that the hard-core violator needs more than just a slap on the wrist to restrict his driving activities.

For twenty or thirty years, it has always been assumed that there has been a high correlation between

accidents and violations. That is, an individual who tends to get violations will ultimately be involved in accidents. As the reader can see from the preceding chapter, this did not bear out, and one of the possible reasons might be that, due to the small number of accidents in comparison to the number of violations, the statistical treatment did not discriminate well enough to determine predictive validity.

The writer also had the feeling, while working with the records of these individuals, that some things affected the lives of these individuals which changed their driving habits. For example, an individual with more than ten moving violations in the follow-up period had all ten within the first three years of this period but nothing the last two years of the study. This may be critical enough to be considered for further study to determine what outside influences do, indeed, affect the driver's behavior.

Recommendations for Research

1. The investigation of the individuals who had "good" records in the first 26 months and had "bad" records in the following 60 months, or vice versa, to see what factors contributed to this reversal.
2. Identifying the individuals who had "bad" records throughout and doing an item analysis

of the items on the Mann Inventory; then comparing them to an equal amount of "good" drivers throughout to see if there is a difference in the response to the items.

3. Using the same data, attempt to equate driving exposure within the categories to determine if a significant variation exists.
4. Utilization of the Mann Inventory to identify individuals in categories 4, 5, and 6. Then, using individual and/or group counseling, see if these individuals might have better records than the individuals in a control group who do not have this experience.
5. Identifying the individuals in all categories who had "bad" records and do a personal interview-type survey to determine if there were some common factors that contributed to the problem.
6. A further study of those individuals identified as under-controlled to determine the basis, i.e., immaturity, hostility. If sufficient numbers could be identified, an item analysis could be used to separate the causes.

7. A further follow-up study of the 480 drivers included in this study should be undertaken to see if the results remain consistent over another five-year period of time.

BIBLIOGRAPHY

BIBLIOGRAPHY

Accident Facts. 1969 ed. National Safety Council.

Adler, A. "The Psychology of Repeated Accidents In Industry." American Journal of Psychiatry, XCVIII (1941), 99-102.

Allgaier, E. "Human Behavior and Traffic Accidents." International Road Safety and Traffic Review, VI, No. 1 (Winter, 1958), 19-26, 36.

Billion, C. "Community Study of the Characteristics of Drivers and Driver Behavior Related to Accident Experience." Bulletin 172, Highway Research Board, 1958.

Birnbach, B. S. "A Comparative Study of Accident Repeater and Accident-Free Pupils." Unpublished Ph.D. dissertation, New York University, 1947.

Brody, Leon. "Personal Characteristics of Chronic Violators and Accident Repeaters." Bulletin No. 152, National Academy of Sciences, National Research Council.

_____. "The Psychology of Problem Drivers." Unpublished material, Michigan State University Highway Traffic Safety Center, 1965.

Case, H., and Stewart, R. "Some Personal and Social Attitudes of Habitual Traffic Violators." Traffic Safety Research Review, III, No. 1 (1959), 15-18.

_____. "Development of a Driving Attitude Scale." Bulletin 172. Highway Research Board, 1958.

Case, H.; Reiter, I.; Feblowicz, E.; and Stewart, R. "The Habitual Traffic Violator." Bulletin No. 120, Highway Research Board, 1956.

Combs, A., and Syngg, D. Individual Behavior: A Perceptual Approach to Behavior. New York: Harper & Row, 1959.

Conger, J. "Personal and Interpersonal Factors In Motor Vehicle Accidents." American Journal of Psychiatry, No. 113 (June, 1957), 1,069-75.

Crancer, A., and McMurray, L. "Credit Ratings As A Predictor of Driving Behavior and Improvement." Department of Motor Vehicles, State of Washington, Report No. 010, May, 1968.

_____, and _____. "Emotional Stress and Driving Performance: The Effect of Divorce." Department of Motor Vehicles, State of Washington, Report No. 016, August, 1968.

_____, and Quiring, D. "Driving Records of Persons Arrested For Illegal Drug Use." Department of Motor Vehicles, State of Washington, Report No. 011, May, 1968.

_____, and _____. "The Chronic Alcoholic As A Motor Vehicle Operator." Department of Motor Vehicles, State of Washington, Report No. 012, May, 1968.

_____, and _____. "The Mentally Ill As Motor Vehicle Operators." Department of Motor Vehicles, State of Washington, Report No. 013, June, 1968.

_____, and _____. "Driving Records of Persons Hospitalized For Suicide Gestures." Department of Motor Vehicles, State of Washington, Report No. 014, July, 1968.

_____, and _____. "Driving Records of Persons With Selected Chronic Diseases." Department of Motor Vehicles, State of Washington, Report No. 015, July, 1968.

DeSilva, H. R., et al. "Some Psychological Factors in Accident Repeater Drivers." Journal of Abnormal and Social Psychology, XXXIV (January, 1939).

Driver Behavior Cause and Effect. Washington, D.C.: Insurance Institute for Highway Safety, 1968.

Dubin, S. "Emotions and Traffic Accidents." Traffic Safety Research Review, V, No. 2 (1961), 4-9.

Eno Foundation for Highway Traffic Control. "Personal Characteristics of Traffic-Accident Repeaters." Saugatuck, Connecticut: 1948.

Eysenck, H. "The Personality of Drivers and Pedestrians." Reprinted by W. Haddon in Accident Research Methods and Approaches. Medicine Science and Law (London), III, No. 1 (1962), 416-23.

Forbes, T. "Psychological Factors In Traffic Accidents on Freeways." Traffic Safety Research Review, II, No. 4 (1958), 24-26.

Gates, W. "An Investigation to Determine the Relationship Between Emotional Immaturity and Accident Proneness." National Safety Council Transactions, XXVII (October, 1958), 52-53.

Goldstein, L., and Mosel, J. "A Factor Study of Drivers' Attitudes, With Further Study on Driver Aggression." Bulletin No. 172, Highway Research Board, 1958.

_____. "Human Variables In Traffic Accidents: A Digest of Research." Traffic Safety Research Review, VIII, No. 1 (1964), 26-29.

Guilford, J. Fundamental Statistics in Psychology and Education. New York: McGraw-Hill, 1950.

Hackley, W., and Schlesinger, L. "Changing Driver Attitudes Through Group Discussion: A Pilot Experiment." Traffic Safety Research Review, X, No. 3 (1966), 78-82.

Haddon, W.; Suchman, E.; and Klein, D. Accident Research Methods and Approaches. New York: Harper & Row, 1964.

Haner, C. "Use of Psychological Inventory in Writing Insurance For Youthful Male Drivers." Traffic Safety Research Review, VII, No. 1 (1963), 5-9.

Heath, E. "Relationships Between Driving Records, Selected Personality Characteristics, and Biographical Data of Traffic Offenders and Non-Offenders." Bulletin 212, Highway Research Board, 1959.

Jacobs, Herbert H., et al. Behavioral Approaches to Accident Research. New York: Association for the Aid of Crippled Children, 1961.

Kenel, F. "The Effectiveness of the Mann Inventory in Classifying Young Drivers Into Behavioral Categories and Its Relationship to Subsequent Driver Performance." Unpublished Ph.D. dissertation, Michigan State University, 1967.

Klein, D. "A Reappraisal of the Violation and Accident Data of Teen-Aged Drivers." The Caldea Calendar, XIV, No. 2 (1967), 19-21.

Levonian, E. "Prediction of Accidents and Convictions." Traffic Safety Research Review, XI, No. 3 (1967), 75-79.

Mann, W. "Let's Talk It Over." Analogy, Charter Issue Allstate Insurance Company, 1966, 4-9.

_____. "Teen-Age Personality As Related To Driving Behavior." Paper presented to the National Home Demonstration Council Conference on Traffic Safety, Kellogg Center, Michigan State University, East Lansing, Michigan, February, 1961.

_____. "The Nature of the Problem Driver." Paper presented to the Driver Improvement School Conference, Kellogg Center, Michigan State University, East Lansing, Michigan, December, 1965.

McFarland, R. "Psychological and Behavioral Aspects of Automobile Accidents." Traffic Safety Research Review, XII, No. 3 (1968), 71-80.

Myrick, Richard; Schlesinger, Lawrence; and Marx, Barbara. A Manual For Instructors Conducting Discussions on Driver Attitudes. The George Washington University, November, 1962.

Preston, C., and Harris, S. "Psychology of Drivers In Traffic Accidents." Journal of Applied Psychology, XLIX, No. 4 (1965), 284-88.

Rainey, R.; Conger, J.; and Walsmith, C. "Personality Characteristics As A Selective Factor in Driver Education." Bulletin No. 285, Highway Research Board, 1961.

_____, et al. "An Investigation of the Role of Psychological Factors in Motor Vehicle Accidents." Bulletin No. 212, Highway Research Board, 1959.

Rommel, R. C. S. "Personality Characteristics and Attitudes of Youthful Accident-Repeating Drivers." Traffic Safety Research Review, III, No. 1 (1959).

Ronis, L. A. "A Study of Characteristics Differentiating Bus Drivers Who Have Accidents from Those Who Do Not Have Accidents." Unpublished Master's dissertation, Western Reserve University, 1950.

Schaff, John G. "Personal Attitude Survey." Unpublished Master's dissertation, Michigan State University, 1957.

Schlesinger, Lawrence. Group Dynamic Study of Driver Attitudes and Driving Behavior. Washington, D.C.: George Washington University, Driver Behavior Research Project, May, 1963.

Schuman, S.; Pelz, D.; Ehrlick, H.; and Selzer, M. "Young Male Drivers." Journal of American Medical Association, CC, No. 12 (1967), 1,026-30.

Schuster, D., and Guilford, J. "An Analysis of Accident Repeater and Chronic Violator Drivers." National Safety Council Transactions, XXIV (October, 1958), 136-39.

_____. "Prediction of Follow-Up Driving Accidents and Violations." Traffic Safety Research Review, XII, No. 1 (1968), 17-21.

Shaw, L. "The Practical Use of Projective Personality Tests As Accident Predictors." Traffic Safety Research Review, IX, No. 2 (1965), 34-72.

Turrell, E. "Emotions: Personality's Multiple Facets." Traffic Safety, December, 1957, 22-23, 53-54.

Venables, P. "Car Driving Consistency and Measures of Personality." Journal of Applied Psychology, XL, No. 1 (1956), 21-23.

APPENDICES

APPENDIX A

THE MANN INVENTORY AND RESPONSE SHEET

MANN INVENTORY

Name_____ Age_____Sex____ ____
mo. da. yr. M F

	A	B	C	D	E
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.	( )	( )	( )	( )	( )
34.	( )	( )	( )	( )	( )
35.	( )	( )	( )	( )	( )
36.	( )	( )	( )	( )	( )
37.	( )	( )	( )	( )	( )
38.	( )	( )	( )	( )	( )
39.	( )	( )	( )	( )	( )
40.	( )	( )	( )	( )	( )
41.	( )	( )	( )	( )	( )
42.	( )	( )	( )	( )	( )
43.	( )	( )	( )	( )	( )
44.	( )	( )	( )	( )	( )
45.	( )	( )	( )	( )	( )
46.	( )	( )	( )	( )	( )
47.	( )	( )	( )	( )	( )
48.	( )	( )	( )	( )	( )
49.	( )	( )	( )	( )	( )
50.	( )	( )	( )	( )	( )
51.	( )	( )	( )	( )	( )
52.	( )	( )	( )	( )	( )
53.	( )	( )	( )	( )	( )
54.	( )	( )	( )	( )	( )
55.	( )	( )	( )	( )	( )
56.	( )	( )	( )	( )	( )
57.	( )	( )	( )	( )	( )
58.	( )	( )	( )	( )	( )
59.	( )	( )	( )	( )	( )
60.	( )	( )	( )	( )	( )
61.	( )	( )	( )	( )	( )
62.	( )	( )	( )	( )	( )
63.	( )	( )	( )	( )	( )

MANN INVENTORY

Response to the following statements appear to reflect an individual's feelings about himself and his relationships with other people. There are no right or wrong answers. Fill in on the answer sheet the response (A) always, (B) usually, (C) sometimes, (D) rarely, (E) never--that best reflects your feelings toward each statement.

1. I (like) (liked) to take part in organized extra-curricular activities in school.

2. Young people are much better drivers than are middle-aged people.

3. Policemen are sincere in enforcing traffic laws.

4. My parents (are) (were) reasonable in their relations with me.

5. My community is a happy place to live.

6. I put off until tomorrow things that I should do today.

7. I like to daydream.

8. I feel full of pep when I get behind the wheel.

9. I (live) (lived) in a home that (is) (was) happy.

10. If I see a police officer, I am more careful.

11. Over-careful drivers cause more accidents than the so-called reckless ones.

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 (any grade level) are set up to meet the needs and interests of the student.

15. I am concerned about the way my clothes look.

16. Slow drivers should be kept off the highways.

17. New drivers should be required to take a course in driver education.

18. Unsafe drivers should be deprived of the right to drive.

19. Accidents (mishaps) 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) (exerted) too much control over me.

23. The people in my community want all traffic laws enforced.

24. I have been tempted to cheat on a test.

25. I get impatient 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 myself out of trouble.

34. Strong discipline in practice makes a better team.

35. I (am) (was) popular with most of the students in my class.

36. Police officers are rougher on teen-agers than on adults.

37. Teachers want to help students with their problems.

38. My (father) (principal driver in family) 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. Society should have the right to question the way I drive.

42. I like to razz a 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 work.

46. Our family (spends) (spent) a great deal of time together.

47. Attitudes toward driving are more important than ability to handle a 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 (become) (am) 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 toward 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) (insisted) that I spend most weekday 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.

(FINISH)